UNIVERSITY OF KWAZULU-NATAL

A conceptual framework for private higher educational institutions to respond to disruptions in South Africa

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2024

DECLARATION

I **Tshepo Religion Maota** declare that

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DEDICATION

Finally, I dedicate this thesis to the Lord Almighty, trusting that it will be used for his glory and to positively impact the world. To God be the glory, great things He has done!"

To my beloved children, who inspire me every day with your curiosity and resilience. May this study serve as a reminder of our collective pursuit for a better future, where education and leadership intertwine to create a world of opportunities. With all my love and dedication, this work is dedicated to you.

LIST OF ABBREVIATIONS AND ACRONYMS

AI	-	Artificial Intelligence
CDC	-	Centres for Disease Control and Prevention
CFO	-	Chief Financial Officer
CHE	–	Council on Higher Education
CISA	-	Cybersecurity and Infrastructure Security Agency
CMB	-	Code matrix browser
CNET	-	Computer Network
COVID-19	-	Coronavirus disease of 2019
CWUR	-	Centre for World University Rankings
CSRP	-	Centre for Sociological Research and Practice
DHET	-	Department of Higher Education and Training
DMB	-	Document Matrix Browser
DT	-	Design Thinking
EAB	-	Education Advisory Board
EAPA-SA	-	Employee Assistance Professionals Association of South Africa
HE	-	Higher Education
HEIs	-	Higher Education Institutions
HR	-	Human Resource
ILO	-	International Labour Organisation
IT	-	Information Technology
ISACA	-	Information Systems Audit and Control Association
IoT	-	Internet of Things
IQR	-	Interquartile range
MANCOSA	-	Management College of Southern Africa
MAXQDA	-	Max Weber Qualitative Data Analysis
MBA	-	Master’s in business administration
MIT	-	Massachusetts Institute of Technology
ML	-	Machine Learning
MOOC	-	Massive Open Online Courses
NERSA	-	National Energy Regulator of South Africa
NDP	-	National Development Plan

NSFAS	-	National Student Financial Aid Scheme
PHE	-	Private Higher Education
PHEIs	-	Private Higher Education Institutions
POPIA	-	Protection of Personal Information Act
PWC	-	Price Waterhouse Coopers
SA	-	South Africa
SAICA	-	South African Institute of Chartered Accountants
STATS SA	-	Statistics South Africa
The IIA	-	The Institute of Internal Auditors
UN	-	United Nations
Unisa	-	University of South Africa
UNICEF	-	The United Nations Children's Fund
UKZN	-	University of KwaZulu-Natal
URL	-	Uniform Resource Locator
WHO	-	World Health Organisation

OUTCOME OF RESEARCH

Book chapter contribution

1. Maota, T. and Naidoo, V., 2022. Response of Private Higher Education Leadership to Pandemic Crisis. *Research Highlights in Language, Literature and Education Vol. 2*, pp.127-148 (**Published**).
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4. Maota, T. and Naidoo, V. 2024. Navigating disruptive frontiers: Exploring management innovations in contemporary higher education **(Unpublished)**

ABSTRACT

During the unprecedented COVID-19 pandemic, global societies experienced widespread disruption and uncertainty, significantly affecting higher education. This "black swan" event tested the resilience of higher education institutions, necessitating an involuntary shift in instructional practices. This study explores the impact of pandemic disruptions on student and staff experiences in local PHEIs, with a focus on their operational flexibility and capacity to navigate turbulent circumstances.

The research employs a mixed-methods approach, involving a sample size of 381 students and 316 staff members from various demographic backgrounds. We administered the survey using reliable measures to ensure high response rates. The findings indicate that lower-level students, such as undergraduates, faced greater difficulties in adapting to online learning compared to higher-level students, such as master's and doctoral candidates. The challenges included limited access to technology and resources, as well as difficulties maintaining engagement and motivation. In contrast, staff members initially reported high levels of support adequacy, but these ratings decreased with increased years of experience, possibly due to burnout and evolving expectations.

Leaders within PHEIs highlighted the need for enhanced training and preparedness to manage disruptions effectively. They identified specific challenges, such as political and economic factors, system changes, and the absence of specialised tools for disruption management. Insights from leaders included the importance of scenario planning, robust communication strategies, and fostering a culture of adaptability and resilience. We developed a comprehensive framework for disruption management as a guiding beacon for navigating disruptive encounters. We created a machine-learning-based predictive model using a binary classification tree to predict disruption risks within this framework. The model was trained on variables such as potential impact, probability of occurrence, warning index, and relevance to the education sector, achieving high accuracy in classifying disruption risks.

Despite limitations like region-specific focus and challenges of data collection during a pandemic, this study provides valuable insights into proactive strategies, support significance, effective leadership, and predictive models for disruption management in

higher education. This research contributes to the understanding of disruption management in PHEIs and provides practical tools for enhancing institutional resilience.

Keywords:

Disruption management, PHEIs, predictive model, preparedness, institutional resilience, support adequacy, machine learning, leadership, mixed-methods design.

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CHAPTER 1

"The epidemics of the early 21st century revealed a world unprepared, even as the risks continue to multiply. Much worse is coming".

- (Ed Yong, 2018)

1.1 INTRODUCTION

The notion that 2020 was a defining moment in the chronicles of societal unrest and instability caused by the COVID-19 pandemic has become an aphorism. COVID-19 was the most challenging stress test that many businesses worldwide had to experience. Early indications are that it had far-reaching consequences across various industries (Accenture, 2020:1; Nehrebecka, 2021). Historical events such as the 2008 financial crisis and the 1918 influenza pandemic have tested the strength of institutions in the past. These upheavals have consistently revealed weaknesses and necessitated rapid changes, highlighting the importance of readiness and flexible tactics in different industries (Beach et al., 2022; Krishnan et al., 2020). COVID-19 has also severely impacted the higher education (HE) sector (Tamrat, 2021). It exposed vulnerabilities in global supply chains and prompted the study of alternate business management strategies (Alao & Gbolagade, 2020:108).

In 2019, a tabletop simulation exercise involving the Johns Hopkins Centre for Health Security, the World Economic Forum, the Bill and Melinda Gates Foundation, and representatives from several governments revealed gaps in pandemic preparedness (Ghiga et al.2021). In this context, Kracov (2021) believes that individuals who did not plan for the anticipated risk should not cite an epidemic such as COVID-19 as an excuse.

Unfortunately, leaders of higher education institutions were among those who were unprepared and taken off guard by the scale and severity of high-risk crises like COVID-19 (Hommel, 2020:1). Wardman (2020:1093) agreed with Hommel (2020) that the COVID-19 pandemic showed many leadership flaws, with most leaders not knowing "fundamentals" like partnership, responsiveness, and openness for handling incidents.

Ronkowitz and Ronkowitz (2021) also add that higher education lacked a proactive response to a national event of the size of COVID-19 and that the only option was to be reactive.

1.2 BACKGROUND TO THE STUDY

Mitroff, Diamond, and Alpaslan's (2006:67) study on university preparedness for crises states that a leader's response to events at other institutions is, "this could never happen here. We have a different situation". However, as Hommel (2020:1) noted, university leaders, should consider the possibility that the "coronavirus rhino is already charging at them." This implies that higher education institutions must anticipate and prepare for recurring crises. The situation poses significant risks because it involves not only shareholders' financial resources but also human lives. This introduces a new aspect to the management of disruptions (Marshall et al., 2020).

Higher education institutions (HEIs) are among the oldest types of organisations (Geschwind & Broström, 2022), yet they face increasingly complex and interconnected problems today, such as pollution, climate change, inequality, overpopulation, and social injustice. While Simpson and Lourenco (2020:10) acknowledge that some large colleges and universities have navigated social changes, student strikes, and civil unrest in the past, the COVID-19 pandemic presented an unprecedented challenge. This crisis forced institutions to pivot into unfamiliar territories rapidly, highlighting their unpreparedness and the need for robust frameworks and business models to plan for the future.

COVID-19's impact on HEIs was global. In the United States, several private higher education institutions (PHEIs) closed (Schleicher, 2020:1), while in countries like Malaysia, Ghana, Uganda, and Ethiopia, there were significant drops in enrollments and profits (Tamrat, 2021:1). In South Africa, a report by Statistics South Africa (2021:1) indicated that the pandemic and subsequent lockdowns negatively affected HEIs' finances due to declining tuition fee collections. This situation is particularly challenging for developing countries like South Africa, which face external barriers to online education, such as high data costs and insufficient student support (Brenya, 2024). In

contrast, HEIs in developed countries benefit from established infrastructure and support systems.

Before the pandemic, many South African HEIs utilised a learning management system (LMS) as an educational tool (Mfingwana, 2023). However, research revealed that these systems were inadequate for full-scale online learning (Mpungose, 2020:5). Even resource-rich institutions like Unisa struggled to transition online effectively. The abrupt shift to online learning in 2020 exposed these weaknesses, compelling all institutions to adapt despite being unprepared (Mhlanga & Moloi, 2020:5).

COVID-19 forced some previously hesitant institutions to embrace e-learning, creating a "blue ocean" opportunity to enhance educational processes (Chelishcheva, 2023). Studies reveal that most Higher Education Institutions (HEIs) globally, particularly in developing countries (Mhlanga & Moloi, 2020:5; Tien et al., 2022), were unprepared for this rapid transition, despite the perceived positive disruption (Almahasees et al., 2021:2). Felix (2021) notes that many institutions adopted technology out of necessity rather than strategic planning.

Research indicates that the shift to online education was a financial and logistical challenge for HEIs worldwide (Purcell & Lumbreras, 2021:1), including prestigious institutions like Harvard University (The Harvard Crimson, 2021:1). As educational processes, technology, and infrastructure become more complex, the risks and challenges for HEI leaders also increase. Leaders had to navigate this uncharted territory without a clear roadmap (Herbst, 2021).

An international survey revealed that many leaders doubted their ability to handle the challenges posed by the pandemic and future crises (Development Dimension International, 2021:16). As the pandemic progressed, HEI leaders had to make difficult decisions, manage the situation, and lead their institutions through unprecedented disruptions. Senior management plays a crucial role in meeting the institution's goals and objectives (Cloete & Maasen, 2015:3). Therefore, it is imperative for HEI leaders to

develop dynamic disruption management frameworks that can adapt to evolving challenges. We must continuously update these frameworks to address emerging factors affecting institutional operations, drawing lessons from the COVID-19 pandemic.

In PHE settings, leaders include chief executives, academic directors, managing directors, registrars, deans, department heads, and managers responsible for institutional governance. These leaders must be capable of collectively addressing all organisational challenges. Readiness, in this context, means the ability to anticipate and respond proactively to disruptive forces. Disruption in education refers to the interruption of traditional educational models (García-Morales et al., 2021:2).

The Department of Higher Education lists the institution under investigation ("the institution"), which serves diverse target markets with various institutional archetypes. Despite the economic challenges posed by COVID-19, the institution demonstrated resilience and adaptability, reporting positive performance in its 2021 annual report (Anon, 2022). Understanding its preparedness for disruptions like COVID-19, with a focus on leadership, is pivotal. This study aims to assess the readiness of leadership before and during the disruption, identifying strengths and areas for improvement.

Collecting feedback from all stakeholders, including staff and students, will ensure a holistic and implementable framework. This framework must be able to adapt to changing circumstances and respond to new and unforeseen disruptions. Preparedness goes beyond having a plan; it requires immediate implementation and continuous adaptation (Ronkowitz & Ronkowitz, 2021).

This study seeks to understand the actions and decisions of HEI leaders during disruptions to provide insights for future planning. By evaluating leaders' strengths and weaknesses, we can develop a comprehensive framework for managing future disruptions in the private higher education sector. We will incorporate lessons learned from the COVID-19 pandemic into this framework and continuously update it to remain relevant and effective.

1.3 PROBLEM STATEMENT

Albert Einstein wrote in *A Message to Intellectuals* in 1948, “Our situation is not comparable to anything in the past. It is impossible, therefore, to apply methods and measures that, at an earlier age, might have been sufficient” (Einstein, 1948:299). This statement remains relevant as the complexity of problems evolves over time. Empirical evidence suggests that higher education institutions were unprepared for large-scale disruptions like COVID-19 (Hommel, 2020:1; Purcell & Lumbreras, 2020; Wardman, 2020:1093) and remain unprepared for future disruptions (Development Dimension International, 2021:16).

Rashid and Yadav (2020) support this view, stating that there were no standards for managing disruptions in higher education during the COVID-19 pandemic. Herbst (2021) concurs, noting that education leaders navigate uncharted territory without a clear map. A recent survey also indicates that leaders of private higher education institutions (PHEIs) are less confident about their institutions' future financial stability (Syntellis, 2022:4). This is particularly challenging for PHEIs in developing nations like South Africa, which must adapt to evolving demands and constraints. Leaders are therefore not fully confident in their ability to manage future disruptions or possess a comprehensive framework for guiding disruption management.

The COVID-19 pandemic has impacted higher education institutions worldwide, revealing their unpreparedness to handle crises. Global institutions have faced disruptions in international student mobility, particularly Chinese students (Liu & Peng, 2024). This has led to financial consequences for countries reliant on international student enrollment (Hari et al., 2023; Gilmartin et al., 2023). Remote learning has presented additional challenges for international students, including technology, language, and cultural barriers. South African higher education also faces difficulties, including a lack of resources and support for vulnerable students (Naidoo & Cartwright, 2022).

The pressure on educational leaders to develop and implement plans to mitigate the consequences of the pandemic and other disruptions is immense (Gonzalez, 2022). Financial constraints and the lack of government assistance exacerbate this challenge

for South African PHEI leaders, increasing their reliance on tuition fees (Singh & Tustin, 2022). Unlike public institutions that are eligible for government support, PHEIs must secure alternative funding sources, heightening their vulnerability to disruptions (Ruiz-Morris, 2023).

The COVID-19 pandemic has highlighted both opportunities for transformation and significant obstacles for higher education institutions, necessitating the management of new imperatives (Younis & Elbanna, 2023). The pandemic's "new normal" underscores the critical importance of preparedness for major disruptions (Sato et al., 2023).

These challenges highlight the urgent need for research focused on higher education leadership roles, readiness, and strategies for managing disruptions. This study is novel in its development of a dynamic disruption predictive model and a holistic framework specifically tailored for higher education institutions. By integrating advanced data analytics and scenario planning, the study offers innovative solutions for anticipating and mitigating disruptions.

The scarcity of studies in this area (Gowing & Langdon, 2015:2; Leal Filho et al., 2020:4; Nel et al., 2018:3; Jandris et al., 2012:2; Rodrigues et al., 2020:8) underscores the importance of this study. By developing a comprehensive framework based on lessons learned from COVID-19, this study aims to fill the research gap, providing higher education leaders with the tools and strategies needed to effectively manage future disruptions. This framework will contribute to the field by offering practical, evidence-based guidelines for enhancing institutional resilience and leadership preparedness in the face of ongoing and future challenges.

1.4 RESEARCH OBJECTIVES

a. To investigate the level of preparedness of institutional leaders to address and resolve disruptive challenges, including but not limited to the COVID-19 pandemic.

b. To examine the capability and capacity that institutional leaders developed in response to diverse disruptions.
c. To identify and apply relevant, predictable factors for a supervised machine learning model that can anticipate various type of disruptions.
d. To identify the non-predictable factors for which we propose management and mitigation strategies applicable to multiple contexts.
e. To understand the experiences of staff and students regarding different types of disruptions.

1.5 RESEARCH QUESTIONS

The following research questions will guide the study:

a. How prepared are institutional leaders in responding to and managing various types of disruptions, including but not limited to the COVID-19 pandemic?
b. What capacity and capability have institutional leaders developed to deal with modern-day disruptive challenges across different contexts?
c. What are the relevant predictive factors that can be applied to a supervised machine learning model for anticipating various types of disruptions?
d. What are the significant non-predictable factors that require specific management and mitigation strategies applicable to multiple contexts?
e. What were the experiences of staff and students regarding different types of disruptions, including but not limited to COVID-19?

1.6 HYPOTHESIS

The study's hypotheses are as follows:

Primary hypothesis

H_{10}: There is no difference between institutions with proactive leadership that have developed and implemented crisis management plans compared to institutions with reactive leadership.

H_{1A}: Institutions with proactive leadership that has developed and implemented crisis management plans are better prepared to respond to and manage disruptions compared to institutions with reactive leadership.

H_{20}: There is no difference in an institution with resources, well-trained staff, and technologies being better equipped to handle modern-day disruptive challenges compared to an institution with limited resources and outdated technologies.

H_{2A}: Institutions with diverse and well-trained staff, resources, and technologies are better equipped to handle modern-day disruptive challenges compared to institutions with limited resources and outdated technologies.

H_{30}: There is no difference in the level of adequate support and communication received during the COVID-19 disruption in terms of Staff having a more positive experience.

H_{3A}: Students and staff who received adequate support and communication during the COVID-19 disruption had a more positive experience compared to those who did not.

Alternative hypotheses

H_{40}: Institutions with reactive leadership that adapt quickly and learn from ongoing crises may develop effective strategies for managing disruptions, potentially performing as well as or better than institutions with pre-existing crisis management plans.

H_{4A}: Some proactive leadership strategies may not be effective in all contexts, leading to varying levels of preparedness and response effectiveness depending on specific disruption scenarios.

H_{50}: Institutions with limited resources but innovative and adaptive strategies may effectively manage disruptions, leveraging community partnerships and alternative technologies.

H_{5A}: The presence of resources and technologies alone may not guarantee better preparedness if not accompanied by effective training and strategic implementation.

$H_{60:}$ There may be variability in staff and student experiences based on individual factors such as resilience, personal support networks, and pre-existing conditions, regardless of institutional support.

H_{6A}: Adequate support and communication may not be sufficient to create positive experiences if other critical factors, such as mental health resources and flexibility in academic requirements, are lacking.

1.7 RATIONALE FOR THE HYPOTHESES

The COVID-19 pandemic has had wide-spread effects on many industries, including HE (Baker, Wagner, & Yuan, 2020; Leal Filho *et, al.* 2022; Ozanne, Chowdhury, Prayag, & Mollenkopf, 2022). HEIs were forced to shift to unplanned remote learning and re-evaluate their education strategies, creating considerable difficulties for the sector (Mncube, Mutongoza, & Olawale, 2021:403). Yet, the pandemic has also revealed the lack of preparedness of HE leaders to deal with high-risk crises (Eckel & King, 2020:166; Ronkowitz & Ronkowitz, 2021:1; Wardman, 2020:1093).

According to Liu *et al*. (2022:353), the crisis management plans in some HEIs developed before the COVID-19 pandemic were insufficient for dealing with the prolonged and unpredictable nature of the crisis. The findings suggest that organizations need to adapt their crisis management strategies to account for unprecedented events such as the COVID-19 pandemic. This highlights the need for proactive sensemaking leadership that can respond to emerging crises (Barton, Sutcliffe, Vogus & De Witt, 2015:75) and continuously update crisis plans in light of new information and changing circumstances. In addition, the study by García-Morales, Garrido-Moreno, and Martín-Rojas (2021) shows how the pandemic challenged the traditional methods of conducting business in HEIs, and leaders battled to keep up with the fast-developing scenario.

Wardman (2020:1093) and Ronkowitz and Ronkowitz (2021:192) provide additional insight that the pandemic has exposed leadership flaws. Wardman observed that leaders lacked the “fundamentals” of cooperation, responsiveness, and openness in resolving crises (Wardman, 2020:1093). Ronkowitz and Ronkowitz (2021:201) believe that the

response of higher education institutions to COVID-19 was reactive rather than proactive, demonstrating that leaders lacked preparation and forethought. Even though the COVID-19 disruption created a lot of challenges for higher education institutions (HEIs), those with proactive leadership, well-trained and diverse staff, and access to the right resources and technologies were better positioned to deal with them (Altbach, Reisberg, & Rumbley, 2019; Daniel, 2020:92).

The studies by Gurin (2020) and Plakhotnik *et al.* (2021) found that students fared better academically throughout the disruptive period if their institutions provided adequate support to them, their educators and other staff members. The opposite was true for institutions that failed to provide support to students and staff members during the crises (Cao *et al.* 2020; Stoloff, Delgado, & Schmitt, 2021). During the pandemic, it was necessary for HEIs to have access to a clearly defined response plan. Institutions that had better prepare for the crisis were able to weather it with minimal loss to their bottom line, whereas losses were substantial at those without contingency plans (Bolman & Gallos, 2020; Maota & Naidoo, 2022:9; Radic *et al*. 2020).

Thus, it is hypothesised that:

H1: Institutions with proactive leadership that has developed and implemented crisis management plans are better prepared to respond to and manage disruptions compared to institutions with reactive leadership.

The COVID-19 pandemic has highlighted the importance of proactive leadership and crisis management plans in higher education institutions (HEIs). Institutions with proactive leadership that have developed and implemented crisis management plans are better prepared to respond to and manage disruptions, compared to institutions with reactive leadership (Bolman & Gallos, 2020; Gurin, 2020; Kim, 2016; McNamara, 2021:10, Ovie, 2022:42). Proactive leadership involves anticipating potential challenges and developing strategies to address them before they occur. In contrast, reactive leadership involves

responding to challenges as they arise, often resulting in a more chaotic and disorganized approach to crisis management (Shufutinsky, Long, Sibel, & Burrell, 2021:140).

HEIs that prioritize proactive leadership have been found to be better able to manage crises, such as the COVID-19 pandemic. For example, researchers notes that institutions with proactive leadership were able to develop and implement contingency plans quickly, enabling them to respond effectively to the pandemic (Giousmpasoglou, Marinakou, & Zopiatis, 2021:7; Hahang, Bayraktar, & Jiménez, 2022:495). In contrast, institutions with reactive leadership struggled to adapt to the sudden disruption caused by the pandemic. Effective crisis management plans are also essential for HEIs. Such plans help institutions to anticipate and mitigate potential risks, minimize disruptions to operations, and ensure continuity of services (Fani, & Subriadi, 2019:276; Koonin, 2020:1). HEIs that have well-developed crisis management plans are better equipped to respond to disruptions, including the COVID-19 pandemic, than those without such plans (Maota & Naidoo, 2022:9; Stoloff, Delgado, & Schmitt, 2021).

H2: Institutions with diverse and well-trained staff, resources, and technologies are better equipped to handle modern-day disruptive challenges compared to institutions with limited resources and outdated technologies.

Institutions that have a diverse and well-trained staff, access to enough resources, and up-to-date technologies are better able to deal with the disruptive challenges in the world today than institutions that don't have enough resources or technologies that are not up-to-date. There is a growing body of research that shows how important it is for institutions to have a diverse and well-trained staff, access to enough resources, and up-to-date technologies in order to deal with disruptive problems in the modern world.

A diverse workforce has been shown to bring about significant benefits for organizations, including increased creativity, innovation, and problem-solving abilities (Eswaran, 2019:1). Similarly, Kim and Jung (2022:4) found that institutions that put a high priority on employee training and development have staff with higher job satisfaction and motivation,

which leads to more work and better results. Also, institutions need to have access to the right resources, including financial, technological, and physical ones, in order to deal with problems like the COVID-19 pandemic (García-Morales, Garrido-Moreno, & Martín-Rojas, 2021; Shammi, Bodrud-Doza, Islam, & Rahman, 2020:4). Institutions with limited resources may struggle to implement necessary changes or respond in a timely manner to disruptive events.

Up-to-date technologies are essential for institutions to keep up with the fast-paced changes of the modern world. Institutions that adopt new technologies and adapt to new ways of working are better equipped to handle challenges such as the shift to remote work and online learning brought about by the COVID-19 pandemic (Gaur, Majumder, Sa, Sarkar, Williams & Singh, 2020:1993). In the midst of the crisis, technologies helped keep the HEI system afloat (Haleem, Javaid, Qadri & Suman, 2022:275).

H3: Students and staff who received adequate support and communication during the COVID-19 disruption had a more positive experience compared to those who did not.

Research shows that students and staff who received sufficient support and clear communication during the COVID-19 pandemic disruption had a more positive experience compared to those who did not. Higher education institutions that provided appropriate resources and guidance to their students and staff during the pandemic were better equipped to manage the unexpected disruptions caused by the pandemic. A study conducted by Lattimer, and Bidjerano (2021), found that students who received regular and clear communication from their institutions during the pandemic disruption felt more supported and less anxious compared to those who did not. Similarly, staff who were provided with adequate support and resources reported higher levels of job satisfaction and felt more valued by their institutions. Therefore, it is essential for higher education institutions to prioritize clear communication and support for their students and staff during periods of unexpected disruption, such as the COVID-19 pandemic. By doing so, institutions can help mitigate the negative impacts of the disruption and ensure a more positive experience for their students and staff.

1.8 SIGNIFICANCE OF THE STUDY

A recent study by Alao and Gbolagade (2020:109) highlighted the scarcity of systematic research on businesses' readiness, effects, and responses following the COVID-19 disruption. This research aims to fill that gap by examining how leaders react to business disruption and addressing the essence of the challenges they face in the age of "wicked problems." The study will contribute to knowledge and inform practice by recommending a comprehensive Disruption Management Framework (DMF) tailored for private higher education institutions.

The proposed DMF includes 14 key pillars: technology, people management, decision-making, scenario analysis and planning, policy, leadership and governance, specialised training and empowerment, collaborations, a flexible business model, change management, communication, monitoring and controlling, research, framework, and environment scanning. These components work together to provide a structured, proactive approach to managing disruptions, ensuring that institutions can maintain continuity and resilience during crises.

This study holds significant value for various stakeholders as below.

For institutional leaders and managers: The DMF will serve as a comprehensive guide, offering detailed procedures and best practices for ensuring the continuity of business processes before, during, and after a disaster. For example, the technology pillar will outline the implementation of advanced digital tools to facilitate remote learning and operations, while the decision-making pillar will provide a clear, structured process for making timely and effective decisions during a crisis.

For students: The framework will ensure that their education will continue with minimal disruption, even in times of crisis. By establishing robust online learning systems and effective communication channels, the DMF will help mitigate the stress and uncertainty students may experience during disruptions. For instance, the change management pillar

will include strategies to help students adapt to new learning environments quickly and smoothly.

Staff: The DMF will provide a consistent and systematic response framework that managers can refer to, ensuring that all staff members understand their roles and responsibilities during a disruption. This will enhance coordination and efficiency, providing job security by ensuring the institution's sustainability. Specialised training and empowerment initiatives will equip staff with the necessary skills to manage and adapt to disruptions effectively.

For shareholders: The study will reassure them about the sustainability and profitability of their investments. The strategic framework will ensure the institution's survival and continuity, protecting shareholders' interests. For example, the flexible business model pillar will outline adaptive strategies to maintain financial stability during economic downturns caused by disruptions.

Disruption management researchers: The study aims to enhance the existing literature on disruption management by offering valuable insights and practical recommendations applicable to diverse contexts. The research pillar will encourage continuous investigation into the evolving nature of disruptions and innovative solutions.

We expect the findings of this study to have a profound impact on the stakeholders involved. For instance, by adopting the DMF, institutions can significantly reduce the downtime and operational inefficiencies experienced during disruptions. This proactive approach will enhance the overall resilience of educational institutions, ensuring that they can continue to fulfil their educational mission despite external challenges. The study will also foster a culture of preparedness and continuous improvement, encouraging institutions to regularly update and refine their disruption management strategies.

This study is poised to provide a comprehensive, actionable framework that addresses the complex challenges faced by private higher education institutions during disruptions.

It will enhance the resilience and sustainability of these institutions, benefiting all stakeholders involved and contributing to the broader field of disruption management.

1.9 RATIONALE OF THE STUDY

While there is some literature on supply chain disruption management in manufacturing industries (Altay & Pal, 2023; Li, Zhang, Xu & Wang, 2022; Zheng, Shou & Yang, 2021) as well as in airline industries (Marla, Jacquillat & Lee, 2020; Ogunsina, Bilionis & De Laurentis, 2021), there isn't much on how ready higher education institutions (HEIs) are for disruptions and how their leaders are to handle them (Gowing & Langdon, 2015:2; Leal Filho et al., 2020:4; Nel et al., 2018:3; Jandris et al., 2012:2; Rodrigues et al., 2020:8; Schalkwyk, 2018:7). This study aims to address this gap by proposing a conceptual framework that enhances our understanding of disruption management within the context of higher education.

Existing literature, such as that by Altay and Pal (2022:3), highlights a lack of comprehensive theories explaining the ongoing process of managing disruptions. The development of theoretical models that can undergo quantitative testing is important to provide decision-makers with enhanced tools for crisis preparation and response (van Der Vegt et al., 2015:974). Conceptual frameworks play an important role in enhancing practitioners' understanding of disruption management by providing structured approaches to address the negative consequences of disruptions (van Der Vegt et al., 2015:3).

This study proposes a dynamic disruption predictive model as a proactive measure to anticipate and mitigate potential future crises. This model will use advanced data analytics and scenario planning to predict potential disruptions and provide actionable insights for leaders. By anticipating future crises, HEIs can implement preventive measures to minimise their impact, thus ensuring greater institutional resilience and continuity.

The study also presents a comprehensive framework that functions as a guide for managing disruptions. This framework encompasses 14 key pillars. By integrating these pillars, the framework provides a structured, multi-faceted approach to disruption

management, ensuring that all aspects of institutional operations are considered and addressed.

The proposed study builds on existing research by incorporating insights from various fields. For instance, Altay and Pal (2022) and van Der Vegt et al. (2015) underscore the necessity for theoretical models and frameworks that can undergo empirical testing and practical application. These studies paved the way for the current research by highlighting the gaps and needs in the disruption management literature. This study aims to fill in these gaps by creating a dynamic disruption predictive model and a holistic framework. By doing so, it hopes to make a contribution to the field of disruption management in higher education.

The proposed study is significant for several reasons. Firstly, it fills a crucial void in the literature by concentrating on HEIs, which have not received enough attention in the field of disruption management. Second, it offers institutional leaders a practical and actionable framework to improve their preparedness and response to disruptions. Third, by providing new models and frameworks for testing and refinement in future research, the study's findings will contribute to the theoretical development of disruption management.

1.10 RESEARCH METHODOLOGY

The research problem and purpose should serve as the guiding principles for the chosen methodology to achieve "methodological congruence" (Bloomberg & Volpe, 2012:27). The selected methodology should directly correlate to the research problem, objective, approach, and questions. This study will use a sequential mixed-methods research design called an equal status design based on the hypotheses and research questions (Leech & Onwuegbuzie, 2009:268) to combine qualitative and quantitative research methods. This method was optimal since it would generate a multi-faceted comprehension of the perspectives of the institution's multiple stakeholders (leadership, staff, and students). The quantitative phase will consist of two sets of staff and student data.

The next step in the study is to collect first-hand experiences from staff and students about their personal experiences with disruption and its effects on them as institutional stakeholders. A questionnaire will be distributed to assess the perspectives of staff and students on how the institution responded to disruptions. At this point, we will expand our pool of potential participants beyond what we will have for the qualitative component in Stage 2. A random sample of PHEIs' students and employees will be sent questionnaires through e-mail.

The second stage of the study includes a qualitative exploration consisting of semi-structured interviews with the institution's management to determine how they responded to disruption. It is imperative to study the leadership response to disruption, its meaning and nature, and how it can be predicted and managed. It is also important to understand how managers make sense of disruption in their leadership roles. The target population will comprise 15 top managers from these entities, forming part of the group.

1.10.1 RESEARCH ARGUMENT

This study will use the deductive process, a systematic and structured approach to research that begins with a theory or hypothesis and tests its validity through data collection and analysis (Creswell, 2014; Cooper & Schindler, 2014:66). This process begins with forming a general theory or hypothesis based on prior knowledge and developing research questions or objectives (Saunders *et al.,* 2016). The research will then be developed and executed using surveys and interviews to obtain data. The acquired data will then be analysed to discover if the evidence supports the theory or hypothesis, and conclusions regarding the relationship between variables will be drawn (Neuman, 2014). The results are then reviewed regarding their ramifications and future research recommendations.

1.10.2 SAMPLING METHOD

The study applies multilevel sampling utilising two different scientific sampling approaches at different sampling levels: at ‘Head Office’ and ‘Business unit levels’. First, purposeful sampling is applied at the ‘Head Office level’ on practicality, the time factor, cost, and convenience to focus on one institution comprising various business units. In this context, random sampling methods were used for the quantitative stage of the research, and purposive sampling will be used for the qualitative stage (Braun & Clarke, 2013:56). To select suitable samples to address the study questions and hypotheses. The researcher will also use concurrent multi-level sampling (multi-stage sampling) (Sharp *et al.*, 2012:35). In this context, purposive and random sampling techniques will be used to choose samples from the same population for both qualitative and quantitative stages of research (Hesser-Biber, 2010:55).

1.11 RESEARCH TRADITION

The study follows a hybrid approach in which the positivist paradigm of scientific disruption prediction is supported by constructivism, in which staff and student experiences will aid in the formulation of the new framework for guiding leaders. Positivism accentuates real facts, in which the truth about a phenomenon is based on logic and rationality. That is, science should prove it, and if it cannot, then it does not exist (Walliman, 2011:175). The researcher will draw findings based on the scientific methodology for this study. This method involves observation, the definition of the problem, experimentation, hypothesis, and theory.

1.12 DATA COLLECTION METHOD

1.12.1 STRUCTURED QUESTIONNAIRE

In the quantitative phase of the study, the researcher will employ a survey questionnaire. According to Walliman (2011:97), questionnaires are "a very adaptable instrument with the advantages of a structured format; they are easy and convenient for respondents;

and they are inexpensive and quick to administer to a large number of cases covering wide geographical areas." The structured questionnaire will serve to collect data on the student and staff assessment of the extent to which the institutions were able to manage COVID-19 disruption. The focus will be on the participants' experiences and interpretations of business disruptions.

1.12.2 SEMI-STRUCTURED INTERVIEWS

The researcher will also conduct interviews with the managers in the PHEIs. The interview guide contains questions designed to assess the participants' comprehension of disruption, awareness of environmental factors, management philosophy and values, institutional policies and procedures, capability, and capacity, change management, the disruption management pillars, innovative strategies, and strategies for responding to disruption. Microsoft Forms was used to construct the instrument, while Microsoft Teams were utilised for interviewing, recording, and transcribing following COVID-19 guidelines and the "new normal."

1.13 PILOT STUDIES

It was determined through a pilot study whether the participants could convey and comprehend the connotations and words. According to Saunders, Lewis, and Thornhill (2016:473), pilot testing is used to refine research questions before the main study. It also determines whether the study will produce the anticipated outcomes. Pilot research will be used in the quantitative and qualitative phases, with 10 and 4 samples, respectively. The pre-pilot tests and pilot data analysis results indicate whether the research instruments must be modified before the main study.

1.14 ETHICAL CONSIDERATIONS

Research ethics is an important part of a sequential mixed-method study. Researchers must be aware of their responsibilities to the participants, the research community, and the public at large (Creswell & Plano Clark, 2011; Trochim & Donnelly, 2008; American

Psychological Association, 2020). The UKZN Humanities and Social Sciences Research Ethics Committee and the Institutional Research and Ethics Committee (institution under study) provided approval and ethical clearance to conduct the research. Furthermore, the following ethical concerns were considered during the research: informed consent, anonymity, beneficence, and data management were all considered during the research. In compliance with the POPIA Act and data retention policies and practices, participants will be told that any recordings, transcripts, or notes will be destroyed as soon as it is deemed safe. No identifying information about the study's participants, including names, companies, or other details, will be made public.

1.15 DELIMITATIONS

Leedy and Ormrod (2015) explain in their book "Practical Research: Planning and Design" that delimitations describe the limits of a study, what it will and will not cover, and what the researcher did not do or did not intend to accomplish. The delimitations assist in focusing the study, enhancing its clarity and usefulness, and acknowledging its limitations. By being explicit about the delimitations, the researcher increases the credibility and validity of the study by making its scope more understandable.

This study's primary objective was to create a conceptual framework for PHE in South Africa. The sample will consist of 381 students currently enrolled in their third year of studies and beyond and 290 staff members with more than three years of experience at an institution. Among the respondents were senior management, staff, and students. Other stakeholders, including regulators, the government, parents, and the business sector, were not included in the sampling frame. The sampling frame did not include other stakeholders, including regulators, the government, parents, and the business sector. Additionally, public institutions were omitted from the study.

1.16. RESEARCH CONTEXT

Private higher education institutions (PHEIs) worldwide faced significant challenges during the COVID-19 pandemic. However, research suggests that the response of PHEIs

varied depending on their context and the strategies they implemented to address the disruption (International Association of Universities, 2023:6,13; Maota & Naidoo, 2022). Globally, PHEIs were forced to adapt to the pandemic by implementing remote learning and other online teaching methods (Borrego-Alonso & Barrales-Molina, 2021). PHEIs also had to implement measures to ensure the safety of staff and students, including social distancing measures and increased sanitation protocols (Naidoo, 2020).

Globally, public and PHEIs faced similar challenges, including disruptions to academic calendars, financial strains, and difficulties in transitioning to online teaching (Abushammala, Qazi, & Manchiryal, 2021:13; Geryk, 2023:3). However, some PHEIs in Africa were able to leverage technology to continue delivering high-quality education to their students (Borrego-Alonso & Barrales-Molina, 2021). For example, some institutions in Africa used online platforms such as Zoom and Moodle to deliver live lectures and provide access to course materials (Tawiah & Nsiah, 2021).

Due to the economic impact of the pandemic, many students at PHEIs in South Africa may have been unable to pay their tuition fees, posing a threat to the financial sustainability of these institutions. However, these institutions responded to the crisis by implementing innovative strategies to support their students and staff (Maota & Naidoo, 2022:7). For example, to limit the number of deferrals due to financial issues, numerous PHEIs implemented flexible payment plans so that students could continue their education (Lim, 2022:95). Some institutions offered emergency funding to students in need, while others provided mental health support and online resources to promote student wellbeing (Tawiah & Nsiah, 2021).

The above said, HEIs globally, in Africa, and in Southern Africa faced significant challenges during the COVID-19 pandemic (Mncube, Mutongoza, & Olawale, 2021:391; Sonn, Du Plessis, Van Vuuren, Marais, Wagener, & Roman, 2021:12888). However, the response of PHEIs varied depending on their context and the strategies they implemented to address the disruption. However, a common challenge faced by many PHEIs was the lack of a clear framework or roadmap to navigate the uncertainties of the pandemic. This

made it difficult for leaders to develop effective strategies to tackle the challenges posed by the pandemic.

Several studies have emphasised the need for a clear and well-defined decision-making framework during times of crisis. For instance, Hoque and Alam (2020) pointed out the need for PHEIs to develop a crisis management framework to ensure they are well-prepared to respond to unexpected events like the COVID-19 pandemic. Similarly, Hannon, Pyle, Ross and Wallace (2021) found that PHEIs need a clear road map to help them manage the complexity of the pandemic and mitigate its influence on their operations.

The COVID-19 epidemic has not only posed a serious threat to public health but has also significantly impacted South Africa's economy. The GDP decreased by 6.4% in 2020, while the unemployment rate is projected to reach a record high of nearly 35.6% in 2023 (Neufeld, 2023:1). The government of South Africa has taken a number of steps to lessen the effects of the pandemic. These steps include giving out social grants, helping small businesses with funds, and starting vaccination programmes (SA Government, 2023). South Africa is still reeling from the effects of the COVID-19 pandemic, despite the government's efforts to mitigate the situation.

The Russia-Ukraine political fights that broke out after the pandemic have made it harder for the country to deal with the effects and consequences of the pandemic. These geopolitical and economic effects of the pandemic are making it hard for governments to deal with its economic effects in a good way (Blake and Wadhwa, 2021:1). It has also created a fear that a recession or economic disaster is on the horizon (Nicola *et al.,* 2020:185). The impact of bad economic conditions (OECD, 2020), load shedding (Chowdhury, 2020), food prices, and the high cost of living on higher education has been a concern for many scholars (Chowdhury, 2020; Cloete, 2018; Pillay, 2016). The impact of high inflation and high-interest rates on the middle class and small businesses, as well as the resulting challenges for students accessing higher education, has also been documented in various studies and reports (Centre for Development and Enterprise, 2020; Resbank, 2021; Treasury, 2022; University of Cape Town, 2022). In a broader

sense, the disease's devastating economic impact may have planted the seeds for future disorder (International Crisis Group, 2020:1).

1.17. RESEARCH PLAN

The research plan for this project will address its major objective, which is to develop a conceptual framework for PHEIs in South Africa. A thorough literature review were done to assess the present level of understanding of the topic. A sequential mixed-method study design was used to collect and analyse data in both qualitative and quantitative ways. Quantitative data will be obtained through surveys and examined statistically, while qualitative data will be collected through in-depth interviews and analysed thematically. Triangulation was used to integrate and validate the findings from both data sources to understand the research subject fully. Finally, the conclusions and recommendations will be presented in the thesis, based on the study's findings (Creswell, 2018; Johnson & Onwuegbuzie, 2004:14). Figure 1.1 below displays the project plan and the conceptual framework development process.

Study objective: The study's objective is to develop a disruption management framework that will help leaders manage disruption in the most effective way possible to either prevent or minimise harm to PHEIs.

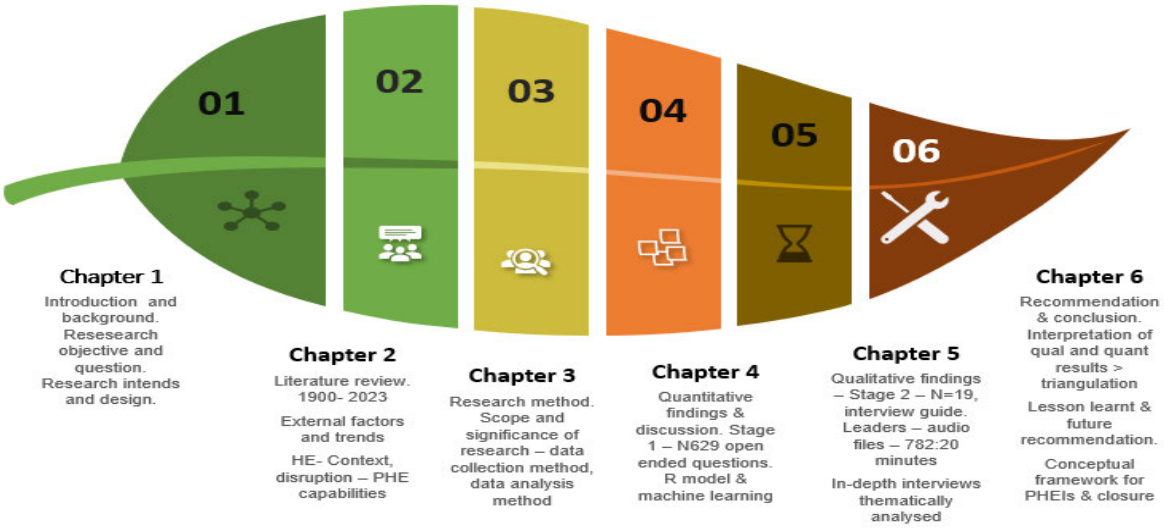

Figure 1.1: Project plan and overview

Source: Researchers compilation

1.18 CONCLUSION

In the first chapter, the researcher gave an overview of the study. This includes a basic introduction to the topic, the research question, and the aims and objectives of the research. The chapter also outlines how the research will be conducted. The purpose and importance of the research were discussed. The methodology for the research was explained, including how the research design, data collection methods, and tools and techniques for analysing data will be used in the study. A brief literature review provided an overview of the existing research on the. Through the review, gaps in the research were identified and discussed.

The second chapter of this study focuses on the theoretical and empirical work that informs the study. The HEI context in South Africa is analysed. The study also considers extraneous factors that impact the PHE sector in South Africa. The chapter introduces disruption in the sector and key trends globally. Leadership, as well as the institution's response to disruptors, are outlined. The chapter intends to provide relevant context for the study.

CHAPTER 2: LITERATURE REVIEW

"Research means that you don't know but are willing to find out"- (Charles F. Kettering, 1876 – 1958).

2.1 INTRODUCTION

As indicated in chapter one, the study's goal is to develop a framework to help leaders manage disruption most effectively to prevent or minimise harm to higher education institutions. Disruptions can be unpredictable and have far-reaching consequences (Parra & Tan, 2021:4). PHEIs can become more resilient and better prepared for future disruptions with the support of a framework that assists leaders in managing disruption. In addition, it can help PHEI leaders manage disruptions, ensure the continuity of education, and promote the well-being of all stakeholders. It can assist institutions in becoming more adaptive and responsive to changing situations, enhancing student results, and addressing equity and access concerns.

The researchers investigated the pertinent literature to inform the development of the framework, ensure that it is based on evidence-based practices, and boost the credibility of the framework. The researcher also tried to comprehend the situation in which the framework was used, such as the unique challenges and chances that leaders in higher education will have to deal with disruption. Best practices, and successful strategies used by other institutions and countries, were considered. This can guide the framework's development and ensure that it is based on scientific proof and practices.

The study used a broad, narrow, and specific method, termed the "funnel" metaphor, for the literature review. Because of its all-encompassing nature, the "broad" approach allows for a comprehensive understanding of the topic's background. Primary and secondary sources, as well as many other studies, are usually included. On the other hand, a "narrower" approach zeroes in on just the part of the study that coincides with the research issue and uses just those sources directly pertinent to answering that question. Lastly, the "specific" approach critically examines each study and its corresponding source (Creswell, 2014; Fink, 2018). This approach helped get a detailed understanding of the

topic, including gaps in the existing research and potential areas for further investigation. Figure 2.1 depicts the chapter's essential concepts.

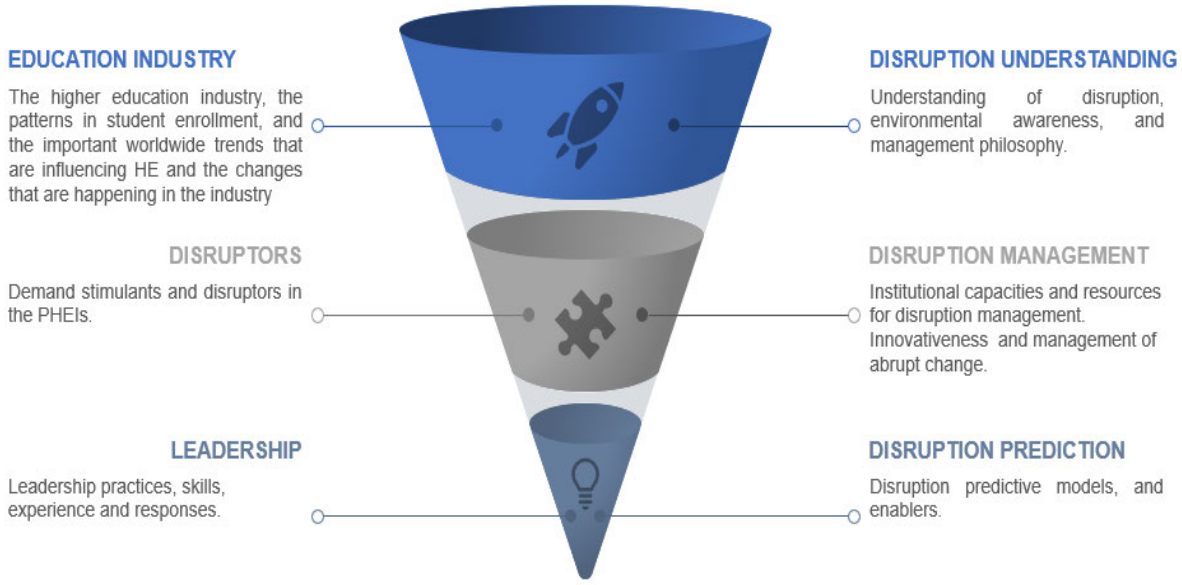

Figure 2.1: Overview of Chapter 2
Source: Adapted from Creswell (2014) and Fink (2018)

2.2 SOUTH AFRICAN HIGHER EDUCATION

The higher education landscape in South Africa is diverse and unique, with its ensuing strengths and weaknesses. The government continues to struggle to remove the legacy of apartheid and address educational inequality (McKeever, 2017:114). Notwithstanding this, several institutions are ranked among the best in the world (CWUR, 2022), educators are working to enhance the nation's higher education system (Shagrir, 2015:783), and many students have access to quality educational options (UNICEF, 2020). The system comprises 26 traditional public universities and 135 registered private institutions that provide undergraduate and graduate education in various fields (DHET, 2021a). The Higher Education Act is the legislation that regulates the private and public higher education systems (Act 101 of 1997, as amended).

PHEIs are governed by a board of directors, while the state governs public institutions. About 82% of higher education students studied at public institutions, with only the

minority of approximately 18% at PHEIs in 2019 (refer to Figure 2.2). The challenge that the public HEIs face is the issue of limited infrastructure and state subsidies to deal with the growing demand (Badenhorst, 2019:1). In contrast, private institutions (such as ADvTECH and Stadio) have raised significant amounts of capital to provide higher education within the private education space.

The government of South Africa has committed to improving opportunities for students from low-income households and historically disadvantaged groups and/or individuals to pursue higher education (Sehoole & Adeyemo, 2016:1). It has pledged to expand opportunities for this group of individuals and low-income students to pursue higher education (Gov, 2022:24). The initiative includes programmes such as the Funza Lushaka bursary, which provides funding for teacher education. The National Student Financial Aid Scheme (NSFAS) (NSFAS, 2020:8) is the country's system to award grants to students who need financial help because they cannot pay for their studies. In recent years, the HE sector in SA has struggled with insufficient funding (Ayuk & Koma, 2019:176), a shortage of academic personnel (Lord, 2022:1), and a lack of physical infrastructure (Milton & Barakat, 2016:404). Due to these challenges, there is also an increased concern regarding the viability of the employment market for recent graduates and the quality of the education they receive (Lauder & Mayhew, 2020:1).

Despite these obstacles, many South African universities produce fundamental research and qualified graduates (Temoso & Myeki, 2022:3). The DHET has found that the South African HEIs have increased the number of research papers published across all publication genres (DHET, 2021:4). Investments in education also increased (Psacharopoulos & Patrinos, 2018:445). The National Development Plan (NDP) outlines a strategy to increase enrolment from 950,000 in 2010 to 1.62 million students by 2030 in South Africa (DHET, 2021b:14). The student protests for free higher education began in 2015 in SA (de Jager & Baard, 2019:70) and are still ongoing. While some advocate for free education to address inequalities, others, like Badat (2017:5), argue that it may not necessarily solve the problem of inequality among students. Thus, a large population

of secondary school graduates began to compete for limited opportunities in public HEIs in South Africa.

Therefore, the increasing demand for higher education has created a shortage of available spaces at HEIs. This shortage is due to a combination of factors, including an increase in enrolment rates by learners in schools and a rise in the number of people who finish high school (Lorber, 2020:1). In SA, the number of matric graduates is steadily increasing the past six years, with a 7% increase in 2022, an 18% increase in 2021 and 2020, and 7% between 2020 and 2019 (Refer to Figure 2.2 below).

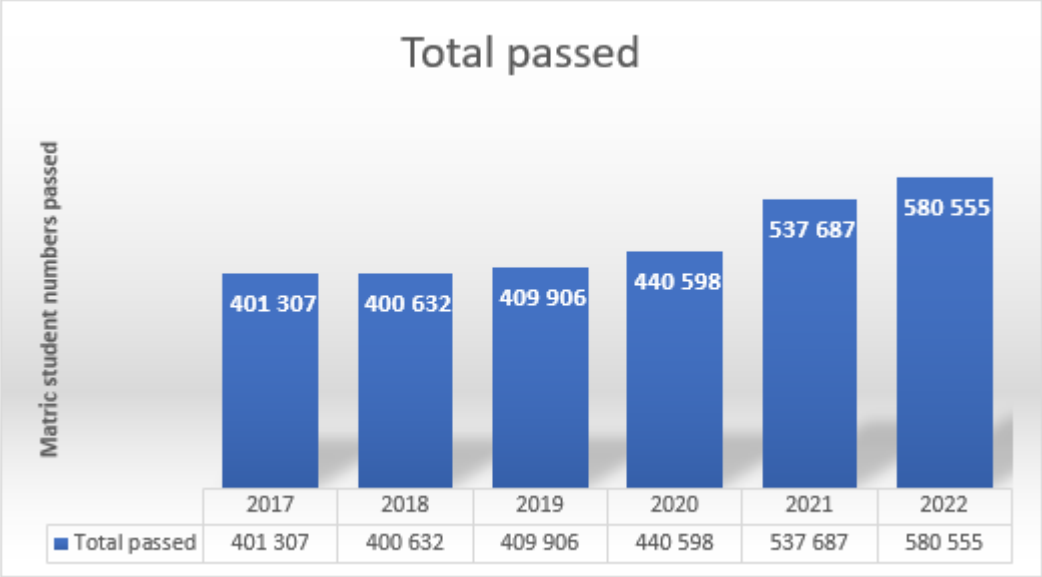

Figure 2.2: Number of matriculants who passed
Source: Own compilation from DBE (2022). National Senior Certificate (NSC) Examination Report 2021, January 2022, Table 6.2.3, pp44-45; SABC News (2023).

So, the government's biggest problem has been the widening disparity between the rising number of high school graduates and the limited number of spaces at public HEIs. Another constraint in meeting rising demand is the Department of Higher Education's enrolment cap, which is based on the limited budget allocation from the national fiscus and is applied to public higher education institutions (Maota & Naidoo, 2022:3).

South Africa's government is still attempting to address the lingering effects of apartheid and reduce inequality, despite some encouraging achievements in the country's HE system. Eliminating these issues remains a priority for the SA government (McKeever, 2017:114). While opportunities for high-quality education in South Africa continue to grow, an increasing number of students are taking advantage of these opportunities each year. This is thanks to the work of the country's higher education system, which consists of many world-class institutions, dedicated teachers, and an increased education budget within the Department of Education (Khuluvhe & Netshifhefhe, 2021:9).

2.3 PRIVATE HIGHER EDUCATION IN SOUTH AFRICA

The DHET oversees regulating the licensure, accreditation, and financial support of non-government institutions (DHET, 2010). PHEIs in South Africa cannot function without first registering with the DHET. To become accredited, an institution must meet various requirements, such as having enough trained employees and adequate facilities. After it has been approved for operation, the next step is to obtain accreditation from the Council on Higher Education (CHE). The CHE's job is to evaluate courses and ensure they meet industry standards (CHE, 2004:7).

In addition to registration and accreditation, private institutions in South Africa must comply with several other regulations, including student fees and financial management. These institutions are also to provide the department with audited financial statements. In South Africa, PHEIs are subjected to regular "pulse reviews" by the DHET to evaluate the quality of the learning environment and assure conformity with national requirements (DHET, 2016a:28). Education, research, student services, and administration are all examined in detail. The DHET suggests change at the reviewed institutions based on the evaluation results. This is part of the procedure to ensure that PHEIs can better secure their students to receive a high-quality education while complying with national regulations.

The first legislation to address the establishment of PHEIs in South Africa was the Correspondence Colleges Act, No. 59 of 1965 (Department of Education, 1965). By the

early 1990s, the legislation above had lost touch with the needs of students, resulting in a "laissez-faire" environment in which private institutions proliferated (Mabizela, 2006:134). In addition to the Correspondence Colleges Act, it is also worth mentioning the Higher Education Institution Act, which was passed in 1997. This act and its rules set out the rights and responsibilities of PHEIs and their students and how these institutions can get registered and offer their programmes (DHET, 2010). The Constitution of the Republic of South Africa, Act 108 of 1996, was a landmark development in formalising the position of PHEIs (South African Government, 1996). According to Article 29(3) of the Constitution, every citizen has the right to start and keep at their expense private institutions that do not engage in racial discrimination, are registered by the government, and adhere to standards that are not lower than those of other institutions offering a similar education.

The market has resorted to PHEIs since the public sector has not and cannot meet the educational requirements of today's high school graduates (Alexander, 2017:6). This is also partly because public institutions cannot meet the demand and because students often protest in public institutions (Tamrat, 2017:20). Regarding education, the number of PHEIs in South Africa went from 40.6% in 1969 to 57.56% in 2015 (DHE, 2018). The PHE sector in South Africa has expanded significantly over the past few decades. It now represents a significant portion of the country's broader system of education (Kajawo, 2020:384). PHEIs in South Africa are primarily for-profit institutions, and their primary source of income, compared to public ones, is tuition fees (Lee, 2017:182). Some PHEIs also receive support from other organisations.

Concerns exist, however, that the education quality offered by certain PHEIs may not be as high as that provided by public institutions and that they may not be effectively governed (Nukunah, Bezuidenhout & Furtak, 2019:283; Stander & Herman, 2017:206). The South African government has formed the Council on Higher Education (CHE) to accredit PHEIs and verify that they satisfy specified quality requirements to overcome this situation. Damelin, Monash South Africa, Varsity College, Boston City Campus and Business College, Vega, the Management College of South Africa (MANCOSA), and the

Pearson Institute of Higher Education are some of the most well-known registered PHEIs (Ugwire, 2022).

Many African governments' efforts to accommodate the expanding demand for higher education are impeded by the slow development of the public sector and financial constraints (Davids & Waghid, 2020:78). In comparison, private higher education (PHE) has been in South Africa for some time. The demand for university places has recently substantially outpaced government allotment, resulting in a solid growth trend for PHEIs.

Government legislation in education allowed for the creation of official recognition of private institutions. The SA government is involved in higher education to help the system adapt to the new democratic order in the country, to put higher education on a trajectory of development and progress, and to ensure that developmental needs are met (Akor, 2008:2). As result, PHEIs "boomed" across South Africa since the government opened the door to their participation in the sector's provision and growth of higher education.

As Swartz, Ivancheva, Czerniewicz, and Morris (2019:571) write, "the educational opportunities of historically disadvantaged communities" would benefit from increased private institution presence in higher education. As Shah and Standford (2019:5) said, PHEI has taken on a new, complementary role in the education industry while increasing competition. Reports indicate that PHEIs are effective in helping students achieve their career goals, partly because they are always looking for ways to improve by developing and delivering cutting-edge academic and other services in areas where the public sector is unable or unwilling to do so (Tamrat & Fetene, 2014).

We acknowledge the distinct historical trajectories of PHEIs in South Africa and how disruption brought about by global trends and events has influenced these institutions. These institutions rely heavily on student tuition and shareholder funding. They do not get government subsidies, unlike their public sector counterparts. Despite the many risks to their survival and operations, these institutions must continue to exist (Tamrat, 2020:677). Perhaps there is a need to devise ways whereby all students who are qualified

academically should be offered an increased opportunity for higher education, especially those who are disadvantaged. NSFAS currently exclusively helps students who attend public institutions. If this were to change, more students might consider enrolling in private institutions, which would help achieve the National Development Plan's objective.

Globally, more students are choosing private institutions than ever (Buckner, 2017:296, Qureshi & Khawaja, 2021:1). PHEIs can be found in every part of the world, despite notable enrolment discrepancies between continents. Since the 1990s, the PHE sector in South Africa has grown every year (Varhese, 2006:131), propelled by increased educational demand and supportive government policies (Nukunah, Bezuidenhout & Furtak, 2019:284). Despite formidable obstacles, the industry has made several significant achievements.

Yet, there is evidence from studies showing that PHEIs are declining in some parts of the world. In Malaysia, many HEIs are on the cusp of a liquidity crisis due to the COVID pandemic's lack of preparedness (Tee, Rasli, Toh, Abas, Zhou & Liew, 2022:1). In Ethiopia, PHEIs' vulnerabilities have been exposed by the COVID-19 pandemic, leaving most struggling financially. In Poland, the study by Kwiek (2016) noted a decreasing demographic as an attribute for a reduction in enrolment (Tamrat, 2021:1). Dr Clayton Christensen, who has conducted extensive research on the sustainability of organisations and disruptive innovation, has expressed concern about the future of traditional universities in the United States. He has argued that, in 15 years from 2017, half of all US universities would be bankrupt (Lederman, 2017:1). Universities in SA are owed almost $700 million in tuition from 2010 to 2020, according to the country's Minister of Higher Education, Blade Nzimande. The burden rests heavily on historically disadvantaged institutions (Africa News, 2021).

2.4 ENROLMENT TRENDS

About 18% of SA's higher education students are enrolled in PHEIs. The previous five years have seen an increase in enrolment at South Africa's publicly funded institutions of higher learning. Even though the overall number of students is increasing, there is

evidence of a downward trend in public institutions. The public sector grew by an average of 2% from 2016 to 2021. From 2017 to 2019, enrolments dropped sharply, but in 2020, they increased by only 2%. The sector saw a 3% drop in 2021, which shows that COVID-19 may have had an adverse effect on the sector (please see Figures 2.3 and 2.4).

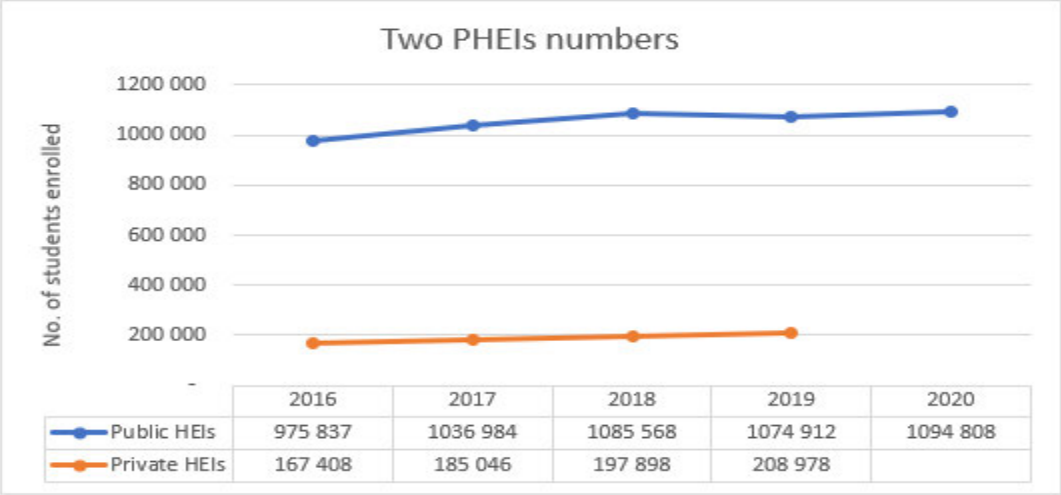

Figure 2.3: Higher education student enrolment
Source: Researcher's compilation

The graph below depicts the trends in public higher education enrolments, showing a declining trend for the last five years, 2017–2021.

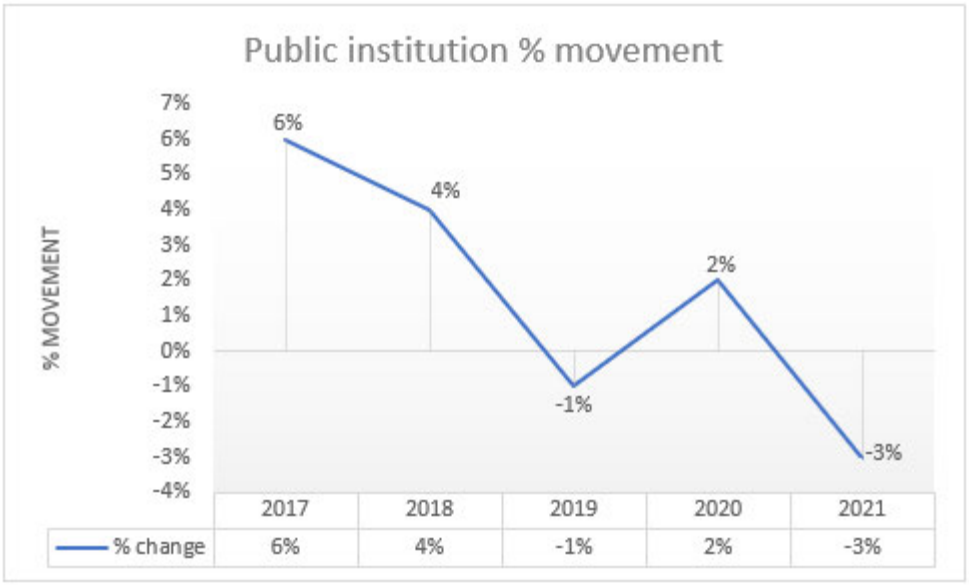

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Figure 2.4: Public institution percentage movement
Source: Researchers' compilation

At the time of this study, information regarding PHEIs enrolments in South Africa for the years 2021 and 2022 was not yet released into open-source data. Since this information was not available for all PHEIs, an enrolments statistic from two large PHEIs that was accessible online was evaluated and analysed (Anon, 2022). This information is available to the public; however, pseudonyms have been used to protect the confidentiality of these institutions. Observations spanning five years, from 2018 to 2022, indicate increased enrolments at these institutions. Even during the COVID period, student enrolments increased at the institutions. Some reports suggest that the pandemic contributed to rising private institution enrolments in South Africa (University World News, 2022:1). The pattern depicted in the image supports these observations.

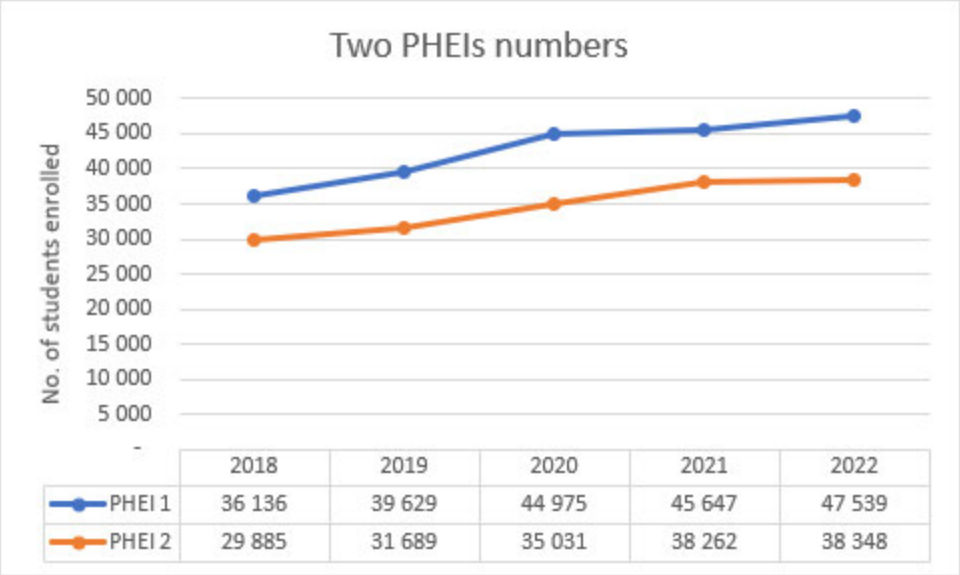


Figure 2.5: PHEIs enrolment stats 2018 - 2022
Source: Own compilation

The preceding chart shows total student enrolments at private and public HEIs have increased. However, over the previous five years, the share of total enrolment held by public institutions has declined, while that held by private providers has increased. One sign of private sector growth is the rising number of private institutions.

In light of the above discussion, it is clear that the challenges facing South African higher education are related to the country's broader problems, such as low economic development, high youth unemployment, and the crippling influence of the political turmoil surrounding the ANC leadership and administration. Tjønneland (2017:2) contends that the most significant problem facing SA higher education is not the tuition cost but the exceptionally high dropout rates among those who do enrol. From a competing viewpoint, Chetty and Pather (2016:1) highlight that many students drop out for various reasons associated with their wrong programme choice, balance issues, finances, social conditions, and health. While the state of South Africa may have the financial and technological means to chart a course forward for the higher education sector, political leadership and limited capability severely limit its ability to act.

Despite the enormous rise of tertiary education over the past decade, many recent graduates still have trouble finding satisfying employment. Rosenbaum, Russell-Bennett, and Contreras-Ramrez (2021:554) say that because the pandemic has had a big effect on affected household finances, HEIs will soon see fewer applications from first-time undergraduate students. Yet, many businesses report a lack of available qualified candidates (Lauder & Mayhew, 2020).

2.5 KEY TRENDS IN THE GLOBAL SPACE IMPACTING HIGHER EDUCATION SECTOR

In a sign of expanding defence cooperation against the West, Russia and China have initiated joint large-scale military drills involving numerous allied countries (Reuters, 2022:1). Then there is the ongoing Russia-Ukraine conflict shows no signs of abating as the West funds Ukraine's armaments and escalates deadlock in negotiations (Wolff, 2023). This suggests that the possibility of a third world war should not be discounted. The ten days of joint military exercises between Russia and Belarus in early 2022 can teach us a lot (BBC, 2022:1). The threats were realised when Russia invaded Ukraine. The conflict started right after the worst of the pandemic's effects were beginning to be addressed, which was a wrong time to start fighting. South Africa is also in the picture. This year, they will be assuming the chairmanship responsibility of BRICS. They must make hard decisions, such as whether to support and review the joint military exercise with Russia and China and the war between Russia and Ukraine (Info BRICS, 2022).

Unfortunately, the threats posed by COVID-19 are still very much present and impending. The COVID-19 pandemic of 2020 kept the world population on edge; fear spread, and an increasing number of people are concerned and insecure as the virus's aftermath has far-reaching economic consequences. The world held its breath, partially paralysed by the "black swan event." The mental and physical effect the pandemic has had on our lives is also far from over. There appears to be no end in sight to this uncertainty and vulnerability. Impacts on economies and societies worldwide, both in the pre- and post-COVID-19 pandemics (Mishra *et al.,* 2020), continue to exist given the persistence of the virus.

The global economy has felt the effects of everything from the COVID-19 virus to Russia's invasion of Ukraine and the Federal Reserve's aggressive monetary policies (Polity, 2022; Resbank, 2022). In addition to the COVID-19 pandemic, these other global crises continue to affect countries. The adage that "when the United States sneezes, the rest of the world catches a fever" is still valid, although the advent of competing powers like China may cast doubt on this saying. However, these global events' disruptive effects cannot be disregarded since they are impactful. The conflict between Russia and Ukraine had global repercussions, much as the COVID-19 virus, which originated in China, did as well. All these factors hurt businesses and industries, making their continued existence in the world uncertain. And this raises the question of whether the higher education industry is prepared for a new wave of disruption that could be even more severe than the ones already experienced.

The China National Health Commission's leaked data revealed that from December 1, 2022, through December 20, 2022, about 250 million people were infected with COVID-19 (Ritchie, Gan, McCarthy, Wang & Zhang, 2022). The virus may be coming for more blood, which could be far worse this time. In the wake of this news, Morocco has introduced a ban on travellers from China (Africa News, 2022), while some nations, like the United States and the United Kingdom, are reinstating mandatory pre-flight COVID-19 checks for Chinese passengers (Time, 2022). Bill Gates, who had previously successfully predicted the 2020 pandemic and held an "event 201," a simulation exercise for the pandemic, also recently spoke of the next pandemic, which will happen in 2025 (Catastrophic Contagion, 2022:1).

Considering how Mr Gates and the World Health Organisation managed to predict this world-changing event, these warnings cannot be taken lightly. The next pandemic exercise was conducted in Belgium and was titled "Catastrophic Contagion: A Global Exercise" and tells of the next virus, Severe Epidemic Enterovirus Respiratory Syndrome (SEERS) 2025 (Redacted, 2022). The Bill and Melinda Gates Foundation cautions that the most prosperous nations will have invested in preparedness during the next pandemic. Many people believe this to be a conspiracy theory or premeditated game plan,

yet, the first predicted incident, Event 201, has occurred. Therefore, individuals and organisations cannot take this lightly.

Leaders need to watch for early warning signs that might signal a potential disruption is on the horizon. For instance, an unexpected rise in the cost of supplies could point to possible problems in the supply chain or the market (Hugos, 2018:14). Or a decrease in enrolment numbers may suggest significant threats to the institution's financial stability and long-term existence (Woolf, 2018:1). On the other hand, using performance indicators and reports, such as those of auditors and other independent reviewers or DHET (pulse review), can help identify possible internal control disruptors within an institution. By analysing key metrics and reports, management can immediately identify areas of weakness and take preventative measures to mitigate risk.

Based on Goudarzi and Alizadeh (2016:85), audit reports can provide important information about an organisation's financial and operational controls. Similarly, Brown and Weintrop (2018:28) emphasise the significance of regular reporting on key performance indicators to monitor organisational performance and identify possible problem areas. Together, these sources indicate that using performance indicators and reports is a crucial element of effective risk management and can assist institutions in identifying and responding to possible disruptions before they become big problems. By observing these early warning indications, leaders can take preventative action to mitigate the effects of disruptions.

Gross and Sampat's (2022) study of American responses to the Second World War and the COVID pandemic reveals that the rapid translation of R&D into production was crucial to victory in World War II. Still, they also argue that the same effort should have been applied to combating the pandemic. The takeaway from this study is that disruption has highlighted the importance of fundamental research, paying attention to warning signs and the necessity for organisations to use the crisis to develop a response strategy and framework that may be useful for future crisis preparedness.

Lastly, the increasing importance of technology in the classroom is another trend with far-reaching consequences for academic institutions. Online learning platforms and other educational technology have allowed students to access educational content from any location at any time. This is modernising the educational system and making it more open to people of all socioeconomic statuses.

2.6 CHANGE IN THE HIGHER EDUCATION INDUSTRY

Institutions of higher learning need disruption because, according to Moreira, Ferreira, Pereira, Gomes, Collazos, and Escudero (2019:616), the so-called traditional educational system does not match the needs of the modern generation. Caruth and Caruth (2013:18) claim that universities and colleges today are not often thought of as having a fast-paced culture. It has historically moved at a snail's pace compared to other sectors. Furthermore, these researchers mention that this resistance to change is not just the standard form of resistance to change that is more commonly seen in the corporate world.

Faculty members' perceptions that their professionalism is being challenged and altered contribute to the pushback seen in higher education. There appears to be a natural predisposition to oppose the change, whether or not it occurs, because HEIs are viewed as complex (Chandler, 2013:248). However, Christensen and Eyring-Buckley (2011:13) and Berman and Paradies (2018) argue that the culture of established academic institutions makes it hard for them to adapt to new challenges and opportunities. They argue that the deeply ingrained norms and values of these institutions make it difficult to introduce new ideas and practices. Universities have a long history of resistance to the change that comes with innovation (Caruth & Caruth, 2013). Not only that, but research shows that HEIs are generally resistant to change (Chandler, 2013:243).

According to a study by Coyne, Carter and Davis (2020), traditional leadership styles in academia, such as top-down and hierarchical models, may not be effective in promoting effective decision-making and change. Others warn that emergency e-Learning should not be normalised as a replacement for face-to-face learning, even while some regard the innovations created in online learning as having the potential to improve education (Knysh & Dudziak 2020; Murphy 2020). Prof. Bethuel Ngcamu (2017) recently published a study

in which he identifies ineffective change measures, centralised decision-making, inflexible work processes, and a lack of performance-based compensation as factors impeding the transformation agenda in South African universities.

Leaders in higher education institutions (HEIs) should be open to new ideas and willing to consider the perspectives of all stakeholders. Henry Mintzberg, a renowned management scholar, proposed in his 1993 work that organisations can be best understood as structures in motion, constantly adapting to internal and external disruptions (Mintzberg, 1993). He argued against traditional views that saw organisations as stable, predictable entities and instead emphasised the importance of considering the dynamic nature of organisational life. On the same note, Ghoshal (1987) argued that traditional approaches to strategy, which focus on a single best way of doing things, are ill-suited to the complex and rapidly changing business environment. Instead, he advocated for a more flexible and adaptive approach to strategy, capable of responding to disruptions and taking advantage of new opportunities.

Mintzberg (1993) also identified three core components of an organisation's strategy, structure, and processes and emphasised that they must be aligned to manage change and disruption effectively. He also introduced the concept of "emergent strategy," which suggests that strategies can arise from the actions of individuals within the organisation rather than being solely driven by top-level executives. Mintzberg's work on organisational management and disruption continues to be widely cited and has significantly influenced management and organisational studies.

Higher education institutions (HEIs) must make a wide variety of difficult decisions in the present. It has become necessary, for instance, for educational institutions that had previously focused on teaching to shift their attention to research and for businesses that had previously focused on the local market to expand their focus to the international market (Ismail & Al Shanfari, 2014:4).

The country's higher education minister has unveiled a new university grading system (DHET, 2022). The policy describes the characteristics that set full universities apart from their precursory university colleges and the distinctions between those colleges and those that offer higher education. This means that universities and colleges that do not measure up are at risk of being downgraded and damaging their credibility.

2.7 UNDERSTANDING DISRUPTION

Higher education institutions must undergo significant transformations to stay in business and deal with disruption (Granger & Bazaz, 2017:6; Robertson & Frick, 2018; Milne & Costa, 2020:2). This could be true for the oldest known university, Al-Karaouine University in Fez, Morocco. Its survival depends on how well it can adapt (Krammer, 2022:4; Koornhof, 2020:1). It is important to study disruption and learn about new models and the role of leadership. For example, most businesses that do well use disruptive technologies like analytics more strategically than their rivals (Anathakrishnan *et al.*, 2018:1).

Disruption is interpreted in this research as a new business model that challenges the value of traditional approaches to higher education. Disruption has the potential to sweep through many different sectors, from technology to business to individual consumers (Kilkki, Mäntylä, Karhu, Hämmäinen & Ailisto 2018:277). The topic of disruption cannot be treated lightly, and it is not the purpose of this research to provide an authoritative appraisal of disruption. A researcher has mentioned that more than 95% of the oceans have not been explored and that a great deal of mystery surrounds the ocean's depths (Fava, 2022:1). Disruption, one could say, is like a deep, dark ocean. Similar to the ocean, global events are unpredictable and are often riddled with ambiguity and uncertainty (Parra & Tan, 2021:4).

Even for Dr Christensen, perfecting the art of disruption has been challenging. When Apple was winning awards left and right a decade ago, he used his hypothesis to predict that the company would eventually collapse. Christensen thought the iPhone would be too advanced for the average consumer and a sustaining technology that only improved upon previously available mobile devices (Rose, 2016). "A failure of the iPhone is what

the theory predicts," he said. Apple's success today, however, disproves this (Apple, 2022; Bajarin, 2022:1), and it can be argued that Steve Jobs applying the theory was important to the company's continued existence. It was stated in Steve Jobs' biography by Walter Isaacson that jobs were "seriously influenced" by the book "The Innovator's Dilemma" (Schwartz, 2013:1).

Amid the doubt, misery, and ambiguity that characterise life following the COVID pandemic, I propose that the underlying theory is not the be-all and end-all, especially when faced with some events that may be an act of God. Mildly put, this theory can be compared to the forethought shown by those who immediately obtain insurance policies upon acquiring a car or a house. It is important always to be prepared for the unexpected by keeping track of global trends, learning from the past, and imagining the future. Furthermore, considering global trends effectively expands our perspectives and builds a solid foundation for decision-making. Following this, I would like to shift the discussion to key trends in the global space affecting HEI and toward the ability of leadership to effectively handle disruptions in the higher education sector by being aware of the external environmental elements and their effects.

2.8 FACTORS AFFECTING THE HIGHER EDUCATION INDUSTRY

There are both internal and external factors that affect the existence and functioning of HEIs. The external and internal environment affects everything from day-to-day operations to creative thinking and managerial decision-making (Shatilo, 2019:85). As an example of a disruptive external factor, consider how the recent COVID-19 pandemic has wreaked havoc on a global scale and continues to reshape many industries while opening doors for others (Jeong, Jean, Kim & Samiee, 2022).

The pandemic increased the market risk, with some industry-specific effects, as stated by Maota and Naidoo (2022:10). In contrast, the hospitality and tourism industries experienced a significant decline in revenue (Stephany, Stoehr, Darius, Neuhäuser, Teutloff & Braesemann, 2020). Healthcare providers saw increases in profits (Reuters, 2021). The higher education sector was also affected. Although it moved quickly to

replace traditional face-to-face teaching processes with online alternatives, the shift had unintended consequences for things like student safety, exam administration, and course continuity (Schleicher, 2021:4). As public revenues drop sharply and governments re-evaluate the importance of education in national budgets, the ongoing economic crises may affect education crises (IIEP-UNESCO, 2020:5).

It is necessary to remember that South Africa's economy was in crisis before the COVID-19 outbreak and that the country is now fighting the dual problems of COVID-19 and a sluggish economy (Adelzadeh, Malumisa & Benecke, 2021:75). This scenario may have an apocalyptic effect on the PHEIs operating among several risks. As Nahar, Hassan, and Khan (2020:191) mentioned, the government should provide a financial package to protect PHEIs because of the potential psychological effects of COVID-19 on society.
Since PHEIs are tuition-dependent in South Africa, perhaps an extension of NSFAS could help in this dire environment. These institutions' budgets can become unstable and jeopardise their very existence if enrolment objectives are unmet (Ismail & Al Shanfari, 2014:4) or their debtors' books increase, affecting their cash flow. Since the risks of COVID-19 are evolving, interest rate hikes and shrinking business income, which results in unemployment, all contribute to a higher risk of credit losses. Maota and Naidoo (2022:8) point out that macroeconomic factors may affect PHEIs and drive them to write off most debtors.

Economic hardship, accountability, globalisation, and the learning curve and complexity of new technology are all complicated factors (Waller, Lemoine, Mense, Garretson & Richardson, 2019:73) and in broader areas such as legislation and regulation, funding, education, infrastructures, resources, and outreach (Tamrat, 2020:677). Ismail and Al Shanfari (2014:42) emphasise that because most PHEIs are at the entry level of the higher education system, assurance and quality are major hurdles for them. The study by Stander and Herman (2017:221) also identified programme accreditation as a major barrier for most PHEIs in South Africa.

Understanding and managing the factors is critical when dealing with disruption. These factors must be considered carefully. The environmental scanning process was regarded as useful in establishing a disruption framework as it encouraged institutions of higher learning to analyse macro-changes that were also occurring outside the education industry and institutions and safeguard them from being blindsided. The PESTEL method was also used to identify and apply global megatrends affecting higher education institutions to our framework. A method of environmental scanning was utilised for the literature review. This study uses surveys and interviews to address internal aspects such as the availability of institutional resources and the internal capabilities for responding to disruption. According to Aguilar (1967) and Choo (1993), environmental scanning is the process of gathering and analysing data on the external environment of a business to help management make strategic decisions. Therefore, examining and analysing the literature in the context in which HEIs exist will provide a better knowledge of external forces of change so that HEIs can build effective solutions that will secure or strengthen their future position.

These factors and others make the financial future of higher education in South Africa uncertain (please see Figure 2.6 below).

Figure 2.6: PESTEL environmental scanning
Source: own compilation

Political

The years 2020 to 2022 were a remarkable disruptive period. After the pandemic had defined the near future for two years, the war in Ukraine then took over. Unsurprisingly, the Collins Dictionary has selected "permacrisis," a word that describes the experience of living through a time of political instability, inflation, and conflict, as its Word of the Year for 2022 (Collins Dictionary, 2023). For the first time in fourteen years, the price of a McDonald's cheeseburger in the United Kingdom has increased due to rising prices in 2022 (CNBC, 2022:1). These recent developments have also made it difficult for organisations to maintain neutrality on political and social matters (Argenti, 2020:1).

They experience investor pressure from above, employee pressure from within, and customer pressure from all directions to explain and defend their principles in the public sphere.

According to a study by Blackrock, geopolitical risk has significantly impacted market interest, revealing how volatile the global climate is (Blackrock, 2023). Geopolitical risk can have a substantial effect on HEIs. Political tensions and travel restrictions might limit the ability of international students to study and visit other countries (Hunter, 2019:i). Similarly, geopolitical dangers might hinder institutions' ability to create worldwide collaborations and partnerships (Voorde, 2022:239). The current situation between China and Australia illustrates how geopolitical risk can affect the sector. The decline in the number of Chinese students studying in Australia over the past few years is primarily attributable to the worsening diplomatic relations between China and Australia (Changyue, 2022:1). This had a major effect on Australia's HE industry, which has grown increasingly dependent on student tuition payments in other countries, particularly China. The pandemic also caused economic and political uncertainty, discouraging students from studying abroad (Mbous, Mohamed & Rudisill, 2022:3). Several institutions have lost money because of this, and the number of international students has gone down overall (NAFSA, 2020).

The current international political system affects education in a variety of ways. While the current political climate severely impacts academic institutions, it also presents universities with intriguing new opportunities for interdisciplinary study and collaboration. The expanding internationalisation of HE, driven by domestic political issues (Kyi, 2022:10), is one of the most apparent trends. Many students study abroad to gain a competitive advantage in the global labour market. Increasing globalisation and the demand for professionals in fields such as technology and engineering are driving this trend (Bhandari, Robles & Farrugia, 2018:5).

Nonetheless, the current political atmosphere has also heightened scrutiny of foreign money and influence in higher education (Chu, 2020:2; Green, 2019:1). Concerns have

been expressed in the United States, for instance, regarding the influence of foreign governments on American universities, with some lawmakers advocating for increased control over financing and research partnerships. This has prompted calls for greater financial transparency and tighter measures to protect academic freedom (Jongbloed, Vossensteyn, Vught & Westerheijden, 2018:442).

Another factor to consider is a space conflict. Even though humans have been venturing into space for decades, the pace of exploration has picked up in recent years, ushering in new possibilities and indicating the emergence of a new realm of risk, particularly due to the increasing militarization and weaponization of the space arena. Conflicts may arise if space exploration and exploitation are not managed with care as the number and variety of actors operating in space increase. Competition from new entrants in the commercial satellite sector threatens established players' monopoly on providing satellite services, especially those related to Internet-based communications. The disruptors are growing due to the limited and antiquated global governance to manage space and the competing national-level laws (WEF, 2022:10).

Glancing at the local political landscape, the ANC's elective conference, held from December 16 to December 20, appeared to be a one-horse race, with Cyril Ramaphosa, the incumbent president of the ANC and the country, in the driver's seat and maintaining the position of ANC president. However, the recent publication of Section 89 Independent Panel Report on constitutional and legal violations at Mr Ramaphosa's Phala Phala farm may weaken his leadership abilities. Mr Ramaphosa accepts the report despite the ANC's National Executive Committee (NEC) stating that its caucus in Parliament would oppose it. One possibility is that Mr Mashatile, the newly elected vice president of the ANC, may succeed Mr Ramaphosa if he resigns within the next few months. Significant pro-growth and investment policy enhancements may not be likely adopted in any of these changes.

Looking ahead to 2023, South Africa may be in for a nightmare scenario: ongoing high loadshedding, anti-investment policies, political uncertainty, slipperier inflation, decreased global demand for commodities, and a dimmed global economic outlook are

all likely to harm South Africa's economic recovery as well as the chances of the African National Congress (ANC) winning the 2024 election. The African National Congress (ANC) has ruled South Africa most of the time since apartheid ended. It has won every national election since 1994 and holds a majority in eight of the country's nine provinces. Without the ANC's national majority, it is unlikely that any other party in South Africa could take over the reins of government.

However, as things stand, the party might lose its national majority and either has to form a coalition government or face electoral defeat. In local elections held around South Africa in 2016 and 2021, voters rejected the ANC, forcing the party into alliances or allowing other parties to build multi-party governments in local municipalities. There is a good chance that this scenario nationwide and in certain provinces will be the same as in so many municipalities; no party gained a majority in about one-fourth of South Africa's municipalities in last year's local government elections.

In South African politics, coalitions are solidifying into a fixture. The days of one party easily obtaining a majority in Parliament or the several provincial legislatures may soon be over as coalitions, formerly uncommon, become increasingly common. Most South African municipalities have recently been embroiled in factional conflict and political instability. Many provincial legislatures and the National Assembly may soon experience the same instability as many local councils. This will have far-reaching effects, as political unrest will become the norm at the provincial and national levels rather than being confined to a select group of cities. This means that not only will service delivery to citizens be disrupted, but so will businesses and industries.

Wall (2021:55) notes that infrastructure neglect impedes service delivery, negatively impacting all individuals and the economy. Africa's infrastructure is falling behind because of financial and technical limitations and frequent political interruptions (OECD, 2020:13). Municipal and public infrastructure in South Africa is fast degrading due to overload, obsolescence, etc. and lack of maintenance (Patience & Nel, 2021). There is a real risk that service interruptions such as water shedding may become the norm at academic

institutions because of poorly maintained pipes, reservoirs, treatment plants, and road infrastructure. For example, burst water and sewage pipes have often resulted in water cuts.

Economic

The economic effects of the pandemic are still a reality. There have been increased economic, geopolitical, public health, and societal fractures after lifting the imposed pandemic lockdowns (Sedik & Xu, 2020). This increases the probability that different and slower responses can be taken to the world's most pressing humanity problems (World Economic Forum, 2022a:12). Additionally, the Russia-Ukraine war in early 2022 further hindered countries' abilities to support a prolonged recovery from the pandemic's consequences (SAIV, 2022:1). In future, these factors will still burden business owners and the middle class, the demographic that makes up the bulk of private universities' students (Maota & Naidoo, 2022:10). Current predictions indicate that because of the pandemic, the global economy will be 3% smaller in 2024 than it would have been if the pandemic had never struck (IMF, 2021).

The future of the pandemic remains unknown as recent studies indicate that long COVID continues to impact the health of many people worldwide negatively (Bach, 2022; Davis *et al*., 2021; O'Mahoney *et al*., 2023). Global economic growth is slowing due to the pandemic. This is exacerbated by inequalities in the labour market, protectionism, and gaps in digital literacy, education, and skills. The pandemic caused severe damage to the sustainable development goals, reversing over four years' worth of progress in alleviating poverty, with Africa being the most affected (Roberts, 2022:1).

Threats like inflation and rising debt levels rise as commodities prices rise. In sub-Saharan Africa, basic food prices increased by an average of 23.9% between 2020 and 2022, the most significant increase ever since the 2008 global financial crisis (IMF, 2022:1). Global trends indicate that food prices will continue to rise annually, impacting the well-being of households (Van Wyk & Dlamini, 2018:1). The cost of road transportation has increased considerably over the past year due to the skyrocketing

prices of gas and diesel (Hamon, 2022:1). When commuting to and from campus increases. Students may favour online education over traditional classroom learning. On the other hand, students who cannot study from home and struggle with mounting prices may miss the most crucial lessons and find it challenging to keep up academically, which could lead to their dropping out or failure.

Inflation has grown in various nations due to supply chain disruptions caused by the pandemic, rising consumer demand, and escalating commodity prices. In 2022, the prices of commodities had risen by almost 30% since the end of 2020 (Basquill, 2022:1). Due to the rising tensions involving Russia and Europe, China's energy shortfall (Cohen, 2021:1), continued supply chain disruptions, and the challenges associated with the shift away from fossil fuel reserves. These prices may continue to fluctuate. This will weaken consumer confidence, which has been important to the economic recovery and increase the likelihood of central bank interest rate increases (WEF, 2022:1).
When rates are increased, it implies that a growing number of people will be unable to afford their loans and that household income will shrink.

Rising prices and more expensive financing would hurt most low-income households in developed and developing countries. Small and medium-sized businesses (SMEs) trying to avoid bankruptcy would also be hurt by weaker consumption. This disruptive period appears to have a long way to go. Economists predict that in 2023, individuals and companies will be negatively affected by inflation (Chambless, 2022). The income gap will continue to widen, and as a result, families may be forced to increase their household debt to keep their desired living standards, which may result in a credit crisis. Since tuition fees are how private higher education institutions make money, this could mean that more of their customers will not pay on time. Given the current poor economic growth rate and the huge number of indebted credit consumers, it is impossible to foresee considerable expansion in the private education industry, which relies on paying clients.

Social

A growing number of people are leaving their homes for a safer environment and a brighter future because of rising insecurity caused by economic hardship, the worsening effects of climate change, and political unrest. In 2022, Q2, GDP fell 0.7% q/q as floods, frequent loadshedding, high input and transportation costs, and global trade disruptions dampened activity (FNB, 2022:1).

Another factor that could dampen the employment forecast is the widespread unpredictability caused by geopolitical tensions and worries about a significant global economic slowdown (Caldara, Conlisk, Lacoviello & Penn, 2022:1). Leaders are trying to ascertain which intervention methods are most likely to control these spiralling costs; consequently, citizens, including students, are getting impatient, and social unrest is on the verge of erupting (Maota & Naidoo, 2022:12).

The number of South Africans immigrating is reported to have risen to nearly 1 million, from 780,000 in 2015 (van Rensburg, 2022:1). Even more unfortunate is the exodus of South Africa's highly skilled workforce. FNB, in their property barometer study, found that 15% of home sales in the R3.6 million and above price bracket were affected by emigration (Business Tech, 2022). This category may involve the departure of highly skilled individuals pursuing opportunities abroad.

Ngoyama (2016) study found a high shortage of academic skills attributed to poor job satisfaction, uncompetitive salaries, and stringent academic appointment. South Africa has been battling a lack of higher education skills (Foko, 2015:10). Education has the most significant skill shortage based on a survey of 21 industries undertaken in 2020. South Africa had a much larger skills gap in competence across all skill areas than the other selected nations (DHET, 2022:98-99). Access to quality higher education proves to be the difference between the provision of skills needed and the ability to pay for those skills in an economy already struggling in South Africa (Talmage-Rostron, 2022:1).

Most people go to economically prosperous provinces like Gauteng and the Western Cape. Looking at those emigrating, between 2016 to 2021, about 1,559,881 persons migrated to Gauteng from other South African provinces, while 469,984 migrated to Western Cape (Stats SA, 2022). At the same time, the Free State, Eastern Cape, Limpopo and KwaZulu-Natal all have negative net migration, meaning that more people are leaving than are moving in. According to a recent study by the Social Research Foundation, more than two-thirds of black voters who make more than R20,000 per month want their children to leave the country to study and find employment (Mkentane, 2022). The above factors may also influence some parents to send their kids to study abroad than in the South African HEIs.

The study by Ola and Zia (2021) found that social media, and Facebook specifically, were the most influential factors in selecting a field of study and an ideal higher education institution. The emergence of social media also has a substantial impact on the academic lives of students (Boateng & Amankwaa, 2016:1). Social networks, particularly educational, social networks in HEIs, are a valuable resource for sharing and exchanging information (Gutiérrez & Del Pino, 2021:47). In crisis communication, social media is the most effective method for mitigating crises (Maresh-Fuehrer & Smith, 2015:621). In contrast, social media have disrupted institutions and governments globally (Anderson & Raine, 2020:1, Gire, 2017:1). Populists and anti-establishment candidates can adversely use this situation to spread disruptive messages, beliefs, and fake messages (Olaniran & Williams, 2020:77, Schleffer & Miller, 2021:1).

Information disseminated via social media technologies can spread rapidly and often beats traditional news channels to the punch. It can harm a higher education institution, especially if a gap in control or an incident can damage the university's reputation. The institution has not done anything to solve the problem. For example, in 2022, a viral incident occurred when a male student at the Stellenbosch campus urinated on the belongings of a black student (Carolissen, 2022). The impact of this kind of news on higher education institutions is detrimental. However, this could be even more problematic

for private institutions because their reputation and public image are more essential to their continued existence than their publicly funded counterparts.

Most private institutions receive funding thanks to the confidence of investors. These institutions cannot afford their investors to lose faith because of negative press. According to the research conducted by Gutiérrez-Villar, Alcaide-Pulido, and Carbonero-Ruz, (2021:11), evaluating the credibility of a company's brand requires a different set of metrics when comparing public and private entities. Previous research by Helm (2007:22) has demonstrated that a company's reputation influences the initial investment decision-making process; hence, these institutions cannot afford to lose investor confidence. Consequently, financial results, competitiveness, customer response, business survival, stakeholder choice and success can all be influenced by a company's reputation for the right reasons (Jung & Seock, 2016; Fombrun, 1996; Hemsley-Brown, 2012, Christensen & Gornitzka, 2017).

Competition to target resources, talented and gifted people (staff and students), and distinguished professors from around the world (Christensen & Gornitzka, 2017) have increased as the higher education sector now exists in a heavily complex and competitive market (Del-Castillo-Feito, Blanco-González & González-Vázquez, 2019:91). For this reason, these institutions must understand how important it is to properly manage intangible assets like reputation and image if they want to attract and keep their stakeholders (Hemsley-Brown *et al.,* 2016; Plewa *et al*., 2016). Based on Garwe's (2016) research, prospective students consider various factors, including reputation, before enrolling in a private learning institution. Gaspar and Soares (2021:24) also believe that the HEI's cultural values, reputation, and surroundings may affect a student's decision. Martin-Miguel, Prado-Román, Cachón-Rodrguez, and Avendao-Miranda (2020:13) note that a private education provider’s reputation is crucial to sustainability.

The Times Higher Education (THE) higher education rankings for 2023 reflect significant shifts in the broader higher education landscape. The Chief Knowledge Officer of THE has stated that there has been "clear evidence of a great global levelling up in the world

ranking of universities in recent years." Eleven Chinese institutions were included in THE's top 200 for 2023, making China the country with the most representation among emerging economies. With a 16th-place global ranking, Beijing's Tsinghua University came out on top. As for reputation, the university is in a respectable ninth place worldwide. Reputation is critical in higher education. Baty mentions that this can help attract prospective investors and bring in high-quality business partners for strategic growth (WEFORUM, 2022).

Environmental, health and safety

In light of the COVID-19 outbreak, higher education institutions were obligated to consider revising their policies, procedures and standards carefully. These changes, directly and indirectly, affect the lecture hall environment for students and educators. Researchers Chetty, Friedman and Rockoff (2014) and Ferguson, Phillips, Rowley and Friedlander (2015) believe that educators have the greatest impact on the academic success of university students. Furthermore, the conditions in which educators are employed substantially impact their performance (Baluyos, Rivera & Baluyos, 2019:206). These conditions have been substantially disrupted by COVID-19, which has considerably impacted educators' work and their well-being and health.

Due to either a lack of time or a lack of specialised training, educators were forced to radically adapt their teaching methods (Rapanta, Botturi, Goodyear, Guardia & Koole, 2020:924). They assumed new responsibilities for ensuring the safety of students attending classes, despite the widespread belief that the facilities were unsafe. They also needed to assist students, many of whom were experiencing a challenging period in their own lives (Basheti, Mhaidat & Mhaidat, 2021:1; Son, Hegde, Smith, Wang & Sasangohar, 2020:1). For instance, students who had never taken an online class found the experience challenging (Ronkowitz & Ronkowitz, 2021:194). The study examining how the pandemic affected students' mental health found that meeting students' social and emotional needs in a digital environment was a recurring concern (Lakhan *et al.*, 2020).

Felix (2021:2) mentions that global educational institutions adopted technology during and after the pandemic out of desperation rather than as a calculated move. It was clear that there was a lack of staff training and the resources necessary to meet the needs of each student. Therefore, teachers at all levels, students, and parents had to learn new technologies quickly (Fisher et al., 2021:523). On the other hand, one could argue that making a quick transition online is essential to ensure continuity (Ronkowitz & Ronkowitz, 2021:190).

Some researchers suggest that most educators have experienced considerable stress and burnout during COVID-19 (Rubilar & Oros, 2021:1), particularly those less experienced with online teaching (Mosleh, Kasasbeha, Alijawarneh, Alrimawi & Saifah, 2022:1). The COVID-19 pandemic brought about new problems in almost every area of life (Abramson, 2022:1). In addition, the study by Ndlovu, Mlambo, and Ndebele (2022:54) found that the government and higher education institutions have overwhelmed and ignored academics because government solutions to the pandemic have primarily focused on students. Even non-academic staff had a lot of breakdowns and burnout because they were putting in more hours and having to do more at home.

Larger PHEIs may also face unique challenges when managing disruptions like the COVID-19 pandemic due to the number of students and the complexity of their systems (Nwachukwu, Winchester, Das & Hagan, 2021:20). According to Park, Adegun, and Venkatraman (2021:307), this is because the size of disruptions can be more severe in larger institutions due to the widespread nature of infections. However, with careful planning and effective communication, institutions can work to minimise the impact of disruptions and support their students during times of uncertainty.

The human impact of these concurrent crises is disastrous. The COVID-19 pandemic, which resulted in over six million deaths worldwide (CNET, 2022), was not the only recent human catastrophe; extreme weather occurrences have harmed countries and individuals globally, with the poor, particularly women and girls, suffering the worst (McCarthy, 2020). The UN expert warns about climate change caused by people, which

is seen as the biggest threat to societies and ecosystems around the world (United Nations, 2022:1). Climate change is seen as a multiplier of threats, exacerbating poverty and conflict (Bowles, Butler & Morisetti, 2015:391). For instance, weather experts predict that many droughts, floods, heatwaves, and wildfires will become more severe due to rising global average temperatures of 1.5 and 2 degrees Celsius (IPCC, 2022). The regions of southern Africa are warming at a rate almost twice the world average while bordering sea levels and greenhouse gas emissions are on the rise (Scholes & Engelbrecht, 2021:1).

The report, authored by a South African clinical phycologist Dr Garret Barnwell for the African Climate Alliance, demonstrates that climate change damages are now negatively affecting our mental health. These harms will only intensify in the future, putting today's youth and future generations in danger (Barnwell, 2021). In agreement, recent studies indicate that extreme weather impairs students' learning capacity (Henry, 2018) and achievement on standardised examinations (Stanford, 2020). Resultantly, fewer higher education students attended classes while institutions shortened class duration (Alberto, Jiao & Zhang, 2021:3). Lagmay and Rodrigo (2022:3) add that excessive temperatures affect the overall educational performance of students.

Technology

COVID-19 has made people more dependent on digital systems, which has changed societies. In the previous 18 months, digitisation has spread rapidly across industries, workers have increasingly utilised remote work opportunities, and the number of platforms and gadgets that make this possible has increased considerably. Malware and ransomware attacks alone surged by 358% and 435% in 2020 (Helpnet Security, 2021), accordingly, and these risks are developing faster than civilizations can adequately prevent or respond to them.

Existing imbalances in the workplace are expanding due to technological advances, both between different sorts of workers and between workers and business owners. Although they do not result in a large decrease in employment overall, they alter the demand for

certain skills and speed the emergence of more flexible, albeit less secure, "contingent labour" arrangements (UN, 2022). Moreover, it is anticipated that between 20 and 50 million new jobs will be produced in the technology innovation and deployment sector by 2030 (Manyika *et al.*, 2017). Polven (2022) contends that unemployment is not a problem in the countries that have used robots extensively (Germany, Japan, Singapore, and South Korea).

Contrary to Polven, graduate employment among young people in SA has increased because of the COVID-19 epidemic, which has forced most businesses to adopt new technology and change how they do business (Goyayi, 2022:1, Stats SA, 2021:1). Technology has become a “must-have” in the modern world. It plays a big part in helping us do things daily, especially in education. Textbooks used to be a big part of teaching and learning, but now most learning is done online. Therefore, to consider this phenomenon comprehensively, higher education must assess the skills gap in the programmes they offer and the field of study requirements of the labour market. Higher education institutions must consider if their programmes are relevant to current market demands.

Survey finds that even while students have a good experience with their educational institutions, more and more students question whether education is worth the cost (Lederman, 2021:1). Critiques of higher education feel that relatively few academic studies give returns to the labour market. In the same vein, Lauder and Mayhew (2020:7) point out that being a top student does not guarantee that you will be a top performer in the workplace. Elon Musk, CEO of Twitter, SpaceX and Tesla, has critiqued the relevance of MBA programmes, arguing that while MBA graduates are good at crafting presentations by PowerPoints, they lack an understanding of "how things operate" (Entrepreneurial, 2021). Higher education institutions (HEIs) should consider whether their prestigious degree provides the best value for their students and the working world. This is especially true for Gen-Z students (Burt, 2022:1).

A study considering the labour market and higher education found that, unfortunately, the number of "permanent jobs" for recent graduates has not increased at the same rate as that of new graduates (Lauder & Mayhew, 2020:1). According to employment data, the graduate unemployment rate in South Africa is lower than that of people without a formal qualification (Business Tech, 2021; Stats SA:2022). Comparatively, the mismatch between private higher education institutions' graduates and the labour market in Oman is also problematic (Ismail Shanfari, 2014:4). The learning process and labour market needs have become increasingly distinct due to technological advancements, required skills and solutions. On the contrary, higher education is considered by many as an investment in one's personal development and saleability (Nukunah, Bezuidenhout & Furtak, 2019:285).

Some believe that education is the most effective tool in the nation's battle against unemployment (Van Broekhuizen, 2016:1; Zimmer, 2016:9). The South African government published a list of scarce skills to minimise young unemployment rates. The list includes high-demand careers and increased employment prospects (DHET, 2022c). However, education expert Professor Mary Metcalfe advises that it is incorrect to assume that certain degrees, such as a Bachelor of Arts in Philosophy, will not lead to employment opportunities despite the scarcity of specific skills (Metcalfe, 2022).

Legal and Compliance

According to Ellis and Steyn (2014), the rapid growth of PHEIs concerned the SA government and public sector. They worried that PHEIs would draw students from public institutions due to their facilities, staff, resources, and affordability. Because of these fears and shifts in the government's social and economic goals, new rules were made for PHEIs (Subotzky, 2003). These regulations from the government governed both the quality and the sustainability of private providers (Prinsloo, 2005). In contrast, the United States and Japan have placed considerably more focus on the governance of private institutions, notwithstanding the substantial development of PHEIs in the United States (Scott, 2021:10).

Higher education as a whole is watched closely. The complexity of the rules has a big impact on the culture of compliance (Eisenstein, 2020:1). For PHEIs in South Africa, these complex regulatory requirements pose a serious challenge (Ellis & Steyn, 2014:1). In the United States, the study by Levy (2013) found that the decline in the growth rate of PHEIs was also due to stringent government policies and hostile regimes. As a result of the 2019 Coronavirus pandemic, governments have now placed more attention on the governance of higher education institutions (Scott, 2021:12).

A decade ago, a study by Ellis (2012:4) found that the regulatory criteria set by the government had an impact on the management functions of PHEIs as they struggled for full recognition by the government. To date, some of these strict criteria are still in existence. For instance, as outlined in section 56 of the Higher Education Amendment Act 26 of 2010, private higher education institutions cannot call themselves universities (DHET, 2010).

The Council on Higher Education (CHE) accredits all-new programmes offered by PHEIs through a rigorous process (CHE, 2022). Subsequently, every three to five years (a cycle), the PHEIs must undergo a re-accreditation process for their programmes, during which the PHEIs and their programmes must meet the minimal requirements for the minimum criteria established (Myburgh & Calitz, 2022). The DHET will re-register PHEIs for the subsequent cycle if their programmes have been re-accredited successfully; however, if the process fails, the DHET may de-register the institution (CHE 2004; DHET 2016a).

The study by van Schalkwyk (2011:32) indicates that PHEIs in South Africa are not trusted because of the widespread belief that these institutions are primarily "entrepreneurial" in character and seek profit for their stakeholders. There is a common perception that these institutions provide qualifications of dubious quality to maximise profits; consequently, the Council on Higher Education (CHE) implemented more stringent measures for the accreditation of qualifications offered by HEIs to combat this perception (CHE, 2016:84). Stander and Herman (2017:220-222) agree that most PHEIs think that the authorities

trust them. They generally see themselves as victims of the system as a whole. The 2017 study also found that PHEIs often believe that public institutions benefit from preferential rules and regulations. Those who advocate for PHE have griped about the increased complexity of the accreditation process and the perception. The evidence from the increasing number of PHEIs with valid accreditation suggests otherwise.

2.9 DISRUPTION IMPACT ON THE DEMAND FOR PRIVATE HIGHER EDUCATION: OTHER CONSIDERATIONS

Private higher education has traditionally been a stable and lucrative industry, offering students an alternative to public institutions and providing a range of academic programs and services. However, the sector has faced significant disruption in recent years, with challenges such as increasing competition (Musselin, 2018; Ostergaard & Nordlund, 2019:1), shifting student demographics (Purcell & Lumbreras, 2021), and the emergence of new technologies threatening the viability of some institutions, the increasing cost of tuition (Prodjomaroeto & Muhyidin, 2020:1), the rise of online education (Bashir, Bashir, Rana, Lambert & Vernallis, 2021), shifting demands of the job market towards more vocational and practical skill-based learning (Allais & Marock, 2020:62). As a result, PHEIs may soon struggle to attract and retain students and competent staff. Many are forced to change their business models significantly to remain competitive. The disruption of private higher education has significantly changed how students access and pay for post-secondary education. These disruptions may result in many customers being unable to pay, leading to financial instability for many PHEIs (Paterson, 2021), forcing them to adapt and innovate to stay competitive.

Traditional brick-and-mortar institutions have had to adapt to stay competitive WITH the proliferation of online learning options (Williams & Corwith, 2021:5055) such as offering their online programs or partnering with edtech companies (Rice, 2023:1). This shift has also sparked a debate about the value of a traditional college degree, as more and more students opt for alternative forms of education such as coding boot camps or micro-credentials (Brown & Kurzweil, 2017:2; Ralston, 2021:83). However, these alternatives may not provide the same level of academic rigour or prestige as a traditional degree,

and there is a risk that the push towards more accessible and affordable options could result in a decline in the overall quality of PHE (Levy, 2013:25).

Despite these obstacles, the demand for higher education remains strong (Nukunah, Bezuidenhout & Furtak, 2019:285), and private institutions still have the opportunity to adapt and succeed in this rapidly changing environment. These institutions continue to be a vital and valuable component of the education system, providing students with a vast array of academic and extracurricular activities that can assist them in achieving success in their chosen careers. Tuition is a major source of revenue for many PHEIs. The recent economic crisis brought on by the epidemic has had a catastrophic impact on their bottom lines (Lim, 2022:94). It is vital to remember that PHEIs may still be struggling financially due to the crisis and may find it particularly difficult to invest in educational technology.

Due to economic strain, public institutions in South Africa have recently struggled with student strikes requesting financial aid (Greeff, Mostert, Kahl & Jonker, 2021:88). This effect of discontent on teaching and learning is prolonged frequently. As a result, private education has a better opportunity of enrolling students from a cohort who choose to study with fewer disruptions from student strikes. Additionally, Garwe (2016) notes that PHEIs are learner-friendly and less susceptible to political interference.

In recent years, the cost of tuition at higher education institutions has risen faster than inflation, causing widespread concerns (Business Tech, 2022; Calitz & Fourie, 2016:150). In the US, there is also a notion that PHEIs are more expensive than public ones, and this gap has been widening in recent years. According to a report by the College Board, the average annual tuition and fees for private four-year institutions in the United States were $35,551 for the 2020-2021 academic year, while the average annual tuition and fees for public four-year institutions were $9,377 for in-state students and $27,091 for out-of-state students. This gap in tuition costs between private and public institutions has been widening in recent years (Hanson, 2022). In a recent study, Singh and Tustin (2022) found that parents think private higher education in South Africa is expensive. This means that

there is a need for better communication by these institutions to clear this up and provide more information.

A study by Johnson (2019), mentions that the expansion of the PHE sector in South Africa has been limited to urban areas, limiting rural and peri-urban students' access to PHE. Consequently, the location of PHEIs in South Africa is said to affect their cost and accessibility substantially, particularly for students from low-income families (Gasper & Soares, 2021:24; Tjønneland, 2017). Research has shown that students in more rural provinces may have poorer experiences regarding online learning. According to Reddy Moonasamy and Naidoo (2022:83), students in rural areas face challenges such as limited access to technology and the Internet, making it difficult to participate in online learning. This lack of connectivity can lead to frustration, feelings of isolation, and difficulties in accessing course materials and engaging with other students. Additionally, students in rural areas may have fewer opportunities for face-to-face interaction with lecturers, which can impact their learning experiences and overall academic success.

Similarly, Bok and Mostert (2020:7) found that students in rural areas may face additional challenges, such as limited access to transportation and other resources, which can further impact their ability to participate in online learning. These challenges can lead to feelings of marginalisation, disengagement, and poorer academic outcomes. Students' experiences in rural areas highlight the need for targeted support and resources to help them succeed in online learning. Educational institutions can help ensure that all students have the same chances to do well in their studies by understanding and addressing the unique problems these students face.

2.10 THE EFFECT OF INNOVATIVE TECHNOLOGY ON HIGHER EDUCATION INSTITUTIONS

HEIs were forced to quickly adapt to an online learning environment when the COVID-19 outbreak necessitated academic application systems change (Mpungose, 2020:1). any organisation will inevitably experience some form of disruption due to the effects of change. Transformational change ultimately produces organisational disruptions (Bucy,

Hall, Yakola & Dickson, 2017:2). These disturbances may vary from small, tolerable disruptions to uncontrollable, institution-closing disruptions. The disruptions brought on by COVID-19 resulted in the collapse of some HEIs worldwide, particularly private ones. Additionally, this sudden shift wreaked havoc on people's personal lives and, within the realm of education, pushed many educators to make drastic changes due to the potential for death. According to Parra and Tan (2021:1), the global spread of COVID-19 necessitated rapid changes in learning pedagogies and education delivery systems, which they had never done before and were completely unprepared for.

Computer and information technology, in general, have created major changes that can be quantified using existing metrics to evaluate modern technology's consequences. Various web-based and Internet-enabled services have posed competition to conventional sectors, such as the encyclopaedia industry, which has been disrupted by CD-ROM technology and then by Wikipedia (Kilkki, Mäntylä, Karhu, Hämmäinen & Ailisto 2018). Education is also being affected by the disruption. Since most publishing organisations today rely on the Internet to distribute information, traditional education cannot exist without this new type of education (Saleem & Gouse, 2018:141).

While the COVID-19 epidemic has spurred a surge in online education delivered via various digital technologies and platforms, it has also highlighted the limitations of such innovations and had other far-reaching consequences. Pre-pandemic futurists hailed the use of technologies in education as playing a near-salvific role in raising education standards worldwide, but this optimism has run into some severe roadblocks (Feenberg, 2015; Wheelan, 2016; Aldama, 2018; Herman, 2020). There is a danger to integrity. However, new and increasingly mobile and discrete technology threatens the ability to guarantee that a student follows the standards and expectations set by an instructor and institution when doing an assessment. It may become useless if people stop believing in this system (Gage & Michelle Sengara 2019).

Hedding *et al.* (2020:2) say that it was tough for students to finish their studies if they still had to collect data on the ground or do lab experiments. On the other hand, the study

found that most HEIs have taken steps to give students access to data, equipment, and educational websites. Even with all these steps, Mpungose (2020:7) said that even though education institutions use online learning management systems like Moodle, the changes needed to make them work in a local setting may make it harder to learn. These systems were designed to store information, not host real-time online lectures at different times. Because teaching and research were hard during COVID-19, everyone involved had to change, which should be seen as a positive chance to grow (Corbera, Anguelovski, Honey-Rosés, and Ruiz-Mallén, 2020:1).

The Fourth Industrial Revolution (4IR) and COVID-19 have hastened the transition to a fully online educational system (Coetzee, Neneh, Stemmet, Lamprecht, Motsitsi & Sereeco, 2021:1). Since HEIs were forced to adjust to new technology systems instantly. Still, many of them were not ready to do so. Leadership faces new hurdles when new technologies are introduced into an organisation. If the transition is rushed, the system change governance process may not be strictly adhered to, increasing the risk of system failure. When a system fails, it may either stop working as expected or be unavailable for an extended period (ISACA, 2020). Organisational operations can be significantly impacted by the success or failure of an IT change management initiative (The IIA, 2020:2). Moreover, IT risk is increasing as the IT landscape evolves and becomes more sophisticated, introducing new risks and threats (ISACA, 2022).

After Russia invaded Ukraine earlier this year, experts worldwide have observed an alarming surge in cyber threats despite the availability of cybersecurity defence solutions. According to the first-ever "Shields Up" notice issued by the United States' Cybersecurity and Infrastructure Security Agency (CISA), the Russian government and its allies (both nation-state and independent) will likely increase cyberattacks against Western governments and organisations in retaliation for their support of Ukraine (Costlow, 2022). According to Verhoef and Coetser's (2021) research, the change to online assessment has led to an upsurge in academic dishonesty worldwide since the COVID-19 pandemic. Given how the pandemic changed how universities work, Maota and Naidoo (2022:4) say that leaders of higher education institutions (HEIs) must now create sector-specific

intelligence tools to help their institutions adapt to disruptive change. Furthermore, efforts should be made to enhance the introduced technologies to have lasting value following the end of the crisis.

Higher education institutions are challenged to prepare students to apply their knowledge and abilities to real-world problems. This is a crucial education component in the modern era. A curriculum that emphasises transfer and application, incorporates important 21st-century skills and requires subject mastery can better prepare students for their future careers and the obstacles they may face in a rapidly changing workplace (McTighe, 2021; Terada, 2021). For instance, artificial intelligence (AI) is revolutionising how we live and work, and education is no exception. AI technologies such as ChatGPT can substantially impact teaching and learning, opening new avenues for tailored and efficient education (Bloomberg, 2023). However, some educators and HEIs may perceive AI as a threat, especially if unfamiliar with its capabilities and applications.

HEIs may prepare students for a quickly changing and technology-driven world by embracing AI and exploring innovative approaches to teaching and learning. To effectively adapt to these developments, educators must embrace artificial intelligence and evaluate how technology may enhance their teaching and assist student learning. This may entail introducing AI technologies into the curriculum or evaluating innovative educational approaches capitalising on AI's strengths. In addition, it is essential to explore AI's ethical and societal consequences and provide students with the skills and knowledge necessary to utilise and interact with these technologies ethically.

Online education and associated technologies have become the standard, and academic institutions must change to accommodate this new learning method. As a result, they will need to reinvest in their students and improve the education system, including by updating teaching methods and technology. With this as the standard, it will be tough to argue that education focused on technology is secondary. This fact carries a wide variety of cyber risks, necessitating the establishment of rigorous quality assurance mechanisms inside these organisations.

2.11 CREATIVE DISRUPTION IN THE CONTEXT OF HIGHER EDUCATION

What we might call "creative disruption" in the context of higher education would be the introduction of new products, services, or business models that significantly alter the traditional modes of providing, selling, and receiving higher education (Christensen, Raynor & McDonald, 2015; Whitelaw & Garcia-Lorenzo, 2017:1). The development of new technology, the establishment of new social standards, and market demands can influence it. It was discovered that this phenomenon, which Professor Christensen originally implemented, had far-reaching dynamic effects on the curriculum (Saleem & Gouse, 2018:141). Online learning, competency-based education, and other non-traditional forms of credentialing can all profit from these trends, which challenge more traditional models of higher education (Dillard, 2018:1; Janresseger, 2014:1).

Creative disruption in higher education can be seen in the rise of free, accessible online courses known as massive open online courses (MOOCs) (Stepan, 2013:iii; Ivancheva, Swartz, Morris, Walji, Swinnerton, Coop & Czerniewicz, 2020:608). Massive open online courses (MOOCs) have significantly altered the traditional university model by making education more affordable and accessible to students worldwide. By the middle of 2012, over 300,000 people were using the massive open online course (MOOC) platform Coursera, enrolled in 38 courses taught by Stanford academics and a handful of other renowned universities (Saleem & Gouse, 2018:142). Soon after, a professor at Stanford founded Udacity, which works with universities and lecturers to offer free, open online courses to anybody interested (Udacity, 2020:1).

The rise of digital badges and micro-credentials, which can be obtained outside formal degree programmes, is another example of creative disruption in higher education (Kato, Galán-Muros, and Weko, 2020:4). Due to escalating student competition and the need to adapt to altering demographic, technical, and cultural trends, the significance of creative disruption in higher education has increased (Coetzee *et al.,* 2021:2). Students' demonstrations of knowledge and skill are evolving in response to these novel credentialing options. This may make it easier for them to enter the workforce with the appropriate skills and credentials. Since creative disruption can benefit or negatively

impact an institution, it shares some features with internal conflict (Kilkki, Mäntylä, Karhu, Hämmäinen, and Ailisto 2018:278), and higher education institutions (HEI) must be mindful of the changes it influences.

2.12 DISRUPTORS IN THE PRIVATE HIGHER EDUCATION INDUSTRY

Living under the new normal implies that we live in a disruptive era. The term "disruptive era" refers to an era in which many innovations are taking place behind the scenes and are not being adopted by traditional institutions. This could disrupt the status quo or even eradicate the institution (Kristanto & Pradana, 2021;277). This means HEIs cannot continue business as usual, using just tried-and-tested methods of operation without looking to innovation for solutions. The success of PHEIs, especially those in South Africa, will depend on their ability to attract and retain students. According to Baskoro (2018:118), those in the private higher education sector who are the most innovative would see increased student enrolments due to the disruption.

Several factors are currently disrupting the private higher education industry. Some of the most notable include are as follows:

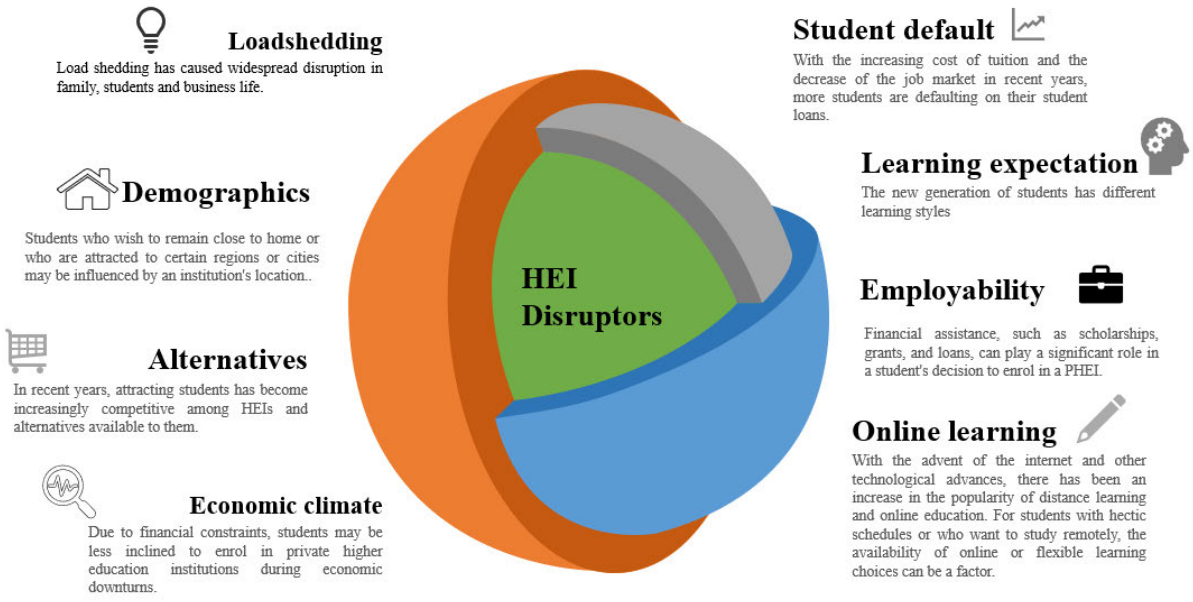


Figure 2.7: HEI disruptors
Source: Own compilation

***Loadshedding as a disruptor*:** Eskom is South Africa's primary national parastatal electricity supplier, in charge of power generation and distribution. Loadshedding in South Africa has become an increasingly prevalent operational issue in recent years. Loadshedding has caused widespread disruption in family, student and business life. Due to power outages, KFC, a major fast-food chain, announced on its official Twitter page that it will temporarily close several stores in December 2022 (EWN, 2022). The National Energy Regulator of South Africa (NERSA) has increased the cost of electricity by 175% over the past ten years (NERSA, 2021:7), and they are still asking for more increases. What is difficult to comprehend is that even with these massive hikes, loadshedding and power cuts remain inevitable. Businesses and individuals will continue to lose money due to fee increases and blackouts.

Eskom supplies approximately 95% of South Africa's electricity (Ndlovu & Inglesi-Lotz, 2019:18). However, Eskom's power generation has constantly been declining due to maintenance backlogs, skills shortages, and difficulty sourcing coal, leading to a deficit between demand and supply (Geldenhuys, 2022:28; Pan, 2015:15). This negative trend persists, and Eskom implemented loadshedding measures as a last resort to prevent a failure of the national power infrastructure, leaving many residents, institutions and businesses in the dark.

Like in South Africa, energy crises and scheduled blackouts are affecting Europe (Bloomberg, 2022, IMF, 2022). Rolling blackouts across the country on a predetermined timetable is what loadshedding is. This is done to prevent a complete collapse of the power grid. Loadshedding has serious economic consequences and will ultimately affect the earnings of educational institution educational institutions' earnings. Dewa, van der Merwe, and Matope (2020:112) say that South Africa's economy lost R20 billion per month in 2022 because of Stage 1 loadshedding, R40 billion per month because of Stage 2 loadshedding, and R80 billion per month because of Stage 3 loadshedding. The country's economy spent R560 billion in 2022 (Daily Investor, 2022).

The rising fuel cost would also make it too expensive for higher education institutions to run backup generators for the lengthy durations provided by these several stages of power outages. Since 2014, when loadshedding became more common (Dewa, Merwe & Matope, 2020:111), higher education institutions have had to factor power outages into their timetabling. These institutions would be better able to plan and arrange classes and examinations if they knew when the next loadshedding would occur. However, loadshedding stages have recently changed frequently due to various factors reported by Eskom, such as sabotage, thefts, breakdown of plants and machinery and lack of finance to purchase diesel (Eskom, 2022:1; Mujuzi, 2020:78).

There are also signs that loadshedding is affecting the country's water and food supplies, which could hurt the economy, people's daily lives, and health. Loadshedding's power interruptions reportedly disrupt water treatment facilities, pumping stations, and reservoirs, resulting in water shortages or low pressure in Gauteng (Joburg Water, 2022:1). Agri SA reported that there might be shortages in the food supply and subsequent price increases because of this (Agri SA, 2022). On another note, many facilities used in the production and distribution of food rely on electricity, so loadshedding and power outages could disrupt their operations. The government and the higher education sector will be faced with this critical issue.

Based on the findings of a study conducted by Khan, Ayub, and Farook (2022), prolonged periods of electric loadshedding negatively impact students' academic results. Loadshedding undoubtedly disrupts the normal operation of higher education institutions, thereby delaying the provision of educational services. These blackouts can disrupt classes, delay assignments and examinations, and make it impossible for students to access Internet resources. Students may also have to study in places that are too dark or hot without air conditioning, making it hard to concentrate and remember what they learn. One example of the impact of loadshedding on students is research done in the Zambian city of Lusaka. This study revealed that power disruptions severely impacted the academic performance of university students. The study revealed that power interruptions were causing delays in assignments and tests and significantly impacted students' daily

routines and academic lives, resulting in less studying time, particularly at night, and thus impacting their academic performance (Phiri *et al.* 2021).

In a similar vein, most of the activities that take place in educational settings require power. The computer is the primary tool for the technology employed in learning environments. The students utilise computers, which are powered by electricity, to complete their research and practice sessions. These actions are made more difficult due to loadshedding on the electric grid. The loadshedding, which has lasted for four hours, is also straining the equipment and depleting the backup batteries. According to telecommunications experts, batteries typically have a capacity of 6–12 hours and require 12–18 hours to recharge; consequently, stages 3 and 4 do not provide enough time to recharge to full capacity (Moyo, 2019). Since backup batteries rarely have time to recharge during power outages, poor cell phone coverage and interrupted Internet connectivity have become common during loadshedding (Vodacom, 2021:1). Students are significantly disrupted because they cannot make or take calls or use the Internet.

The preceding information suggests that students will have difficulty conducting online studies, which may severely affect their academic performance. South Africa surpassed 200 days of power outages in 2022 (TechCentral, 2022) - approximately 54% of days lost in a calendar year. The scenario may be significantly worse for an academic calendar year, which varies from February to November at higher education institutions. One of the obstacles that will need to be addressed in the future is finding a suitable solution for all students who live in different areas and are connected to different electrical grids. Moreover, due to the technology's reliance on electricity, most higher education institutions must reconsider their online education strategies.

Loadshedding also increases inequality, with rural and township students most affected. The Centre for Sociological Research and Practice (CSRP) at the University of Johannesburg studied this topic. Their research report titled "Energy Racism: The Electricity Crisis in South Africa" reveals that black working-class townships nationwide endure loadshedding and load reduction. (Maggott, Mbatha, Ceruti, Moyo, Mporo,

Ngwane, Shezi & Sinwell, 2022). Students, particularly from townships and rural areas, are severely disrupted due to the length and frequency of these blackouts. In addition, Eskom and the government are slow to respond to repair requests in these areas. Backup powers and applications that alert citizens about loadshedding are rendered obsolete in the instance of load reduction or slow response by the government. Therefore, electrical loadshedding that lasts for hours at a time and does not happen at a set timetable will make students' lives very difficult, especially on days when they need to study for exams.

The study by Ronkowitz and Ronkowitz (2021:193) reveals that off-campus, the inequalities drew attention to additional groups that were technologically, geographically, and economically neglected and where the infrastructure was lacking. In many rural areas, for instance, access to wireless hotspots is limited by the absence of broadband Internet and the inability to receive a cell phone signal, preventing the use of such services. Therefore, students in rural and township regions will be disproportionately affected by loadshedding, further widening the gap between them and their urban peers.

As the power crisis continues to escalate, HEIs must be vigilant and proactive in recognising the signs of potential severe disruption, particularly in the event of a total power blackout. This kind of scenario could have serious repercussions, including limited access to learning materials for students, compromised water supplies affecting residential, office and studying facilities, increased security risks, and potential food shortages. Valuable lessons can be drawn from countries like Venezuela, where a prolonged blackout lasting six days resulted in dire consequences for citizens (Dube & Castro, 2019:1; Jones, 2019:1).

Similar to other crises, such as the COVID-19 pandemic, it is important to acknowledge that even with simulation exercises and preparedness efforts, there is often a sense of disbelief or unanticipated impact when the crisis actually unfolds. The phrase *"they never thought it would come to pass*" encapsulates this sentiment, highlighting the need for HEIs to proactively prepare for unforeseen events that were once considered improbable.

Therefore, it is crucial for HEIs to pay attention to the warning signs and prepare for any disruption that could result from a total power blackout. Drawing lessons from past experiences, such as the Venezuela blackout and the challenges faced by Eskom, HEIs can take proactive measures to ensure the continuity of education, address student welfare concerns, enhance security protocols, and develop contingency plans to mitigate the impact of unforeseen events.

Economic climate: For decades, the cost of attending higher education has increased faster than inflation and other sectors, making it increasingly challenging for many students and families to finance a private education (Akers, 2022:5; Nesbit & Mulhere, 2020:1, Stats SA, 2015). Cost considerations deny the optimal use of PHEIs. Therefore, fee rises are met with resistance, and there is mounting demand to make private institutions more accessible financially (Taparia, 2020). As a result of increased operating costs (Boggs, Boroditsky, Krishnan & Sarakatsannis, 2021:6) and diminishing revenue streams (Alao & Gbolagade, 2020:108), rating agencies like Moody's, S&P, and Fitch have assigned a "negative" outlook to the education sector (Purcell & Lumbreras, 2021).

Financial challenges affect students' academic performance (Shange, 2018:2) and may lead to dropping out (Stucomm, 2020). Furthermore, during economic downturns, students may be less willing to enrol in private institutions of higher education due to financial restrictions. Interest rate increases may also make the loan repayments expensive since PHEI students cannot be funded through the government student loan programme, NSFAS, or the Funza Lushaka financial assistance.

Some estimates put the unemployment rate in South Africa at 50%, a number that has been consistently high for the better part of two decades due to the COVID-induced lockdown and subsequent economic downturn (Francis, Valodia & Webster, 2020:352). The financial markets are striking investors with sharp falls as the pandemic consequences, loadshedding, and Russia-Ukraine war force many enterprises to fail due to the destructive effects on the economy and many industries. According to Simpson and Lourenco (2020:10), the pandemic could significantly impact the economy for several years.

The emergence of online and distance learning: With the advent of the Internet and other technological advances, there has been an increase in the popularity of distance learning and online education. PHEIs must find ways to adapt to the new standard because of the increased competition to survive (van Schalkwyk, 2018:iii). Loadshedding and power outages may prevent students from participating in real-time online sessions due to a lack of access to data and connectivity. Due to the need for Internet access, PHEIs must suddenly upgrade their systems at a cost they did not anticipate. A shortage of resources could have disturbed teaching and learning. Staff, especially lecturers, may lack the motivation or confidence to teach normally (Winter, Costello, O'Brien, and Hickey, 2021:238). Students could become disappointed due to a lack of understanding of systems or communication issues (Özüdoğru, 2021:321), which would be detrimental to the reputation of the PHEI. With the advent of technology, geographic barriers have been eliminated. Competition has risen since every institution of higher education globally can now compete for a market share to recruit new students.

Employability: With many students and families now focusing on the practical benefits of college education, private institutions face increased pressure to provide students with the skills and experience needed to succeed in the workforce after graduation. About 250,000 new HE graduates join the job search in South Africa annually. Still, only about 30% of them find jobs (Goyayi, 2022:1). Therefore, employability and institution appeal to the market can be one of the key factors. Studies show that first-generation students rely heavily on HEIs for help with professional and career development (EAB, 2021). This is because they do not have any personal connections to use when looking for a job. At a quarter of the cost of a typical four-year degree program, alternative solution courses like Google's "Grow with Google" give students the job goals and career planning they want (Rosenbaum, Russell-Bennett & Ramirez, 2021). Considering these new threats, it may take some time for PHEIs to introduce new courses that align with the needs of the labour market due to the lengthy process required to get accreditation for their programme from CHE.

Demographic trend: In some areas, a declining number of higher education-aged students may affect enrolment at PHEIs due to an ageing population and low birth rates (Dorn, Dua, Law & Ram, 2020:1; Salihu, 2020:678). In South Africa, semi-migration, which saw more people move to stronger economic provinces like Gauteng and Cape Town (Stats SA, 2022), may mean that PHEIs in other provinces may start suffering from a drop in enrolments.

The growth of alternative education providers: In response to the growing demand for remote education, coding bootcamps (Brown & Kurzweil, 2017:2) and fully online schools have emerged. As a result, students now have more options from which to choose, placing pressure on more traditional educational institutions to adapt. In recent years, attracting students has become increasingly competitive among HEIs (Christensen & Gornitzka, 2017; Musselin, 2018, Ostergaard & Nordlund, 2019:1). Both private and public institutions must now strive to outperform one another in the current environment. Over time, the rules of competition have also altered dramatically. For example, criteria like tuition, accreditation, and infrastructure are no longer merely a prerequisite for success but rather the most likely victor in a competition centred on disruption and innovation (Fisher *et al.*, 2021:3; Serdyukov, 2017). One holistic innovation incorporates everything from the classroom to the actual world. Most South African graduates have had difficulty finding employment; therefore, new ways are required to prepare them to be marketable to employers.

The increase in student loan default: With the increasing tuition cost and job market decrease in recent years, more students are defaulting on their student loans. This has increased scrutiny of private institutions and the student loan system more broadly, which has put pressure on the industry to reform (Jongbloed, Vossensteyn, Vught & Westerheijden, 2018:442). While enrolment in private higher education is on the rise, Maota and Naidoo (2022:8) believe these institutions will continue to struggle with debt management.

Even though the number of students going to PHEIs is rising, most of those who apply need financial assistance (Stats SA, 2017:24; DHET, 2018:2). Since the government does not subsidise PHEIs, setting the right price is a leadership challenge. For this institution to keep an excellent academic record, it needs to pay more to get the best educators, affecting its tuition cost. On the other hand, students can get loans from banks or other registered lenders. However, if interest rates keep going up, it will be harder to pay back loans, which could lead to more defaults.

The changing expectation of learners: The new generation of students has different learning styles (Iftode, 2019:255; Jurenka, Stareek, Vraeková & Cagaova, 2018:251), and they prefer flexible, self-paced, accessible, interactive, and personalized learning modalities; therefore, traditional learning modalities struggle to meet this new learner expectation. Other circumstances, aside from pandemics, could disrupt PHEI currently. Therefore, PHEIS need to change and adapt to stay competitive and meet its students' needs.

2.13 RESOURCES AND CAPABILITIES FOR DISRUPTION MANAGEMENT

Preparation for disruptions requires a combination of resources and capabilities (Pu, Li& Bai, 2022:1). The specific resources and capabilities required will depend on the type and severity of the disruption and the organisation's industry and size. Below are some examples of the types of resources and capabilities that organisations may need in preparation for disruptions:

- Risk management: Organisations need to have a process in place for identifying, assessing, and mitigating risks (Bygballe, Dubois & Jahre, 2023; Paul, Essam & Sarker, 2016:9). This may include conducting regular risk assessments, developing risk management plans, and training employees and students on how to identify and respond to risks (Work Safe, 2018).
- Business continuity planning: Organisations need to have plans for maintaining operations during a disruption (Baba, Watanabe, Nagaishi & Matsumoto, 2014:298). This may include identifying critical functions and processes, developing continuity

plans, and training employees and students on what to do during a disruption (Järveläinen, 2020:1967).

- Communications: Organisations need to have a plan to communicate with employees, customers, suppliers, and other stakeholders during and after a disruption. Crisis communication and team are also important because a team in place can act quickly during a non-predictable event. This team's roles and responsibilities should be clear, and trained to work well together under pressure (Bhamra, Dani & Burnard, 2011). The team should develop messaging templates, identify key contacts, and train employees to communicate effectively during a crisis (Eldridge, Hampton & Marfell, 2020:50).
- Technology: Organisations may need to invest in technology to enable remote work, data backup and recovery, and other capabilities to help them maintain operations during a disruption (Munawar, Mojtahedi, Hammad, Kouzani & Mahmud, 2022).
- Training: Organisations need to regularly train employees on preparing for and responding to disruptions. This may include training on risk management, business continuity planning, and emergency response.
- Agility: The ability to adjust quickly to new conditions is essential for any successful organisation. This requires a culture encouraging experimentation and learning and a leadership team that can make decisions quickly and effectively. Agility has become an essential business need for companies that want to stay unique and competitive (Harraf, 2015:675).
- Diversification: Diversifying revenue streams and customer bases can assist businesses in mitigating the effects of disruptions in a single area. This method might buffer against unanticipated market or economic shifts, such as declining demand for a specific product or service. Additionally, businesses with many revenue streams might continue to generate income even if one revenue stream is compromised. For instance, a business that relies primarily on the sales of a single product may suffer substantially if that product becomes obsolete or is replaced by a rival. Nonetheless, a business that produces income from services, licencing, or other sources will better weather such a disruption (Forbes, 2017; Markides, 1997:1). As with other businesses, PHEIs may need to diversify their revenue

streams and client base to reduce the impact of a disruption in one sector. This may involve diversifying financing sources, such as government subsidies, tuition, and endowments, and the students they serve, such as traditional, non-traditional, and international students. Higher education institutions can be less reliant on a single source of funding or a single type of student by spreading out their sources of income and clientele. This gives them a safety net in case the market or economy changes in ways they did not expect (Coronel, 2021; Cormican, 2013:22; Leuhusen, 2017).

- Partnerships: Organisations should have partnership agreements, mutual aid agreements and a network of partners or stakeholders who can help them in case of disruption (Khatib, 2017). It is worth noting that preparing for disruptions involves having the necessary resources and capabilities in place and regularly testing and updating them so that they can be more effective and efficient during a disruption. In addition, the modern industrial revolution, or "Industry 4.0", encourages institutions to work closely together to foster innovation and adapt to change (Khan, Kauppila, Fatima & Majava, 2022:1).

2.14 INSTITUTIONAL SUPPORT TO STAFF AND STUDENTS DURING DISRUPTIONS

There are several ways in how PHEIs can provide support to their staff. Some of those aspects are discussed below:

- Communication: Regular communication and updates is another good way of supporting their staff and students. Genç (2017:513) states that communication is important since it is used to encourage, persuade, inform, and create common understanding with others. Institutions should keep staff informed about the latest developments related to COVID-19 and any changes to policies or procedures that may affect them.
- Offering mental health and well-being support: The pandemic has taken a toll on the mental health of many individuals, and institutions should provide resources to support the well-being of staff (EAPA-SA, 2022:1; García-Álvarez, Soler & Achard-Braga, 2021:1; Visser & Law-van Wyk, 2021:229). This can include access to

counselling services, stress management workshops, or other resources. Harvard University created the "Healthy Harvard" campaign to provide students and staff with resources to manage stress, promote mental health, and stay connected during the pandemic. They also offered virtual mental health counselling services and workshops (Harvard, 2020). Likewise, Stanford University and the Massachusetts Institute of Technology (MIT) University established the initiative to support the well-being of students and staff during the pandemic. The initiative provided mental health resources, self-care tips, and wellness activities (MIT, 2022; Stanford, 2022).

- Allowing for flexible working arrangements: Remote work has become the norm for many people during the pandemic, and institutions should consider allowing staff to continue working from home if possible. At least during the pandemic and/or while new strains emerge, remote work is a great way to protect high-risk and vulnerable people with comorbidities (ILO, 2020:4).
- Providing training and professional development opportunities: Staff may need additional training or support to navigate the changes brought about by the pandemic, and institutions should provide opportunities for staff to develop new skills or gain new knowledge (Work Safe, 2018).
- Encouraging collaboration and community building: The pandemic has created a sense of isolation for many people. Institutions should find ways to foster a sense of community and collaboration among staff (Leal Filho *et al.*, 2021:1).

There are several ways that PHEIs can support students in the post-COVID environment and the "new normal." Some strategies that institutions might consider include:

- Providing flexible and remote learning options: Many students may still be unable or unwilling to return to in-person classes due to health concerns or other factors. Institutions can support these students by continuing to offer online or hybrid learning options (Naidu, 2022).
- Implementing health and safety measures: Institutions can help reduce the risk of COVID transmission by implementing mask-wearing requirements, social distancing, and increased cleaning and sanitation. Even post-lockdown, such health measures should be retained to prevent the spread of other diseases, enforce a

culture of health and safety, and guard against emerging variants. Japan is known for its culture of cleanliness and attention to detail. Certain lessons can be drawn from this culture, including attention to detail, collective responsibility, emphasis on routine and respect for the environment (Yoda, 2021). Two years into the pandemic, Japan has shown it can handle outbreaks better than the US and European countries (Kodama, Campbell, Tanaka & Inoue, 2022:173; Smith, 2022). Overall, it is important to note that it is not enough to copy the Japanese culture but to adapt it to the context of the institution, culture, and society. Promoting a health and safety culture can help sustain these measures over time (Napier, 2017:xi; United Nations, 2022).

- Offering mental health and well-being support: The COVID pandemic has taken a toll on the mental health of many students, and institutions can support them by providing resources such as counselling services, wellness programs, and stress management tips (García-Álvarez, Soler & Achard-Braga, 2021:1; Visser & Law-van Wyk, 2021:229).
- Providing financial assistance: Many students and their families have been impacted financially by the pandemic (Negash *et al.*, 2021:2), and institutions can help by offering financial assistance such as emergency grants, flexible payment plans, and other support. A survey done in the US by the Pew Research Centre found that 44% of households anticipate it will take three years or more to get back to where they were financially before COVID-19 (Horowitz, Brown & Minkin, 2021:1).
- Providing connectivity support: During the COVID-19 pandemic, many institutions recognised the difficulties students experienced with Internet connectivity and other obstacles and took steps to provide support. The University of California system created a $15 million fund to assist students with unexpected financial needs, including laptops and an Internet connection (University of California, 2020). During the pandemic, the University of Pittsburgh created a laptop loaner programme to supply students with loaner laptops (University of Pittsburgh, 2023). The University of Texas at Austin and Arizona State University have established a student emergency fund to provide financial aid to students affected by the pandemic, including funding for technical needs such as Internet connections (Arizona State

University, 2023; University of Texas, 2023). In South Africa, the University of KwaZulu-Natal (UKZN) gave all enrolled students and staff from different networks free data and zero-rated access to specific URLs (UKZN, 2023).

- Supporting students in transitioning to the workforce: The pandemic has disrupted the job market (Khamis, 2021) and made it more challenging for students to find employment after graduation (Khamis, Prinz, Newhouse, Palacios-Lopez, Pape & Weber, 2021:22). Institutions can support students by providing career counselling, job search resources, and networking opportunities. There is a strong market for higher education in South Africa, triggered by a need for employment. Education, especially higher education, is being seen increasingly as crucial for economic growth and as a way to reach a goal, in addition to being a tool needed to keep human capital sustainable (Adetiba, 2019:1).

  Transitioning from a student to a working professional can be a daunting experience for many individuals. This anxiety is amplified often for students in their final year of studies. Studies have shown that final-year students experience high anxiety related to their employability. Their concerns range from securing a job to performing well in their chosen career (Tremblay, Croteau & Bilodeau. 2017; Van den Berghe, Vansteenkiste, Cardon, Kirk & Haerens, 2014). This anxiety is compounded further for students from struggling families, who may need to succeed to support their families and break the cycle of poverty (Dennis, 2018).

  On the contrary, masters and doctoral students are often older and more experienced than their undergraduate counterparts, and they frequently have greater academic autonomy and independence (Koohang, Paliszkiewicz & Goluchowski, 2015). These students are more likely to be working professionals. They may already have established time management and self-directed learning abilities and may be better suited to deal with disturbances such as changes in their work or personal lives (Garrison & Kanuka, 2004). In addition, research indicates that adult students are frequently highly motivated and have a strong desire to learn (Knowles, 1970), which may contribute to their adaptability and capacity to deal with disruptions. As such, HEIs and career counsellors must

provide tailored support and counsel to final-year students, with particular attention given to those from disadvantaged backgrounds.

On the other hand, it is certainly concerning that the employment rate of those with higher qualifications is lower than those without qualifications, according to Stats SA's data from 2022 (Stats SA, 2022). Additionally, the fact that a high number of unemployed youths with tertiary qualifications have applied for social relief grants, approximately 714,000 of them, is a clear indication that there are still challenges in creating opportunities for this group in the job market (Nkosi, 2023). This problem requires a multi-faceted approach involving various stakeholders, including the government, businesses, and educational institutions.

Possible contributing factors to this trend may include a lack of job opportunities that match the skills and qualifications of those seeking employment, a lack of work experience, or a mismatch between the skills and capabilities required by employers and those possessed by job seekers. PHEIS must monitor and analyse the data to understand better the factors driving these trends and to develop effective strategies for addressing them. In the meantime, efforts should be made to provide support and resources to students in their last year of studies and unemployed youth with tertiary qualifications, such as training and mentorship programs.

By taking these steps, private higher education institutions can help support their students in the post-COVID environment and the "new normal."

2.15 LEADERSHIP IN THE DISRUPTIVE ERA AND FOCUS

The top leaders of an institution are in charge of ensuring it moves in the right direction. In private higher education institutions, senior leaders would include chief executives, academic directors, deans, registrars, heads of departments, and so on. When an institution is led adequately at this level, it is more likely to be able to manage and react appropriately to all of its problems. So, Muriisa (2014:83) said that leadership theories

say, "the leader should take a responsive role, which is about adapting the organisation to demands and constraints imposed by its environment."

Disruption management in PHEIs typically involves planning and implementing strategies to mitigate the effects of unforeseen events, such as natural disasters, economic downturns, or changes in government regulations. There is a high level of need for educational leaders to devise and implement plans to lessen the educational impact of the pandemic (Reimers & Schleicher, 2020:4). However, many leaders are leading from the grey zone of indecision as they struggle to make sense of the post-COVID business environment (Maota & Naidoo, 2022:1). Leadership is complex in any setting. Still, South Africa's higher education system can be exceptionally demanding. As PHEIs face more financial challenges than their publicly funded counterparts, meeting educational standards is considerably more difficult. Without government aid, they must raise money in other ways, most commonly through tuition.

Integrating technology in the classroom is one area of focus in future thinking for disruption management in PHEIs. With advancements in online learning and virtual reality, institutions may need to consider adapting their curriculum and teaching methods to utilise these technologies better and stay competitive in the market. This may involve investing in new software and hardware and training faculty and staff on using it effectively (McBride, 2020). Additionally, institutions may need to consider how to maintain the quality of education while delivering it remotely or online. Upskilling and intensive online training for using e-Learning applications followed suit (Harris & Jones, 2020; Netolicky, 2020).

As economic disruptions can affect students and their families' ability to pay for tuition, another area of emphasis is the enrolment and retention of students. Institutions may need to offer more flexible and affordable payment choices or financial aid programmes to assist students. Institutions may also need to investigate strategies to enhance the student experience and engagement to raise retention rates. Changes in the demography of the student population are also significant factors (Purcell & Lumbreras, 2021). Institutions may need to explore ways to establish a more inclusive and equitable campus

culture, including offering support services and resources for students from underrepresented groups (Greer, 2014:1, Martinez-Acosta & Favero, 2018:253).

Overall, the key to successful disruption management in PHEIs is a combination of proactive planning and flexibility. Institutions must proactively identify potential disruptions, analyse their impact, and develop mitigation strategies. Additionally, institutions must be flexible and adaptable to respond quickly to disruptions and make changes as necessary. The study by Maota and Naidoo (2022) recommends that leaders re-evaluate their strategies and provide disruption training to all employees to future-proof their institutions against disruptions.

It is also important to mention that it is also important for private higher education institutions to ensure they are well connected to other institutions, to learn from each other, and also have a better understanding of the external environment in which they operate. This can include building relationships with industry leaders and other organisations to stay informed about trends and developments in the education market and identify potential disruptions.

It is difficult to generalise organisational leaders' competence level in dealing with an abrupt change, as it can vary greatly depending on the individual and the organisation. Some leaders may have experience managing change and be well-equipped to handle disruptions, while others may struggle. However, it is generally acknowledged that dealing with change is one of the most challenging aspects of leading an organisation (Hemmingsen, 2017:1). Many leaders feel ill-equipped to handle it (Development Dimension International, 2021:16). This is especially true for abrupt changes which are challenging to predict and often require a quick response.

Organisational success depends heavily on the role and preparedness of its leaders to respond to and guide the organisation in confronting external forces (Muriisa, 2014:76). Leaders' actions in areas like planning, motivation, communication, and empowerment can reveal how they feel about and deal with these challenges. Leaders at educational

institutions must be adaptable and possess a wide range of abilities to deal with new challenges. When dealing with catastrophic and disorienting events like COVID-19, organisations turn to their top decision-makers and put faith in their leadership (Belhadjali & Abbasi, 2020).

Leaders with good adaptability, vision, empathy, strategic thinking and communication skills are generally more equipped to handle unexpected disruptions (Matarazzo & Pearlstein, 2016:162; Renjen, 2020:1). However, they must be ready to face the challenges that come with it and must have a clear action plan to mitigate the impact and adapt to the new situation. Also, it is worth noting that most organisations provide training and development opportunities for their leaders and employees to help them develop the skills they need to manage change and disruption more effectively. This could include courses on change management, leadership, risk management, mentoring, reskilling, and other forms of support (Agrawal, De Smet, Lacroix & Reich, 2020:1).

2.16 COVID-19 AS A 'BLACK SWAN'

Black swan events are rare and highly impactful occurrences that are often difficult to predict and can have significant consequences (Taleb, 2007:1) for PHEIs. The author of "The Black Swan: The -of the highly improbable," Nassim Nicholas Taleb, is credited with popularising this term. Just as the existence of black swans was long thought to be impossible until their discovery, so too may the occurrence of seemingly improbable events be dismissed as such until they take place. The terrorist acts of September 11, 2008, the worldwide financial crisis of 2008, and the COVID-19 pandemic are all examples of black swan catastrophes. Some examples of black swan events directly impacting the education sector might include economic recessions, natural disasters, or significant changes in government policies.

Natural disasters, pandemics, economic downturns, regulatory changes, and technological upheavals are all examples of unpredictable elements that private higher education institutions must anticipate. As part of this process, performing periodic risk assessments, creating a contingency plan, and providing staff with emergency response

training may be necessary. Also, institutions must be flexible and adaptable to react to disruptions swiftly and make the required adjustments. According to Lindaas and Pettersen (2016:11), prediction is one technique for limiting the danger of a black swan, which entails a constant process encompassing formal risk evaluation and risk management practices.

Private higher education leaders may need to adopt various strategies to manage black swan events. One approach is to build organisational resilience, which can help institutions to better withstand and recover from disruptions (Sahebjamnia, Torabi & Mansouri, 2018:63). This might include efforts to diversify revenue streams, strengthen financial stability, and improve operational efficiency. Leaders may also need to proactively identify potential black swan events and develop contingency plans to minimise the impact on their institutions (Hajikazemi, Ekambaram, Andersen & Zidane, 2016:185). This might involve scenario planning, risk assessment exercises, and regular reviews and updates of emergency plans and protocols (Deloitte, 2019a:1; Steyn, 2022:1).

Scenario planning is important for businesses to manage risk and proactively traverse uncertain situations. It involves analysing and evaluating how disruption will influence an institution and developing contingency plans to limit its impact (Wade & Hulland, 2020). While effective risk assessment is important for organisations to manage risk and maintain long-term success proactively, it also requires understanding the possible impact of disruptions on a business and implementing ways to minimise such risks (Nocco & Stulz, 2020). Effective disruption management, as suggested by both Teece (2018) and a study by PWC (2019), requires "establishing a cross-functional team, using scenario analysis to identify key risks, creating a prioritised list of potential disruptors, developing and testing contingency plans, and monitoring and reviewing plans regularly to ensure they remain fit for purpose." Additionally, private higher education leaders may need to be flexible and adaptable in their decision-making to respond effectively to unexpected events as they arise (O'Keeffe, 2020; Szemzo, Mosquera, Polyák & Hayes,2022:4).

Managing such unexpected events can be challenging, as they are by definition difficult to predict and plan for. However, using tools such as predictive analysis, PHEI leaders can mitigate the impact of black swan events and better position their institutions to recover from them. Finally, private higher education leaders should proactively seek out and address potential institutional vulnerabilities (Ali, 2020:16; OECD, 2022). This may include identifying and mitigating risks related to financial stability, technological infrastructure, and other areas. By taking these steps, private higher education leaders can be better prepared to manage the impact of black swan events and minimise their consequences.

2.17 ARTIFICIAL INTELLIGENCE AND IOT IN HIGHER EDUCATION FOR DISRUPTION MANAGEMENT

Artificial intelligence (AI) and the Internet of Things (IoT) can greatly enhance disruption management in higher education. For instance, using “predictive maintenance” such IoT sensors placed throughout campus, can gather data on the condition of equipment and facilities (Kelly, Campbell, Gong & Scuffham, 2020). Then, machine learning algorithms can be used to look at this data and predict when equipment will likely break down. This makes it possible to schedule maintenance before incidents arise (Chigurupati, Thibaux & Lassar, 2016:1; Wang, Zhang, Wang, Song, Liu, Li, Lou & Liu, 2017:18554).

Then “intelligent scheduling” which AI-powered scheduling systems can optimize class schedules, considering factors such as student availability, room occupancy, and faculty preferences (Gajanayake & Pemarathne, 2020:523). This could help to minimise disruptions and ensure that resources are used efficiently. On another note, real-time monitoring using IoT-enabled cameras and other sensors can provide real-time monitoring of facilities and classrooms (Herlianto & Kusuma, 2020:6423; Ojo, Kareem, Odunuyi & Ugwunna, 2022:298). This can help to quickly detect and respond to disruptions, such as a medical emergency or a security threat.

PHEIs can also consider “personalised learning” system, which is an AI-powered tutoring system that can provide personalised instruction to students, helping to keep them on

track and minimise disruptions caused by falling behind (Bhutoria, 2022:2; Trojer, Ambele, Kaijage & Dida, 2022:75). PHEIs must also gravitate towards building “smart campus”. These are IoT sensors to monitor the occupancy of a building and adjust the lighting, temperature, and other settings accordingly (Victoria, Úbeda, Skarmeta & Zamora, 2014; Sari, Ciptadi & Hardyanto, 2017:2). This can help to reduce energy consumption and improve the overall experience for students and faculty.

Remote learning introduced during COVID-19 should also be maintained and enhanced (Naidu, 2022). PHEIs should explore how IoT and AI can create a virtual classroom experience for all programs. In case of emergency or pandemics, the virtual classroom can be implemented to avoid physical disruptions. Something to ponder on as well is a virtual classroom using holograms. A concept in which a teacher would appear as a hologram in a physical classroom, allowing for remote instruction (Quin, Limbu, Beerens & Specht, 2021:2). This would allow for greater flexibility in education, as students could attend classes remotely while still having the experience of a traditional classroom setting. The technology for this concept is currently being developed, but it is not yet widely available in South Africa.

Intelligent transportation fitted with IoT sensors and cameras can be used to monitor and optimize traffic flow on campus, reducing disruptions caused by congestion and accidents (Damadam, Zourbakhsh, Javidan & Faroughi, 2022:1293). Additionally, AI algorithms can be used to optimize the routes of buses and other transportation, reducing wait times and improving reliability. AI-powered emergency response systems can analyse sensor data around campus to quickly identify and respond to disruptions, such as fires, floods, or power outages (Kuglitsch *et al.* 2022:1). They could also use data from social media, cameras and microphones to detect and locate an incident for a quick response (Anderson, 2020).

IoT devices such as cameras and microphones can be used to monitor and detect cheating during online exams to preserve academic integrity (Hoque, Ahmed, Uddin & Faisal, 2020:392). AI algorithms can be used to analyse the data from these devices and

flag suspicious behaviour. Since security is a key issue of recent due to an increase in kidnapping, IoT and AI can be used to enhance campus security through facial recognition technology to identify potential security threats and real-time monitoring of security cameras to detect suspicious activity. For instance, AI can monitor the student's facial expressions in the classroom. If the student is distressed, a campus student support expert can intervene before the student commits suicide or have a severe health issue (such as a stroke, injury or heart attack) (Meddeb, Abdellaoui & Houaidi, 2023). These technologies could also detect and respond to physical security threats, such as a break-in or a shooter on campus.

IoT-enabled digital twins of a physical space can be created to represent it virtually (Khallaf, Khallaf, Anumba & Madubuike, 2022:2029; Hu, Lim & Cai, 2022). This can simulate different scenarios, such as emergency drills and test the effectiveness of different evacuation plans. IoT and AI can gather data on student engagement, performance and behaviour. The learning analytics generated can identify when students are struggling, provide early interventions and create personalised learning experiences to support students and minimise disruptions. AI-powered predictive analytics systems can identify patterns and trends in student data, such as attendance, grades, and behaviour. This can help to identify potential disruptions early on, such as students who are at risk of dropping out, and intervene before it happens (De Sousa, Alexandre, Mello, Falcão, Vesin & Gašević, 2021:7). AI-powered chatbots or virtual assistants can be used to provide personalised support and assistance to students, faculty, and staff (He & Xin, 2021:1). This can help minimise disruptions caused by confusion or misunderstandings and improve the overall experience for all campus community members.

These are just a few examples of how AI and IoT can enhance the management of disruption in higher education. With the fast-paced development of technology, it is quite likely that new use cases and applications will emerge in the near future. AI and IoT technologies can be used in many ways to help prevent or manage higher education disruptions by providing real-time monitoring, predictive maintenance, intelligent scheduling and response to an emergency, personalising the support and promoting

efficiency and a sustainable environment. However, it is important to note that implementing these technologies should be done with appropriate ethical guidelines and privacy considerations in place.

Implementing these technologies in higher education can help to prevent and manage disruptions by providing real-time monitoring, predictive analytics, and intelligent response to an emergency. It also helps to improve the overall experience for students, faculty, and staff by providing personalised support and promoting a safe, efficient and sustainable environment. However, it is important to remember that implementing these technologies should be done with appropriate ethical guidelines and privacy considerations in place.

2.18 PREDICTIVE MODEL AS A TOOL FOR DISRUPTION PREPAREDNESS

A predictive model can be a powerful tool for private higher education leaders seeking to manage disruption and navigate an increasingly complex and rapidly changing landscape. By analysing data on a range of factors such as enrolment trends, student demographics, and economic conditions, predictive models can help leaders to anticipate and plan for potential disruptions and to make informed decisions about the direction of their institutions. Examples of predictive models relevant to private higher education include enrolment forecasting models (which can help leaders to anticipate changes in student demand and to adjust their recruitment and retention efforts accordingly) and financial forecasting models (which can help leaders to identify and manage financial risks) (Bleazard & Lourens, 2015:47).

Additionally, predictive models can be used to understand and respond to shifts in the competitive landscape, such as emerging new technologies or expanding online learning options (Wang, Sha, Huang, Contractor, Fu & Chen, 2018). By leveraging the insights provided by predictive models, private higher education leaders can better position their institutions to adapt to disruption and succeed in an increasingly dynamic environment. This could help improve their future thinking, as it would mean they would be positioned better to consider the complex evolution of existing trends and potential disruptors.

2.19 DISRUPTION MANAGEMENT THEORY

The Disruption Management Theory (DMT) offers a basis for understanding how organisations react to unforeseen disruptions. According to DMT, organisations must create flexible strategies in order to effectively handle crises (Altay & Pal, 2022; Moosavi et al., 2022; Shekarian & Mellat, 2021). This theory is the basis for the proposed Disruption Management Framework (DMF), which emphasises the need for proactive planning, resource allocation, continuous learning, and the ability to quickly adapt and respond during times of crisis. It acknowledges that disruptions can be unpredictable and have substantial impacts on organizations. The theory emphasises the importance of organisations taking a comprehensive approach to managing disruptions, focusing on both short-term response and long-term resilience and recovery.

2.19.1 Resource-Based View (RBV)

The Resource-Based View (RBV) theory suggests that the resources and abilities of an organisation are essential for achieving a competitive edge and effectively handling disruptions (Nayak et al., 2023). In the realm of higher education institutions (HEIs), essential elements for effective disruption management include technology, skilled personnel, and financial security. In the Disruption Management Framework (DMF), the Resource-Based View (RBV) advocates for considering institutional resources and staff training. RBV highlights the significance of HEIs strategically managing and distributing resources to strengthen their capacity to address and adjust to disruptions. Additionally, RBV emphasises the importance of leveraging current capabilities and cultivating new ones in order to skillfully handle disruptions and maintain a competitive advantage.

2.19.2 Contingency theory

The effectiveness of an organisation's structure and strategies is contingent on the external environment and specific situational factors, according to contingency theory (Tompkins, 2023; Fuertes et al., 2020; Lawrence & Lorsch, 1967). The DMF aligns with this theory as it underscores the significance of flexibility and adaptability in managing disruptions, emphasising their customisation to the distinct contexts of various higher education institutions. It acknowledges that disruptions can differ in type and extent, so

organisations need to be able to modify their strategies accordingly. In order to effectively manage disruptions, contingency theory stresses the importance of aligning organisational structure and strategies with the external environment. It also encourages organisations to evaluate their current approaches and make necessary adjustments to better fit the specific circumstances they are dealing with.

2.19.3 Relationships between variables

2.19.3.1 Leadership readiness and institutional response

It is crucial for an institution to have strong leadership preparedness in order to effectively respond to disruptions. Developing and executing crisis management plans can greatly improve an institution's ability to respond to disruptions (Chatzipanagiotou & Katsarou, 2023; Ma & Zhang, 2022; Gowing & Langdon, 2015). Effective leadership fosters a culture of readiness and strength within the company, ensuring prompt and coordinated responses during challenging times. Leaders who focus on dealing with unexpected events take steps to find possible dangers, create plans to lessen their impact, and set up clear ways to communicate to make it easier to make decisions and take action during disruptive times.

2.19.3.2 Resources, capabilities, and disruption

Organisations that have a wide range of resources, experienced employees, and cutting-edge technologies are better prepared to address the complex challenges of today. The connection is clear: having more resources and abilities results in better management of disruptions (Leal Filho et al., 2020). Sufficient resources are essential for organizations to provide the necessary support and expertise to effectively address disruptions. Resources such as financial stability, infrastructure, and technology enable organisations to adapt and implement new strategies quickly during disruptive events. Well-trained staff also play a crucial role in guiding institutions through disruptions and making informed decisions to minimise their impact.

2.19.3.3 Stakeholder experiences and institutional support

The quality of support and communication offered to both employees and students during disruptions has a significant impact on their overall experience. Effective support and transparent communication channels can result in more favourable experiences and easier adjustments to changes caused by isruptions (Rashid & Yadav, 2020). When institutions place importance on gaining support from those involved, they promote trust, comprehension, and teamwork. By keeping communication channels open and sharing information in a timely and accurate manner, institutions can decrease uncertainty and worry among stakeholders, leading to easier changes and an improved ability to bounce back from challenges. Supportive atmospheres enable individuals to share their views and suggestions, boosting their overall ability to handle disruptions effectively.

2.19.4 Justification of variables

2.19.4.1 Being ready for leadership is important because it plays a crucial role in how institutions handle crises (El et al., 2022). Skilled leaders recognise the importance of being proactive in identifying and addressing potential disruptions, as emphasised by the Contingency Theory. They create a culture within their organisations that emphasises the significance of being prepared and resilient when managing disruptions (Madi et al., 2023). They take the initiative to find weaknesses, create plans for managing crises, and offer advice and assistance during disruptions. In addition, strong leadership sets an example, encouraging and inspiring people across the organisation to help with the effective management of disruptions.

2.19.4.2 Institutional resources and capabilities

The resource-based view emphasizes the importance of integrating resources and capabilities in order to maintain a competitive advantage and effectively handle disruptions. Institutions with strong resources are better equipped to be resilient and flexible (Lubis, 2022; Kruesi & Bazelmans, 2023). Organisations that have sufficient financial, technological, and human resources are better able to respond to disruptions by providing the needed support and expertise. Moreover, establishments that have modern technologies and infrastructure can quickly adjust and put in place alternative

strategies to keep their operations running smoothly (Gupta et al., 2003). Additionally, building skills and abilities within the company allows organisations to create internal strengths and use them to lessen the effects of interruptions.

2.19.4.3 Stakeholder support and communication

Maintaining team morale and effectively managing any disruptions requires the support and communication of stakeholders. This emphasises just how crucial it is to have a positive experience when dealing with disruptions (Rashid & Yadav, 2020). Institutions help stakeholders navigate disruptions with confidence and resilience by offering the support they need. Communication channels that provide clear and timely information allow stakeholders to voice concerns and share their perspectives in the decision-making process (Marzouki et al., 2022). Creating a nurturing environment increases stakeholders' confidence and involvement, encouraging teamwork and successful implementation of disruption management strategies.

2.19.5 Conceptual framework

The suggested theoretical model combines different theoretical views and identified factors to create a cohesive framework for the DMF. This framework demonstrates how leadership readiness, institutional resources, and stakeholder backing work together to impact disruption management results. To successfully manage disruptions, it is essential to align these vital elements to improve an organisation's ability to bounce back and respond effectively. The framework emphasizes the interconnectedness of these factors, highlighting the importance of a comprehensive and coordinated approach to handling disruptions. By taking into account the influence of leadership, resources, and stakeholder support throughout the disruption management process, organisations can enhance their resilience and recovery capabilities.

Conceptual framework diagram

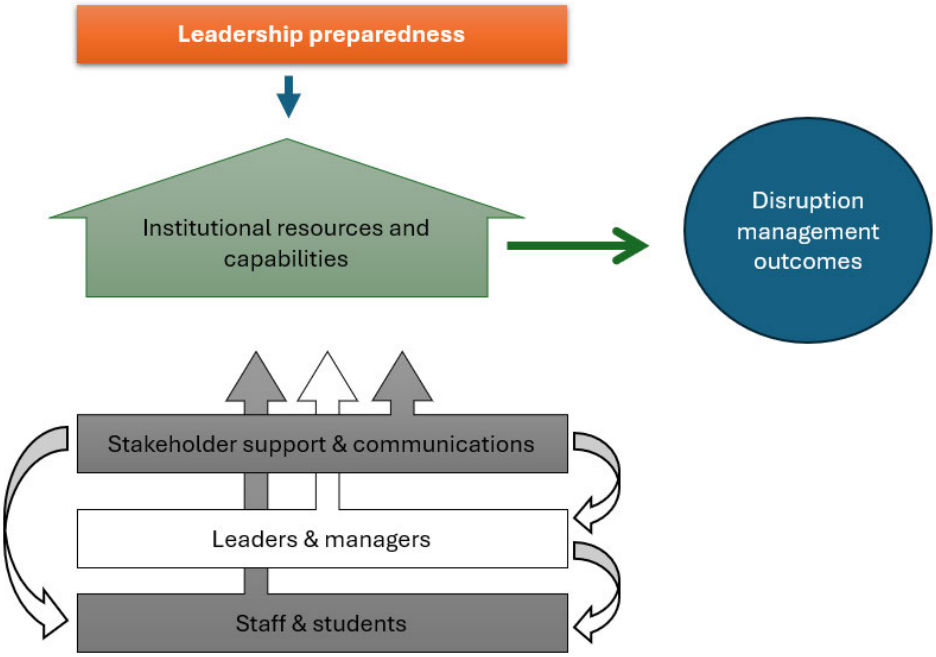


Figure 2.8: Conceptual Framework

Source: Own compilation

Being prepared for leadership: Being proactive and strategic in leadership is important for ensuring that an organisation is ready to handle unexpected disruptions effectively. This helps to keep operations running smoothly and minimise any potential risks. By taking a forward-thinking approach, leaders can identify and take advantage of opportunities, as well as anticipate and plan for challenges, which strengthens the organisation's ability to withstand unexpected events. This kind of insightful leadership also helps teams adapt quickly and make well-informed decisions, creating a culture of preparedness that leads the organisation towards long-term success even in uncertain times (Muneeb et al., 2023).

Institutional resources and capabilities: Adequate resources and well-trained staff with comprehensive knowledge and expertise in their respective fields enable institutions to successfully implement highly efficient and proactive disruption management strategies that encompass a wide range of innovative techniques and cutting-edge technologies. The availability of abundant resources, combined with a skilled workforce, empowers organisations to effectively navigate through unforeseen challenges and swiftly adapt to

rapidly evolving circumstances, ensuring uninterrupted operations and optimal performance in the face of any disruptions that may arise. By investing in the development of their resources and fostering a culture of continuous improvement, institutions can establish a resilient framework that enables them to proactively identify potential disruptions, effectively mitigate their impact, and emerge stronger and more resilient than ever before (Masenya, 2022).

*Stakeholder support and communication***:** Effective communication and support systems ensure positive experiences for staff and students, facilitating smoother transitions during disruptions (Thomas et al., 2023).

The combined effect of leadership preparedness, resources, and stakeholder support leads to improved disruption management outcomes, including resilience and adaptability (Pescaroli et al., 2023; Kolodny-Goetz et al., 2021).

2.20 CONTEXTUAL FACTORS IN DISRUPTION MANAGEMENT

Institutional size and type influence on disruption preparedness

Based on previous research, it is evident that an institution's size and type have a significant impact on its preparedness and response strategies in times of disruption (Moosavi et al., 2022; Sharma et al., 2021). Smaller institutions can often adapt quickly and efficiently in crises due to their flexibility and ability to make swift decisions. On the other hand, larger institutions have more resources, but their complex structures may hinder their ability to respond promptly (Etemad, 2020; Evans & Bahrami, 2020). Finding the right balance between resource availability and agility is important for effective preparation and response to disruptions.

Geographical disparities in institutional infrastructure

Numerous studies across the globe consistently show that institutions in highly developed countries have access to more advanced infrastructure (An & Tang, 2020; Rodríguez-Pose, 2020). This advantage allows them to manage disruptions more efficiently. On the other hand, the limited resources and technology access in developing countries pose

unique challenges that necessitate progress (Neumeyer et al., 2020; Rodríguez-Abitia et al. 2020)

Differences in education sector funding and governance

Public and private educational institutions operate under distinct funding mechanisms and governance structures, which significantly impact their response to disruptions (Sharma et al., 2021). Public institutions prioritise coordination with government bodies and contingency planning aligned with government directives, while private institutions take a more autonomous approach, tailoring strategies to their specific financial commitments and leveraging private investors and sponsors (Adhikari & Safaee, 2023).

Cultural factors in disruption responses

The organisational culture within institutions and the cultural backgrounds of staff and students play crucial roles in shaping responses to disruptions. Cultural factors affect communication effectiveness, support mechanisms, and overall resilience within institutions (Madi et al., 2023).

2.21 THE CONCEPT OF FUTURE THINKING AS A TOOL FOR LEADERSHIP IN THE FACE OF DISRUPTION

To successfully navigate and adapt to future changes and disruptions, combining the power of AI and IoT with the correct human skills and knowledge is necessary. AI provides the scalability and automation required to handle big data and make complex decisions, while human skills add the context and nuance needed to use that data effectively (Diana, 2015:1). Leaders in higher education must adopt a future-thinking mindset, practicing leadership without having all the answers to hone this skill (Herbst, 2021). This combined approach can help leaders make informed decisions, fostering resilience and adaptability to disruptions. Future thinking involves anticipating and planning for potential risks and opportunities, thereby positioning organisations to navigate disruptions and capitalise on emerging opportunities (The Futures School, 2021). Leaders must consider the long-term impact of their decisions today to predict and shape the future business landscape.

Promoting a culture of strategic foresight is essential for fostering future thinking within organizations. Strategic foresight involves identifying and understanding long-term drivers of change to make informed decisions today (van der Laan & Yap, 2016:91; Canyon, 2021:1). Additionally, overcoming cognitive biases, such as the "planning fallacy," can help leaders think more clearly about the future and make better decisions (Soll, Milkman, & Payne, 2015:68; Office Dictionary, 2022). Implementing strategies like strategic foresight and cognitive bias management can cultivate a culture of continuous learning and development, ensuring organisations stay updated with emerging trends and technologies. By embracing future thinking, leaders can foster innovation, adaptability, and resilience within their institutions, positioning them to navigate disruptions and seize emerging opportunities.

2.22 THE CONCEPT OF DESIGN THINKING AS A TOOL FOR LEADERSHIP IN THE FACE OF DISRUPTION

One may argue that we live in a global "poly-crisis," defined as the simultaneous occurrence of multiple crises on a global scale (Collins Dictionary, 2023). The COVID-19 pandemic and Russia's invasion of Ukraine demonstrate the interconnectedness and mutual reinforcement of these crises, demonstrating that systemic risks extend beyond their origin (Lawrence et al., 2024). This study aims to address the impact of polycrisis on higher education institutions (HEIs) by integrating artificial intelligence (AI) and predictive tools with human skills to enhance disruption management.

Maota and Naidoo's (2022) study indicates that some PHEIs responded well to the pandemic, but it remains unclear if these actions will withstand future disruptions. Sectors like technology, which thrived during the lockdown, are now facing layoffs, highlighting the increased complexity of the economic world (Amenta et al., 2022). Staff and student opinions on how institutions handled the pandemic were not considered in Maota and Naidoo’s study, prompting this research to triangulate existing data to establish the impact. Socioeconomic variables disproportionately affect students from low-income

families, making it harder for them to succeed in remote learning due to issues like poverty and lack of access to technology (Bao, 2020; Gurung, Shrestha, & Shrestha, 2021).

In addition to socioeconomic challenges, students may struggle with limited access to counselling and mentoring services, as well as networking opportunities crucial for their professional growth. The COVID-19 pandemic has highlighted disparities in students' remote learning experiences, with Human Science and Commerce students facing more significant challenges than IT students due to technical difficulties and limited resources (Liu, Liu, Zhong, & Zhang, 2020). Health, economic, and social crises impact both staff and students, affecting their satisfaction with institutional support during disruptions.

A global poly-crisis requires comprehensive and coordinated responses from governments, HEIs, and civil society. Addressing these challenges effectively involves adopting design thinking, which emphasises a human-centred, iterative, and flexible approach to problem-solving (Kolko, 2015:4; Liedtka, 2018:9). Design thinking helps HEIs understand stakeholder needs, identify root causes of problems, encourage collaboration, and adapt to changing conditions. By combining AI, IoT, and design thinking, leaders can create more effective solutions for managing disruptions. AI simplifies and enhances the design thinking process by providing predictive capabilities and optimising resources, making HEIs more resilient and adaptable (Tigges, Ipert, & Mauer, 2022:147).

Integrating AI and predictive tools with human skills and design thinking can help HEIs navigate the complexities of a global polycrisis. This multidisciplinary approach fosters innovation, adaptability, and resilience, enabling institutions to manage disruptions effectively and support the well-being of all stakeholders. By embracing future thinking and strategic foresight, leaders can better anticipate and mitigate the impacts of crises, ensuring the continuity of education and the stability of their institutions.

2.23 CHAPTER CONCLUSION

This section of the study project sought to perform a chronological and systematic literature review to comprehend disruption in the context of PHE and the factors that may contribute to disruption in the industry and institution. The researcher looked at South Africa's higher education landscape in this chapter and focused on the PHE sector. The study's original aim was to develop a framework to assist leaders in managing disruption most efficiently and effectively to prevent or mitigate damage to HEIs. Consideration was also given to the leadership concepts and most effective strategy to predict disruption and safeguard the institution.

The researcher used Semantic Scholar's AI-powered research feeds, significantly improving the researcher's efficiency and precision in literature search and discovery. This technology, which combines AI algorithms and natural language processing techniques, quickly found and recommended relevant papers based on keywords and other criteria. This allowed the researcher to stay abreast of the most recent developments in their field and save time on manual literature searches. Having article recommendations instantly delivered to one's mailbox was also a particularly beneficial feature since it saved time and ensured the researcher had access to the most recent and pertinent material.

In this chapter's first section, we got a bird's-eye view of the higher education landscape, including its governance and significant issues. Next, we turned our attention to the South African PHE context, discussing the dynamics of the higher education (HE) sectors and analysing enrolment trends in two PHEIs. In the next step, disruption, the study's primary purpose, was introduced to the PHE setting. Key global trends were discussed, such as the evolving political landscape and the rise of the new world order, that influence the regulation and funding of higher education in some countries.

The global health crisis (COVID-19) intensification has resulted in an economic slump and uncertainty, which has negatively impacted the higher education sector. In addition, the ongoing trade and political tensions between nations are altering the global economic

power structure, resulting in a shift in the need for various education and skills. Literature also highlights the necessity to be vigilant and proactive in preparing for the next pandemic crisis and catastrophic contagion and collaborate to mitigate its effects on world health and economies.

The chapter also emphasises the need for leaders in higher education to be proactive and adaptable in the face of change to prepare their institutions for the next crisis. This necessitates an attitude that is receptive to new knowledge, flexible in the face of change, and able to make sensible decisions under pressure. Leaders also need to be aware of the external factors that could affect their institution during a crisis and have a firm grasp of its strengths and weaknesses. For example, when new technologies emerge and the need for digital skills grows, the curriculum and its teaching need to be changed.

Many institutions were compelled to switch to online education during the COVID-19 pandemic, demonstrating the significance of being flexible and having a contingency plan. A pandemic's social and economic consequences may also threaten financial security, such as decreased financing and altered student enrolment patterns. This chapter explains in detail why top management should prepare to use artificial intelligence and the Internet of Things to maintain business as usual, promote remote learning, and secure digital assets during the next catastrophe. In the chapter's final paragraph, researchers discussed the disruption management and the contextual factors of disruption management.

CHAPTER 3: RESEARCH METHODOLOGY

"Research is formalised curiosity. It is poking and prying with a purpose." - (Zora Neale Hurston, n.d.).

3.1 INTRODUCTION

The research topic in this study was explored using a mix of both qualitative and quantitative methods. The methodology described in this chapter resulted in a thorough understanding of the research problem. Using quantitative and qualitative approaches to data collection and analysis, as in this methodology, allows for a more thorough investigation of the study problem. Thanks to the comprehensive perspective afforded by this method, more investigation into the topic were possible via triangulation in three ways: methodological, data and investigator triangulation. The combination of quantitative and qualitative methods assisted in addressing methodological limitations and enhancing the findings' robustness.

This chapter devoted to the study methodology, the research design, the justification for using a mixed-procedures approach, and the methods for gathering and analysing both types of data are all given out. Quantitative data gives you statistical information, and qualitative data gives you more information about the situation. For instance, we will combine interview transcripts and survey results to gain a comprehensive understanding of disruption management methods.

This method provided a complete picture of the study problem and enabled in-depth investigation by triangulating different data sets encompassing the staff, students, and management. The chapter also detailed the research design, discussing the reasoning for the mixed-methods approach and the techniques employed to collect and analyse both qualitative and quantitative data. This study aims to investigate the efficacy of a mixed-methods research design in delivering comprehensive results and to contribute to the ongoing discourse on the use of mixed-methods research. The chapter provides a detailed explanation of the research paradigm, research objectives, and significance of the study, providing a clear foundation for the subsequent analysis and interpretation of results.

Methodological congruence refers to aligning research methods used in a study with the research questions and objectives. As Bloomberg and Volpe (2012:27) outlined, achieving methodological congruence is crucial in a successful mixed-method research design. Five steps (as depicted in Figure 3.1) help to attain methodological congruence in a study design.

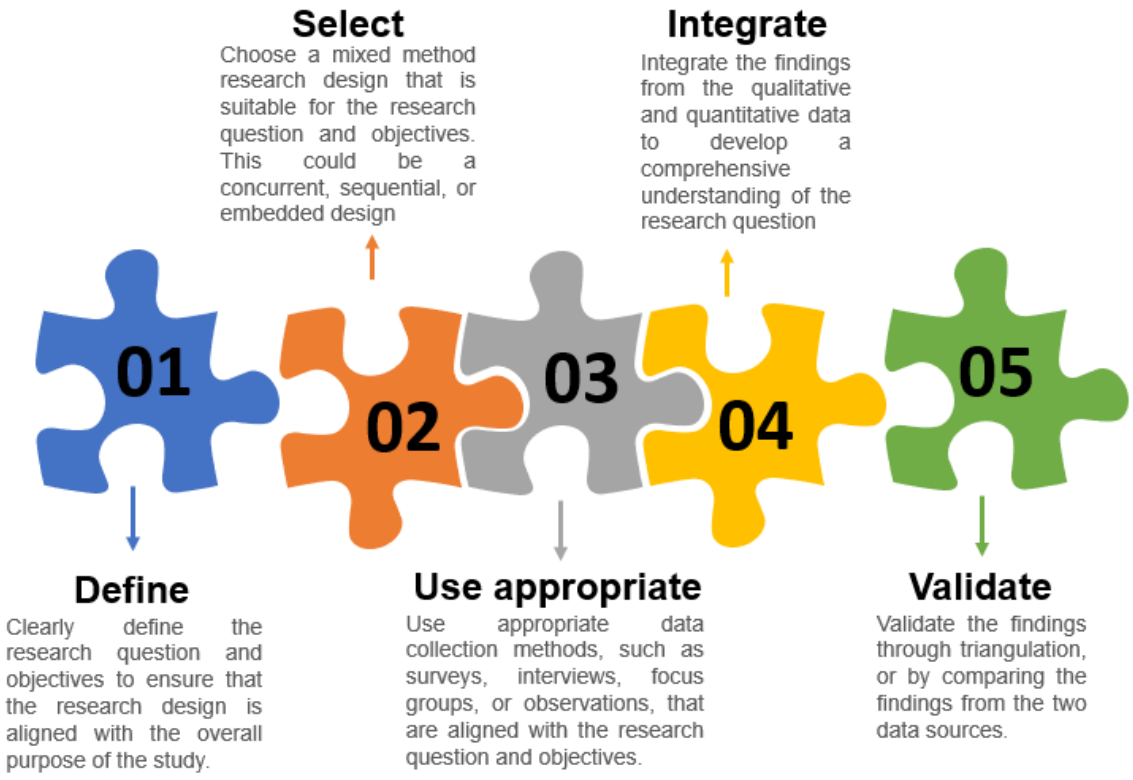


Figure 3.1: Methodological congruence steps

Source: Adapted from Bloomberg and Volpe (2012:11-12, 14-23, 26-27) and Creswell (2018:58-91).

By following these steps, researchers can ensure that the mixed-method research design is congruent with the research question and objectives, providing a more robust and comprehensive understanding of the research question.

Given the study problem, a sequential mixed-methods approach is a methodology that was appropriate for use in this study, specifically the equal status design, whereby the

qualitative and quantitative approaches are used sequentially (Leech & Onwuegbuzie, 2009:268). The quantitative phase comprised two data sets, namely data sets collected from the staff and students. A questionnaire is used to collect and explore the data on staff and students' experiences. This method is appropriate as it generates a multi-faceted understanding of the views of various stakeholders in the institution (leadership, staff and students).

In the qualitative phase of the study, semi-structured interviews were conducted with the management of the institutions on various factors which the management had to deal with in the disruption management process. The factors include institutional resources, policies and processes, leadership traits and characteristics, internal and external environmental factors, training needs, disruption risk prediction factors, disruptive innovation and the structure within an institution designed to deal with disruption. Studying the leadership challenges and disruptive factors is imperative as it contributes to crafting the framework. The institutional leaders also provided input regarding factors or disruption prediction as a proactive measure. Understanding how leaders make sense of disruption in their leadership roles is important. Interviewing leaders with deeper insight into their institutions' operations brings numerous advantages. The method is influenced by the characteristics intrinsic in the approach as follows (Creswell, 2013:185; Creswell, 2014:19:234; Cooper and Schindler, 2011:161-163; Ritchie, Lewis, Nicholls and Elam, 2013:3; and Salkind, 2010:400):

- It shows the viewpoints of all participants.
- It encourages intellectual collaboration.
- It offers flexibility in methodology.
- It has rich and complete data collection.
- Can explore quantitative results using qualitative data.
- Findings may be validated using both qualitative and quantitative sources.

Considering the above, the theoretical perspective of the researcher was that of a constructivist. A constructivist approach recognises that researchers build new understanding and knowledge, incorporating new knowledge with what they already

know. Social constructivists sincerely believe that people are working to understand their organisations' world of work. They create subjective meanings of their experiences (Creswell, 2014:37). Like any model, the models mentioned above are not regarded to provide definitive answers to research and management problems but rather as guiding structures to create a model. As the constructionist approach is adopted, the researcher reflected on the current problems and evaluate this current knowledge.

Several theories, including contingency theory and resource-based view (RBV) theory, guide this study. The Resource-Based View (RBV) stresses the strategic use of resources to gain a competitive edge (Nayak et al., 2023) while the Contingency Theory says that the success of management initiatives depends on a number of factors (Zou, 2024) The study design will incorporate these ideas by assessing the alignment between various disruption management strategies, situational variables, and resource availability within private higher education institutions.

In research, the integration of findings is important. Using a mixed-methods approach, surveys will collect quantitative data, providing statistical insights. Interviews will gather qualitative data, offering contextual understanding. Triangulating the findings will identify discrepancies or common themes. Integrating quantitative and qualitative data will provide a comprehensive understanding of disruption management strategies.

3.2 RESEARCH SCOPE

The research aims to develop a framework for disruption management in the private higher education industry in South Africa. This study explored the various types of disruptions using pertinent literature sources and historical past research projects that can potentially affect the higher education industry and the institutions' staff and students. The researcher reviewed academic journals, books, and conference proceedings to gather insights. The literature evaluation also contain pertinent government and organisation publications from the past ten years to more recent years (2023).

This research aims to provide a comprehensive and current understanding of disruption in the PHEI by incorporating various sources and contributing to the ongoing discourse on a framework for managing disruptions in the PHEI. Therefore, the study drew upon existing literature in the fields of education, business management, and organisational studies, including works by authors such as Clayton Christensen (2017), Henry Mintzberg (1993), and Sumantra Ghoshal (1987), to develop a comprehensive understanding of the topic.

The study aims to identify key challenges and opportunities facing PHEIs in managing disruptive events, such as pandemics, economic downturns, and technological innovations. The ultimate goal of the research is to provide PHEIs with a comprehensive and practical tool for addressing and managing disruptions proactively and effectively. The findings of this study will contribute to the body of knowledge on disruption management and provide valuable insights for practitioners and policymakers in the private higher education industry. In addition, the findings will provide valuable insights for PHEIs in developing strategies for managing disruptive events and mitigating their impacts on institutional operations and stakeholders. Lastly, the framework developed in this research will serve as a valuable resource for practitioners and scholars in the private higher education industry.

3.3 SIGNIFICANCE OF THE RESEARCH

Altay and Pal (2022:3) mention that there is a paucity of theories that explain how to deal with disruptions in a comprehensive way. This research aims to address this gap in the literature by developing a conceptual framework for disruption management in the private higher education industry. The methodology will be based on existing research on supply chain disruption management in other industries while considering the particular difficulties and opportunities facing PHEIs. This study's findings will provide PHEI leaders with significant insights for building strategies for managing disruptive events and ensuring the future success of their institutions. This research will contribute to a deeper knowledge of disruption management in higher education and inform future research on this topic by developing a conceptual framework.

3.4 POPULATION

The institution under study is a leading private higher education service provider in South Africa. The target population consists of several institutions, which form a group. They are coded in the study as ‘Entity Brown (eBrown)’, ‘Entity White (eWhite)’, ‘Entity Green (eGreen)’, ‘Entity black (eBlack)’, ‘Entity Red (eRed)’ and ‘Entity Blue (eBlue)’ and ‘Entity Orange (eOrange)’. The registered private higher education institutions (PHEIs) are duly recognised by the Department of Higher Education, while the other additional entities are entrusted with academic administration and financial operations. The other entities are legally registered and assume the responsibility for managing the academic, administrative, and financial functions of the PHEIs.

The rationale behind including them is compelling. The executives, registrars, and academic heads of these entities warmly welcomed the study, recognising its potential to add long-term value to the PHE industry in South Africa. All of these institutions offer qualifications comparable to those of public and private institutions, ranging from certificates to PhD programmes. Although the Head Office and academic management division support the PHEIs, each individual PHEI follows a unique business-oriented strategy, targeting diverse clienteles across the country. As a result, each PHEI has its own distinct management team, including managing directors and principals. It is important to note that these PHEIs may respond differently to disruptions and may be affected in varying ways due to their distinct profiles and strategies.

The entities have several campuses all over South Africa. The institution's leaders will form the survey group for the qualitative data providing opinions data that will help in the thematic classification analysis. The staff and students will participate in the study by completing relevant structured questionnaires to help gather quantitative data.

One of the most important parts of conducting research is deciding who you will be studying to deliver actionable results to them. When conducting a study, it is common to practise narrowing the focus to a certain subset of the population (the "target population") to avoid overwhelming the researchers. This method is often used in research because it

increases the likelihood that the results will be applicable and beneficial to the target audience. Within the greater population that serves as the study's primary focus, a subset of people serves as the study's target population. Authors like John Creswell (2013) and Don Dillman (2000), who write on research techniques and survey design, have examined this concept at length and earned widespread recognition.

This institution's student profile is generally homogeneous with that of other higher education institutions; it includes previously disadvantaged students and those who speak a second language. The institution had a total number of students (30,200) meeting the research criteria (excluding first and second years) at the time of this study. The Department of Higher Education recognises the institution has accreditations for all courses from the Council on Higher Education.

The significance and relevance of selected PHEIs to disruption management in higher education provide a reasonable argument for including them in this study. When it comes to higher education, private institutions are indispensable, as they provide students with a valuable service while also making important contributions to the economy and society. Therefore, it is crucial to comprehend the difficulties and potentials of these establishments in handling disruptive events and to devise methods for reducing their effects. The selected PHEIs represent a diverse range of institutions in terms of size, location, and level of experience in managing disruptions, making them ideal subjects for this study. This creates a strong case for including these institutions in the population. The results of this research will help private universities deal with disruptions and ensure they continue to be successful.

The selection of a case study approach for this research study is compelling due to the unique characteristics of the private higher education institutions under investigation. The institutions have distinct product offerings and target markets, which provide a multi-faceted dimension for the study. By focusing on a single case, the researcher can gain a deeper understanding of the complexities involved in managing disruptions in private higher education. This approach facilitates in-depth analysis of the practices and

processes used by the institutions to manage disruptions and the impact these practices have on the institutions and their stakeholders.

The case study approach is recognised widely as an effective research method for exploring complex social phenomena. Its use has been justified by researchers such as Yin (2018) and Stake (2000) in their works on case study research. The selection of a case study approach in this research provides a compelling case for gaining a deeper understanding of the unique challenges and opportunities facing private higher education institutions in managing disruptions.

The Institutional Ethics Committee welcomed the study and granted access to all institutions within the national footprint. This access provides a unique opportunity to gather data and insights from diverse private higher education institutions within the group. The support of the institution's research committee is also a testament to the importance of this research and its potential to contribute to the knowledge base on disruption management in private higher education. The availability of data and insights from multiple institutions allows for a more comprehensive analysis of the practices and processes used in managing disruptions and the impact of these practices on institutions and their stakeholders. This level of access is crucial for the success of the research study and represents a compelling case for the value and potential of this study to advance knowledge in the field.

Gentles, Charles, Ploeg, and McKibbon (2015:1780) emphasised that the entire case was studied in the case study technique, and all subsamples were considered for sampling. As a result, all business units and faculties within the institution and individuals (staff and students) were considered. Only senior leadership, member of staff, and students who have worked or studied in the institution for more than two years were considered for inclusion for relevance. Before detailing each of the study’s methodologies, a breakdown of the framework followed is provided in Figure 3.2 below.

3.5 DATA COLLECTION AND ANALYSIS FRAMEWORK

The use of a data collection and analysis framework is supported in several studies, including Bachmann (2017). A data collection and analysis framework defines and organises the data to collect and analysed. It helps define, guide and underpin data collection, collation, storage and analysis by identifying or defining key analytical input, process and output at each analytical step in an investigation. The data collection and analysis follow the steps outlined in the framework diagram displayed underneath. The statistical software package SPSS 28.0 was used to specify the model to be used as input when running the CFA.

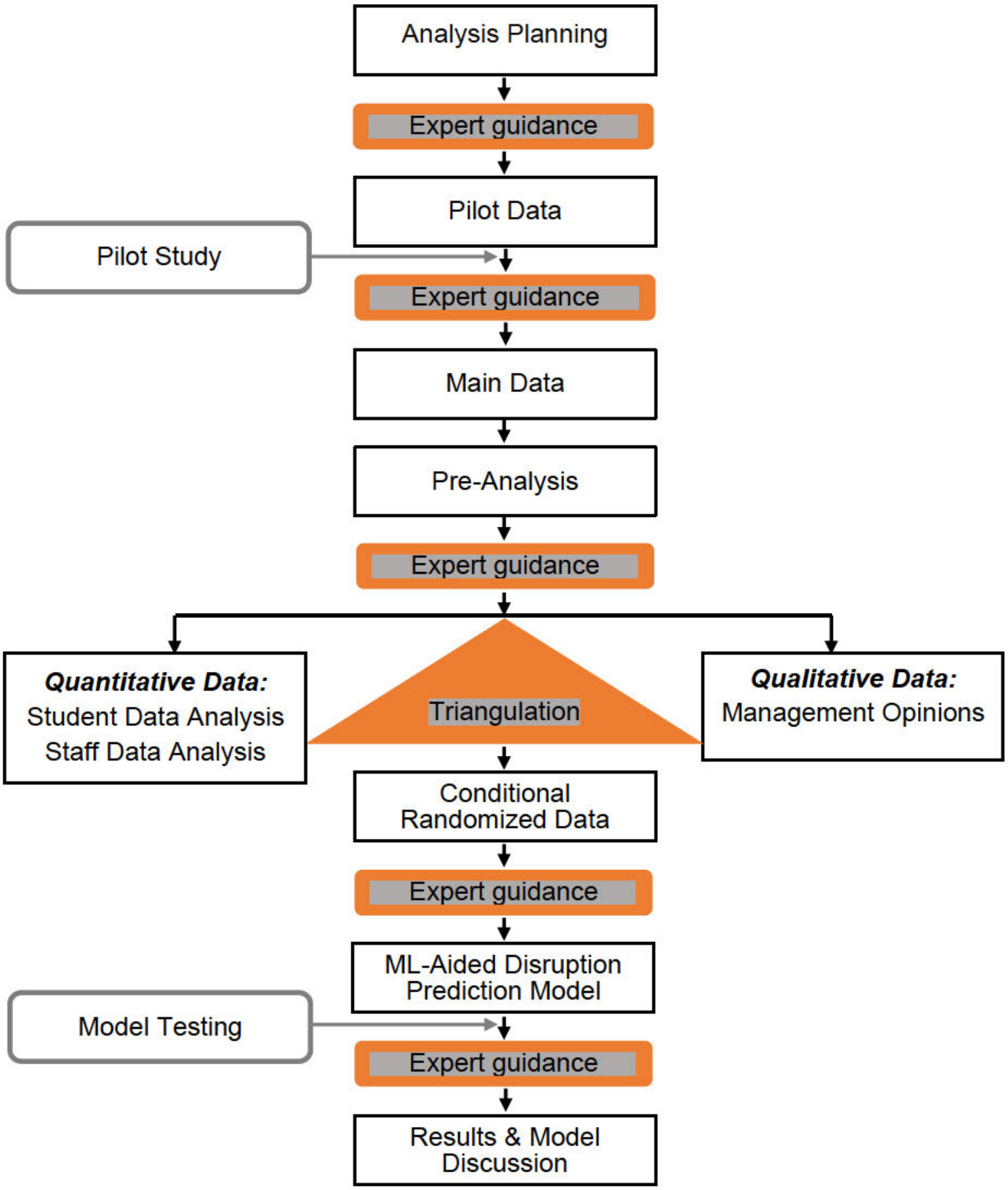


Figure 3.2: Overview of the Data Collection and Analysis Framework Applied

Source: Framework formulated by the researcher.

The framework provides a sequential set of steps that the study followed, from the planning of data collection to the final results, including the disruption prediction model. It also indicates each step at which the expert judgement is invoked.

Statistical and machine learning expertise is sought in some key steps of the data collection and analysis processes. Statistical expertise is vital primarily for the quantitative and qualitative data collection and analysis phases of the investigation. In contrast, machine learning (ML) expertise is applied in the ML-aided predictive model construction phase. The expert judgement provides knowledgeable opinions at each critical stage of the study.

As depicted in the framework above (Figure 3.2), triangulation is performed in three ways in this study: data, methodological and researcher/investigator triangulation. The study compares the quantitative results with the qualitative deductive thematic analysis. Three data sources will be used: the students, staff and managers.

3.6 SAMPLING METHOD

The study applies two different scientific sampling approaches: purposive sampling for the qualitative data (managers' data) and stratified random sampling for the quantitative one (students and staff data).

3.6.1 Purposive sampling: Managers' data – qualitative phase

The multilevel sampling is applied at the 'Head Office' and 'Business units' levels'. First, purposeful sampling will be used at the 'Head Office level' on practicality, the time factor, cost, and convenience to focus on one institution comprising various business units. Purposeful sampling was applied to draw out a sample of 15 senior managers from the entire institution who will be interviewed. Purposeful sampling was also applied as the study intentionally seeks out participants with first-hand experience with the concept under study who also meet the sample selection criteria. The inclusion criteria are 'senior managers with a minimum of 3 years of experience (in the institution) and knowledge of

the institution'. The ideal sample size should be enough respondents to reach saturation. A sample of 15 leaders was obtained from a total of 117 through judgemental sampling.

3.6.2 Stratified random sampling: Students and staff data – quantitative phase

The multi-stage sampling approach is applied to minimise sampling bias. A stratified random sampling is applied to select 316 participating staff members (employed by the institution for more than three years) from a population of 1,761. The sample size for staff was determined using Krejcie and Morgan's (1970:607) formula and table for stratified random sampling. The population of interest consisted of 1,761 staff members employed by the institution for more than three years. A proportion of 0.165 (i.e., 165/1,761) was assumed to have the characteristic of interest. The desired level of precision was set to 5%, and the confidence level was set to 95%. To determine the sample size with a desired level of precision of 5% and a confidence level of 95%, the following formula was applied:

$$n = N * p * q * [(Z/E)^2 + (N-1)/(N-1)(e^2)]$$

Using a population size of 1,761 and assuming a proportion of 0.165, the calculation yields:

$$n = 1,761 * 0.165 * 0.835 * [(1.96/0.05)^2 + (1,761-1)/(1,761-1)(0.01^2)]$$

$$n \approx 316$$

Therefore, a sample size of approximately 316 participants was determined for this study. Staff total population and sample size by entity are listed in Table 3.1a below.

No.	Entity	Population	Proportion	Sample size
1.	'eGreen'	28	0.016	5
2.	'eBlue'	103	0.058	18
3.	'eBlack'	729	0.414	131
4.	'eRed'	308	0.175	55
5.	'eBrown'	494	0.281	89
6.	'eWhite'	99	0.056	18
	Total	**1,761**	**1**	**316**

Source: Researcher own compilation

And 381 students (who are in their third year of studies and beyond) were selected from a total population of 30,200 from across different levels of the study. The sample size was determined using the formula proposed by Ben-Caleb *et al* (2019:309), which takes into account the population size, desired level of precision, and proportion of the population with the characteristic of interest.

With a desired level of precision of 5% and assuming that 10% of the population has the characteristic of interest, the sample size of 381 was determined to be appropriate for this study. Substituting the values into the formula, we get:

$$n = 30,200 / (1 + 30,200(0.05^2)(0.10)(1-0.10))$$

$$n = 381$$

For the stratified random sampling of the students' group, the weighting is proposed to be 60% for 3rd-year students and 20% for each of the honours, masters, and PhD student groups, while 20% weighting is applied across all institutions for the selection of the staff. Students' total population and sample size by entity are listed in Table 3.1b below and 3.1c depict the distribution weighting per level.

No.	Entity	Population	Proportion	Sample size
1.	'eBlue'	4898	0.162	62
2.	'eBlack'	11,728	0.388	148
3.	'eOrange'	456	0.015	6
4.	'eBrown'	10,942	0.362	138
5.	'eWhite'	2,176	0.072	27
	Total	**30,200**	**1**	**381**

Source: Researcher own compilation

Entities	Number of Students	Population			Proportion			Sample Size		
		3rd years	Honours	Masters/PHD	3rd years	Honours	Masters/PHD	3rd years	Honours	Masters/PHD
'eBlue'	4,898	4235	654	9	0.140	0.022	1	32	21	9
'eBlack'	11,728	11,728	0	0	0.388	0.000	0.000	148	0	0
'eOrange'	456	456	0	0	0.015	0.000	0.000	6	0	0

Entities	Number of Students	Population			Proportion			Sample Size		
		3rd years	Honours	Masters/PHD	3rd years	Honours	Masters/PHD	3rd years	Honours	Masters/PHD
'eBrown'	10,942	10,710	232	0	0.217	0.145	0.000	83	55	0
'eWhite'	2,176	2,091	85	0	0.043	0.029	0.000	16	11	0
Total	30,200	29,220	971	9				285	87	9

Source: Researcher own compilation

In this context, random sampling methods was used for the quantitative stage of the research. Purposive sampling as used for the qualitative stage (Braun & Clarke, 2013:56). The researcher employed concurrent multi-level, multi-stage to select suitable samples to address the study questions and hypotheses (Sharp *et al.*, 2012:35). In this context, purposive and random sampling techniques was used for both qualitative and quantitative stages of research to choose samples from the same population (Hesser-Biber, 2010:55). In addition, higher education institutions are hierarchical in form, with several interconnected layers that include sites, faculties, study levels, educators, and students.

Multi-level mixed-methods sampling approaches were ideal because they are commonly used in educational institutions and other institutions where multiple units of analysis are integrated (Teddlie & Tashakkori, 2009:190). The researcher selected students from the third year based on their knowledge of the institution and institutional experiences. It also select staff members involved in the academic activities, such as lecturers, heads of departments, campus managers, and senior leaders employed for two years or more in the institution across South Africa, to participate in both the quantitative and qualitative phases of the study. The researcher used purposive sampling since the investigation is interested in samples of students and staff who experienced disruption during the commencement of the COVID-19 lockdown in 2020.

Since the senior staff members may be difficult to reach, a derived rapport method was used to alleviate participant scepticism of the study process (Ellard-Gray, Jeffrey, Choubak & Crann 2015:6). A triangulated approach to analysis which gives the strands

equal weight, was applied (Creswell, Fetters & Ivankova, 2004:11). On that basis, senior staff members (chief executives, registrars, and HoDs), members of staff (lower-echelon staff members who are not part of the senior leaders), and students were included in the study. The purpose wass to ensure that staff and students freely participate in the investigation of how leadership responded to the disruption of COVID-19. It also aims to ensure that their viewpoints were considered in efforts to respond to disruptions. The sample sizes were estimated at a 95% confidence level (Saunders *et al*., 2016).

3.7 RESEARCH TRADITION

The study follows a hybrid approach in which the positivist paradigm applying scientific disruption prediction is supported by constructivism in which staff and student experiences will aid the formulation of the new framework for guiding leaders. Positivism accentuates real facts, in which the truth about a phenomenon is based on logic and rationality. That is, science should prove it; if it cannot, then it does not exist (Walliman, 2011:175). The positivist paradigm is a useful theoretical framework for doing mixed-methods research in the field of disruption management. This paradigm is based on the idea that scientific research can be used to objectively study and understand social phenomena (Creswell, 2014). This makes it a good choice for empirical research.

With the positivist paradigm, you can get a complete picture of the complicated nature of disruptions and how they affect organisations by using quantitative and qualitative methods. For example, a positivist mixed-methods study of how to deal with disruptions could involve collecting quantitative data on how often and how bad disruptions are and then conducting qualitative interviews to find out how people affected by disruptions feel about them (Johnson & Onwuegbuzie, 2004). By using all these methods together, the researcher can get a complete and more precise picture of the problem at hand, which can help them make decisions based on facts.

The researcher drew findings based on the scientific methodology for this study. This method involves observation, the definition of the problem, experimentation, hypothesis, and theory. As part of the qualitative research tradition, managers with first-hand

experience with disruption issues in the organisation help share information on the issue. Thus, the study used broad, open-ended interview questions that helped participants respond freely. The participants' responses were all noted, transcribed and analysed for similarities and differences.

3.7.1 Research arguments

In research, induction and deduction are two different ways to develop or test hypotheses. Inductive reasoning is a way to move from specific observations to broad conclusions. It is an inductive process that starts with data and observations and uses them to build general theories or laws. This method is often used in qualitative research, where researchers try to get a complete and vivid picture of something complicated (Hamad, 2007).

In contrast, deductive reasoning involves going from broad principles or rules to more narrowly targeted predictions. In this method, a theory or hypothesis is used to explain and predict certain phenomena (Johnson-Laird, 2010:15). In quantitative studies, researchers often use deductive reasoning to test hypotheses with real-world data (Casula, Rangarajan & Shields, 2021). A deductive process was used in this mixed-method study. This meant starting with a theoretical framework or hypothesis and using it to make specific predictions about the phenomenon being studied. The goal was to create a conceptual framework for managing disruptions in private higher education, which required a methodical and evidence-based approach. The researcher could test the existing theories using a deductive process of existing models and results in the field to improve or create new knowledge.

This method is often used in quantitative research. It lets researchers develop testable hypotheses and gather real-world data to prove or disprove those hypotheses.

Saunders, Lewis, and Thornhill (2016) stress the systematic and empirical nature of the deductive approach and its potential to generate rigorous and valid results, highlighting its advantageous characteristics. By following the deductive method, researchers can

evaluate current ideas and models and use their findings to refine or generate new ones. This method is well suited for examining the correlations between variables and producing hypotheses that can be confirmed or refuted by empirical evidence.

The mixed-methods study benefited from the researcher's use of a deductive approach to gain a deeper and more systematic comprehension of disruption management in private higher education. The researcher gained a profound insight into the problem and created a theoretical framework supported by empirical evidence by integrating qualitative and quantitative approaches.

3.7.2 Methods and approach

A wide range of approaches exists to solve research problems. For this study, a mixed-methods research approach is well suited for addressing complex research questions that require a comprehensive understanding of the phenomena under study. This approach combines qualitative and quantitative methods to provide a rich and nuanced understanding of the issue. By using multiple methods, a mixed-methods study can overcome the limitations of either approach used alone or provide a complete picture of the topic (Feilzer, 2010:9). This approach provided a holistic view of the research problem, allowing for a deeper exploration of the topic through the triangulation of different data sources. For instance, not only management voices were considered to develop conceptual disruption management. The staff and students' experiences of management's responses to the disruption were obtained through quantitative and qualitative data.

3.7.2.1 Triangulation

'Triangulation in research' is defined by Jick (1979:607) and Patton (1990:244) as using multiple datasets, methods, theories, and/or investigators to address a research question. It is a research strategy that can help you enhance the validity and credibility of your findings and mitigate any research biases in your work. Data triangulation refers to using various data sources, which may include the time the data is collected, the space or the

persons serving as respondents to the study. Researchers use data triangulation when they independently use two or more sources to confirm their findings.

Methodological triangulation refers to using different methods to approach the same research question. Data triangulation allows for corroborated results, which may minimise the weaknesses in using one piece of data – as the weaknesses in one dataset may be compensated for by the strengths of other data, thereby improving the validity and reliability of the results. Investigator triangulation is when the 'original' researcher involves multiple observers, experts or other researchers to collect, process, or analyse data separately.

This triangulation of data sources helped validate and enrich the findings, leading to a more in-depth and precise understanding of the research problem. As such, the mixed-method approach allowed for a more comprehensive examination of the topic and a more robust set of findings that would not have been possible with a single method. By considering both the perspectives of management and the experiences of staff and students, this study provides a comprehensive examination of disruption management in the PHEI, contributing to a complete understanding of this critical issue.

Leedy and Ormod (2015) provide four benefits for selecting the mixed-methods approach as follows:

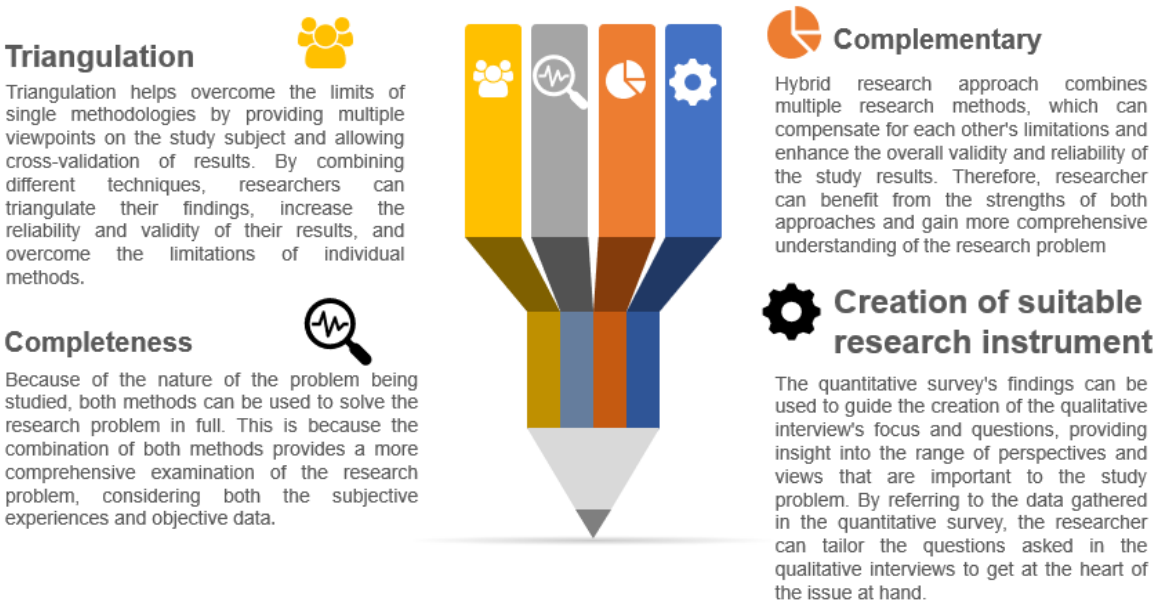


Figure 3.3: Mixed-method benefits

Source: Adapted from Leedy and Ormod (2015)

Mixed-methods research proved valuable for addressing complex research questions in various fields, including education, healthcare, and psychology. This mix of data allow researchers to grasp both the objective and subjective consequences and generate a complete picture of the research problem. This approach has been supported by numerous scholars, including Creswell and Plano Clark (2011), who argue that mixed-methods research can provide a more comprehensive and deep understanding of complex research questions than either qualitative or quantitative methods used alone. The advantages of a mixed-methods approach to research are highlighted by Saunders *et al.* (2016). The authors suggest that a more thorough investigation of the research problem is made possible by the use of mixed techniques, therefore boosting the study's credibility.

3.7.2.2 Explanatory sequential mixed-method

Combining qualitative and quantitative methods is possible in many different contexts. This study used the explanatory sequential mixed-method research approach to collect

qualitative and quantitative data. The study began with quantitative data analysis, followed by qualitative thematic analysis. The quantitative phase provided systematic data analysis, while the qualitative phase added depth and understanding to the subject being studied. Combining these two methodologies enabled data triangulation, which improved the results' dependability and validity.

Explanatory research is a type of research design used to explore the reasons behind a phenomenon when limited information is available (Swedberg, 2020:14). The purpose of explanatory research is to explain why something is happening rather than simply describing what is happening. Explanatory research is often used when there is a gap in understanding or when previous research has not adequately addressed a particular issue (Creswell & Plano Clark, 2011).

In a study of disruption that involves ambiguity, explanatory research can be an effective tool in creating a disruption management framework. The lack of a map to guide education leaders through disruption makes explanatory research an appropriate method. Explanatory research can help identify the causes of disruption. This information can be used to develop a framework to help education leaders respond effectively to these disruptions. By understanding the reasons behind the disruption, leaders can make informed decisions and develop strategies that can help to mitigate its effects and ensure a successful outcome.

Explanatory research is a type of research that is conducted to explain the cause-and-effect relationship between variables. This research is designed to test a theory or hypothesis about why certain phenomena occur and to predict future occurrences based on the study's results (Sainani, 2014:841). Therefore, this study followed the methodology of Creswell and Plano Clark (2011), who suggested the explanatory sequential design as a good way to conduct research when the researcher lacks a clear understanding of the problem's nature but wishes to learn more through a combination of qualitative and quantitative techniques.

Further motivation for using an explanatory sequential method, where the first stage is a quantitative method and the second stage is a qualitative method, stems from the strengths and limitations of each approach. Quantitative methods are typically structured and allow for collecting and analysing large amounts of numerical data (Ragab & Arisha, 2018:7). They are efficient and objective but sometimes lack the rich, in-depth understanding that qualitative methods can provide. On the other hand, qualitative methods are flexible and allow for an in-depth exploration of complex phenomena. They are effective in exploring the meaning and experiences of individuals but can be time-consuming and may not provide the same level of generalizability as quantitative methods (Sofaer, 1999).

Starting with a quantitative exploration as a strategy to increase the applicability and value of an assessment instrument is a commonly used approach in measurement and evaluation (Messick, 1989). The idea behind this strategy is that quantitative data provides a more objective and systematic way to gather information about the measured construct (Yin, 2002). This initial quantitative exploration can help to identify the most relevant aspects of the construct and provide information about the reliability and validity of the assessment instrument. After the initial quantitative exploration, qualitative methods can gather more in-depth information about the construct and provide additional validation for the assessment instrument (Creswell, 2014). This approach helped ensure that the assessment instrument is accurate and relevant and provides a comprehensive understanding of the measured construct.

The quantitative phase provides a systematic and objective understanding of the phenomenon under investigation and is used to test hypotheses and identify patterns in the data. The qualitative phase, which follows the quantitative phase, provides a deeper and more in-depth understanding of the phenomenon, exploring the experiences and perspectives of individuals and providing a more nuanced understanding of the issue.

The explanatory sequential mixed-method combines the strengths of both quantitative and qualitative methods, providing a comprehensive and rich understanding of the

phenomenon being studied (Almeida, 2018:138). This approach aims to explain and clarify the findings from the quantitative phase through qualitative data and to provide a complete understanding of the studied topic. Explanatory research is often used to identify a particular phenomenon's underlying causes, and the research results are used to develop a predictive model. This research type uses experimental or quasi-experimental methods, where variables are manipulated, and their effects on other variables are observed (Baskerville & Pries-Heje, 2010).

One of the critical characteristics of explanatory research is that it is guided by a clear set of research hypotheses that specify the relationships between the variables being studied. These hypotheses are typically developed based on existing theories or prior research in the field. The hypotheses were then tested by collecting and analysing data and comparing the results to the hypotheses. The hypotheses were then either supported or rejected. Using explanatory research with a deductive approach can be beneficial for developing a conceptual framework for disruption management in higher education. This approach can help leaders understand the causes, predict future disruptions and then take proactive measures to minimise the impact of these disruptions.

With the explanatory sequential method, quantitative data is gathered and analysed first, followed by qualitative data (Creswell & Plano Clark, 2011). From the literature review, the research process went to a quantitative stage to explore the concept of disruption and the external factors affecting the higher education industry. This stage aimed to study and comprehend the concept of disruption. These external factors impact the higher education industry and identify the tools and skills that private higher education leaders can utilise for managing disruption. The research process continued with the intermediate phase of instrument development, based on the literature review and quantitative research findings.

The various stages of the research process were sequential, and each stage produced unique outcomes. The final stage involved a qualitative study that tested the developed instrument. This approach eventually led to creation of a conceptual framework for

managing disruption in private higher education institutions (PHEIs) in South Africa. Lastly, the explanatory sequential method can be used to conduct deductive research by combining quantitative and qualitative methods to comprehensively understand the phenomenon being studied (Trochim, 2006). The quantitative phase provides the necessary empirical evidence to support or reject the theory, while the qualitative phase provides additional insights into the underlying mechanisms and processes.

3.7.2.5 Deductive approach

The deductive approach involves testing a pre-conceived theory or hypothesis through empirical data collection and analysis (Tariq, 2015:228). In the context of disruption management in higher education, this approach was useful for identifying the underlying causes of disruptions and their potential impact on students, staff, and the institution. The research results was used to develop a predictive model to help leaders make informed decisions about managing future disruptions.

Furthermore, one of the key benefits of using the deductive approach in explanatory research is that it provides a systematic and structured approach to testing theories and hypotheses (Rahi, 2017). This approach wass based on a clear set of assumptions and expectations, and the results were objectively evaluated based on the data collected and analysed.

Another benefit of using explanatory research with a deductive approach is that it can help to build a comprehensive and robust conceptual framework for disruption management. This framework can provide a comprehensive understanding of the underlying causes of disruptions and their potential impact and be used to develop evidence-based strategies for managing and predicting future disruptions.

3.7.2.6 Inductive vs Deductive thematic analysis

Inductive and deductive thematic analysis are both systematic processes that serve qualitative studies. Caulfield (2019) distinguishes between the two approaches: an inductive approach allows the data to determine the researcher’s themes, while the

deductive approach involves coming to the data with some pre-conceived themes that the researcher expects to find reflected there based on theory or existing knowledge.

When using the inductive orientation in thematic analysis, codes and theme development are directed by the content of the data. Thus, this approach requires the researcher first to familiarise themself with the data. After reading and re-reading the content, the investigator developed codes (labels). Studying all available data content allowed the investigator to refine the codes. Braun and Clarke (2019:27-52) lay down the broad steps of inductive and deductive thematic analysis as (1) generating initial themes, which are the words for the tentative themes which come from the data, (2) reviewing themes which involve checking the themes against all the study data and (3) defining and naming themes which involves revisiting the scope and focusing on each theme ensuring no overlaps. The key steps are illustrated in Figure 3.4 below.

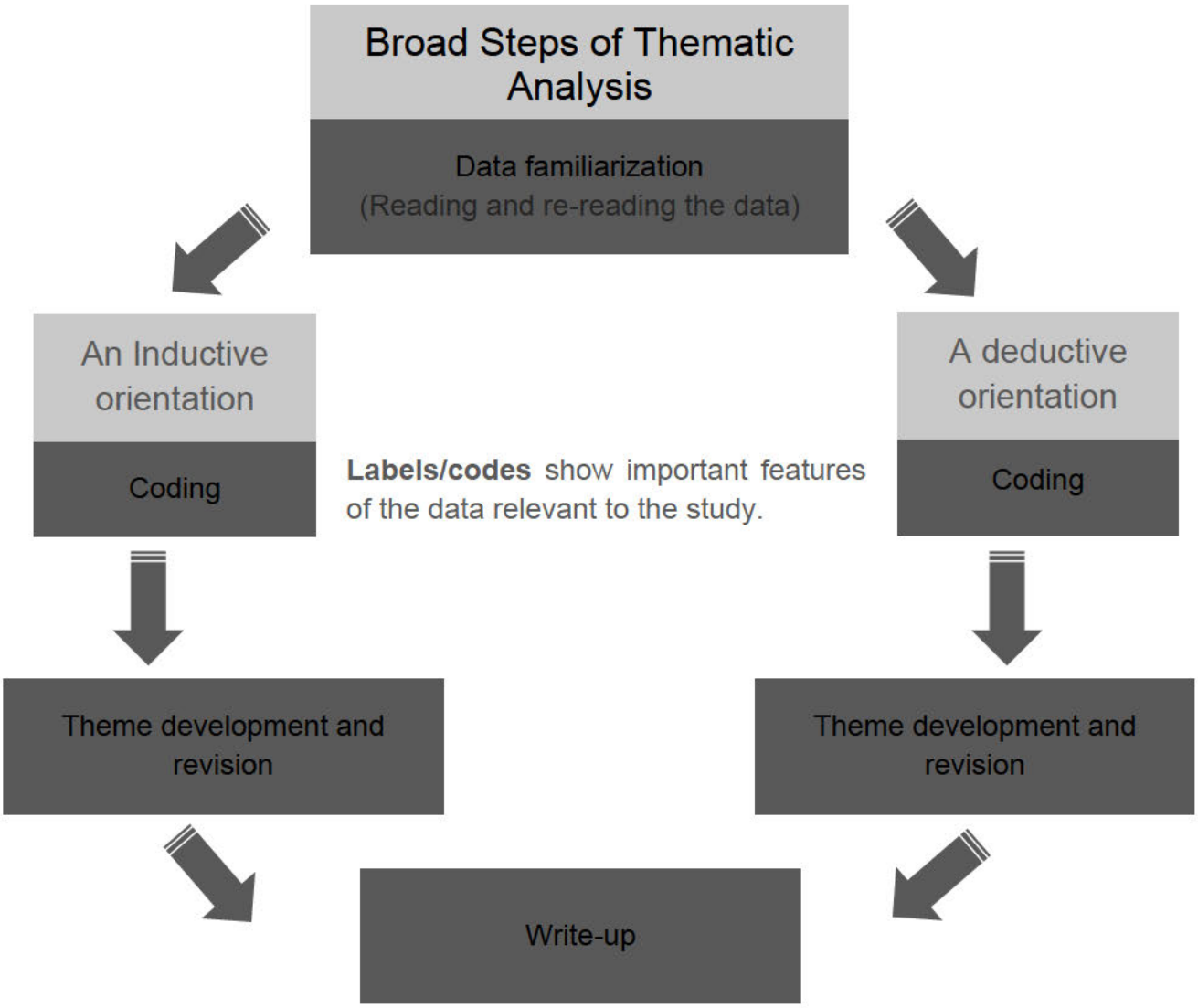


Figure 3.4: Broad Steps in Inductive and Deductive Thematic Analysis

Source: Adopted from Braun & Clarke (2019:27-52)

3.8 DATA COLLECTION METHOD

3.8.1 Structured questionnaire

The researcher first used a survey questionnaire for the quantitative part of the study. Questionnaires was used in this study as per Walliman (2011:97) since they are "a very flexible tool that has the advantages of having a structured format, they are easy and convenient for respondents, and are cheap and quick to administer to a large number of cases covering large geographical areas".

The first section of the research questionnaire comprises basic demographic questions before moving on to other research questions, as supported by Wagner, Kawulich & Garner (2012:104). The second section carries questions on the level of preparedness of the group for disruption management, institutional capability and capacity, disruption experiences and proposed framework.

The questionnaire was self-administered using Microsoft Forms, an online tool used to create an online questionnaire, create a link, sent it to respondents, and saved their submitted surveys. Using Microsoft assures that the researcher will comply with POPIA and other SA privacy laws when collecting data via forms. This is not the case with other applications without the same arrangement. Participants were sent a link in their inbox to click on and complete the survey online to adhere to COVID-19 restrictions.

Both staff and student responses were gathered using a questionnaire with a preset set of questions (the questionnaire, informed consent forms, and ethics approval are all attached as appendices). A questionnaire with twenty-three (23) questions, divided into five (5) main sections, was used as the research instrument. It took most students and staff between 5 and 10 minutes to fill out the questions. There were five main sections for staff and students, namely: biographic information of the PHEIs (section A), level of preparedness for disruption (section B), capability and capacity developed by the institution (Section C), staff/students experiences and future (section D) and proposed framework (section E). A five-point Likert scale was used to measure all of the different

factors. This made it possible to gather and compute the responses for statistical analysis, as respondents could easily understand them. It also made it easy to come up with conclusions, reports, and results from the answers.

A Likert-style rating, according to Saunders *et al.* (2016), requires respondents to choose their level of agreement or disagreement with a statement or series of statements. Typically, responses are measured on a 4, 5, 6, or 7-point scale. Comrey (1988, cited in Barry *et al*., 2011:323) warns against using a 3- or 4-point rating scale due to the lack of variation. Comrey suggests that a Likert-type scale include at least five response options. In accordance with this recommendation, a 5-point Likert scale extending from 1 = very poor/strongly disagree to 5 = excellent/strongly agree was utilised in this study.

A standardised 5-point Likert-type scale was employed across all individual variables, allowing participants to rate their responses on a continuum from 1 (very unsatisfactorily) to 5 (very satisfactorily). This consistent rating scale provided a uniform framework for measuring participants' levels of satisfaction across different variables:

1	2	3	4	5
Very unsatisfactorily	*Unsatisfactorily*	*Neutral*	*Satisfactorily*	*Very satisfactorily*

The results of the pilot study indicated excellent scale reliability among the items (variables) in the questionnaire. The Cronbach's alpha coefficient, which measures internal consistency, calculated demonstrated a high degree of reliability (see section 3.8.1.2).

3.8.2 Semi-structured interviews

Secondly, the researcher conducted interviews with PHEIs leaders. The interview guide carried questions that investigated the participants' understanding of disruption. Interviewing leaders was crucial for gaining insights into the ways in which these PHEIs manage and respond to disruptive changes in their operating environment. Such leaders are responsible for charting the strategic direction of their institutions, making key decisions, and allocating resources to achieve institutional goals. By exploring their

understanding of disruption, awareness of environmental factors, and the philosophy and values that underpin their management approach, researchers gained valuable insights into the strategies that institutions adopted in response to disruptive changes.

Moreover, leaders are typically well-placed to provide rich, nuanced, and detailed accounts of institutional policies and procedures, including those related to change management and risk assessment. As such, interviewing them helped the researcher understand the institutional context and identify the factors that facilitate or impede successful responses to disruption. There is a growing body of research that highlights the importance of studying leadership in HEIs. For instance, a study by Jones, Harvey, Lefoe, and Ryland (2019:15) emphasises the need for leaders to develop a deep understanding of the changing external environment in order to effectively manage change and respond to disruption. Similarly, a study by Sánchez-Barrioluengo and Villarroya (2020:1051-1067) underscores the importance of leadership in driving institutional change, particularly in the face of disruptive challenges.

The focus was on the participants' lived experiences and how they interpret their experiences of business disruptions. Microsoft Teams was used for all interviews. Because of how the COVID-19 pandemic has altered our daily lives, the decision was made to conduct all the interviews online. With the need to maintain social distancing and minimize in-person interactions, online interviews have become an increasingly popular and necessary mode of data collection in research. Additionally, online interviews offer the advantages of convenience, cost-effectiveness, and accessibility, as they can be conducted from anywhere with an internet connection.

Research has shown that online interviews can be just as effective as face-to-face interviews in terms of the quality of data obtained and can even offer some advantages over in-person interviews, such as increased participant comfort and reduced researcher bias (Braun & Clarke, 2019). As such, online interviews are a valuable tool for researchers, particularly in situations where in-person interviews are not feasible or advisable.

The interviews were conducted using an instrument designed to elicit detailed accounts of the disruptions that the participants experienced and the decisions that they made as a result. The researcher drew on the literature, logic, his own experiance in disruption management and the PHE sector, and conversations with other researchers from a variety of PHEIs to develop the themes and questions for the interview guide. The interview guide was sent to all respondents via email prior to the arranged interview. Bryman (2016:248) notes that providing interviewees with information about the interview questions beforehand can help to reduce anxiety and increase the validity and reliability of the interview data. During the interview, the researcher asked in-depth questions and allowed the respondent to take the initiative. The discussion remained on-topic and allowed the respondent to elaborate on their views.

The interviews were audio-recorded and transcribed verbatim for analysis on Microsoft Teams. The researcher reviewed the transcriptions and made necessary corrections to unclear words for accuracy. The final interview guide used in the study is included in the appendices for reference.

3.8.3 Acknowledgment of limitations and consideration of complementary methods

Limitations of questionnaires and interviews:

This research primarily used surveys and interviews to collect information. While these methods are useful for gathering a variety of data, they also have their own limitations.

Questionnaires: Survey participants may experience social desirability bias, meaning they might give answers that they think others want to hear instead of their genuine thoughts (Bergen & Labonté, 2020). We created the surveys to protect respondents' privacy and confidentiality to encourage truthful responses, addressing this issue.

Interviews: Conducting interviews can take up a lot of time and require a significant amount of resources (Solarino & Aguinis, 2021). There is also the potential for interviewer bias to affect the responses given. To mitigate these potential biases, we employed structured interview guides and had multiple well-trained interviewers.

Consideration of complementary methods:

Despite considering various additional techniques to improve the research design, resource limitations ultimately prevented their use.

Focus groups: These methods could offer a better understanding of disruption management through the dynamics and interactions within a group (Ghadge et al., 2022). However, the requirement for experienced facilitators and extra resources prevented their implementation.

Case studies: Conducting thorough case studies on individual institutions could provide extensive knowledge on how various organizations handle disruptions (Orlando et al., 2022). However, the detailed nature of case studies and access restrictions rendered this approach impractical.

Longitudinal studies: Observing differences over time may offer valuable information on how disruption management strategies have evolved (Katsaliaki et al., 2022). However, due to constraints on the research timeline, a long-term approach was not feasible.

Surveys with larger sample sizes: Increasing the size of the survey sample could make the results more applicable to a broader population (Giner-Sorolla et al., 2014). However, we were unable to do so due to limits on resources and time.

Justification of chosen methods:

We selected questionnaires and interviews despite some constraints because they effectively gather thorough data in a timely manner. Steps were taken to minimise their limitations, such as maintaining anonymity and using structured guides, which improved the accuracy of the results. These approaches were considered suitable for achieving the research goals and gaining valuable insights into managing disruption in private higher education institutions.

3.9 PILOT STUDIES

A pilot study was conducted to ensure participants can communicate and understand the connotations and phrases. Pilot testing enhances questions before conducting the main study (Saunders, Lewis & Thornhill, 2016:473). It was also used to see if the study will achieve the expected results. The quantitative and qualitative phases applied a pilot study with pilot samples of 10 and 4, respectively. Before the main study, pre-pilot tests and pilot data analysis were conducted, and the results were evaluated to determine whether the research instruments needed to be modified. There were no significant modifications to the research instruments because the participants understood the questions and provided adequate responses.

3.10 DATA ANALYSIS

3.10.1 Quantitative analysis

The quantitative phase applied descriptive statistics to obtain the summary measures indicating the inherent distributional properties of the data collected from staff and students from the institutions using the structured questionnaire. The utilisation of quantitative research methods offers several advantages in examining a phenomenon or a set of activities, as it enables accurate results and facilitates the testing of hypotheses by deriving models and theories from empirical data (Eyisi, 2016:91). Following the collection and coding of responses, the variables and participants' data were summarised. Descriptive statistical analysis, including measures such as means, medians, modes, degrees of skewness, standard deviation, and variation, was performed using SPSS 28.0. These analyses provided valuable insights to address the research questions and interpret the findings.

Furthermore, graphical illustrations helped visualise the properties and patterns inside the quantitative data. Detailed boxplots, for instance, were used to display information such as the degree of variation (using jitters), the graphs and outliers in the staff and students'

datasets concerning the categorical variables such as institution, years of experience (years in the institution), faculty, province, gender, race etc.

A binary classification tree (for disruption prediction) is constructed based on four attributes: relevance to the industry sector, management familiarity with the risk factor, probability of occurring and potential impact if it occurs. Using SPSS software, a binary classification model will be applied to classify potential outcomes of predictive factors as ‘disruptive’ or ‘non-disruptive’. The potential outcome states of the model are “0” for “no disruption” and “1” for “disruption”. The simulated data is partitioned into two subsets, that is, 75% for the training dataset and 25% for the test data. The train run sets a seed for the replication of the model results. The results are displayed in the form of a binary classification tree, and a summary table displaying model prediction accuracy is also provided (see Figure 4.17).

3.10.1.1 Validity Test

To ensure the validity of the instrument used in the study, both content validity and construct validity were assessed. The content validity of the instrument was achieved by aligning its items with pertinent concepts and theories. Exploratory factor analysis, which included principal component analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, and Bartlett's test of sphericity, determined construct validity in accordance with Blumberg, Cooper, and Schindler's (2014) recommendations. The KMO values, which indicate the proportion of variance in the variables attributed to underlying factors, were all acceptable, surpassing the threshold of 0.5 (please refer *section 4.8.1* for further details). Additionally, Bartlett's test of sphericity confirmed that the variables were suitable for detecting underlying structure.

Why is factor analysis important?

Factor analysis is a statistical technique commonly employed for the purpose of data reduction (Kline, 2011). It finds its application in survey research, particularly when researchers aim to represent multiple questions using a smaller number of hypothetical factors (Watkins, 2018:219). Factor analysis can be used to establish whether the three

measures do, in fact, measure the same thing. If so, they can then be combined to create a new variable, a factor score variable that contains a score for each respondent on the factor. Factor techniques are applicable to a variety of situations. A researcher may want to know if the skills required to be a decathlete are as varied as the ten events, or if a small number of core skills are needed to be successful in a decathlon. You need not believe that factors actually exist in order to perform a factor analysis, but in practice the factors are usually interpreted, given names, and spoken of as real things.

This statistical technique has been used to identify key factors or dimensions that contribute to the disruptions experienced by students in this context. By analysing a set of survey questions or items related to various aspects of disruption, factor analysis helps reduce the data and identify underlying factors that explain the common variance among these items.

3.10.1.2 Reliability test

To assess the reliability of the instrument, a test-retest method was employed during the pilot study. This approach aimed to determine whether the developed factors consistently measured what they were intended to measure. The internal consistency of the variables was evaluated using the Cronbach's alpha test, which calculates an alpha coefficient ranging from 0 to 1. A Cronbach's alpha value of 0.7 or higher indicates that the items effectively measure the variable. By examining the interrelatedness of the variables, the Cronbach's alpha test provided insights into the internal consistency of the instrument.

The Appendix Section (Appendix 1) provides a summary of the reliability test results. A sub-sample of 10 observations on 29 questions for both the student and staff data was applied to test the internal consistency of the data based on the Cronbach Alpha coefficient. The staff pilot data had a Cronbach’s alpha of 0.8739. In contrast, the student pilot data had a reliability coefficient of 0.9010. Both indicate a high level of internal consistency of the study data according to the scientific research coefficient threshold. The boxplot highlights the degree of spread of responses from participants for all the

questions applied in the investigation. In other words, it measures reliability and internal consistency (the extent to which the questions being answered vary).

In most scientific studies, including Trizano-Hermosilla and Alvarado (2016), Cronbach's alpha was used to look for internal consistency in the main student data, just like in the pilot. The main data from the students has a Cronbach's alpha coefficient of 0.947. This value scale highlights high internal consistency for the student responses (Trizano-Hermosilla & Alvarado, 2016). The student reliability output indicates that dropping questions 1, 2, 3, 4, 5, 6, 7, 28 and 29 will improve the reliability results while dropping any other questions will not. This is the case because the responses to the first seven questions and the last two questions are less correlated to the rest of the questions leading to an increase in reliability if they are dropped. Likewise, Cronbach's alpha overall reliability coefficient for the staff main data is quite high (at 0.932). However, dropping questions 1 – 6, 27-29 and 10 will improve the reliability coefficient as these questions seem to be less correlated to the rest of the questions.

3.10.1.3 Structural Equation Model (SEM)

SEM is an important tool for improving research results because it can analyse multiple relationships between observed and hidden variables at the same time (Dash & Paul, 2021). This helps to provide a more thorough understanding of the data. By using SEM in a study, researchers can accurately estimate the relationships between variables, resulting in more trustworthy conclusions. Additionally, SEM can account for measurement errors and test complex theoretical models, making the findings more accurate and robust (Zhang et al., 2021).

In accordance with Kothari's (2004) recommendation, the convergent validity of the measurement model was determined by investigating the construct reliability and standard factor loadings of the observed variables. The fit indices for the final measurement model and structural model were evaluated using Byrne's (2016) suggested cut-off values. chi-square/degree of freedom <3.0, goodness of fit index (GFI) >0.9, root mean residual (RMR) >0.08, comparative fit index (CFI) >0.9, Tucker-Lewis index (TLI) >0.9, and root mean square error of approximation (RMSEA) < 0.05. To test

hypotheses 1 and 2, the structural model's standardised regression weights were examined. Utilising the correlation coefficient, Hypothesis 3 was evaluated. All hypotheses were evaluated with the difference of means test, with significance levels set between 0.01 and 0.05 (please refer to *section 4.9* for more details).

3.10.1.4 Normality test

The appropriateness of the Kolmogorov Smimov test was determined for conducting the normality test. This test evaluates the ratio of two estimates of the variance derived from a random sample of 'n' observations and is commonly used to assess the suitability of the data collected for all the explanatory variables. The Kolmogorov Smimov test is applicable when the sample size falls between 3 and 2000 and the p-value is less than 0.05. In this study, the sample size for students is 381, and for staff, it is 316. It is observed that the significant values of all the constructs for each explanatory variable are 0.000, indicating that they are less than 0.05. This suggests that the normality assumption of the variables used is not supported.

Normality assumption not met

The researchers used the Kolmogorov-Smirnov test to evaluate if the explanatory variables in the study followed a normal distribution. It's important to check for normality because many statistical analyses and interpretations, like parametric tests, regression models, and structural equation modelling, rely on this assumption.

Importance of normality assumption

The assumption of normality holds significance for the following reasons.

Tests that are parametric, like t-tests and ANOVAs, require data to follow a normal distribution to ensure accurate test statistics. Similarly, to make valid inferences about coefficients and accurate hypothesis testing, linear regression models assume that the errors follow a normal distribution. Also, structural equation modelling (SEM) assumes that the data underneath is multivariate normal, which changes the chi-square test of model fit and other fit indices.

Findings from the Kolmogorov-Smirnov test

Based on the sample sizes of 381 students and 316 staff, we chose the Kolmogorov-Smirnov test to evaluate normality. We found the significant values for all constructs related to each explanatory variable to be 0.000, which is less than 0.05. These findings indicate that the data for these variables do not adhere to a normal distribution, thereby not meeting the assumption of normality.

Implications of non-normality

Not meeting the assumption of normality can have several implications. First, parametric tests may produce biased or invalid results because they rely on the assumption of normality. Additionally, non-normality in regression analysis and structural equation modelling (SEM) can lead to inaccurate estimates and invalid inferences, impacting the reliability of the statistical models used in the study.

Addressing non-normality

Since the normality assumption is not met, other methods were explored to deal with this issue. In appropriate cases, we used non-parametric tests, which do not rely on normality, to confirm results from parametric tests. Additionally, we approximated normality using data transformation techniques like log transformation. We also employed robust statistical methods, less influenced by deviations from normality, to ensure the accuracy of the results. We used bootstrapping techniques to estimate standard errors and confidence intervals, which provide more reliable inferences in the absence of normality.

3.10.1.5 Multicollinearity Test

Collinearity statistics were performed to assess the presence of multicollinearity among the variables. Two methods, namely the vector inflation factor (VIF) and the tolerance value (TV), were employed for testing multicollinearity. High multicollinearity between a variable and other variables is indicated by a VIF exceeding 10 or a tolerance value below 0.1. The results presented in the table demonstrate that there is no evidence of multicollinearity among the variables.

Students

The VIF values for all the predictor variables are within an acceptable range, indicating that there is no severe multicollinearity issue among the variables. The results provide evidence that the predictor variables included in the model assessing students' perceptions of their institution's overall experience in disruption management exhibit acceptable levels of multicollinearity.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,804[a]	0.646	0.619	0.70208

a. Predictors: (Constant), What was your experience like after transitioning to online learning during the Covid-19 lockdown?, Technology, Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?, Staff competence, Other, Kindly rate the institutions level of student support during disruption, Kindly rate the model of the establishment of your institution in terms of relevance or compatibility with future requirements, Managing out the crisis, What was your experience with the institution during the Covid-19 disruption period?, Technology integration in support of smooth learning, Did you get adequate support during the disruption period?, Innovativeness, Structure and policy formulation, Does your institution have a clear guidelines in place for managing disruptive challenges?, Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change, Contingency plan, Problem solving, Kindly rate your institution/institutional management's innovativeness, Support

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	225.703	19	11.879	24.100	<0.001[b]
	Residual	123.722	251	0.493		
	Total	349.424	270			

a. Dependent Variable: Can you rate your institution's overall experience in disruption management?

b. Predictors: (Constant), What was your experience like after transitioning to online learning during the Covid-19 lockdown?, Technology, Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?, Staff competence, Other, Kindly rate the institutions level of student support during disruption, Kindly rate the model of the establishment of your institution in terms of relevance or compatibility with future requirements, Managing out the crisis, What was your experience with the institution during the Covid-19 disruption period?, Technology integration in support of smooth learning, Did you get adequate support during the disruption period?, Innovativeness, Structure and policy formulation, Does your institution have a clear guidelines in place for managing disruptive challenges?, Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change, Contingency plan, Problem solving, Kindly rate your institution/institutional management's innovativeness, Support

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Adequacy of support	0.352	2.844
	Level of support	0.410	2.442

Clear guidelines for disruption	0.301	3.319
Guide or policy effectiveness	0.419	2.386
Problem solving	0.270	3.709
Technology integration	0.382	2.620
Managing out the crisis	0.343	2.915
Structure and policy formulation	0.339	2.953
Innovativeness	0.321	3.111
Other	0.386	2.588
Model of establishment	0.391	2.560
Institutional management's innovativeness	0.262	3.813
management's level of flexibility	0.266	3.756
Technology	0.380	2.628
Support	0.203	4.923
Staff competence	0.350	2.857
Contingency plan	0.272	3.676
Experience during the Covid-19 disruption period?	0.368	2.716
Experience like after transitioning to online learning during the Covid-19 lockdown?	0.572	1.750

a. Dependent Variable: Can you rate your institution's overall experience in disruption management?

Source: Researchers own compilation using SPSS 28.0

Staff

The collinearity statistics results affirm that the predictor variables in the model examining the staff's overall experience in disruption management exhibit acceptable levels of multicollinearity. This indicates that the regression coefficients for the predictor variables can be reliably interpreted, enabling a comprehensive understanding of the factors impacting the staff's perception of disruption management.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,732[a]	0.535	0.355	0.593

a. Predictors: (Constant), Do you think that is important to manage disruptions in future in order to minimise the negative impact on your work?, Support, Did you get adequate support during the disruption period?, Does your institution have a guide or policy in place for managing disruptive challenges?, What was your experience like after transitioning to work from home during the Covid-19 lockdown ?, If your answer to question 8 is YES, kindly rate the institutions level of staff support during disruption, Structure and policy formulation, Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?, Problem solving, Technology integration in support of smooth learning, Other, Kindly rate the institution's capability and capacity to deal with disruption with respect to each of the factors below:, Kindly rate your institution/institutional management's innovativeness (1- Very poor,2- Poor,3- Neutral,4 -Good,5- Very good), Technology, Contingency plan, Managing out the crisis, Staff competence, Innovativeness, Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change (1- Very poor,2- Poor,3- Neutral,4- Good,5- Very good)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.847	19	1.045	2.972	0,001[b]
	Residual	17.225	49	0.352		
	Total	37.072	68			

a. Dependent Variable: Can you rate your institution's overall experience in disruption management?

b. Predictors: (Constant), Do you think that is important to manage disruptions in future in order to minimise the negative impact on your work?, Support, Did you get adequate support during the disruption period?, Does your institution have a guide or policy in place for managing disruptive challenges?, What was your experience like after transitioning to work from home during the Covid-19 lockdown ?, If your answer to question 8 is YES, kindly rate the institutions level of staff support during disruption, Structure and policy formulation, Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?, Problem solving, Technology integration in support of smooth learning, Other, Kindly rate the institution's capability and capacity to deal with disruption with respect to each of the factors below:, Kindly rate your institution/institutional management's innovativeness (1- Very poor,2- Poor,3- Neutral,4 -Good,5- Very good), Technology, Contingency plan, Managing out the crisis, Staff competence, Innovativeness, Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change (1- Very poor,2- Poor,3- Neutral,4- Good,5- Very good)

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Adequacy of support	0.578	1.730
	Level of support	0.550	1.817
	Clear guidelines of disruption	0.487	2.053
	Guide or policy effectiveness	0.463	2.160
	Problem solving	0.403	2.483
	Technology integration	0.394	2.541
	Managing out the crisis	0.329	3.043
	Structure and policy formulation	0.293	3.417
	Innovativeness	0.196	5.111
	Other	0.333	3.000
	Institutional management's innovativeness	0.308	3.247
	Management's level of flexibility	0.187	5.355
	Institution's capability and capacity	0.235	4.257
	Technology	0.369	2.710
	Support	0.207	4.832
	Staff competence	0.257	3.891
	Contingency plan	0.335	2.981
	Experience after transitioning to work from home during the Covid-19 lockdown ?	0.571	1.751
	Do you think that is important to manage disruptions in future in order to minimise the negative impact on your work?	0.826	1.211

a. Dependent Variable: Can you rate your institution's overall experience in disruption management?

Source: Researchers own compilation using SPSS 28.0

Multicollinearity refers to the high intercorrelation between predictor variables in a regression analysis, which can lead to inaccurate and unstable coefficient estimates. Addressing multicollinearity is crucial for ensuring the reliability and validity of statistical analysis. The use of VIF and tolerance values is a common approach to assess multicollinearity in research studies (Hair *et al.,* 2019). A VIF value greater than 10 or a tolerance value less than 0.1 is generally considered indicative of problematic multicollinearity (Rahayu *et al*., 2017:76).

The absence of multicollinearity in the current study suggests that the selected variables are relatively independent and do not excessively overlap in their information content. This allows for more reliable estimation of the relationships between the variables of interest. The findings show that all VIF values are less than 10, and all tolerance values are greater than 0.1, indicating that there is no significant multicollinearity among the variables for both students and staff. This suggests that the predictor variables are relatively independent and do not excessively overlap in their information content, which allows for a more trustworthy estimation of the relationships between the variables of interest. The study enhances the validity and interpretability of its results by effectively managing multicollinearity.

3.10.1.6 Confirmatory factors analysis

According to Hair *et al*. (2010), factor analysis serves the purpose of identifying the underlying structure among variables, particularly in the context of questionnaire responses. In this study, exploratory confirmatory factor analysis (EFA) was utilised to validate and examine the associations between observed variables and their corresponding latent factors. The analysis involved testing predefined hypotheses and evaluating the fit of the proposed measurement model using various goodness-of-fit indices, such as the Chi-square/degree of freedom ratio, GFI, RMR, CFI, TLI, and

RMSEA (please refer to *section 4.10.1* for more details). By employing EFA, the researchers aimed to confirm the expected relationships, gain a deeper understanding of the latent constructs and their interdependencies, and refine the measurement instrument to enhance the validity and reliability of the study findings.

3.10.2 Qualitative analysis

Classification thematic analysis were applied to identify the relevant categories of new data among a set of existing (predefined) categories using a labelled set. Thematic analysis, which is a flexible and most frequent method for analysing qualitative research, allowed researcher to identify, organise and interpret themes in data by making meaning of collective or shared thoughts and experiences (Clarke & Braun, 2014:1). In a qualitative study, a theme, or a category, which comprises of coded data grouped according to similarities or patterns, refers to an element of data or sequence of words that can serve as a synoptic and accurate representation of the signification that interviewed participants attribute to an object, phenomenon, or situation. Therefore, a theme comprises coded data grouped according to similarities or patterns (Labra, Castro, Wright & Chamblas, 2019). This is applied to the data collected from the higher education leaders using the interview guide.

Themes are used in this study to understand the most popular views/opinions of the interviewed managers. The qualitative results are compared to the quantitative phase to obtain a holistic view of the problem under investigation. The managers' opinions regarding the future of the institution’s disruption preparedness were compared with the predictive results of the ML model for improved future disruption preparedness.

3.10.3 Steps involved in the thematic analysis

The process followed by the investigator in this study involved data familiarisation in relation to study objectives. The investigator visited and revisited Braun and Clarke (2012) guiding framework frequently to establish a theoretical analysis framework for this study. The investigator also read and re-read the content documents many times to improve the accuracy and consistency of the analysis. Thus, the data was coded with constant

reference to the codebook. The codes were checked and double-checked, and the study themes were refined accordingly. The summary six-phase procedure followed in this study (using the software application MAXQDA) in the appropriate sequence discussed in the literature section and prescribed by Braun and Clarke (2021), involves:

Phase 1: Familiarising with the dataset
Phase 2: Coding
Phase 3: Generating initial themes
Phase 4: Developing and reviewing themes
Phase 5: Refining, defining and naming themes
Phase 6: Writing-up

The final phase involved weaving together the analytic narrative and data extracts concerning the study's objective, contextualising the analysis concerning the existing literature, as Braun and Clarke (2019) advocated. A document matrix browser was drawn to show the themes for each research question in the interview guide regarding disruption management, comparing it to existing literature and quantitative study results.

The MAXQDA software was preferred and applied in the entire thematic analysis process for five key reasons, namely: 1) extensive qualitative analysis features, 2) high flexibility, 3) iterations, 4) transparency, and 5) the ability to connect and integrate all research project elements.

The qualitative analysis seeks to achieve three broad objectives: coding, sorting, and connecting the data. Coding qualitative data refers to identifying meaningful information from the data and developing labels representing all the meaningful information. The labels developed are intended to help the investigator address the research questions.

After coding the data, the next objective involves sorting, which refers to categorising the codes to establish themes. The themes must sufficiently address the study questions. Sometimes, the investigator may need to go beyond developing themes and connect

them through their relationship (Braun & Clark, 2019). Suppose each of the themes can not individually answer the research questions. In that case, there may be a need to connect them to address the research questions adequately. The study discussion focuses on thematic analysis. There is a wide range of approaches for conducting qualitative analysis. However, qualitative analysis is commonly executed using the following approaches: thematic analysis, content analysis, grounded analysis, narrative analysis, discourse analysis or phenomenology (also called heuristic analysis).

Thematic analysis

Thematic analysis is the commonly used and foundational method for qualitative data analysis which involves the steps outlined in the previous diagram (Figure 3.4). The researcher used thematic analysis of qualitative data to identify common themes, that is, topics and ideas that come up repeatedly, to identify patterns of meaning in texts such as interview transcripts, newspaper articles, and speeches (Braun & Clarke, 2019). The next subsection discusses the six steps involved in the thematic analysis process.

PHASE 1: Familiarise yourself with the dataset.

During this phase, the researcher immerses himself in the dataset and becomes intimately familiar with its contents (Braun & Clarke, 2021). This includes reviewing the data multiple times (and listening to the recordings once if dealing with audio data transcripts) and writing (short) notes about any analytical thoughts or insights the researcher may have about each data item and the dataset totality.

PHASE 2: Coding

During this phase, the researcher analysed the dataset methodically and in detail. The researcher looked for parts of the data that seem interesting, important, and relevant to the research question and then gave them short, analytically meaningful names (code labels). The focus is narrow and specific, and the coding aims to capture single meanings and ideas. In reflexive thematic analysis, one can code at multiple levels, from the most explicit or surface meaning (called semantic) to the most conceptual or implicit meaning

(called latent). Coding involved summarising and reducing content and recording "analytic perspective" on the data. The researcher thoroughly and methodically coded the entire dataset. When complete, combined the code labels and built the pertinent data segments for each code.

PHASE 3: Generating initial themes

The researcher's goal at this stage was to start recognising patterns of shared meaning across the sample. Sets of codes were gathered that share a common theme and which were seen as as useful "solution" to the study problem. While we referred to this process initially as "looking for themes," we now realise that terminology might be deceiving because the process is not analogous to an excavation, in which the meaning remains dormant but can be unearthed with the correct search strategy. On the other hand, constructing themes was an intentional process in which the researcher actively built themes out of the data, the research questions, and the researcher's prior knowledge and insights. In contrast to codes, which often capture a singular or specialised meaning, themes describe more significant, shared meanings. After identifying possible candidate themes that the researcher believe adequately encapsulate the data and answer the research question, he compiled all coded data pertinent to each candidate topic.

PHASE 4: Developing and reviewing themes

Phase 4 involved reviewing the entire dataset to assess how well the tentative candidate themes fit the data and whether or not the overall analysis can stand. As part of the development and evaluation procedures, the researcher verifed that the themes make sense in the context of both the coded extracts and the full dataset. Does each theme tell a tale that persuades and excites you about a major pattern or ordinary meaning in the data? To what extent do these themes, taken as a whole, bring out the most salient patterns throughout the dataset in light of your research question? Radical revision was possible; in fact, it was pretty common. Some candidate themes were collapsed together, one or more split into new themes, others retained, and some discarded. The researcher was prepared to let things go! Reviewing required the researcher to reflect on the nature of each subject, its key emphasis or idea ("central organising concept"), and the breadth

of its application. Also, considered the bigger picture of the research and how themes fit in with the current body of knowledge and/or practice in its profession.

PHASE 5: Refining, defining, and naming themes

To determine the significance of a theme, you should first ask yourself, "What story does this theme tell?" and "How does this theme fit into my story about the data?" Essential tasks at this stage include summarising each topic in writing. Here, the researcher honed his analysis, drawing distinct boundaries around each subject and establishing a solid foundation at their core. In addition, the researcher gave each topic a succinct yet descriptive term. The researcher was prepared to abandon the analysis if it found out that additional work was required.

PHASE 6: Writing-up

Writing is an integral phase of the analytic process for thematic analysis, as it is for many qualitative analytic approaches, so you start writing early on. In reflexive thematic analysis, formal analytic writing often starts in Phase 3; the more informal writing you do at the start of the process - familiarisation notes and reflexive journaling - can feed into the more formal writing. Finishing your writing with a flourish requires you to "write up." When everything is said and done, you want to convey a compelling story about the dataset and how it relates to your research question using a combination of your analytic narrative and captivating, vivid data extracts. The final write-up involved producing the research report's introduction, method, and conclusion sections, as well as a lot of editing. The writing and editing process aimed to produce a high-quality research report that was clear, concise, and easy to understand. By enlisting the services of a professional editor and conducting thorough editing, the report's readability and effectiveness were significantly improved. The professional editor's letter, which is included in the appendices, provides valuable feedback on the language used in the report.

3.11 TRUSTWORTHINESS IN THE STUDY

Member checking was implemented to ensure all interviewed participants understand the study's objective and the trustworthiness and objectivity required. Ultimately, the participants were allowed to tell their stories without bias and determine if the results truly indicate what happens with disruption management in their institution.

Based on Rose and Johnson (2020:432), trustworthiness refers to the degree to which the findings of a research study are deemed credible and worthy of consideration by others. Similarly, Gunawan (2015:10) argue that the trustworthiness of a research study relies on the perceptions and judgements of the readers. In line with the aims of this research, the trustworthiness of the study was assessed using the trustworthiness model proposed by Visagie (2012).

According to Visagie (2012), the Trustworthiness Model, initially proposed by Lincoln and Guba (1985), encompasses four key strategies to ensure trustworthiness in qualitative research: credibility, transferability, dependability, and confirmability. These strategies are described in the following manner:

- Credibility refers to the extent to which the findings accurately represent the participants' perspectives and experiences. This is achieved through techniques such as prolonged engagement, member checking, and triangulation (Johnson, Adkins & Chauvin, 2020). To ensure trustworthiness in this study, several measures were implemented. Firstly, in-depth conversations were conducted during the interviews, allowing for a comprehensive exploration of the participants' perspectives and experiences. This approach was supported by the work of Smith and Osborn (2015:57), who emphasised the importance of engaging in rich and meaningful dialogue with participants.

  Furthermore, attention was given to presenting the findings in a detailed and logical manner. The researchers ensured that the results were clearly articulated and supported by relevant evidence. This aligns with the guidelines proposed by

Nowell *et al.* (2017), who stressed the significance of providing a thorough and coherent account of the research findings. Additionally, the use of current references from credible sources enhanced the credibility and rigour of the study. The researchers drew upon reputable literature from experts in the field, ensuring that their work was grounded in established knowledge and theory. This approach was informed by the recommendations of Greenhalgh *et al.,* (2017), who highlighted the importance of incorporating up-to-date and authoritative sources to enhance the trustworthiness of research.

Moreover, triangulation was employed as a methodological approach to validate the findings. Multiple data sources and methods were utilised to corroborate the results, including interviews, observations, and surveys. By triangulating the data, the researchers sought to enhance the dependability and confirmability of the study (Denzin, 2012). By implementing these measures, the researchers aimed to establish trustworthiness and instill confidence in the validity and reliability of the study findings. These practices align with the principles of trustworthiness outlined by Lincoln and Guba (1985, as cited in Visagie, 2012), ensuring that the research was conducted with rigour and integrity.

- Transferability pertains to the applicability of the findings beyond the immediate research context. Researchers strive for rich, detailed descriptions and provide thick descriptions of the research setting and participants, enabling readers to assess the transferability of the findings to other contexts (Johnson, Adkins & Chauvin*,* 2020).
- Dependability relates to the consistency and stability of the research findings over time. This is established through methods such as detailed documentation, clear data analysis procedures, and the use of an audit trail (Smith *et al.,* 2019).
- Confirmability refers to the objectivity and neutrality of the research process and findings. Researchers employ techniques such as reflexivity, peer debriefing, and an audit trail to ensure that their own biases do not unduly influence the results (Braun & Clarke, 2019).

3.12 RESEARCH ETHICS

Research ethics, including a sequential mixed-method study, is important in any research project. Researchers must ensure that their study design and methodology respect the rights, dignity, and wellbeing of the participants and maintain the integrity and reliability of the research findings.

When conducting a sequential mixed-method study, researchers should be aware of the following ethical considerations as outlined by Creswell, Plano Clark (2011), Trochim, Donnelly (2008), and the American Psychological Association (2020):

- Informed consent: Participants were fully informed of the nature and purpose of the study and provided informed consent to participate. In addition, all participants were recruited voluntarily and without any promised incentives. As soon as the interview appointment was confirmed, the informed consent letter was emailed to the participants.
- Confidentiality and privacy: Participants' confidentiality and privacy is protected by maintaining anonymity or obtaining explicit consent for using personal information.
- Minimising harm: Researcher minimised potential harm to participants by avoiding sensitive topics or supporting participants if needed.
- Respect for participants: Participants were treated with respect, dignity, and sensitivity, and their rights and opinions were valued.
- Data integrity: Researcher ensured that the data collected is accurate and reliable and that any data manipulation or fabrication is avoided.
- Conflict of interest: Researchers must declare any potential conflicts of interest and take steps to minimise their impact on the study.

In conducting this study, the researcher did his best to follow the six guidelines above. The following considerations were made to ensure the highest ethical standards were met:

- Permission to conduct the study was obtained from UKZN Humanities and Social Sciences Research Ethics Committee.

- In addition, permission was also obtained from the institutions' Research Ethics Committee.
- The language of the final questionnaire was edited, a statistician performed a review of the questionnaire, and a pilot study was undertaken.
- Respondents actively participated and were informed of their freedom to withdraw from the study at any time without repercussions.
- Participants were made aware of the research study's purpose and objectives.
- The respondents were informed of the intended use and publication of the results.
- Respondents could ask questions and offer feedback regarding the research study.
- The quantitative results from Stage 1 were gathered with the help of Microsoft Forms, and the participants who filled them out were assured that their answers would be kept private and anonymous.
- Respondents were assured that all data would be saved on a password-protected computer and safely discarded permanently five years after collection.
- Upon request, a summary of the findings and conclusions will be supplied to PHEIs.
- No one was hurt because of the research project.
- Lastly, care was taken not to distort the qualitative findings and quantitative data to fulfil the study's main objective.

3.11 CONCLUSION

This chapter on research methods describes in detail how data is collected and analysed. The chapter also describes the measures taken to ensure the validity and reliability of the research, including the choice of research design, sample selection, data gathering methodologies, and data analysis methods. It also acknowledges any study limitations and assumptions. This provides a comprehensive study picture and enables a thorough review of the results. Chapter four of the study provides the study results and the interpretations. In conclusion, research ethics is essential to conducting a sequential

mixed-method study. Researchers must be mindful of their obligations to the participants, the research community, and the wider public.

CHAPTER 4: QUANTITATIVE RESULTS - STATEMENT OF FINDINGS, INTERPRETATION AND DISCUSSION OF THE DATA

"The power of statistics and the clean lines of quantitative research appealed to me, but I fell in love with the richness and depth of qualitative research."

- Brené Brown

4.1 INTRODUCTION

Chapter 4 reveals the story behind the study's quantitative (student and staff) and qualitative (managers) data. The quantitative analysis systematically observes the standard guidelines prescribed by Bryman (2016). These guidelines ensure that the findings are trustworthy and that they can be used to inform policy or practice. Braun and Clarke (2019) provide the yardstick for applying the deductive thematic analysis steps. It focuses on the findings of the data analysis and their discussion. This chapter presents the analysis of the quantitative data from Stage 1 of the research project, followed by the qualitative findings in Stage 2 discussed in Chapter 5.

The primary hypotheses for this study are:

H_{10}: There is no difference between institutions with proactive leadership that has developed and implemented crisis management plans compared to institutions with reactive leadership.

H_{1A}: Institutions with proactive leadership that has developed and implemented crisis management plans are better prepared to respond to and manage disruptions compared to institutions with reactive leadership.

H_{20}: There is no difference in an institution with resources, well-trained staff, and technologies being better equipped to handle modern-day disruptive challenges compared to an institution with limited resources and outdated technologies.

H_{2A}: Institutions with diverse and well-trained staff, resources, and technologies are better equipped to handle modern-day disruptive challenges compared to institutions with limited resources and outdated technologies.

H_{30}: There is no difference in the level of adequate support and communication received during the COVID-19 disruption in terms of Staff having a more positive experience.

H_{3A}: Students and staff who received adequate support and communication during the COVID-19 disruption had a more positive experience compared to those who did not.

The following section contains the biographical and demographic information of the quantitative study's respondents, beginning with the students and moving on to the staff.

4.2 BACKGROUND INFORMATION

The study used questionnaires as the primary data collection tool, which were distributed to 381 students and 291 students. The collected data from the responses was analysed using SPSS version 28.0. The results section presents descriptive statistics in the form of graphs, cross tabulations, and other figures to summarise the quantitative data obtained. Inferential techniques such as correlations and chi-square (χ^2) tests were employed, and their significance was interpreted using p-values. In accordance with the conventional reporting approach, the statistical significance of the findings is indicated by stating the p-value, with a significant result considered as "$p < 0.05$".

This section provides a summary of the biographical and demographic information regarding the students and staff who participated in the study. By analysing and reporting this data, this section aims to provide a comprehensive understanding of the study population, thereby establishing its credibility. An overview of PHEI, years of experience, position category, and the department is provided for staff responses. Likewise, the synopsis for student respondents includes the kind of qualifications, the PHEI linked to it, gender, ethnic group, type of qualification being studied, faculties, and location.

4.2.1 The Sample

A total of 381 questionnaires were distributed to students across five (5) PHEIs, resulting in 339 questionnaires being returned. This corresponded to a response rate of 89%. Similarly, for staff, 316 questionnaires were sent to individuals in five (5) PHEIs, the academic management division, and Head Office, with 291 responses received, yielding

a response rate of 92%. It is important to note that all respondents were considered engaged, meaning they actively participated in the survey.

The achievement of the sample size aligns with the recommendations put forth by Saunders *et al*. (2016). Their work emphasises the importance of achieving a sufficient sample size to ensure the statistical power and representativeness of the population. In this study, the response rates of 89% and 92% indicate a high level of participation, suggesting that the sample size is reliable and adequately represents the target population of students and staff.

Furthermore, the sample size achievement can also be discussed in the context of DeVellis (2003) guidelines for survey research. DeVellis emphasises the need for a balance between achieving a large enough sample size for generalizability and maintaining high response rates for data quality. The response rates of 89% and 92% in this study demonstrate a strong commitment from the participants, increasing the reliability and validity of the collected data.

4.2.2 The Research Instrument

The research instrument comprised 30 items, categorised into 5 sections, with a level of measurement at the nominal or ordinal level. The questionnaire was designed to measure different themes and aspects, as outlined below:

1 Biographical data
2 Level of preparedness for disruption
3 Capability and Capacity developed
4 Student experiences and future
5 Proposed framework

4.3 SECTION A: BIOGRAPHICAL DATA

This section presents a concise overview of the biographic and demographic profiles of the students and staff who participated in the study. Its purpose is to provide a description of the population under investigation and establish the credibility of the data.

The summary for student respondents encompasses their gender, ethnic background, enrolled qualification type, year of study, and affiliation with a specific PHEI. This information provides an overview of the demographic characteristics and educational context of the participating students. In a similar manner, the summary for staff respondents encompasses their gender, ethnic group, and the PHEI they are associated with.

The intention of this section is to provide a comprehensive snapshot of the participants' characteristics, ensuring transparency and enabling readers to understand the composition of the population being studied.

4.3.1 Students profile

A total of 339 students participated in the survey. Table 4.1 shows the students' demographics and biographies.

Biographic variable	Category	Frequency	Percentage
Gender (n= 339)	Female	212	62.5
	Male	123	36.3
	Non-binary	1	0.3
	Prefer not to say	3	0.9
Ethnicity (n=339)	Black	218	64.3
	Coloured	19	5.6
	Indian	29	8.6
	White	49	14.5
	Prefer not to say	24	7.1
Qualifications studying (n=339)	Doctorate	1	0.3
	Masters	3	0.9
	Honours	25	7.4
	Year 3 undergraduate	283	83.5
	Blank	27	8.0
Faculties (n=339)	Faculty of Commerce	157	46.3
	Faculty of Education	33	9.7
	Faculty of Humanities & Social Science	54	15.9

Biographic variable	Category	Frequency	Percentage
	Faculty of Information & Communications Technology	57	16.8
	Faculty of Law	23	6.8
	Blank	15	4.4
Institutions/PHEIs (n=339)	EBlue	88	26.0
	EBlack	135	39.8
	EOrange	5	1.5
	EBrown	92	27.1
	EWhite	19	5.6

Table 4.1: Demographic and biographic of students

Most respondents were from eBlack (39.8%), followed by eBrown (27.1%) and eBlue (26%) ($p < 0.001$) with smaller representations from eWhite (5.6%) and eOrange (1.5%).

There could be several factors affecting the variations in representation among various demographics. For example, the larger representation of female students could be due to the gender composition of the overall student population at the PHEIs. Similarly, the higher percentage of black students may reflect the demographic composition of the surrounding community or the institution's recruitment efforts. Historical and socio-cultural factors may also have an impact on the variations in representation between different ethnic groups. Additionally, the differences in faculty representation could be attributed to the popularity and enrolment patterns in different academic disciplines.

Regarding the participation rates, the students from the entity Black showed a higher level of interest or willingness to participate in the study compared to students from other entities. This could be influenced by factors such as motivation, awareness of the research topic, or the perceived relevance of the study to their experiences. These factors have been considered in the interpretation of the study results and in generalising them to the broader population.

Most of the respondents were from Gauteng (59.5%), with a further 22.5% coming from Kwa-Zulu Natal. There were much smaller numbers of respondents from the other

provinces ($p < 0.001$). The were significantly more undergraduate respondents (91.0%) in the sample than graduate respondents ($p < 0.001$).

Half of the respondents (49.7%) were from the Faculty of Commerce, with similar numbers of respondents from the faculties of ICT and HSS (17.3%). The smallest number of respondents were from Education (9.6%) and Law (6.2%) ($p < 0.001$). Half of the respondents (49.7%) were from the Faculty of Commerce, with similar numbers of respondents from the faculties of ICT and HSS (17.3%). The smallest number of respondents were from Education (9.6%) and Law (6.2%) ($p < 0.001$). It is worth noting that there was only one student from the doctoral programme. The gender distribution among the respondents was approximately two-thirds female (62.5%) and one-third male (36.3%), with a significant difference ($p < 0.001$). Approximately two-thirds of the sample was African (64.3%), with smaller numbers of respondents in each of the other categories ($p < 0.001$).

4.3.2 Staff profile

A total of 291 employees participated in the survey. Staff demographic and biographical information is provided in Table 4.2.

Biographic variable	Category	Frequency	Percentage
Category role (n= 291)	Academic staff	128	43.9
	Non-academic staff	163	56.0
Working experience (n=291)	2 to 4 years	108	37.1
	5 to 7 years	47	16.2
	6 to 8 years	29	10.0
	9 to 11 years	20	6.9
	Over 11 years	60	20.6
	Other	27	9.3
Departments (n=291)	Finance	36	12.4
	Shared Service	9	3.1
	HR	17	5.8
	IT	22	7.6
	Management	15	5.2
	Operational	80	27.5

Biographic variable	Category	Frequency	Percentage
	Research	10	3.4
	Sales and marketing	33	11.3
	Other	69	23.7
Institutions (n=291)	EGreen	2	0.7
	EBlue	16	5.5
	EBlack	119	40.9
	ERed	67	23.0
	EBrown	72	24.7
	EWhite	15	5.2
	EOrange	0	0

Table 4.2: Demographic and biographic of staff

The majority of respondents were non-academic members of staff at 56% ($p < 0.001$). The remaining 44% of the respondents were academic staff members. This distribution of staff members allows for a comprehensive representation of both academic and non-academic perspectives within higher education institutions (PHEIs). In terms of the length of service, a significant portion of the staff members who responded have been associated with the PHEIs for a duration of two to four years, constituting 37% of the respondents ($p < 0.001$). This suggests that there is a relatively large group of staff members who have gained a moderate level of experience within the PHEIs. Additionally, 26% of the participants reported having a tenure of over 11 years with the institutions ($p < 0.001$), demonstrating a substantial level of experience within the PHEIs.

The inclusion of both academic and non-academic staff members, along with the diverse range of experience levels, enhances the richness and diversity of perspectives obtained in this study. It allows for a comprehensive understanding of the challenges, perceptions, and insights related to disruption management within the PHEIs, considering the unique experiences and expertise of staff members from different backgrounds and lengths of service. The staff participants in the study exhibited varying levels of interest and willingness to participate, with entity Black showing the highest level at 40.9% ($p < 0.001$). This suggests that staff members from entity Black had a stronger inclination to engage in the study compared to staff from other entities. Entity Brown ranked second with a

participation rate of 24.7% ($p < 0.001$), while entity Red closely followed at 23% ($p < 0.001$).

One possible explanation for the higher representation of staff in entity Black could be attributed to factors such as organisational culture, leadership support, or departmental initiatives. It is possible that entity Black has cultivated an environment that encourages staff engagement and participation in research activities ($p < 0.001$). Additionally, the entity may have established mechanisms that promote research involvement, leading to a higher level of interest among their staff members. These factors can contribute to a greater willingness to participate and a higher response rate from staff belonging to entity Black compared to other entities.

Regarding the departmental distribution of staff respondents, the majority indicated their affiliation with the operational department, accounting for 27.5% ($p < 0.001$) of the responses. Other significant departments included other departments (23.7%) ($p < 0.001$), finance (12.4%) ($p < 0.001$), and research (3.4%) ($p < 0.001$). On the other hand, the shared service department had the lowest representation with 3.1% ($p < 0.001$) of the staff respondents. These findings highlight the diverse departmental representation within the study, allowing for insights and perspectives from various functional areas of the PHEIs.

A χ^2 goodness-of-fit test was used to determine the potential differences in scoring patterns for each statement across the various options. The null hypothesis proposes that an equal number of respondents would select each option for each statement. The alternative hypothesis, on the other hand, suggests that there is a significant difference in the levels of competence among the alternatives.

4.4 SECTION B: LEVEL OF PREPAREDNESS FOR DISRUPTION

This section focuses on the quantitative analysis of the responses obtained from students and staff regarding the level of preparedness of PHEIs to deal with disruption. The analysis involved the use of a Likert-scale questionnaire to gather students' views on

various aspects related to preparedness. The Likert scale allowed participants to rate their agreement or disagreement with specific statements. The collected data was then subjected to a thorough analysis to derive meaningful insights. Descriptive statistical techniques were employed to summarise the responses and provide an overview of the students' perceptions. Measures such as frequencies, percentages, means, and standard deviations were calculated to quantify the level of agreement or disagreement expressed by the students.

Additionally, inferential statistical techniques were used to identify potential relationships or patterns within the data. Techniques such as correlation analysis and regression analysis were employed to explore the associations between different variables and assess their impact on preparedness. The study's research objectives and research questions served as the guide for these analyses. The quantitative analysis of the study aimed to provide a comprehensive understanding of the students' perceptions regarding the preparedness of PHEIs to deal with disruption. The results of the analysis are presented in the following sections, including tables, charts, and graphs, to effectively communicate the findings and facilitate interpretation.

It is important to note that the analysis is based on the responses provided by the participants, and any conclusions drawn are specific to the study sample. The findings from this quantitative analysis will contribute to the overall assessment of the preparedness of PHEIs and provide insights for future improvements in managing disruptions effectively.

4.4.1.1 Student and staff responses 1: Rating on the institution approach for dealing with disruption.

The students and staff were asked about their perspectives on the important approaches to dealing with disruption. Their responses, which provide valuable insights into effective strategies for managing disruptive events, are assessed below.

	Frequency	Percent
Building internal capability and capacity for dealing with disruption	132	39.5
Managing and responding when disruption occurs	93	27.8
Contingency plan	45	13.5
Identifying indicators and disruption prediction	41	12.3
Other	23	6.9
Total	334	100.0

Table 4.3: Assessing student response on approach for dealing with disruption.

The most important approaches identified by students were “Building internal capability and capacity for dealing with disruption” (39.5%), with a further 27.8% identifying “Managing and responding when disruption occurs” (27.8%) ($p < 0.001$).

	Frequency	Percent
Building internal capability and capacity for dealing with disruption	139	48.3
Managing and responding when disruption occurs	39	13.5
Contingency plan	34	11.8
Identifying indicators and disruption prediction	68	23.6
Other	8	2.8
Total	291	100.0

Table 4.4: Assessing staff response on approach for dealing with disruption.

The most important approaches identified by staff were “building internal capability and capacity for dealing with disruption” (48.3%), with a further 23.6% selecting “identifying indicators and disruption prediction” ($p < 0.001$).

The finding highlights the importance of having a well-defined and agile response strategy in place to handle disruptions as they arise. It is crucial for PHEIs to be flexible and adaptable in their response, taking swift action and implementing appropriate measures to minimise the negative consequences of disruptions. This reinforces the need for PHEIs to prioritise building internal capabilities and developing effective response strategies to effectively manage disruptions like COVID-19.

These findings have important implications for HEIs, as they underscore the importance of proactive and flexible approaches to disruption management. By investing in resources, training, and systems that enhance internal capabilities, PHEIs can better anticipate and respond to disruptive events. Moreover, having a robust response strategy in place enables PHEIs to react quickly and efficiently when disruptions occur, minimising the potential negative impact on their operations and overall performance.

4.4.1.2 Student and staff responses 2: Ratings on the overall experience in disruption management.

The students and staff were invited to provide their ratings on their respective institutions' overall experience in managing disruptions. This assessment aimed to capture their perceptions of how well their institutions have handled disruptive events and their satisfaction with the management strategies used. Understanding these perspectives is important for institutions to gauge their effectiveness in responding to disruptions and identify areas for improvement. The opinions of both students and staff are essential in this evaluation, as they are directly impacted by the management of disruptions. Therefore, their perspectives offer unique insights into the effectiveness of disruption management practises, as assessed below.:

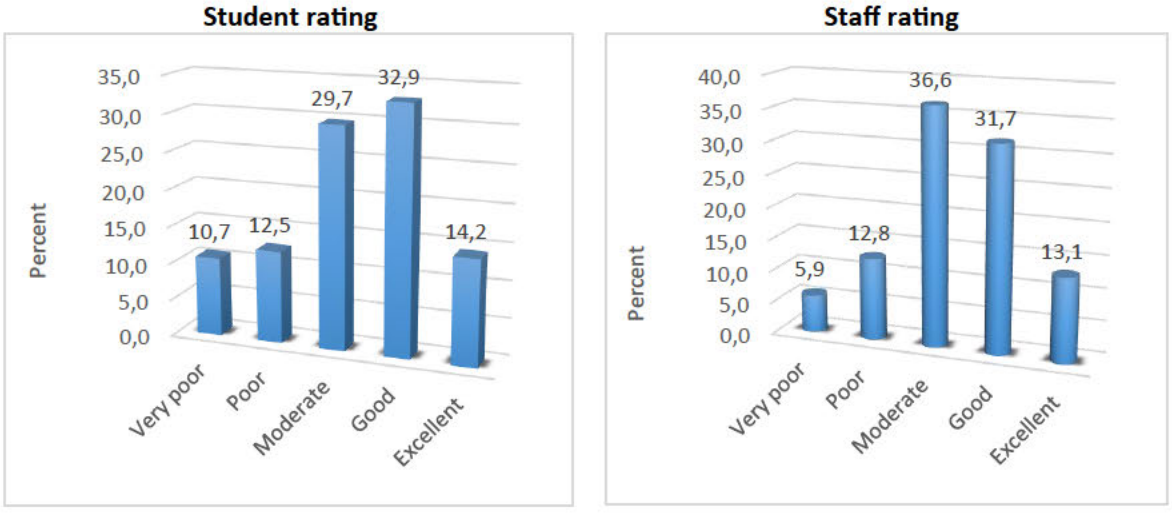


Figure 4.1: Assessing student and staff ratings on the overall experience in disruption management.

A little less than half of the student respondents (47.1%) indicated that their institution was adequately prepared for disruptive management. A fair number of respondents (29.7%) indicated that the institution was moderately prepared ($p < 0.001$). Approximately 44.8% of staff respondents rated their institution's overall experience as good to outstanding, while 36.6% indicated the institution was moderately prepared ($p < 0.001$).

The high percentage of respondents (47.1% - student and 44.8% - staff) rating their institution's overall experience as good to excellent is an encouraging sign. It suggests that a considerable number of individuals have had positive experiences with their institution's handling of disruptions. This positive perception can be attributed to effective crisis management practices, clear communication, proactive measures, and supportive resources provided by the institution. However, it is noteworthy that 36.6% (staff) and 29% (students) of respondents perceived the institution's preparedness as moderate, indicating that there is still room for improvement in certain areas.

4.4.1.3 Student and staff responses 3: Ratings on the support obtained during the disruption period.

Students and staff were asked to assess the support they received during the disruption period. This aspect is important as it provides valuable insights into the effectiveness of the support mechanisms implemented by the institution during challenging times. By assessing and understanding the level of satisfaction, it becomes possible to identify areas for improvement and develop targeted strategies to enhance the support provided, ultimately contributing to a more resilient and adaptive learning environment.

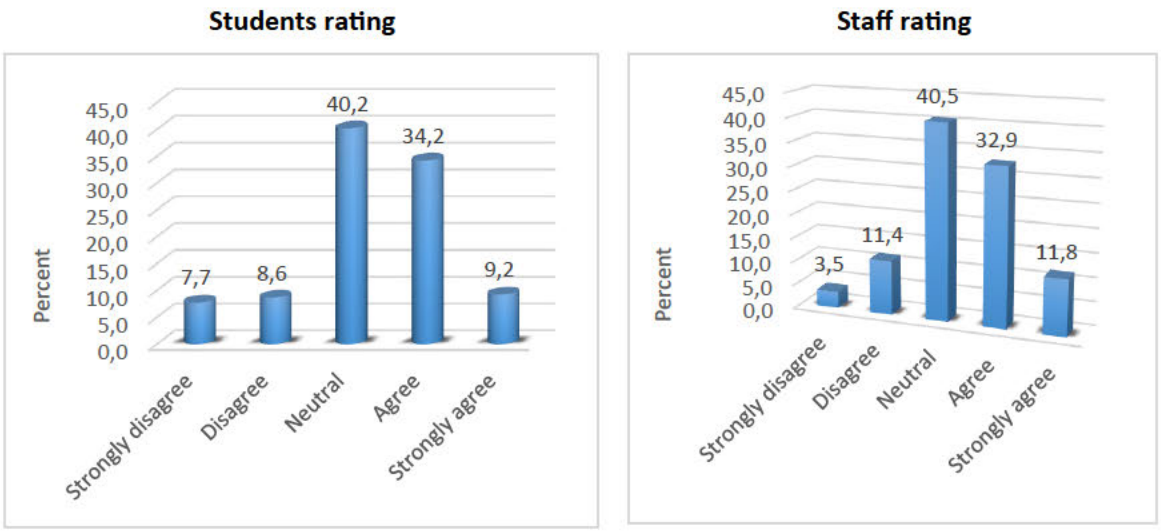


Figure 4.2: Assessing student and staff ratings on the support obtained during the disruption period.

Some respondents (40%) had no view on the matter, even though a majority (43%) felt they had received appropriate support ($p < 0.001$). About 16.3% rated that they did not have support during the disruption period. Some staff respondents (40.5%) had no opinion on the matter, despite the fact that the majority (44.7%) believed they had received adequate assistance ($p < 0.001$). About 14.9% rated that they did not have support during the disruption period.

It is important to note that approximately 16.3% (student) and 14.9% (staff) of respondents reported that they did not have support during the disruption period. This highlights a concerning aspect, as it suggests that a portion of students felt unsupported during a time of economic pressure, sickness, and societal ills. The lack of support can have detrimental effects on students' wellbeing, academic performance, and overall experience during such challenging times.

These findings align with previous literature highlighting the importance of adequate support systems in addressing the needs of students during disruptions. Research has emphasized the role of social support, both from family and institutions, in mitigating the negative impacts of economic pressures, health challenges, and societal issues (Bao, 2020; García-Álvarez, Soler & Achard-Braga, 2021:1; Visser & Law-van Wyk, 2021:229). It has been demonstrated that when students receive timely and appropriate support, they

are more likely to cope effectively, maintain their wellbeing, and achieve academic success.

4.4.1.4 Student and staff responses 4: Rating on the institution's level of support during disruption

Both staff and students were asked to provide their ratings on the level of student support provided by their institutions. This assessment aimed to gauge their satisfaction with the support received and shed light on the effectiveness of the institution's efforts in assisting students during challenging times.

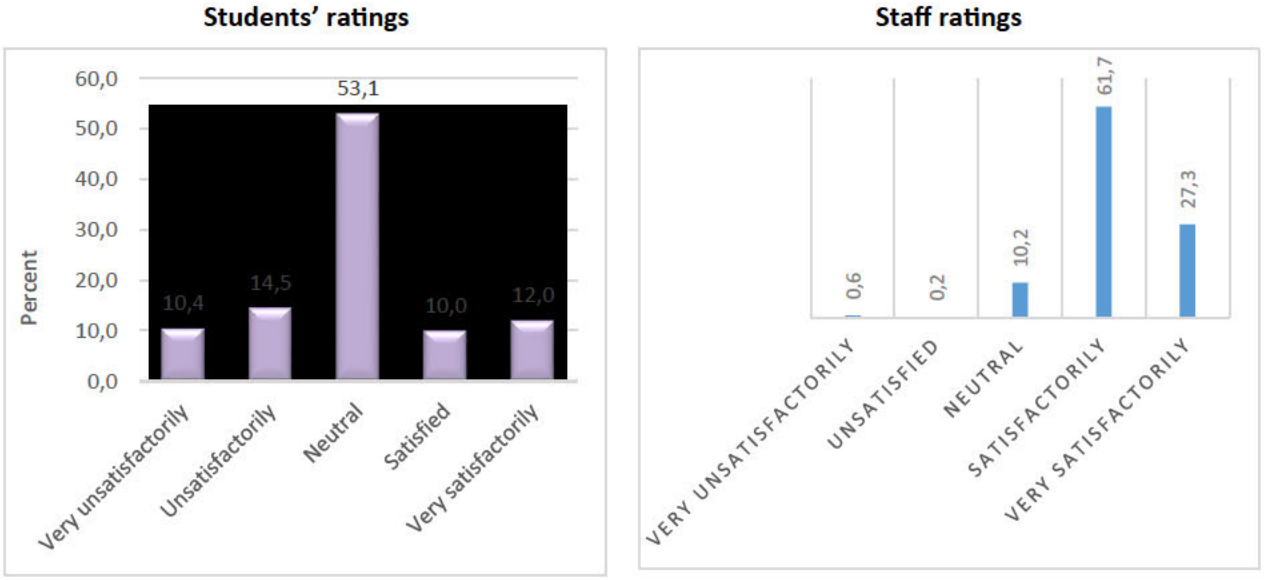


Figure 4.3: Students and staff ratings on the institution's level of support during disruption.

The findings revealed that a quarter of respondents (24.9%) were dissatisfied with the level of support received during the disruption period, while a smaller percentage (22%) reported being satisfied with the support. It is concerning that most respondents (53.1%), indicating a lack of awareness or uncertainty regarding the support provided by PHEIs, did not express a distinct opinion on the matter ($p < 0.001$). These results suggest that there is room for improvement in terms of providing adequate support to students during times of disruption.

In contrast to the students' perspective on the level of support during the disruption, a significant majority of staff members (89.1%) expressed satisfaction with the support they received. This finding suggests that the institution's efforts to provide assistance and resources to staff members during challenging times were generally well received. There could be several reasons why staff members expressed higher satisfaction with the level of support during the disruption compared to students. Staff members may have had more direct access to resources and support systems provided by the institution. They may have received clearer communication and guidance on how to navigate the challenges brought about by the disruption.

Secondly, staff members' expectations and experiences during the disruption period may have differed from those of the students. Staff members, being professionals in their respective roles, may have had more autonomy and control over their work environment compared to students. This sense of control and familiarity with their roles could have contributed to their overall satisfaction with the level of support.

It is also important to consider the individual circumstances and personal experiences of students and staff members, as these factors can influence their perception of support. Factors such as prior experiences, personal resilience, and available social support networks can play a role in shaping satisfaction levels. There is empirical evidence that a variety of factors can affect students' satisfaction with support services during disruptions, including clear communication, accessibility of resources, personalised support, and timely assistance (Genç, 2017:513). On the other hand, staff contentment may be influenced by institutional support, empowerment, and a sense of control over their work (García-Álvarez, Soler & Achard-Braga, 2021:1; Visser & Law-van Wyk, 2021:229).

The lack of satisfaction with support services in educational institutions during challenging times has been documented in previous research. For instance, a study by Baber (2020) found that students' perceptions of support services influenced their overall satisfaction with the institution. Students who felt that support services were insufficient or lacking reported lower levels of satisfaction. Similarly, a study by García-Álvarez, Soler and

Achard-Braga (2021) highlighted the importance of proactive and comprehensive support mechanisms in mitigating the negative impact of disruptions on student wellbeing and academic performance. This finding emphasises the need for PHEIs to prioritise and enhance their support systems to better meet the needs of students during disruptive periods.

4.4.1.5 Student and staff responses 5: Rating on the institution's guidelines for managing disruptive challenges.

This section focuses on the ratings provided by students and staff regarding whether their institution's have a guideline or policy for managing disruptive challenges. The ratings reflect the perceptions and satisfaction levels of the respondents with the strategies and measures implemented by their institutions in response to disruptive events.

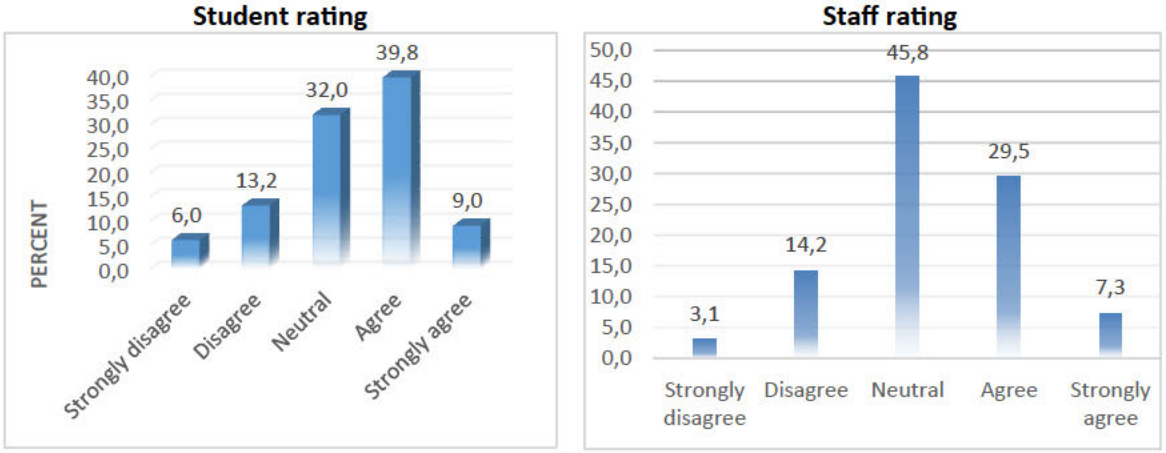


Figure 4.4: Students and staff rating on the institution's guidelines for managing disruption.

The findings revealed that approximately half of the student respondents (48.8%) agreed that their institutions had clear guidelines in place for managing disruptive challenges ($p < 0.001$). This indicates that a significant proportion of students perceive their institutions to have proactive measures for addressing disruptions. However, it is noteworthy that a considerable portion of respondents (32.0%) expressed a neutral perspective, suggesting a lack of clarity or awareness regarding the existence of such guidelines. This finding

underscores the need for enhanced communication and transparency from institutions in conveying their strategies and policies for managing disruptions effectively.

On the other note, the data revealed that approximately 36.8% of staff respondents acknowledged the presence of a guide or policy in their institutions for managing disruptive challenges. However, a notable proportion of respondents (45.8%) expressed neutrality on this matter, indicating a lack of clear consensus ($p < 0.001$). These findings highlight the need for further improvement in the creation and communication of guidelines or policies within institutions to effectively address disruptive challenges.

This result aligns with previous research highlighting the importance of clear guidelines and policies in navigating disruptive challenges. Studies have emphasised that well-defined frameworks and guidelines are crucial for institutions to respond promptly and effectively to disruptions (Hoque & Alam, 2020). Institutions with comprehensive guidelines are better equipped to mitigate the impact of disruptions on students' academic progress and overall wellbeing. Therefore, it is imperative for institutions to proactively communicate and reinforce their guidelines to ensure that students are aware of the measures in place to address disruptions and feel supported during challenging times.

4.4.1.6 Student and staff responses 6: Rating on the institution's guide or policy's effectiveness in dealing with disruption management.

Both students and staff were asked to assess the effectiveness of their institution's guide or policy in dealing with disruption management. The ratings provided by the respondents offer valuable insights into the perceived efficacy of these guidelines or policies.

Students rating

	Percent
Very poor	5.6
Poor	13.6
Average	22.0
Good	49.3
Excellent	9.5
Total	100.0

Staff rating

	Percent
Very poor	4.9
Poor	13.2
Average	40.4
Good	28.6
Excellent	12.9
Total	100.0

Table 4. 5: Students and staff rating on the institution's guide or policy's effectiveness in dealing with disruption management.

The findings of the study reveal divergent perspectives between student and staff respondents regarding the effectiveness of their institution's policies in dealing with disruption management. A significant majority of the student respondents (58.8%) expressed satisfaction with their institution's policies' effectiveness in dealing with disruption management. In contrast, a lower proportion of staff (41.5%) was satisfied with their institutions effectiveness and 40.4% rated the policy effectiveness as average. This suggests that the measures and strategies implemented by the institutions to address disruptive challenges have been perceived positively by the students. The high level of satisfaction among the respondents reflects a sense of confidence and trust in their institution's ability to effectively handle disruptions and mitigate their impact on the learning environment.

The positive response could be attributed to several factors. Firstly, the researcher is of the view that institutions that have clear guidelines and policies in place for managing disruptions are more likely to create a sense of preparedness and stability among students. When students perceive that their institution has a well-defined plan to address potential disruptions, it instils a sense of assurance and confidence in their ability to navigate through challenging times (Visser & Law-van Wyk, 2021:229).

Secondly, effective communication and proactive measures taken by institutions play a vital role in managing disruptions. When institutions prioritise clear and timely communication with students, keeping them informed about any changes, updates, or

support services available, it helps alleviate uncertainties and reduce anxiety during disruptive periods (Genç, 2017:513). Students appreciate institutions that demonstrate a proactive approach to addressing challenges and providing necessary support.

Furthermore, institutions that have invested in resources and infrastructure to facilitate remote learning, alternative teaching methods, and student support services are more likely to receive positive ratings from students (Fisher *et al.*, 2021:3; Serdyukov, 2017). The ability of institutions to adapt quickly and provide seamless online learning platforms, digital resources, and virtual support systems during disruptions can greatly enhance students' satisfaction and overall experience (Rasiah, Kaur, & Guptan, 2020:7).

It is important to note that the positive response does not imply that there is no room for improvement. Institutions should continue to evaluate and refine their policies and strategies for managing disruptions based on student feedback and emerging best practises. Regular assessment and enhancement of guidelines can ensure that institutions remain responsive, agile, and effective in addressing future disruptive challenges.

4.4.1.7 Student and staff responses 7: Rating on the institution's competence level in dealing with disruption.

Assessing the competence level of institutions in dealing with disruption is crucial to understanding their preparedness and ability to navigate challenges effectively. Both students and staff were asked to rate their institutions' competence in various aspects related to disruption management, including problem-solving, technology integration, crisis management, structure and policy formulation, and innovativeness. By understanding the ratings of competence in these key areas, PHEIs can identify areas for improvement and allocate resources accordingly. This information is vital for fostering a resilient and adaptable learning environment where students and staff can effectively navigate disruptions and ensure continuity of education.

The table below summarises the scoring patterns:

	Absolutely no competence		Minimal		Neutral		Good competence level		Very high competence		χ^2 p-value	Mean	Std. Deviation
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %			
Problem solving	37	11.0%	67	19.9%	107	31.8%	108	32.0%	18	5.3%	< 0.001	3.01	1.08
Technology integration in support of smooth learning	30	9.4%	58	18.1%	89	27.8%	108	33.8%	35	10.9%	< 0.001	3.19	1.14
Managing out the crisis	31	9.8%	43	13.6%	117	36.9%	111	35.0%	15	4.7%	< 0.001	3.11	1.03
Structure and policy formulation	30	9.4%	44	13.8%	111	34.9%	104	32.7%	29	9.1%	< 0.001	3.18	1.09
Innovativeness	24	7.5%	50	15.6%	124	38.6%	97	30.2%	26	8.1%	< 0.001	3.16	1.03
Other	24	8.1%	40	13.5%	143	48.1%	70	23.6%	20	6.7%	< 0.001	3.07	0.98

Table 4. 6: Students rating on the institution's competence level in dealing with disruption.

	Absolutely no competence		Minimal		Neutral		Good competence		Very high competence		χ^2 p-value	Mean	Std. Deviation
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %			
Problem solving	5	1.7%	37	12.9%	82	28.7%	128	44.8%	34	11.9%	< 0.001	3.52	0.92
Technology integration in support of smooth learning	11	3.8%	33	11.5%	88	30.6%	116	40.3%	40	13.9%	< 0.001	3.49	0.99
Managing out the crisis	9	3.1%	44	15.2%	96	33.1%	111	38.3%	30	10.3%	< 0.001	3.38	0.97
Structure and policy formulation	6	2.1%	42	14.5%	85	29.3%	117	40.3%	40	13.8%	< 0.001	3.49	0.97
Innovativeness	10	3.4%	29	10.0%	97	33.4%	115	39.7%	39	13.4%	< 0.001	3.50	0.96
Other	6	3.0%	25	12.6%	95	48.0%	51	25.8%	21	10.6%	< 0.001	3.28	0.92

Table 4. 7: Staff rating on the institution's competence level in dealing with disruption.

The analysis reveals several scoring patterns among respondents:

- All statements display substantially greater levels of competence, while lower levels of competence are relatively lower but still greater than disagreement levels.

- None of the statements demonstrate lower levels of competence at a higher level.
- All statements receive exceptionally high scores for neutrality.
- The table displays the significance of the differences that have been tested.

The highlighted sig. values (p-values) are less than 0.05 (the level of significance), which implies that the distributions were not similar. That is, the differences between the way respondents scored were significant. The mean measures reflect the average ratings given by participants in each category, and the significance level ($p < 0.001$) indicates the scoring patterns of the results. Generally, the means fall within the range of 3.01 to 3.52, indicating a moderate level of agreement with the statements related to competence in different aspects of disruption management.

Even though the overall level of competence is high, a breakdown reveals that very small numbers of respondents indicate “very high” levels of competence. A significantly high number of respondents indicated that they had a neutral opinion on the issues. These four areas highlight strategies that are available or that can be implemented to circumnavigate the problem criteria.

The findings revealed noteworthy insights regarding the perceptions of the students regarding the competence and preparedness of PHEIs in managing disruptions. The findings are summarised as follows:

Problem-Solving Competence: Regarding problem-solving, 37.5% of students and 44.8% of staff rated their institutions as having good competence in this area. This suggests that a considerable portion of respondents believe their institutions possess the necessary skills to effectively address challenges and find solutions during disruptions.

Technology for a Smooth Transition: 44.7% of students and 54.2% of staff perceive their institutions as having good competence. This indicates that a significant number of staff members believe their institutions successfully facilitated a smooth transition to online

learning, leveraging technology to support educational continuity. This finding highlights the importance of technological resources in supporting educational institutions during times of disruption. Prior research has emphasised the need for robust technological capabilities to enable remote learning and ensure the continuity of education during disruptions (Harris & Jones, 2020; McBride, 2020; Netolicky, 2020).

Competency in Crisis Management: Interestingly, 39% of students and 48.6% of staff believe their institutions have competency. This suggests that while a substantial proportion of respondents perceived their institutions as competent in managing crises, there is room for improvement in this area. Studies have highlighted the complexity and unpredictability of disruptions, necessitating proactive crisis management strategies that address various dimensions such as communication, decision-making, and resource allocation (Belhadjali & Abbasi, 2020; García-Álvarez, Soler & Achard-Braga, 2021, O'Keeffe, 2020).

Policies and Structure: When it comes to policies and structure, 41.8% of students and a majority of staff (54.1%) rated their institutions as having good competence. This indicates that staff members were more likely to perceive their institutions as having effective policies and organisational structures in place to manage disruptions. This finding suggests that a significant portion of the participants recognised the importance of well-defined frameworks and guidelines for effective disruption management. Research has emphasised the significance of well-defined policies, contingency plans, and organisational frameworks that enable effective response and resilience during disruptions (Deloitte, 2019a:1; Steyn, 2022:1; Wade & Hulland, 2020).

Innovation in Crisis Management: In terms of innovativeness, 38.3% of students and a significant majority of staff (53.1%) indicated that their institutions were competent in this aspect. This suggests that staff members were more inclined to believe that their institutions demonstrated innovative approaches to managing disruptions. This highlights the potential for PHEIs to explore and implement novel approaches and solutions to address challenges for students during times of crisis. In addition, this finding aligns with

literature emphasising the need for innovative approaches in crisis management within the higher education sector, such as leveraging technology, fostering collaboration, and implementing creative solutions (Chesbrough & Rosenbloom, 2002:531; Wang, Sha, Huang, Contractor, Fu & Chen, 2018).

These findings serve as valuable inputs for the development of a robust disruption management framework. The results highlight the areas where PHEIs have demonstrated strength as well as areas that require further attention and improvement. By addressing the identified gaps and building upon the strengths, the framework can be tailored to enhance the preparedness and resilience of PHEIs in managing future disruptions effectively.

4.4.1.8 Student and staff responses 8: Ratings on the institution management's innovativeness.

This rating serves as a valuable measure of the institution's ability to embrace and implement innovative practises, strategies, and initiatives. Understanding the level of innovativeness within an institution is crucial as it directly impacts the institution's competitiveness, adaptability to changing educational landscapes, and overall success in providing a dynamic and future-oriented learning environment.

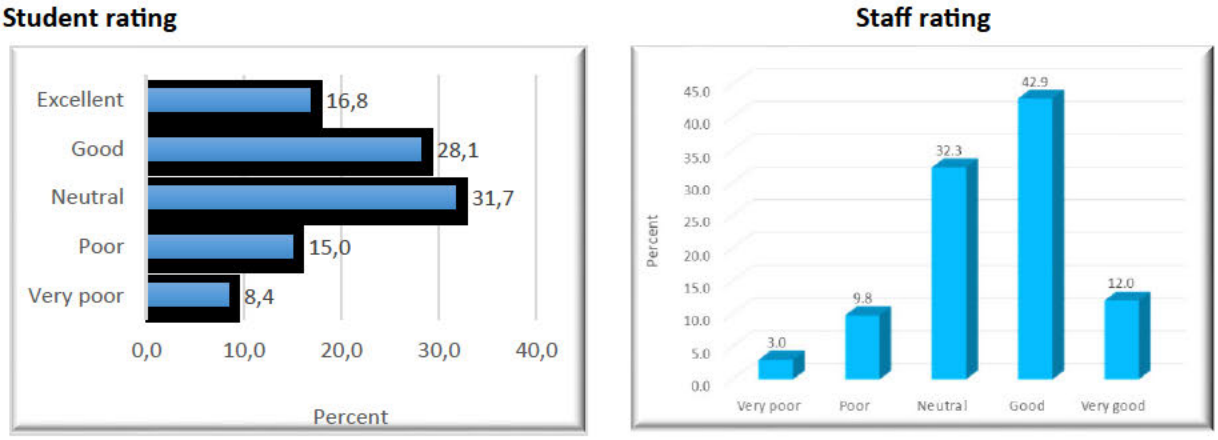


Figure 4.5: Students and staff rating on the institution management's innovation.

The results indicate that a considerable proportion of respondents, both students (44.9%) and staff (54.9%), rated their institution's management innovativeness as good or excellent. However, it is noteworthy that a substantial number of respondents expressed a neutral stance towards management innovation, (with 31.7% of students and 32.3% of staff providing neutral ratings) indicating a level of uncertainty or ambivalence towards the management's innovativeness. These findings are statistically significant ($p < 0.001$), emphasising the differences in the scoring patterns.

These findings resonate with existing literature that emphasises the importance of innovation in organisational management. Research has shown that organisations that foster a culture of innovation are more likely to adapt to changing environments, seize new opportunities, and remain competitive (van der Laan & Yap, 2016:91). Innovative management practices can include encouraging experimentation, supporting creative problem-solving, and fostering a climate that values and rewards innovation (Shields, 2022:1).

While many staff believe that management is innovative, the presence of neutral scores indicates that the PHEI's innovation practices should be regularly assessed and enhanced. PHEIs success and competitiveness may be maintained in the long run by actively promoting and supporting an innovative culture and removing any obstacles or unknowns that might get in the way of innovation.

4.4.1.9 Student and staff responses 9: Ratings on the institution management's level of flexibility.

In today's rapidly evolving and unpredictable environment, organisations, including PHEIs, face various challenges and disruptions that require them to adapt and respond effectively. Flexibility in management allows institutions to navigate uncertainties, embrace innovation, and swiftly adjust their strategies and operations to address emerging needs and opportunities. By assessing the perception of students and staff regarding institutional flexibility, valuable insights can be gained to identify areas for

improvement, enhance responsiveness, and foster a culture of adaptability within the institution:

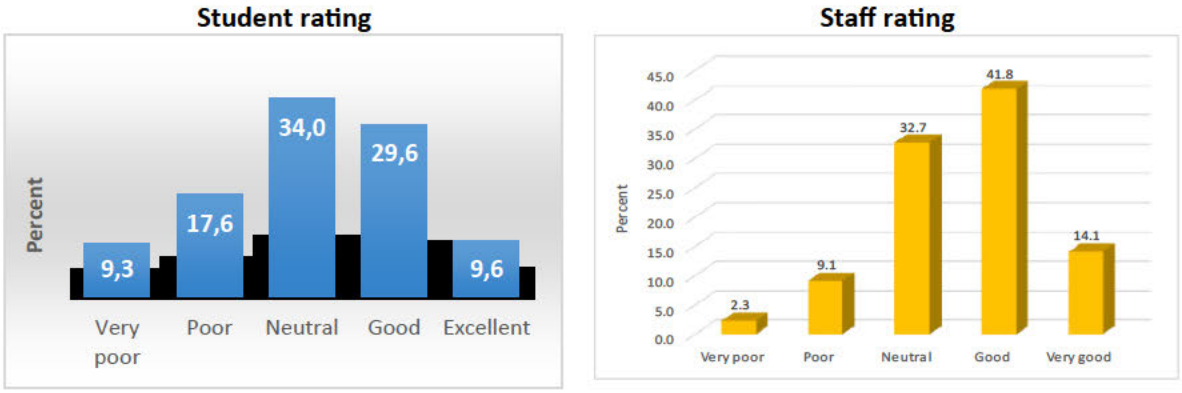


Figure 4.6: Students and staff rating on the institution management's flexibility.

A greater percentage of student participants (39.2%) expressed favourable ratings, classifying the level of management flexibility as either high or excellent in handling disruption and change. In contrast, most staff participants (55.9%) rated the management's flexibility as high. A considerable portion of student respondents (34%) gave neutral ratings, while 32.7% of staff respondents also provided neutral ratings. This difference in proportions within each group (students and staff) was found to be statistically significant ($p < 0.001$).

These results align with the current literature's emphasis on the value of organisational flexibility in navigating disruptions and facilitating change. Empirical evidence shows that organisations with a more adaptable management style are better able to weather storms, exploit opportunities, and stay resilient (Koornhof, 2020:1, Krammer, 2022:4; Maota & Naidoo, 2022:9). Flexible management practises can include fostering a culture of agility, empowering employees to make decisions, and embracing innovative strategies.

While a slightly larger percentage of respondents acknowledge the PHEIs management flexibility, the presence of neutral ratings indicates the need for ongoing evaluation and improvement. By fostering a culture of adaptability, promoting open communication, and addressing any perceived barriers, the PHEIs can enhance its capacity to navigate disruptions and respond effectively to change.

4.5 SECTION C: CAPABILITY AND CAPACITY DEVELOPED BY THE INSTITUTIONS FOR DISRUPTION

4.5.1 Student and staff responses 10: Ratings on the institution capability and capacity developed to deal with disruption.

This section focuses on the ratings provided by students regarding the capability and capacity of PHEIs to deal with disruptions. Students were requested to assess their institutions' capability on a Likert scale varying from 1 to 5, with 1 indicating absolute incapability and 5 indicating high capability and capacity. The purpose of this rating was to gauge the students' perception of their institutions' preparedness and ability to effectively manage and navigate disruptions.

The results are shown in Tables 4.8 and 4.9 below.

	Absolutely incapable and incapacitated		Minimal capability and capacity		Neutral		Capable and capacitated		Very capable and capacitated		χ^2 p-value	Mean	Std. Deviation
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %			
Technology	33	9.9%	59	17.8%	92	27.7%	115	34.6%	33	9.9%	< 0.001	3.17	1.14
Support	32	9.9%	49	15.2%	115	35.7%	91	28.3%	35	10.9%	< 0.001	3.15	1.12
Contingency plan	31	9.6%	40	12.4%	125	38.8%	98	30.4%	28	8.7%	< 0.001	3.18	1.13
Staff competence	25	7.8%	64	19.9%	100	31.2%	91	28.3%	41	12.8%	< 0.001	3.16	1.07

Table 4.8: Student rating on the institution's capability and capacity to deal with disruption.

	Absolutely incapable & incapacitated		Minimal capability & capacity		Neutral		Capable & capacitated		Very capable & capacitated		χ^2 p-value	Mean	Std. Deviation
	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %			
Technology	11	4.1%	33	12.4%	90	33.7%	97	36.3%	36	13.5%	< 0.001	3.43	1.01
Support	6	2.3%	37	14.0%	72	27.3%	114	43.2%	35	13.3%	< 0.001	3.51	0.97
Staff competence	5	1.9%	24	9.1%	78	29.4%	129	48.7%	29	10.9%	< 0.001	3.58	0.87
Contingency plan	7	2.7%	41	15.5%	94	35.6%	101	38.3%	21	8.0%	< 0.001	3.33	0.92

Table 4.9: Staff rating on the institution's capability and capacity to deal with disruption.

The results indicate that a significant percentage of students (44.5%) and staff (49.8%) perceive their PHEIs to have capable technology for managing disruptions. This suggests a positive perception of the institutions' technological preparedness. However, when it comes to the provision of support during disruptions, a slightly smaller proportion of students (39.2%) believe their institutions offer adequate support, while a majority of staff (56.4%) expressed satisfaction with the support provided. These findings highlight the need for institutions to focus on improving support mechanisms and resources for students during challenging times.

The findings indicate that a significant proportion of student respondents (39.1%) perceive their institutions to have contingency plans in place for addressing disruptions, while a higher percentage of staff respondents (46.2%) expressed confidence in their institution's capabilities. This suggests that a considerable number of staff believe their institutions are proactive in managing potential disruptions. However, it is important to note that a substantial portion of students (38.8%) and staff (35.6%) expressed neutral views, indicating uncertainty or a lack of awareness regarding the existence or effectiveness of these contingency plans.

Additionally, only 41.1% of students believe that their institution's staff members are capable of dealing with disruptions, whereas a majority of staff (59.6%) had confidence in their colleagues' competence. This highlights a perception gap between students and staff regarding the staff's ability to effectively respond to and navigate disruptions. To address this, institutions should prioritise staff development and training programmes to ensure that staff possess the necessary skills and knowledge to support students during challenging times.

These results are consistent with the literature that highlights the importance of technological capabilities, support systems, contingency planning, and staff preparedness in the successful management of disruptions in educational institutions.

There is growing evidence that incorporating technology into the classroom can help students become more resilient and make smoother transitions when faced with disruptions (Ronkowitz & Ronkowitz, 2021:190). Researchers also advise pre-emptive contingency planning and comprehensive support services as ways to lessen disruption's detrimental effects on students' education (García-Álvarez, Soler & Achard-Braga, 2021:1).

Although a significant proportion of staff believe that their PHEIs have capable technology and contingency plans, there is room for improvement in terms of adequate support provision and enhancing staff capabilities to effectively manage disruptions. By addressing these areas and adopting best practices, PHEIs can better support students during difficult times and cultivate a resilient learning environment.

4.6 SECTION D: STUDENTS AND STAFF EXPERIENCE AND FUTURE REQUIREMENTS

4.6.1 Student and staff responses 11: Ratings on the students and staff experiences and future requirements

This section focuses on the responses and ratings that students gave about their experiences with PHEIs during the COVID-19 pandemic and their transition to online learning that followed.

Figure 4.7: Students and staff rating on the experience on COVID-19

More respondents indicated a good experience (43.8%) with a large number having a neutral rating (35.1%) ($p < 0.001$). This suggests that a substantial number of students had positive perceptions and satisfaction with their educational experience amidst the challenges posed by the pandemic. However, it is important to note that a considerable percentage of respondents (35.1%) provided neutral ratings, indicating a level of ambivalence or mixed opinions regarding their experience.

These findings are consistent with recent studies that emphasise the diverse experiences of students during disruptive events such as the COVID-19 pandemic. While some students adapt well to online learning and value the flexibility it provides, others struggle with limited access to resources, technological issues, and feelings of isolation (Hodges *et al.,* 2020). Variations in student experiences can be attributed to variables such as individual circumstances, technological readiness, and institutional support (Dhawan, 2020).

4.6.2 Student responses 12: Ratings on the students experience after transitioning to online learning during the COVID-19 lockdown.

This rating allows PHEIs to understand the effectiveness of their online learning initiatives and make informed decisions for future planning and improvements. It helps to foster a sense of shared responsibility and collective effort in shaping the online learning experience to meet the evolving needs of students. Ultimately, the assessment aims to create a comprehensive understanding of the online learning experience during the Covid-19 lockdown and pave the way for continuous improvement in delivering quality education in both virtual and traditional settings.

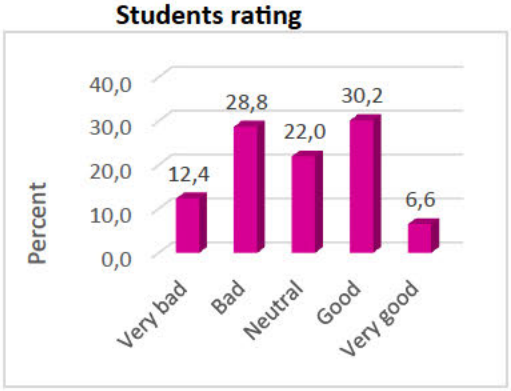


Figure 4.8: Students rating on their experience after transitioning to online learning.

The transition to online learning during the COVID-19 pandemic resulted in a significant number of student respondents (41.1%) reporting a negative experience, while a smaller percentage (36.8%) indicated a positive experience ($p < 0.001$). These findings underscore the challenges faced by students during this unprecedented disruption, as well as the need for institutions to address and support their evolving needs. The high proportion of students reporting a negative experience aligns with previous research emphasising the importance of adaptability and resilience in navigating such disruptions (Hodges *et al.,* 2020).

Despite the difficulties encountered, students have demonstrated their ability to adapt to online learning environments and effectively utilise available resources to continue their education. However, the negative experiences reported highlight the need for effective communication, comprehensive support systems, engaging instructional strategies, and access to technological resources in ensuring a positive learning experience (Barr & Miller, 2013:12; Costley, 2014:8). These insights emphasise the importance of addressing the concerns raised by students and implementing measures to enhance their online learning experience.

4.6.3 Staff responses 13: Ratings on the staff opinion on the importance to manage disruptions in future in order to minimise the negative impact on work.

In the ever-changing landscape of the modern workplace and learning environment, disruptions are inevitable and can have a significant impact on the productivity and well-being of staff and students. This rating offers insights into the awareness and recognition of the potential challenges posed by disruptions and the need for proactive measures to mitigate their impact. It highlights the extent to which staff and students feel empowered, equipped, and supported in effectively dealing with disruptions that may arise in the future. This assessment serves as a foundation for developing robust framework, providing relevant training and support, and fostering a resilient work and learning environment capable of effectively navigating disruptions and minimising their negative impact on students' academic progress and staff work.

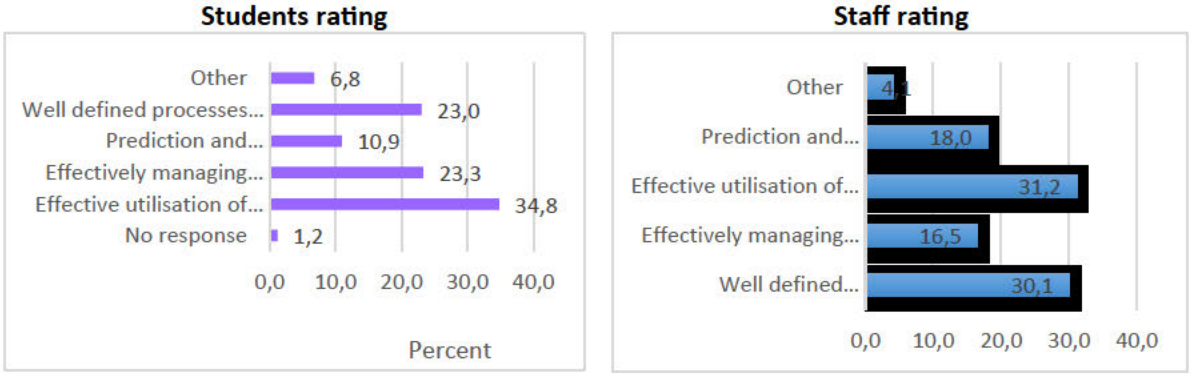


Figure 4.9: Staff and student opinion on how the institution should manage disruptions in future.

The majority of staff (31.2%) and student respondents (34.8%) recognised the significance of effectively using technology tools in dealing with disruptions. This finding aligns with existing literature emphasising the role of technology in enhancing organisational resilience during challenging times (He *et al.*, 2023:171). The significance of clearly defined processes for managing disruptions was another crucial factor that staff members identified, with 30.1% of respondents highlighting their importance and students rating it at 23%. This suggests that having clear and established protocols and procedures in place can contribute to a more organised and efficient response to disruptions.

Literature supports the notion that effective processes and strategies for managing disruptions contribute to improved organisational performance and agility (Tse *et al*., 2016:2).

During disruptions, the preference for efficient use of technology tools aligns with the growing reliance on digital platforms and online learning. Technology can facilitate remote teaching, provide opportunities for interactive learning, and encourage student engagement and participation (Bao, 2020). In addition, technology can facilitate the delivery of timely updates and information, thereby fostering openness and efficient communication between institutions and students (Hodges *et al.,* 2020). Consequently, prioritising the effective use of technology tools can improve the institution's capacity to manage disruptions and mitigate their negative impact on student learning.

Additionally, a notable percentage of staff (18%) and students' (10.9%) expressed the importance of prediction, indicating the value of anticipating and preparing for potential disruptions in advance. This finding underscores the proactive approach organisations should take to identify and assess potential risks and develop strategies to mitigate their impact (De Sousa, Alexandre, Mello, Falcão, Vesin & Gašević, 2021:7). Additionally, 16.5% of staff and 23.3% of students believed that controlling the abruptness of disruptions was important. This suggests the need for organisations to establish mechanisms for quickly and effectively responding to unexpected and sudden disruptions. Literature highlights the significance of agility and adaptability in managing disruptions characterised by their unforeseen nature (Harraf, 2015:675; Raj *et al.*, 2023:1).

On the other hand, clear communication, support structures, and efficient decision-making processes can help students adapt quickly to changing circumstances (Hodges *et al.,* 2020). By focusing on well-defined processes, institutions can effectively address immediate challenges, ensure consistency in their responses, and provide a sense of stability during uncertain times. The lower rating for prediction and anticipation suggests that students may have varying perspectives on the feasibility of accurately predicting

and anticipating future disruptions. While it is important for institutions to be forward-thinking and anticipate potential disruptions, the unpredictable nature of events like the COVID-19 pandemic poses challenges for accurately forecasting their impact and duration. It is crucial to strike a balance between proactive planning and adaptability to respond effectively to unexpected situations (Dhawan, 2020).

4.7 SUMMARY OF THE SURVEY RESULTS

4.7.1 Student skim results

The summary statistics of the student data combining measures of centrality with the measurements of spread (with an accompanying histogram display) are provided to provide a quick view of the data distribution. The summary is provided for the quantitative variables ranging from Q8 to Q27 in the research questionnaire for students.

Skim Variable	Mean	Std Dev	N	Histogram
Q8: Overall experience	3.28	1.17	337	
Q9: Adequacy of support	3.29	1.01	336	
Q10: Level of support	3.09	1.20	337	
Q11: Clear guidelines	3.33	1.01	334	
Q12: Guide & policy effectiveness	3.43	1.02	337	
Q13: Institution's problem-solving	3.01	1.08	337	
Q14: Institution's technology integration	3.19	1.14	320	
Q15: Managing out the crisis	3.11	1.03	317	
Q16: Institution's structure & policy	3.18	1.09	318	
Q17: Institution's innovativeness	3.16	1.03	321	
Q18: Other institution's strengths	3.07	0.98	297	
Q19: Institution's future relevance & compatibility	3.30	1.00	330	
Q20: Management's innovativeness	3.30	1.16	334	
Q21: Management's flexibility	3.13	1.10	335	
Q22: Adequacy of existing technology	3.17	1.14	332	
Q23: Management support	3.15	1.12	322	
Q24: Staff competence	3.18	1.13	321	

Skim Variable	Mean	Std Dev	N	Histogram
Q25: Devising contingency plan	3.16	1.07	322	
Q26: Experience during COVID	3.27	1.07	333	
Q27: Experience post-COVID	3.44	1.11	331	

Table 4.10: Skim Results: Students' Main Data

As suggested by the summary statistics and distributions in the histograms above, students generally indicate that their experience during the COVID-19 pandemic was moderate and that they received support from the institution during that period. However, the distribution suggests the support level was insufficient. The distribution of data on policies and guidelines reveals that institutional teaching and learning policies and guidelines support disruption management to some extent. Other variables that had a positive reflection are the institution's technology integration, capacity, innovativeness, staff competence and institutional future relevance and compatibility based on their higher central tendency measures, relatively low spreads and distributions indicating higher frequencies above the central values. The institution's technology integrated quite well towards managing the institutional processes as per the student data.

The institution's problem-solving capacity and ability to devise and implement contingency plans during COVID were judged by students as relatively poor. The support for students was also poor. Other variables that reflected a bad outlook include the effectiveness of institutional guidelines, the management's flexibility in dealing with disruption, and other aspects not fully captured by the variables applied in the research instrument. Although students share that their experiences were not very bad during the COVID-19 pandemic, their experience in the aftermath was not good, as evidenced by very small values of the central tendency measures and the histogram distribution with a higher frequency below the central measures.

More students believe that the institution does not have sufficient clear guidelines to manage disruption experiences. The students are generally quite positive about the future capacity of the institution. The student's responses on the potential of the institution based

on the relevance and compatibility of the institution with future requirements, management flexibility, management competence and flexibility, ability to devise contingency plans, staff competence and technological improvement all reflect positively.

4.7.2 Staff skim results

The table below summarises the corresponding summary results for the staff data.

Skim Variable	Mean	Std Dev	N	Histogram
Q7: Overall experience	3.33	1.05	290	
Q8: Adequacy of support	3.38	0.95	289	
Q9: Level of staff support	4.15	0.65	128	
Q11: Institution guidelines	3.24	0.90	288	
Q12: Guide or policy effectiveness	3.31	1.02	287	
Q13: Problem-solving	3.52	0.92	286	
Q14: Technology integration	3.49	0.99	288	
Q15: Managing out the crisis	3.38	0.97	290	
Q16: Structure & policy formulation	3.49	0.97	290	
Q17: Innovativeness	3.50	0.96	290	
Q18: Other institution’s strengths	3.28	0.92	198	
Q19: Management innovativeness	3.51	0.93	266	
Q20: Management flexibility	3.52	0.92	263	
Q21: Institutional capability & capacity	3.53	0.88	261	
Q22: Technology	3.43	1.01	267	
Q23: Support	3.51	0.97	264	
Q24: Staff competence	3.58	0.87	265	
Q25: Contingency plan	3.33	0.92	264	
Q26: Staff experience post-COVID	3.38	0.74	266	

Table 4.11: Skim Results: Staff Main Data

The results for the staff (above) indicate moderate-to-good experience across all applied measures or variables. However, caution must be taken in the interpretation since this

reflects the results of all sampled staff. These results do not drill into separate organisational units such as provincial operations, departments, role categories, different levels, or any other specific categorical variables of interest.

4.8 SECTION E – OPEN-ENDED QUESTION ANALYSIS

This section relates to the last phase of the data analysis process, which involved analysing the responses provided by students and staff members to open-ended questions. Out of the 339 usable questionnaires given to students, 104 responses were received in this area. For staff, out of the 263 usable questionnaires, a total of 78 responses were collected and subjected to thematic analysis to uncover additional insights and recommendations that could be incorporated into the disruption management framework. To maintain anonymity, pseudonyms or numbering have been used instead of student names, numbers, and institutions.

Table 4.12 presents the reference system employed to present the findings of Stage 1, which involved the analysis of responses to open-ended questions in the research project.

Reference	***P-student 6***	***P-staff 6***
P	Relates to participant	Relates to participant
Student or staff	Student	Staff
6	Participant number	Participant number

Table 4. 12: Reference method used in open-ended questions.

The analysis of open-ended responses yielded significant findings in five key dimensions, as identified by students and staff. These dimensions offer valuable insights and recommendations for improving the institution's capacity to effectively handle future disruptions. The significance and necessity of each dimension are highlighted by direct participant quotations (Table 4.12, references indicated in bold letters). The following discussion delves into each dimension, highlighting their implications and providing recommendations based on the qualitative data. The objective was to gather comprehensive and detailed descriptions of the experiences and perspectives of staff and students. In the presentation of findings, a careful selection of responses has been made to provide a representative and insightful overview. By including these chosen responses,

the aim is to present a rich and diverse range of viewpoints that capture the essence of staff and students' experiences.

A significant proportion of staff respondents (38%) emphasised the significance of clear policies and guidelines to effectively navigate disruptions, whereas 28.3% of students expressed a similar viewpoint. Notably, both students (32.4%) and staff (32.3%) highlighted the importance of agile systems and management tools to facilitate smooth adaptation to disruptions. Some 19.8% of students and 16.5% of staff deemed the existence of contingency plans in the event of disruptions to be important. In addition, 8.3% of students and 10.0% of staff suggested instituting predictive models capable of anticipating and alerting institutions before disasters struck. Furthermore, participants also pointed out issues such as a lack of clear communication and difficulties during the roll-out of the Wakanda system that negatively impacted student learning.

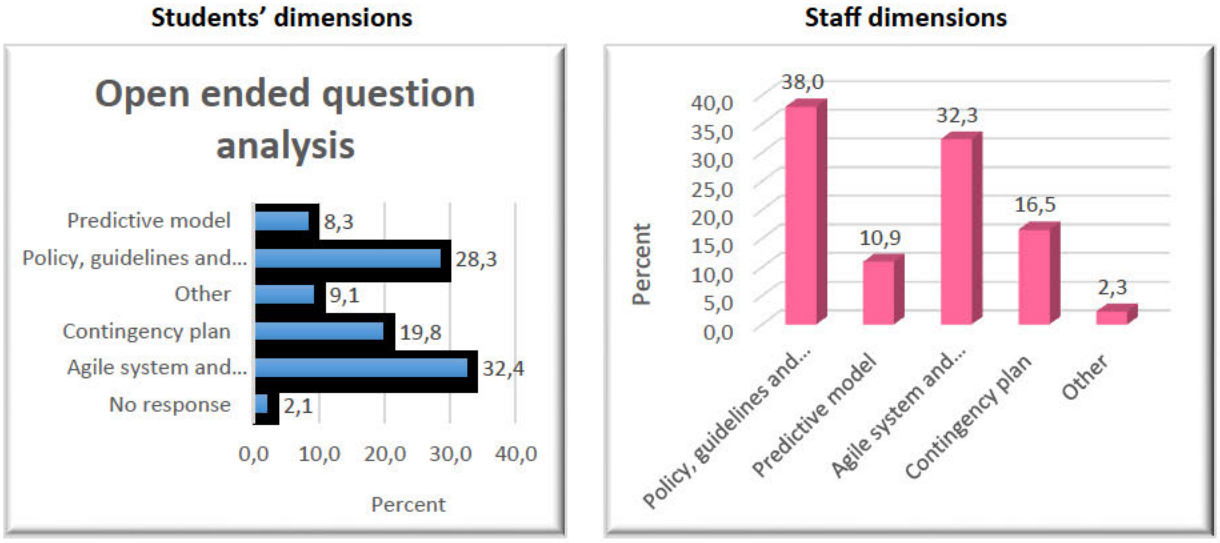


Figure 4.10: Staff and student opinion identified dimensions from open-ended questions.

The presence of a significant number of neutral ratings in other sections of the survey indicates the need for a deeper investigation into the underlying factors contributing to these responses. To gain more clarity on why students expressed neutrality, open-ended questions play a crucial role. By analysing the responses to these questions, we can gain insights into the specific aspects of the disruption experience that influenced students'

neutral stance. This valuable information can assist PHEIs in identifying areas for improvement and developing targeted strategies to address any concerns or challenges faced by students. By understanding the factors contributing to students' neutrality, institutions can take proactive measures to enhance their response to future disruptions and provide a more positive and supportive learning environment.

4.8.1 Policy, guidelines, and standards

Student responses highlight several key points regarding the importance of flexibility, clear communication, and preparedness in managing disruptions in higher education institutions (PHEIs). Students expressed the need for PHEI leaders to be flexible in their approach, adapting policies, guidelines, and standards to accommodate the challenges faced during disruptions. They emphasised the significance of clear communication of policies, ensuring that important information is effectively conveyed to students. Students also emphasised the importance of problem-solving skills within the management team, specifically highlighting the need for leaders who understand the students' unique circumstances and struggles. The views are represented below:

> *"Inform student properly with the policies every semester and better the communication skills as not all-important information is sent out to students"* (P-Student 240).
>
> *"Have problem-solvers in management who also understand the framework of its students to understand what their struggles might be"* (P-Student 1).
>
> *"Management needs to be able to be flexible with their systems, policies and technology"* (P-Student 106).
>
> *"Start listening to students; if they say something isn't working out, it's probably going against challenges you can't imagine. Also, we're humans; we can't be dealing with once-in-a-lifetime events and still expect to be the best students; we also get affected by world events. Stop pressuring students in such situations"* (P-Student 142).

The above findings align with several theoretical perspectives related to managing disruptions in HEIs. One such perspective is the concept of organisational flexibility, which emphasises the importance of adapting to changing circumstances and being responsive to disruptions (Bal & Izak, 2021:38). Students' emphasis on the need for flexible policies, guidelines, and systems reflects this perspective, as it recognises that rigid structures may hinder the institution's ability to effectively respond to disruptions. On the other hand, clear and timely communication is crucial during disruptions to ensure that students are well-informed and can navigate the challenges effectively (Genç, 2017:513).

The staff participants' perspectives also align with theoretical frameworks related to managing disruptions in HEIs. *“If a policy/plan is not socialized, unpacked and workshopped it remains stagnant and difficult to apply if not well understood and embedded in the business”* (P-Staff 199). The significance of effectively socialising and communicating policies is one important aspect that the staff has highlighted. This aligns with the concept of policy and strategy implementation and organisational change, which emphasises the need for policies to be understood, embraced, and embedded within the organisation (Ashioya, 2014:6; Özüdoğru, 2021:321).

The staff participants also emphasised the importance of having comprehensive policies in place to navigate various disruption scenarios. This aligns with the notion of preparedness and proactive planning in managing disruptions (Kaur, Adar, Gilbert, & Lampe, 2022:1). *"I think it's important that we have policies or guidelines in place to help navigate these situations when they arise. During the floods, managers were not efficiently prepared to see the dangers of letting staff work until the close of business"* (P-Staff 69). In agreement, another participant (P-Staff 54) emphasise that ensuring *"that a set of structured processes are in place of which staff are aware and can be equipped for when and if such disruptions take place*".

4.8.2 Agile systems and management tools

The students highlighted the significance of an agile system and management tools that enable effective response, continuous engagement, and uninterrupted academic

progress during disruptions. The students comments emphasise the importance of having a well prepared and agile framework that can effectively navigate and overcome any disruptions that arise.

> *"Having a prepared and agile framework is a definite must and an overall better strategy when dealing with uncontrollable disruptions, by using the resources and modernization to its max, we can make it through pretty much anything that's thrown our way"* (P-Student 159).
>
> "*Quick response to problems when there is a disruption and systems that allow students to continue with submissions or schoolwork. At the moment the systems are not allowing us to move forward and not working for students, they are blocking us from doing the academic process effectively"* (P-Student 247)

The findings from the staff highlight the importance of an agile system and appropriate management tools in dealing with disruption frameworks in higher education. Staff members recognise that having an agile system enables the institution to continue delivering value to its stakeholders in the face of disruptions. Their views are presented below:

> *"Having an agile system along with the correct management tools will allow the institution to still deliver value to customers while at the same time effectively having tools and systems in place to deal with disruption frameworks in Higher Education" (P-Staff 167).*
>
> *"Private higher education can allow disruption framework by agile system and management tools" (P-Staff 42).*

The concept of agility in managing disruptions aligns with the theoretical perspective of organisational flexibility. Organisational flexibility emphasises the ability to adapt and respond to disruptions in a timely and effective manner (Chakravarthy, 1982:35; Ivančić, Mencer, Jelenc & Dulčić, 2017:54-56). Additionally, the staff comments suggest that management tools play a crucial role in enabling the institution to effectively deal with disruption frameworks.

4.8.3 Contingency plan

The findings from both students and staff highlight the importance of having a well-defined and proactive contingency plan to effectively manage disruptions in HEIs.

The comments from the students below indicate their recognition of the necessity for HEIs to have well-defined and adaptable contingency plans to mitigate the impact of disruptions. They emphasise the need for continuous planning, regular review, and the inclusion of alternative strategies to ensure preparedness for unforeseen circumstances (Maota & Naidoo, 2022:9; Ronkowitz & Ronkowitz, 2021)

> *“Having a better plan to deal with disruption issues”* (P-Student 3).
> *“Have a sound contingency in place as we are faced with many challenges on a daily basis”* (P-Student 10).
> *“There should be a contingency plan available at all times…”* (P-Student 15)
> *“Plan for disruption regularly and include and review the plan on a regular basis to make sure it still fits the situation at hand”* (P-Student 262).

Similarly, the staff participants highlighted the significance of planning as a fundamental approach to dealing with disruptions. They emphasised the need for comprehensive contingency plans that consider diverse disruptions and offer alternative solutions while aligning with institutional policies.

> *"In my opinion, disruption should have a contingency plan that seeks to implement strategies that are already in place to combat any disruption"* (P-Staff 6).
> *"Planning should be the starting point when dealing with disruptions"* (P-Staff 27).
> *"Contingency plans for diverse disruptions, with alternative ways to be utilised that do not go against policy"* (P-Staff 115).
> *"Better planning in the event of unforeseen circumstances Plan for the impossible, have a plan B set, and possibly a plan C"* (P-Staff 117).

"Appropriate planning and testing of various different solutions before implementing a plan of action Also making use of focus groups to ascertain and gauge the customer or student response to how the disruption will be handled (P-Staff 123).

The participants emphasised the need for PHEIs to anticipate and prepare for potential disruptions rather than merely reacting to them when they occur. The comments also highlight the importance of testing different strategies, seeking input from stakeholders, and gauging the response of students or customers. These recommendations align with the literature on effective crisis planning, including the involvement of stakeholders and the testing of various solutions (Steigenberger, 2016:60).

4.8.4 Predictive model

The students and staff participants expressed the need for proactive approaches that go beyond reactive measures and focus on predicting potential disruptions. The student participant emphasised the value of having predictive models in place to prepare for future disruptions: *"Nothing except for predictive models just in case something like this happens in the near future"* (P-Student 44). This perspective aligns with the concept of proactive crisis management, which emphasises the importance of anticipating and preparing for potential disruptions before they occur (Ronkowitz & Ronkowitz, 2021:201). By utilising predictive models, institutions can identify potential risks and take preventive measures to minimise their impact.

The staff participants also recognised the significance of re-evaluating the methods used for predicting disruptions: *"The way in which disruptions are predicted should also be relooked at"* (P-Staff 47). They emphasised the need for clear escalation procedures and predictive resolution methods to address potential issues: *"clearly defined escalation procedures and predictive disruption resolution methods*" (P-Staff 170). This aligns with the literature on crisis management, which emphasises the importance of developing and implementing effective escalation processes and predictive approaches (Ali, 2020:16).

By employing predictive disruption resolution methods, PHEIs can enhance their preparedness and response capabilities. Furthermore, the staff participant mentioned the importance of testing and piloting systems to predict and resolve potential disruptions. *"Testing or piloting a system predicts process input-process output-outcome results-feedback"* (P-Staff 114). This aligns with the concept of organisational learning, which emphasises the value of continuous improvement through testing and feedback processes (Norman & Nielsen, 2013:1; Ries, 2011:85). By piloting and testing systems, institutions can identify potential weaknesses and refine their predictive capabilities.

4.8.5 Other

Both students and staff raised concerns regarding the introduction of a new system that ended up causing disruptions within the institutions. The following are some of the viewpoints expressed:

> *"The problem is the new Wakanda system it is very poor, and most learners have not even received their marks for the first semester"* (P-Student 189).
>
> *"Kindly improve student portal systems like Wakanda and make it more effective especially with the delay we've been having with the release of our results"* (P-Student 133).
>
> *"I think when management are changing the system, they need to make sure that every staff get a proper training on time and be sure that new system that will be introduced is user friendly for staff and clients to avoid misunderstanding between clients and staff"* (P-Staff 168).

These statements highlight the common concerns and frustrations shared by both students and staff regarding the negative impact of the new system on the institutions. The issues raised include problems with functionality, poor execution, a lack of testing, and inadequate management of the transition process. The disruptions a new system may cause may have repercussions for various aspects of the institutions' operations, including daily functioning, workflow, productivity, and teaching and learning processes.

Concerns raised by staff and students regarding communication (P-Student 15, 77, 120, 175, 161, & P-Staff 55, 66, 192), management-employee disconnect (P-Staff 32), resource allocation (P-Staff 63, 94, & P-Student 185), and fostering innovation (P-Staff 43, 162, 209) align with literature on organisational communication, employee engagement, and innovation. To effectively manage disruptions, PHEIs should prioritise clear and effective communication channels, engage employees in decision-making processes, allocate resources strategically, and foster a culture of innovation.

Effective communication is crucial during disruptions to ensure that all stakeholders are well informed and can navigate challenges successfully (Mendy, Stewart & Van Akin, 2020:2; Reddy & Gupta, 2020:3793). The staff's concern about the disconnect between top management and employees highlights the importance of clear and consistent communication channels throughout the institution. Similarly, the students' feedback regarding the lack of communication and incomplete information underscores the need for improved communication strategies to keep students informed and engaged. Lattimer and Bidjerano's (2021) study found that during the pandemic disruption, students who received consistent and clear communication from their institutions felt more supported and less anxious than those who did not.

Employee engagement and involvement in decision-making processes are essential for successful change management and innovation (Rhee & Mehra, 2013). The staff's suggestions for cultivating a spirit of innovation and providing opportunities for employees to contribute new ideas align with the literature on fostering an innovative culture in organisations. Involving employees in problem-solving and decision-making can lead to more effective solutions and better adaptation to disruptions (Ghiga et al.2021).

Resource allocation and contingency planning are critical for effectively managing disruptions (McNamara, 2021:10, Ovie, 2022:42; Radic, *et al*. 2020). The staff's suggestion to have the flexibility and budget for contingency plans aligns with the literature on organisational resilience and preparedness. Adequate resources, including

technological infrastructure, are essential for minimising disruptions and ensuring smooth operations during challenging times (Pu, Li& Bai, 2022:1; Tawiah & Nsiah, 2021).

4.9 CROSS TABULATIONS

4.9.1 Students

The cross-tabulation between student study level and faculty is presented below. A χ^2 test of independence was performed to determine whether there was a statistically significant relationship between the variables (rows and columns). The null hypothesis asserts that there is no relationship between the two. The alternative hypothesis proposes that a relationship exists.

The table summarises the results of the chi square tests. For example: The p-value between "Did you get adequate support during the disruption period?" and "Kindly indicate the faculty in which you are undertaking your studies" is 0.005. The variables highlighted below show a significant relationship, indicating that the faculty to which the respondents belonged played a significant role in shaping their perceptions of the support they received.

			Kindly indicate the faculty in which you are undertaking your studies					Total
			Faculty of Commerce	Faculty of Education	Faculty of Humanities & Social Sciences	Faculty of Information and Communications Technology	Faculty of Law	
Did you get adequate support during the disruption period?	Strongly disagree	Count	8	2	10	5	0	25
		% within Kindly indicate the faculty in which you are undertaking your studies	5.0%	6.7%	18.2%	8.9%	0.0%	7.8%
	Disagree	Count	19	1	1	6	0	27
		% within Kindly indicate the faculty in which you are undertaking your studies	11.8%	3.3%	1.8%	10.7%	0.0%	8.4%
	Neutral	Count	70	10	20	20	11	131
		% within Kindly indicate the faculty in which you are undertaking your studies	43.5%	33.3%	36.4%	35.7%	57.9%	40.8%
	Agree	Count	55	14	12	20	7	108
		% within Kindly indicate the faculty in which you are undertaking your studies	34.2%	46.7%	21.8%	35.7%	36.8%	33.6%
	Strongly agree	Count	9	3	12	5	1	30
		% within Kindly indicate the faculty in which you are undertaking your studies	5.6%	10.0%	21.8%	8.9%	5.3%	9.3%
Total		Count	161	30	55	56	19	321

	% within Kindly indicate the faculty in which you are undertaking your studies	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 4.13: Cross tabulation faculties

Crosstab

			Kindly indicate your level of study			Total
			Year 3 undergraduate	Honours	Masters	
Kindly indicate the faculty in which you are undertaking your studies	Faculty of Commerce	Count	139	9	2	150
		% within Kindly indicate the faculty in which you are undertaking your studies	92.7%	6.0%	1.3%	100.0%
		% within Kindly indicate your level of study	50.9%	39.1%	66.7%	50.2%
		% of Total	46.5%	3.0%	0.7%	50.2%
	Faculty of Education	Count	20	0	0	20
		% within Kindly indicate the faculty in which you are undertaking your studies	100.0%	0.0%	0.0%	100.0%
		% within Kindly indicate your level of study	7.3%	0.0%	0.0%	6.7%
		% of Total	6.7%	0.0%	0.0%	6.7%
	Faculty of Humanities & Social Sciences	Count	42	12	1	55
		% within Kindly indicate the faculty in which you are undertaking your studies	76.4%	21.8%	1.8%	100.0%
		% within Kindly indicate your level of study	15.4%	52.2%	33.3%	18.4%
		% of Total	14.0%	4.0%	0.3%	18.4%
	Faculty of Information and Communications Technology	Count	53	2	0	55
		% within Kindly indicate the faculty in which you are undertaking your studies	96.4%	3.6%	0.0%	100.0%
		% within Kindly indicate your level of study	19.4%	8.7%	0.0%	18.4%
		% of Total	17.7%	0.7%	0.0%	18.4%
	Faculty of Law	Count	19	0	0	19
		% within Kindly indicate the faculty in which you are undertaking your studies	100.0%	0.0%	0.0%	100.0%
		% within Kindly indicate your level of study	7.0%	0.0%	0.0%	6.4%
		% of Total	6.4%	0.0%	0.0%	6.4%
Total		Count	273	23	3	299
		% within Kindly indicate the faculty in which you are undertaking your studies	91.3%	7.7%	1.0%	100.0%
		% within Kindly indicate your level of study	100.0%	100.0%	100.0%	100.0%
		% of Total	91.3%	7.7%	1.0%	100.0%

Table 4.14: Cross tabulation faculties and level of study

It is observed that significantly more respondents from the Faculty of Education agreed that they received adequate support, with more respondents from the faculties of Commerce, HSS and ICT disagreed compared to the other two faculties.

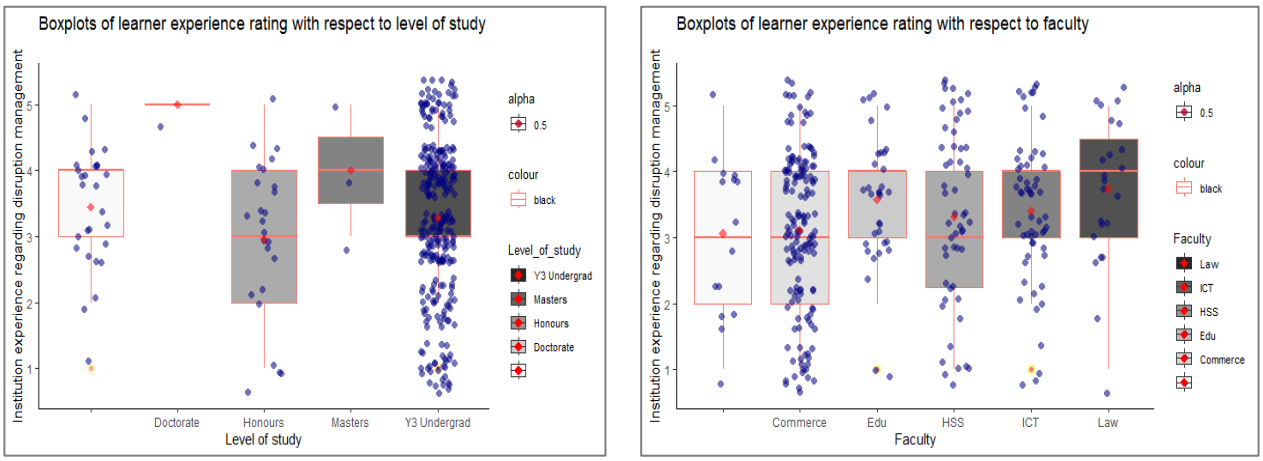


Figure 4.11: Experience rating concerning the faculty and level of study.

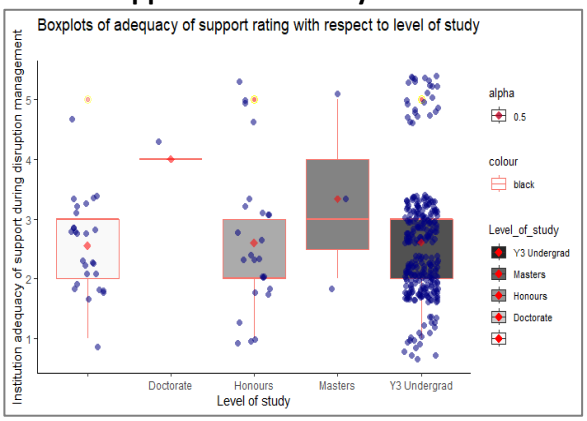
4.9.1.1 Overall experience

The COVID-19 disruption experience was worse at lower levels than the higher levels of study. The indication of poor experience rating for the undergraduate and honours students compared to the masters and doctoral students' evidence this. Also, the data spread for the undergraduate and honours students is higher than that of the higher levels.

4.9.1.2 Adequacy of support

As shown in Figures 4.15, overall, the data for adequacy of student support indicates that there are clusters of students with poor backing. At the same time, clusters of students receive very good support. Doctoral student(s) received very good support compared to all other levels, with the support for masters' students second best. The support for honours and undergraduate students is relatively poor. There is not much disparity among the different faculties' ratings of the institution's level of support during the COVID-19 disruption management. However, the Law faculty depicts relatively low variability in the scores compared to other faculties.

Student support level of study



Student support per faculty

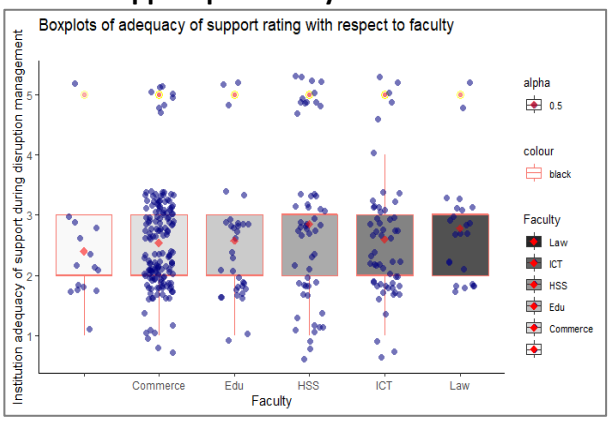


Figure 4.12: Student support per level of study and faculties

4.9.1.3 Policy effectiveness

The higher levels of study (Doctorate and Master's) have higher ratings, while the honours and undergraduates have relatively lower ratings.

4.9.1.4 Problem-solving

The data for problem-solving rating does not depict any separate discernible clusters in its distribution. The doctoral student rated the institution's problem-solving as very good at a rating of 4. At the same time, there seems to be a very tight difference in the distribution of the data of the other three levels considered in the study: undergraduate, honours and masters levels.

The students who did not indicate their levels of study also rated the institution highly on problem-solving. Their average rating scores are between 3 and 4. There is not much difference in the rating concerning the faculty, all with quite good scores. However, the Faculty of Education ranks slightly higher than the Faculties of Law and Human Sciences.

4.9.1.5 Technology integration

The overall rating for institutional technology integration towards disruption management was quite good on a 1 – 5 rating scale, with most ratings averaging scores between 3 and 4, except for very limited cases. The doctoral student rated the institution highly above all other levels of study. Surprisingly the average and median of undergraduate level surpass

that of masters and honours for this variable. Education and IT faculties rate the technology integration above the rating of other faculties.

4.9.1.6 Managing out crisis.

All faculties had good ratings with high variability in distributions evidenced in the Human Sciences and ICT data. The institution eBlue had a poor rating, while eWhite had an average rating. The rest of the institutions had ratings with an average that was not too high above average.

4.9.1.7 Innovativeness

The Doctorate and Master's levels rated the institution's innovativeness above other levels of study, with the doctorate rating significantly high. However, all ratings in this category are generally good. The ratings for innovativeness concerning different faculties are also relatively consistent, as the average and median of each faculty rating are not far from each other.

4.9.1.8 Management flexibility

Students give varied ratings on the institution management's flexibility in dealing with disruption, especially for three variables: institution, province and level of study. The Doctoral and Master's students continue to rate the institutional performance as high, with the former ranking above the latter.

The students who did not specify their levels of study also rated the management's flexibility highly. However, in general, the overall rating of all students was relatively high for this variable. The rating for the various institutions' faculties was generally high, with that of the Faculty of Education ranking above all others.

4.9.1.9 Technological capacity

The institution's technological capacity was rated highly by eWhite, eBrown and eBlack and average by eBlue and eOrange. The Doctoral and Master's students provided excellent ratings. The scores for the undergraduate and honours students were just good.

The Faculty of Education's average rating exceeds all other faculties, while all others are close to an average rating of 3 with high data variability.

4.9.1.10 Contingency plan

The institution eBlue's students rated the ability of the institution to implement an effective contingency plan during the COVID-19 disruption at an average rating level, while others rated higher.

Again, the doctoral, Master's and those who did not indicate their level of study rated the institution significantly higher than others. Analysis concerning the faculty does not show significantly different average ratings, but the Education Faculty rates highest. Splitting the group regarding gender does not reflect any significant differences in the ratings between the two subgroupings.

4.9.2 Staff

The cross-tabulation between staff category (academic or non-academic) and institution is presented below. A χ^2 test of independence was performed to assess whether there was a statistically significant association between the variables in terms of rows versus columns.

Crosstab

			What is the most appropriate category for your role within the institution?		Total
			Academic	Non-academic	
Can you rate your institution's overall experience in disruption management?	Very poor	Count	7	10	17
		% within What is the most appropriate category for your role within the institution?	5.6%	6.5%	6.1%
	Poor	Count	12	25	37
		% within What is the most appropriate category for your role within the institution?	9.6%	16.2%	13.3%
	Moderate	Count	40	64	104
		% within What is the most appropriate category for your role within the institution?	32.0%	41.6%	37.3%
	Good	Count	48	40	88
		% within What is the most appropriate category for your role within the institution?	38.4%	26.0%	31.5%
	Excellent	Count	18	15	33

		% within What is the most appropriate category for your role within the institution?	14.4%	9.7%	11.8%
Total		Count	125	154	279
		% within What is the most appropriate category for your role within the institution?	100.0%	100.0%	100.0%

Table 4.15: Cross tabulation category and entity

This analysis examines the distribution of experience levels among non-academic staff and the overall staff population during a disruption period, aiming to identify areas that require additional efforts to improve disruption management in institutions. By assessing the distribution of experience, the analysis provides valuable insights into potential gaps and areas where more attention and resources should be directed to enhance the institution's ability to effectively navigate and mitigate disruptions.

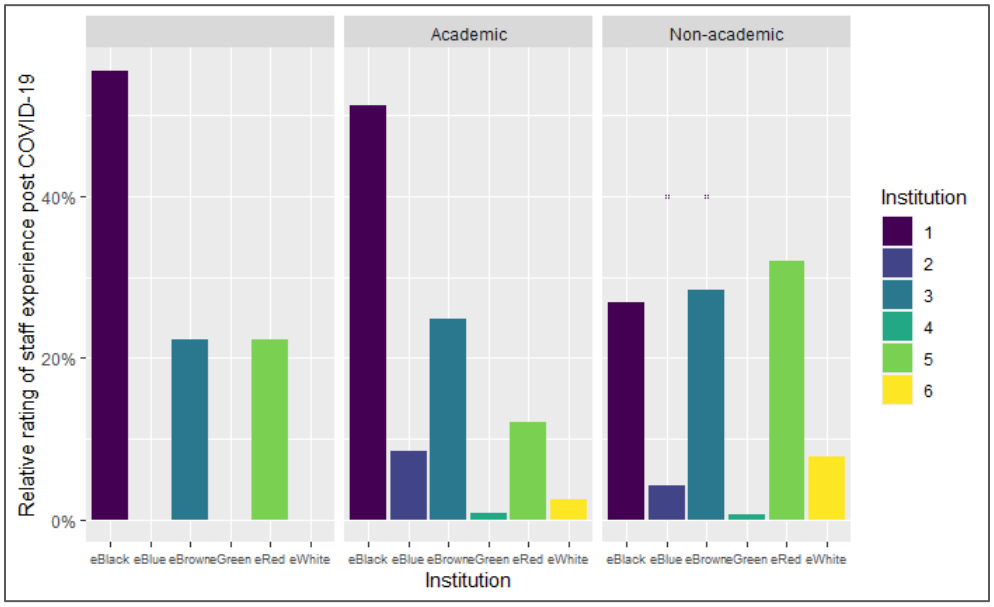


Figure 4.13: Comparison of the experiences of non-academic to academic staff subcategories

4.9.2.1 Overall experience

eBlue and eWhite have the best experience of all the institutions in the study. This is in contrast with the student's experience. The institutions eBlack, eBrown, eGreen and eRed have poorer experience ratings than others. Also, eBrown and eBlack have relatively high data variability.

4.9.2.2 Adequacy of support

The ratings of the staff on the adequacy of support are relatively high as they have averages and medians that are 3 or greater. Significantly higher ratings are noted on institutions eBlue, eGreen and eWhite. The rating of the adequacy of support across all provinces is high (with averages all greater than 3). A few staff members did not indicate whether they belonged to academic or non-academic subgroups, but they also rated the support adequacy high. The department 'management' rated the institution's support adequacy highest, followed by the human resources (HR) department. However, all departments rated the support adequacy high. The data shows that the support adequacy rating decrease with the increase in the number of years that the staff have spent with the institution, except for those who have been with the institution for more than 11 years. Also, the rating for all experience levels is generally high.

4.9.2.3 Guides and policy effectiveness

The institution eGreen rated the institution's guides and policy effectiveness highest. The rating distribution for all other institutions tends to even out, but all are high above 3. The academic staff also rates slightly higher than the non-academic. Variation in the data seems high when analysed concerning each department. Management has the highest rating, while the Group Support Services has the lowest average rating. The results for the years of experience are smoothed out with the slightly higher rating on the group 'other'.

4.9.2.4 Problem-solving

The data for eBlue, eGreen and eWhite displays minimal variability. The institution eWhite has the highest rating on the variable 'institution's problem-solving ability' followed by eBlue and eRed. The staff who did not indicate their province rated the institution highest on problem-solving during the disruption period. The staff who did not state their role category rated highest on the institution's problem-solving ability during disruption, followed by academic and non-academic. The rating scores concerning the department seem visually not too significantly different. The scoring seems fairly similar for the number of years of experience in the institution.

4.9.2.5 Technology integration

The institution eGreen has the highest rating, with the rest having scores in the same range. The Group Support Services has the lowest rating, while the rest of the provinces are not significantly different from one another. Again, non-academic staff have a lower rating than the academic. Overall, the ratings are all high on the institution's technology integration. Also, ratings concerning years of experience seem to be fairly even.

4.9.2.6 Managing out crisis

The highest average rating is observed on eGreen. However, the institution has few staff members. The analysis of the role category shows that the two subcategories, 'academic' and 'non-academic' seem to have almost the same average rating. Departmental analysis shows higher variability in scores, with management and HR again recording high ratings. The staff subcategories 'other' and 'more than 11 years show higher ratings than others. The rest of the subcategories have fairly similar rating averages.

4.9.2.7 Institutional innovativeness

The entity White (eWhite) carries the highest average rating. All other entities (institutions) also have high average ratings (all above 3). The ratings tend to decrease with more experience except for the subcategory 'over 11 years. Nevertheless, there is a high variation in scores recorded concerning the department. Management ranks highest in average rating, followed by IT and sales and marketing (S&M), with the remaining departments also scoring high.

4.9.2.8 Management flexibility

The institutions eBlue and eWhite have higher average ratings than their counterparts. The data for eGreen and eWhite show less spread. All institutions have high average ratings. The academic role category has relatively higher average ratings than non-academic. When the data is analysed concerning the departments, the results indicate a high degree of variability, with management having the highest average rating. Also, S&M, HR and others have high average ratings. Group Support Services has the lowest

rating. The score ratings again decrease with the length of staff experience, except for the subcategories ‘9 -11 years’ and ‘over 11 years’.

4.9.2.9 Technological capacity

There is high variability in the means distribution (average of ratings) concerning technological capacity, institution and province. However, the averages of scores are generally high for all variables. eGreen has higher average ratings than other institutions. However, the high rating comes from one staff member who participated in the study from that particular institution. Entity black (eBlack), Red (eRed) and White (eWhite) also have high average ratings. The variability of the data in each institution is high.

Although not significantly higher than others, the Gauteng province and the group of staff who did not indicate their provinces have high average ratings. The category academic rated the institution’s technological capacity higher than the non-academic. Also, the group of staff members with unidentified work categories also has higher ratings than the non-academic. Management, IT and S&M reveal high average ratings, while Group Support Services has the lowest.

4.9.2.10 Contingency plan

eGreen has the greatest ratings average, significantly larger than in other entities. The other entities also have high ratings. The non-academic ranks above the academic in terms of rating the institution’s ability to devise an effective contingency plan during the period of disruption. Management, HR and S&M have much higher average ratings, while the Group Support Services have significantly lower average ratings. The data for the contingency plan rating concerning the years of experience in the institution has a rating average that is much closer to each other. Still, the data in each subgroup indicates a high degree of variability. All ratings are quite high except for the subgroup ‘9 to 11 years’ experience.

4.10 RELIABILITY STATISTICS

According to Leedy and Ormrod (2015) and Saunders *et al.* (2016), reliability in research refers to the extent to which data collection techniques generate reliable and consistent

results on a consistent basis. The study applied composite reliability (CR) and internal reliability measures. The internal consistency of scale items was evaluated using Cronbach's alpha coefficient, which measures internal reliability. Cronbach's alpha values of 0.6 and above indicate the effective measurement of the same construct across multiple queries (Saunders *et al.,* 2016). On the other hand, the CR measure evaluates the internal consistency and reliability of a latent construct. It provides further insight into the reliability of the measurement model used in the study.

Reliability and validity are two crucial aspects of precision in research. Reliability refers to the consistency and stability of measurements when repeated on the same subject. Researchers often calculate reliability coefficients to assess the reliability of a newly developed construct. A commonly accepted threshold for reliability is a coefficient of 0.60 or higher, indicating an "acceptable" level of consistency. Literature supports the importance of reliability in research, emphasising the need for reliable measurements to ensure accurate and credible results (Sürücü & Maslakci, 2020:2695). Researchers often employ various statistical methods, such as Cronbach's alpha or test-retest reliability, to evaluate the reliability of their measures (Hajjar, 2018:50). Table 4.16 presented below displays the Cronbach's alpha scores for each item included in the questionnaire, indicating the internal consistency of the measures.

Students:

	Section	Number of Items	Cronbach's Alpha
B13	Institution's competence	6	0.918
C17	Institution's capability and capacity	4	0.898
All items included		20	0.947

Staff:

	Section	Number of Items	Cronbach's Alpha
B13	Institution's competence	6	0.907
C17	Institution's capability and capacity	4	0.886
All items included		20	0.932

Table 4. 16: Cronbach’s alpha scores for the questionnaire

The reliability scores for all sections exceed the recommended Cronbach's alpha value. This value scale highlights high internal consistency for the student responses (Trizano-Hermosilla & Alvarado, 2016). This demonstrates an acceptable level of consistency in scoring for these sections of the research.

The Cronbach's alpha coefficient for this study was found to be 0.947 for students and 0.932 for staff, indicating a high level of internal consistency among the items in the scale (Hair *et al*., 2010). According to Hair *et al.* (2010), a Cronbach's alpha value of 0.60 is considered acceptable, 0.90 is considered traditional, and values above 0.95 are considered excellent. Therefore, the Cronbach's alpha value obtained in this study falls within the range of acceptable internal consistency. To assess convergent validity, a commonly accepted criterion is a value of 0.6 or higher (Hair *et al*., 2010; Trizano-Hermosilla & Alvarado, 2016). In this study, the convergent validity was found to meet this criterion, indicating that the items in the scale are measuring the same construct effectively.

4.10.1 Factor Analysis

By using factor analysis, the study gained insights into the key factors influencing students' experiences during disruptive events. This understanding allowed for the development of targeted strategies and interventions to address specific factors and mitigate the negative impact of disruptions on students' academic progress and wellbeing. In this study, the survey comprised a series of questions addressing various facets of disruption, including academic challenges, technological issues, social and emotional impact, and institutional support. These responses were then subjected to a factor analysis.

The variables served as the unit of analysis for factor analysis in this study. In particular, R factor analysis was used to show the underlying structure of the relationships between the variables. This type of factor analysis investigates the correlation matrix of the variables in an effort to identify latent dimensions that account for their shared variance (Hair *et al.,* 2010).

The primary result of factor analysis is data summarization, which entails deriving these underlying dimensions that can be interpreted to characterise the data using fewer concepts than the original number of variables. This enables the researcher to evaluate the variables' collective representation rather than their individual characteristics. By summarising the data, valuable insights are obtained regarding the relationships between variables and the number of variables anticipated to have a significant impact on the analysis. This structured method provides a clearer comprehension of the interrelationships between variables and facilitates the identification of the phenomenon's driving factors.

To ensure the suitability of the variables for factor analysis, careful consideration was given to their conceptual relevance before incorporating them into the survey instrument. Additionally, a pilot study was conducted to validate the appropriateness of the variables. In addition, a pilot study was conducted to validate the variables' applicability. The variables were re-evaluated for their suitability in the factor analysis as their contribution to the measurement model was found to be limited. Therefore, their inclusion in the analysis was reassessed. This iterative process assisted in refining the selection of variables and bolstering the reliability of the factor analysis.

The table presented below provides a summary of the **KMO (Kaiser-Meyer-Olkin)** and **Bartlett's Test** results, which assess the suitability of the data for detecting underlying structure. The KMO measure indicates the extent to which the variables contribute to the identification of underlying factors, with higher values (close to 1.0) suggesting that a factor analysis would be appropriate. Values below 0.50 indicate that the results of the factor analysis may not be meaningful or useful.

Bartlett's test of sphericity examines whether the correlation matrix represents an identity matrix, indicating that the variables are unrelated and not suitable for factor analysis. A small p-value (less than 0.05) suggests that a factor analysis would be appropriate with the given data. In this study, factor analysis was conducted specifically

for the Likert scale items. The resulting components were further divided into more specific components, as illustrated in the rotated component matrix.

		Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
	Section		Approx. χ^2	df	Sig.
B13	Institution's competence	0.918	1126.194	15	< 0.001
C17	Institution's capability and capacity	0.812	819.606	6	< 0.001

Table 4. 17: KMO and Bartlett's Test

Factor analysis was deemed appropriate in this study as all the necessary conditions were met. The Kaiser-Meyer-Olkin (KMO) measure, with a value greater than 0.500, indicated that the data was highly suitable for factor analysis. Similarly, Bartlett's test revealed a highly significant χ^2 value (p-value < 0.01), indicating the presence of non-zero correlations among the variables. These findings further supported the suitability of the data for conducting factor analysis (Hair *et al.*, 2010). These results provide strong evidence for the applicability of factor analysis to the dataset and support its use in identifying underlying dimensions and relationships among the variables.

Rotated Component Matrix

B13	Component
	1
Problem solving	0.879
Technology integration in support of smooth learning	0.792
Managing out the crisis	0.855
Structure and policy formulation	0.846
Innovativeness	0.860
Other	0.830

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

C17	Component
	1
Technology	0.818
Support	0.927
Staff competence	0.856
Contingency plan	0.902

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table 4. 18: Rotated Component Matrix

The statements in sections B13 and C17 exhibited a strong loading on a single component in the factor analysis. This suggests that these statements effectively captured and measured the intended constructs without any ambiguity or overlap.

4.11 STRUCTURAL EQUATION MODEL (SEM)

Following the recommendation of Kothari (2004), the convergent validity of the measurement model was determined by evaluating the construct reliability and standardised factor loadings of the observed variables. To assess the fit between the final measurement model and the structural model, several fit indices were calculated using Byrne's (2016) suggested cut off values.

4.11.1 Student & staff SEM

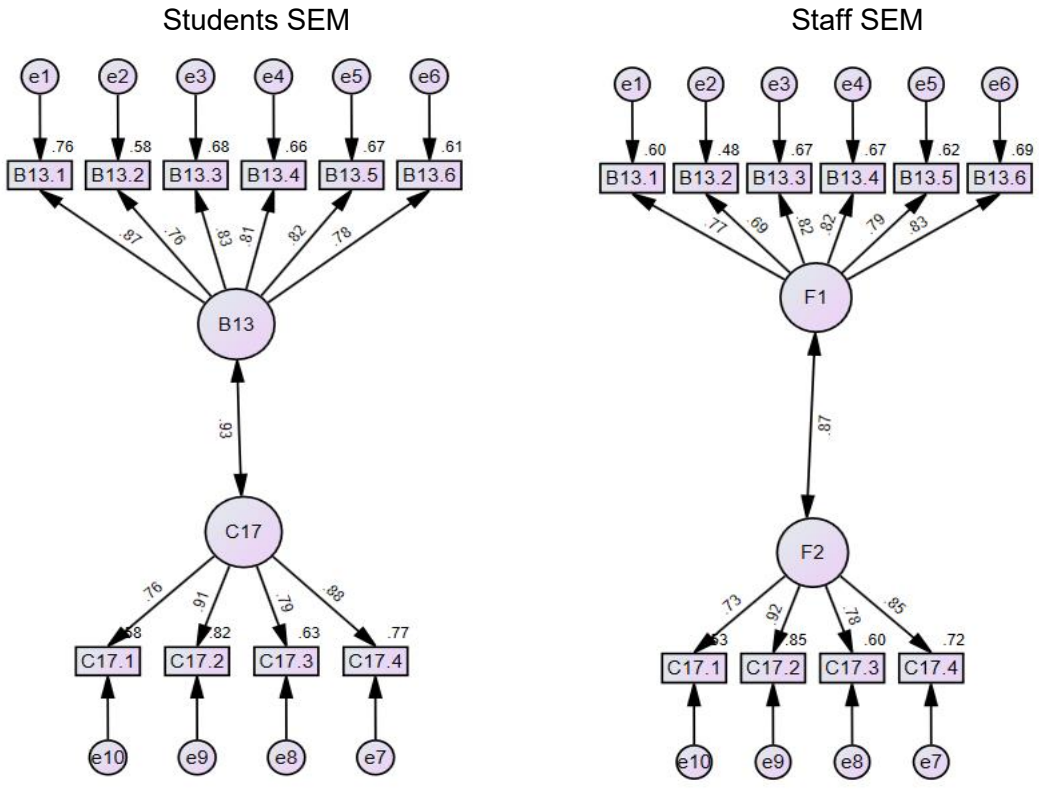


Figure 4.14: Structural equation model – Student and Staff

The path diagram illustrates the modified structural equation model (SEM) employed in this study. This model uses factor analysis and multiple regression analysis techniques to examine the relationships between observed variables and latent constructs. It provides a multivariate statistical analysis of the structural relationships within the research framework. The dimensions are categorised and represented in accordance with their reliability measures.

The initial analysis of the SEM for the student group revealed a minimum result, indicating that the model fits the data well. The χ^2 value was 106.605 with 34 degrees of freedom, resulting in a probability level of .000, indicating statistical significance. Similarly, for the staff group, the default model also achieved a minimum result with a χ^2 value of 147.587 and 34 degrees of freedom, resulting in a probability level of .000. These findings suggest that the initial models adequately represent the relationships among the latent variables. However, further model refinement and analysis are necessary to ensure the accuracy and reliability of the measurement model and the underlying constructs. This iterative process aligns with the principles of SEM and allows for the continual improvement and validation of the research model (Boomsma, Hoyle & Panter, 2012).

This χ^2 test examines the null hypothesis that an overidentified (reduced) model matches the data as well as a just-identified (complete, saturated) model. There is a direct path (not via an intervening variable) from each variable to each other variable in a recently identified model. In such a model, the χ^2 value will always be zero, as the fit will always be flawless. The probability should not be statistically significant. The χ^2 p-value for this model is < 0.050 ($p = 0.005$). Notably, despite the fact that technically the χ^2 should be non-significant in model testing, it is difficult to attain a non-significant χ^2 value in practise due to sample size requirements. Therefore, if the χ^2 is significant, it is not necessarily problematic if other indicators of fit are satisfactory.

			Estimate
B13.1	<---	B13	.872
B13.2	<---	B13	.759
B13.3	<---	B13	.827
B13.4	<---	B13	.812
B13.5	<---	B13	.818
B13.6	<---	B13	.779
C17.4	<---	C17	.879
C17.3	<---	C17	.793
C17.2	<---	C17	.906
C17.1	<---	C17	.761

Table 4. 19: Standardized Regression Weights (Default model students)

			Estimate	S.E.	C.R.	P	Label
B13.1	<---	F1	1.000				
B13.2	<---	F1	.962	.079	12.168	***	par_1
B13.3	<---	F1	1.106	.074	14.868	***	par_2
B13.4	<---	F1	1.104	.075	14.770	***	par_3
B13.5	<---	F1	1.060	.075	14.191	***	par_4
B13.6	<---	F1	1.073	.079	13.648	***	par_5
C17.4	<---	F2	1.000				
C17.3	<---	F2	.864	.058	15.000	***	par_6
C17.2	<---	F2	1.137	.058	19.515	***	par_7
C17.1	<---	F2	.934	.068	13.669	***	par_8

Table 4. 20: Maximum Likelihood Estimates

Regression Weights (Default model staff)

The variables demonstrated strong loadings on their respective factors, as indicated by the significant p-values (*** p < 0.001). These findings validate the results obtained from the Exploratory Factor Analysis (EFA) conducted earlier.

			Estimate
B13.1	<---	F1	.774
B13.2	<---	F1	.695
B13.3	<---	F1	.821
B13.4	<---	F1	.817
B13.5	<---	F1	.790
B13.6	<---	F1	.828
C17.4	<---	F2	.847
C17.3	<---	F2	.776
C17.2	<---	F2	.920
C17.1	<---	F2	.728

Table 4. 21: Standardised Regression Weights (Default model staff)

The parameters in the model were estimated using maximum likelihood (ML) methods, which involve an iterative procedure aimed at maximizing the likelihood of accurately predicting the criterion variable. All the coefficients in the model exceeded the recommended threshold of 0.600.

The assessment standards for the structural equation model (SEM) used in this research consist of a number of critical fit indices. The specific values of these indices, which are important for evaluating the model's accuracy and the hypothesis's outcomes, are listed below.

Students SEM:

- Chi-square (χ^2): 106.605
- Degrees of Freedom (DF): 34

- p-value: 0.000
- CMIN/DF (Relative Chi-square): 3.135
- Goodness of Fit Index (GFI): 0.91
- Root Mean Square Error of Approximation (RMSEA): 0.079
- Comparative Fit Index (CFI): 0.971
- Tucker-Lewis Index (TLI): 0.954
- Normed Fit Index (NFI): 0.959
- Root Mean Residual (RMR): 0.037

Staff SEM:

- Chi-square (χ^2): 147.587
- Degrees of Freedom (DF): 34
- p-value: 0.000
- CMIN/DF (Relative Chi-square): 4.341
- Goodness of Fit Index (GFI): 0.88
- Root Mean Square Error of Approximation (RMSEA): 0.107
- Comparative Fit Index (CFI): 0.939
- Tucker-Lewis Index (TLI): 0.902
- Normed Fit Index (NFI): 0.924
- Root Mean Residual (RMR): 0.054

These measures show how well the model fits the data and how well the observed data aligns with the expected data based on the proposed theory. For example, if the CFI and TLI are both above 0.90 and the RMSEA is below 0.08, it indicates that the model has a good fit, even if the Chi-square value is significant due to the large sample size.

4.12 ABSOLUTE FIT MEASURES

4.12.1 Absolute measures

Model Fit Summary

The relative χ^2 (CMIN/DF) value should ideally be below 5 to minimize reliance on sample size. Additionally, the cut-off range for indices such as TLI, CFI, NFI, and IFI is between zero and one. A favourable model is indicated by an RMSEA value of 0.05 or lower.

CMIN - Students

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	31	106.605	34	.000	3.135
Saturated model	65	.000	0		
Independence model	10	2601.685	55	.000	47.303

CMIN - Staff

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	31	147.587	34	.000	4.341
Saturated model	65	.000	0		
Independence model	10	1930.491	55	.000	35.100

Table 4. 22: CMIN/DF results

The CMIN statistic juxtaposes the tested model and the independence model to the saturated model using χ^2. The relative χ^2, CMIN/DF, indicates the degree to which the fit of the data to the model is diminished when specific trajectories are eliminated. In the case of students, the CMIN/DF value (3.135) is lower than the acceptable threshold of 5, indicating a favourable match. Similarly, the CMIN/DF value for personnel (4.341) is below the acceptable threshold of 5, meeting the CMIN criterion.

Baseline Comparisons - Students

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.959	.934	.972	.954	.971
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Baseline Comparisons - Staff

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.924	.876	.940	.902	.939
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 4. 23: Baseline comparisons

This goodness of fit indices compares the model to the independence model as opposed to the saturated model. The Normed Fit Index (NFI) is determined by dividing the difference between the χ^2 of the two models by the χ^2 for the independence model. The NFI for student data is 0.959, and the NFI for staff data is 0.924, which exceeds the recommended value of 0.90 for a satisfactory fit. The Comparative Fit Index (CFI) employs a similar method (with a noncentral χ^2) and is deemed suitable for use with limited sample sizes. Similar to the NFI, it spans from 0 to 1, and 0.90 indicates a good fit. The CFI values of 0.97 (students) and 0.93 (faculty) indicate a favourable match.

- **RMSEA**

In SEM the root-mean-square error of approximation (RMSEA) is a prominent goodness-of-fit (GOF) metric. The RMSEA provides a more accurate evaluation of model fit than the χ^2 statistic because it takes into account the population, which can influence the χ^2 statistic (Schumacker & Lomax, 2010). It is a more accurate measure of a model's population fit because it does not rely solely on sample estimates (Hair *et al*., 2010).

Below is how the RMSEA is computed:

$$\text{RMSEA} = \sqrt{\left(\chi^2_{\text{model}} - df_{\text{model}}\right) \Big/ \left(N-1\right) df_{\text{model}}}$$

STUDENT RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.079	.063	.097	.003
Independence model	.370	.358	.382	.000

STAFF RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.107	.090	.125	.000
Independence model	.343	.330	.356	.000

Table 4. 24: RMSEA

The Root Mean Square Error of Approximation (RMSEA) is a measure of model misfit compared to a saturated model. A RMSEA between 0.05 and 0.08 indicates an adequate fit. A RMSEA of 0.050 or less indicates a decent fit. LO 90 and HI 90 are the lower and upper limits of an interval of 90% confidence for this estimate. The model fits adequately, with the PCLOSE value (0.003) being statistically significant.

According to Hair *et al*. (2010), RMSEA values between 0.05 and 0.10 are considered to indicate a moderate fit for the model. In this study, the calculated RMSEA values were 0.079 (students) and 0.10 (staff), falling within the specified range. Therefore, based on the literature, it can be concluded that the model exhibited a respectable level of fit.

- **Regression Analysis**

The significance level is proportional to the quality of the relationships. The correlations are evaluated in the table below.

Covariances: (Group number 1 - Default model, Students)

	Estimate	S.E.	C.R.	P	Label
C17 <--> B13	.814	.075	10.793	***	par_9

Covariances: (Group number 1 - Default model, Staff)

	Estimate	S.E.	C.R.	P	Label
F2 <--> F1	.493	.056	8.889	***	par_9

Table 4. 25: Co-variances

- **PCLOSE**

The p-value of close fit (PCLOSE) represents the statistical significance associated with testing the null hypothesis (H0) that the RMSEA value is less than 0.05:

H0: RMSEA < 0.05

against the alternative hypothesis (H1) that the RMSEA value is greater than 0.05:

H1: RMSEA > 0.05.

The obtained PCLOSE values for the initial model were 0.003 (students) and 0.000 (staff), which deviated from the Kline (2011) recommended threshold of 0.05. According to Kline's recommendation, a PCLOSE value greater than 0.05 indicates a closer fit for the model. However, the obtained PCLOSE values in this study were significantly smaller, suggesting that the model's fit was not as close as desired.

If the PCLOSE value is greater than 0.05, it implies that there is no statistically significant difference from a close fit. This suggests that the model fits the data well. On the other hand, if the PCLOSE value is lower than 0.05, it suggests that the model's fit is not satisfactory, indicating that the RMSEA is much higher than 0.05.

The PCLOSE values obtained in this study were 0.003 for students and 0.000 for staff, which are significantly below the suggested threshold of 0.05. These findings indicate that the models for both students and staff do not meet the acceptable degree of "close fit" as described by Browne and Cudeck (1993).

The significance of low PCLOSE values

The small PCLOSE values have many significant implications for the model fit assessment:

The low PCLOSE values suggest that the RMSEA values exceed the 0.05 threshold. This suggests a discrepancy between the model and the observed data, indicating that the model does not accurately represent the data's underlying structure.

Model revision required: Due to the substantial divergence from the planned threshold, it is imperative to reassess and possibly modify the model. This may entail reassessing the

designated routes, incorporating or eliminating variables, or investigating alternate model frameworks to more accurately align with the data.

Assessment of additional fit indices: Although PCLOSE is a useful measure, it should not be the exclusive factor for determining model adequacy. It is important to also take into account other fit indices such as CMIN/DF, NFI, TLI, and CFI. Despite the low PCLOSE values, the NFI, TLI, and CFI indices for students (0.959, 0.954, and 0.971, respectively) and staff (0.924, 0.902, and 0.939, respectively) indicate a relatively strong fit of the model. This implies that we should maintain the model's notable strengths while addressing its weaknesses.

When analyzing data, consider its complexity and nature. Factors such as sample size, measurement errors, and inherent variability in the data can influence the RMSEA and PCLOSE values. It is important to analyse these numbers in relation to the overall objectives of the study and the specific qualities of the data. This aspect was considered, and the structural relationships among variables were revised. This iterative process of modifying the model assisted in improving its fit.

- **Hoelter**

The Hoelter test, also known as the Hoelter index, is a statistical test used to determine the minimum sample size required for a given level of statistical power in SEM. It helps researchers assess whether their sample size is sufficient to detect meaningful relationships among variables. The Hoelter index is based on the critical ratio of the standardized coefficient estimates, and it determines the sample size at which a given coefficient becomes statistically significant. The formula for calculating the Hoelter index is:

$$\text{Hoelter index} = (Z * \text{sqrt}(N)) / |b|$$

where Z is the critical value of the standardized coefficient estimates, N is the sample size, and |b| is the absolute value of the path coefficient.

We used the Hoelter index in this study to assess the adequacy of the sample size. A Hoelter index of 0.05 suggests a minimum sample size of 155 to achieve a statistical power of 0.05, while a Hoelter index of 0.01 suggests a minimum sample size of 178 for a statistical power of 0.01.

The findings imply that the sample size used in the study exceeds the minimum requirement for achieving the desired level of statistical power. A Hoelter index of 155 for a desired statistical power of 0.05 and 178 for a desired statistical power of 0.01 shows that the sample sizes are good enough to find significant relationships at these levels of significance. This provides greater confidence in the reliability and generalizability of the study's findings.

Limitations of the model

Although SEM and fit indices provide statistical insights, they have limitations. The Hoelter index assesses sample size adequacy, but it has limitations and assumptions. Understanding these will help researchers make informed decisions and interpret results. Applying SEM and fit indices requires caution. Considering all factors and alternative methods can enhance the reliability of statistical analysis findings.

a) **Assumption of normality**: The Hoelter index presumes that the data follows a normal distribution. Deviations from normality can affect the accuracy of the index, potentially leading to incorrect conclusions about sample size adequacy. The SEM relies on the assumption that the data is distributed normally. However, the results of the Kolmogorov-Smirnov test showed that this assumption was not fulfilled, which could impact the accuracy of the SEM results.

b) **Fixed path coefficients**: The index calculation relies on fixed path coefficients, which means it does not account for the variability in the estimates. This can be a limitation when the path coefficients are not stable across different samples or conditions.

c) **Single model context:** The Hoelter index does not take into account model complexity or the presence of multiple models within a study**.** As a result, it may not provide a comprehensive assessment of sample size adequacy for studies involving complex model structures.

d) **Sensitivity to sample size**: Although the Hoelter index helps determine the minimum sample size, it may be sensitive to the actual sample size used in the study. Small changes in sample size can have a significant impact on the index value, making it less robust for studies with varying sample sizes. The Chi-square test in SEM is influenced by sample size and can be particularly sensitive in large samples. This means that even small deviations from the model can produce significant Chi-square values, indicating a poor fit despite other fit indices suggesting otherwise.

e) **Overestimation risk**: In some cases, the Hoelter index may overestimate the required sample size, leading researchers to believe that a larger sample is necessary when a smaller sample could suffice. This can result in unnecessary resource expenditures.

f) **Model complexity:** Structural equation modeling (SEM) can be difficult to interpret and handle when there are numerous observed and latent variables involved, leading to complexity. The risk of overfitting is also present, meaning that the model may fit the sample data closely but may not be able to accurately predict or represent other datasets.

g) **Multicollinearity**: Even though the VIF and tolerance values showed that there is no significant multicollinearity, the presence of multicollinearity can still cause the standard errors of coefficients to increase, resulting in less accurate estimates.

h) **Measurement error:** SEM relies on the assumption that the measurement errors are not correlated with each other. If this assumption is violated, it can result in estimates that are not accurate.

i) **Model specification**: Providing the wrong specifications for the model, like leaving out important variables or adding unnecessary ones, can result in inaccurate findings. Even though refining the model through an iterative process can help, it does not completely remove this risk.

The findings in this study indicate that the sample sizes exceed the minimum requirement for achieving the desired levels of statistical power (0.05 and 0.01). This enhances the reliability and generalizability of the results. With a larger sample, researchers can have

greater confidence in the reliability and generalisability of their findings. It is important to note that a larger sample size enhances the ability to detect significant relationships and increases the precision of the estimated coefficients in SEM.

4.12.2 Incremental fit indices

Incremental fit indices play a crucial role in comparing the fit of a specified model to a baseline model, often a null model with no assumed correlations among observed indicators (Hair *et al.,* 2010). Unlike absolute fit indices that assess model fit independently, incremental fit indices gauge the extent to which a model improves when incorporating correlated constructs and multiple items. They offer insights into how much better the specified model fits compared to the baseline model.

These indices serve as valuable tools for researchers in evaluating whether the inclusion of correlated constructs and multiple items enhances the fit of their specified model. By comparing the fit indices of the specified model with those of the baseline model, researchers can assess the degree to which their model captures the relationships among observed variables. This enables them to make informed judgments about the appropriateness and explanatory power of the specified model.

- **NFI**

As explained by Schumacker and Lomax (2010), the normed fit index (NFI) is a modification of the χ^2 statistic into a scale from 0 (no fit) to 1 (perfect fit). The null model is used as a standard against which a limited model and an all-inclusive model can be compared:

$$NFI = (X^2_{null} – X^2_{model})/ X_{2null}$$

The NFI (Normed Fit Index) values of 0.924 for staff and 0.959 for students indicate a good fit for the model. Citing Hair *et al*. (2010), a benchmark value of 0.90 is typically used to assess model fit, and values above this threshold are considered indicative of a good model fit.

- **CFI**

The Comparative Fit Index (CFI) was devised to address the limitations of the Normal Fit Index (NFI) in nested models, as per Schumacker and Lomax (2010). CFI integrates a population parameter and distribution, such as a population comparative fit index, for evaluating the comparative fit of stratified models. The concept of comparative fit entails a hierarchy of models, from the least restrictive model (Mi) to the most restrictive model (Ms). There are distinct model-fitting statistics and degrees of freedom for each model in this sequence. The CFI assesses the improvement in noncentrality resulting from the transition from model Mi to model Mk.

Comparative fit is defined as the ratio between incremental model fit and incremental model fit for the least restrictive model. It indicates the degree to which the theoretical model improves the fit of the least restrictive model, taking into consideration the differences in degrees of freedom and model-fit statistics among the nested models. Using the CFI, researchers can evaluate the relative improvement in fit between the theoretical model and the least restrictive model. This allows for a more thorough evaluation of the model's suitability and its ability to represent the underlying data relationships. Comparative fit is defined as:

$$(\lambda_i - \lambda_k)/\lambda_i \text{ , with } \lambda_k = \chi_k^2 - df_k$$

Where λ_k the difference between the chi-square statistic and its degrees of freedom is the noncentrality coefficient of the noncentral chi-square (dk) distribution.

$$\text{CFI} = 1 - (\lambda_i - \lambda_k)/\lambda_i .$$

The CFI (Comparative Fit Index) values of 0.939 for staff and 0.971 for students indicate a good fit for the model. A CFI value of 0.90 is considered standard, and values above this threshold are generally desirable (Hair *et al.,* 2010).

- **RFI**

The Relative Fit Index (RFI) is a measure that compares the fit of the proposed model to that of the null model by utilizing the χ^2 statistics. The RFI value is calculated based on the differences between these two models. According to Hair et al. (2010), the recommended threshold for the RFI is 0.90, indicating an acceptable level of fit.

In this study, the RFI value for the students' model is 0.934, which surpasses the recommended threshold, suggesting a satisfactory fit. However, the RFI value for the staff model is 0.876, slightly below the threshold, indicating that the model does not achieve the desired level of relative fit. This discrepancy necessitated consideration of model modifications to improve the fit.

The focus is on addressing the limitations of RFI below the threshold.

The RFI value of 0.876 for the staff model, which is below the recommended threshold of 0.90, indicates that the model does not fit the data as well as expected. We conducted a detailed evaluation of the model's structure and relationships to address this limitation.

Key steps in this process included:

a) **Identifying misfitting paths**: Examining the standardised residuals and modification indices to identify specific paths or relationships that contributed to the poor fit.
b) **Reevaluating relationships**: Reassessing the theoretical justification for each path to ensure that all included relationships are theoretically sound and empirically supported.
c) **Modifying model structure:** Making changes to the model, such as adding or removing paths, to better capture the data's underlying structure.

Model refinement process

The initial fit indices indicated areas where the model did not align well with the observed data, prompting a refinement process to enhance the model's overall fit. This process involved several steps:

a) **Looking at modification indices:** Modification indices (MIs) showed how the model could be made better by suggesting changes that would greatly lower the χ2\chi^2χ2 value**.** Paths with high MIs were considered for addition or adjustment.
b) **Iterative testing**: The model was iteratively tested and refined. We added, removed, or modified paths in each iteration based on their theoretical relevance and statistical significance. We re-evaluated the fit indices after each iteration to assess improvements.
c) **Theoretical consistency:** We maintained theoretical consistency throughout the refinement process to make sure that modifications were not just data-driven but also supported by the underlying theory.
d) **Re-specification of relationships:** We redefined specific relationships among variables in the staff model. For instance, we reconsidered paths that showed weak or non-significant relationships, and added new paths suggested by the theoretical framework and modification indices.
e) **Evaluation of the final model:** We evaluated the final model using the same fit indices, including RFI, to confirm that the modifications significantly improved the model fit. We reassessed the final RFI value to ensure it either met or approached the recommended threshold.

- **TLI**

One way to evaluate competing hypotheses is through the Tucker-Lewis index (TLI index), which compares the proposed model to the null hypothesis. The range is from 0 (no fit) to 1 (excellent fit). Following is the formula for calculating the TLI with the chi-square statistic (Schumacker & Lomax, 2010):

$$\text{TLI} = \left[\left(\chi^2_{\text{null}}/df_{\text{null}}\right) - \left(\chi^2_{\text{model}}/df_{\text{model}}\right)\right] \Big/ \left[\left(\chi^2_{\text{null}}/df_{\text{null}}\right) - 1\right]$$

A TLI (Tucker-Lewis Index) value of 0.954 for students and 0.902 for staff indicates a satisfactory level of fit for the model. The guideline value of 0.90, as suggested by Hair *et al.* (2010), is commonly used to determine a good value for the TLI.

- **IFI**

The incremental fit index (IFI) is yet another incremental fit measure. Model fit can also be evaluated with the IFI. It is determined by dividing the difference between the null and alternative χ^2 values by the difference between the null and alternative degrees of freedom:

$$\text{IFI} = \left(\chi^2_{\text{null}} - \chi^2_{\text{model}}\right) \Big/ \left(\chi^2_{\text{null}} - df_{\text{model}}\right)$$

An IFI (Incremental Fit Index) value of 0.97 for students and 0.94 for staff indicates a good fit for the model. These values are above the guideline of 0.90, which is commonly used to determine a satisfactory level of fit.

4.12.3 Chi-square statistics

This section explains the two χ^2 statistics used as GOF measurements.

- χ^2 statistics

The χ^2 test is used in structural equation modelling to see how well the observed data and the estimated model fit together. The acceptability of a χ^2 value depends on several factors, including the degrees of freedom, the significance level, and the fit indices associated with the model.

In this study, the χ^2 value is 147.587 with 34 degrees of freedom, resulting in a very low probability level of 0.000. This indicates that the observed data deviates significantly from the estimated model. Typically, a non-significant χ^2 value ($p > 0.05$) suggests a good fit, but in this case, the χ^2 value is statistically significant.

However, the χ^2 test is famously sensitive to sample size and larger sample sizes tend to produce significant χ^2 values even with minor discrepancies between the model and the data. Therefore, relying solely on the χ^2 value may not provide a complete assessment of model fit.

To obtain a more comprehensive evaluation, it is recommended to consider other fit indices such as the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA).

In this study, the CFI values for both staff (0.939) and students (0.971) indicate reasonably good fit, as values above 0.90 are considered acceptable. The TLI values for staff (0.902) and students (0.954) also suggest a relatively good fit, with values above 0.90 indicating satisfactory fit. The RMSEA values for staff (0.107) and students (0.079) fall within the moderate range, where values between 0.05 and 0.10 are considered acceptable.

Considering the combination of these fit indices, it appears that while the χ^2 test indicates a lack of perfect fit, the other fit indices suggest a reasonably acceptable fit for the model. It is important to interpret these fit indices collectively rather than relying solely on the χ^2 value.

4.12.4 Parsimony fit indices

Schumacker and Lomax (2010) explain how the fit indices can be used to compare the relative merits of competing or comparable models in order to pick the best one. These indices take into account the parsimony ratio, which is the number of degrees of freedom that are accessible divided by the number of degrees of freedom that a model employ.

In the case of students, the PRATIO (parsimony ratio) was 0.618, indicating that the model used a moderate number of degrees of freedom relative to the total available. The PCFI (parsimonious comparative fit index) was 0.601, suggesting an acceptable level of fit for the model. For staff, the PRATIO was also 0.618, implying a similar balance

between the degrees of freedom used and available. The PCFI was 0.581, indicating a slightly lower level of fit compared to the students' model.

The key GOF data are summarised below. Each statistic from the sample data, as reported by SPSS, is presented alongside the recommended threshold and the observed value.

The initial model's goodness of fit statistics is summarised below:
CMIN/DF

- **Acceptable fit**: A CMIN/DF value between 1 and 5 is generally considered acceptable (Wheaton et al., 1977).
- **Good fit**: A CMIN/DF value closer to 1 indicates a better fit.
- **Study results**: The observed values for both students (3.135) and staff (4.341) indicate a good fit, as they are below the acceptable benchmark of 5.

RMSEA:

- **Acceptable fit**: RMSEA values between 0.05 and 0.08 indicate an adequate fit (Browne & Cudeck, 1993).
- **Good fit**: RMSEA values below 0.05 indicate a close fit.
- **Study results**: The observed values for students (0.079) and staff (0.107) suggest a good fit and a moderate fit, respectively. A value of 0.05 or lower is considered good.

PCLOSE:

- **Acceptable fit**: A PCLOSE value greater than 0.05 indicates a close fit (Kline, 2011).
- Study results: Both students (> 0.003) and staff (> 0.000) achieved p-values greater than 0.05, indicating a good fit.

NFI:

- **Acceptable fit:** NFI values above 0.90 are considered indicative of an acceptable fit (Aksu et al.2022)
- **Good fit**: NFI values closer to 1 indicate a better fit.
- **Study results**: The observed values for both students (> 0.959) and staff (> 0.924) surpass the benchmark of 0.90, indicating a good fit.

CFI:

- **Acceptable Fit**: CFI values above 0.90 are generally considered acceptable (Bentler, 1990).
- **Good Fit**: CFI values closer to 1 indicate a better fit
- **Study results:** The observed values for both students (> 0.971) and staff (> 0.939) indicate a great fit, surpassing the thresholds of 0.80, 0.90, and 0.95 for sometimes permissible, traditional, and great fits, respectively.

RFI:

- **Acceptable Fit**: RFI values above 0.90 are generally considered acceptable (Sathyanarayana & Mohanasundaram, 2024).
- **Study results:** The observed values for both students (> 0.934) and staff (> 0.876) suggest a good fit, exceeding the benchmark of 0.90.

TLI:

- **Acceptable fit**: TLI values above 0.90 indicate an acceptable fit (Tucker & Lewis, 1973).
- **Good fit**: TLI values closer to 1 indicate a better fit.
- **Study results:** The observed values for both students (> 0.954) and staff (> 0.902) indicate a good fit, surpassing the threshold of 0.90.

IFI

- **Acceptable fit**: IFI values above 0.90 are considered indicative of a good fit (Sathyanarayana & Mohanasundaram, 2024).
- **Good fit**: IFI values closer to 1 indicate a better fit
- **Study results**: The observed values for both students (> 0.972) and staff (> 0.940) suggest a good fit, surpassing the benchmark of 0.90.

Hoelter Index

- **Acceptable fit**: A Hoelter index indicating a minimum sample size of 200 or more is typically desired for adequate power (Venkatesan, 2024).
- **Study results**: The study's Hoelter index values suggest that the sample sizes exceed the minimum requirement for achieving the desired level of statistical power.

Based on these observations, the initial model demonstrates a favourable fit across various goodness of fit statistics (Hair *et al.*, 2010 & Kline, 2011).

4.13 CORRELATIONS

The findings of a bivariate correlation analysis of the ordinal data are provided in Appendix 3. The results show several patterns in the interrelationships of the variables. Those that are positive represent a proportional relationship, whereas those that are negative represent an inverse one. Significance levels are denoted by * or **. It is important to note that the literature supports the use of bivariate correlation analysis to explore relationships between variables and provide insights into their associations (Pallant, 2020).

(Group number 1 - Default model, Students)

	Estimate
C17 <--> B13	.928

(Group number 1 - Default model, Staff)

	Estimate
F2 <--> F1	.874

Table 4. 26: Correlations

Null hypothesis: There is no correlation between the dimensions.
Alternative hypothesis: There is a significant correlation.

In general, when the covariance between two constructs is significant, the correlations between them should also be significant since correlation is a standardised form of covariance, representing the strength and direction of the relationship. All relationships in the study were found to be significant ($p < 0.001$). The results demonstrate a strong, positive relationship between the latent variables, as indicated by the positive r estimates.

In correlation analysis, a correlation coefficient ranges from -1 to +1. A positive correlation value (between 0 and +1) indicates a direct or positive relationship, meaning that as one variable increases, the other variable also tends to increase. In the context of disruption management and higher education institutions in crisis, this could suggest that as one variable increases (e.g., the level of management innovativeness), the other variable (e.g., the level of support received during the disruption period) also tends to increase. This interpretation suggests that institutions with higher levels of management innovativeness may be more likely to provide adequate support during disruptive events.

For example, the correlation value between "Did you get adequate support during the disruption period?" and "Kindly rate your institution's or institutional management's innovativeness" is 0.592. This is directly related to proportionality. Respondents indicate that the greater the level of management innovativeness, the greater the level of support would be, and vice versa.

		Student	Staff
Adequacy of support	Correlation coefficient	0.685**	0.548**
	Sig (2tailed)	0.000	0.000
	N	335	288
Guide or policy effectiveness	Correlation coefficient	0.583**	0.403**
	Sig (2tailed)	0.000	0.000
	N	335	285
Institutional innovativeness	Correlation coefficient	0.592**	0.423**

	Sig (2tailed)	0.000	0.000
	N	332	265
Contingency plan	Correlation coefficient	0.685**	0.575**
	Sig (2tailed)	0.000	0.000
	N	309	263
Technology integration	Correlation coefficient	0.637**	0.492**
	Sig (2tailed)	0.000	0.000
	N	320	284

*Students: **. Correlation is significant at the 0.01 level (2-tailed).*

*Staff: **. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Table 4. 27: Correlation of students' and staff values

Source: Researcher's field study result (2022)

The Spearman's rank correlation test, which is a non-parametric statistical method, was used to analyse the strength and direction of the relationship between variables using SPSS software. It is particularly useful when dealing with ordinal or non-normally distributed data. The test measures the monotonic association between variables, allowing researchers to assess if changes in one variable are consistently associated with changes in another variable.

In this study, the Spearman's test was used to provide insights into the relationships among various factors. It was used to examine the correlation between different dimensions or variables related to disruption management, crisis response, and organisational resilience. By analysing the correlation coefficients, researchers can identify patterns and understand the strength and direction of relationships. The test was used to explore the relationship between different dimensions or variables related to disruption management strategies, organisational preparedness, and adaptability. By examining the correlation coefficients, the study identified which strategies or factors are positively or negatively associated with each other. This information can inform decision-making processes and guide the development of disruption management framework for managing disruptions in HEIs. It is important to note that while the Spearman's test provides valuable insights into the relationships between variables, it does not imply causation.

The R factor analysis was used to uncover the inherent structure of relationships among the variables. This type of factor analysis is used to examine the correlations between a set of variables and uncover latent or underlying dimensions. The analysis, based on the correlation matrix of the variables, revealed positive and significant relationships among them, as depicted in Table 4.27 (Hair *et al*., 2010).

The analysis of correlations between various factors related to disruption management in HEIs reveals interesting findings. For students, there is a moderate and statistically significant positive relationship between the adequacy of support and their overall experience during disruptions ($r = 0.685^{**}$, $p < 0.01$). Similarly, for staff, a moderate positive correlation is observed between these variables ($r = 0.548^{**}$, $p < 0.01$). This suggests that when adequate support is provided, the overall experience of students and staff during disruptions tends to be more positive.

Another important finding is the positive correlation between guideline or policy effectiveness and the adequacy of support during disruptions. This relationship is significant for both students ($r = 0.583^{**}$, $p < 0.01$) and staff ($r = 0.403^{**}$, $p < 0.01$). This implies that when the institution's guidelines and policies are effective, they contribute to the provision of adequate support during disruptive events. Furthermore, the correlation between institutional innovativeness and the adequacy of support is also positive and significant for students ($r = 0.592^{**}$, $p < 0.01$) and staff ($r = 0.423^{**}$, $p < 0.01$). This indicates that institutions that exhibit a higher degree of innovativeness are more likely to provide sufficient support to their stakeholders during disruptions.

The correlation between technology integration and problem solving is positive and significant for students ($r = 0.637^{**}$, $p < 0.01$) and staff ($r = 0.492^{**}$, $p < 0.01$). This implies that integrating technology into the institution's problem-solving processes contributes to a better response to disruptions. These findings align with previous literature in the fields of disruption management and HEIs. For example, research has emphasised the importance of effective support mechanisms, well-designed policies, institutional

innovativeness, and contingency planning in managing disruptions (Smith, 2015; Jones *et al*., 2018). Furthermore, studies have highlighted the role of technology integration in enhancing problem-solving capabilities during crises (Dwivedi *et al.,* 2022).

The results of the correlation analysis support the notion that factors such as support adequacy, policy effectiveness, institutional innovativeness, contingency planning, and technology integration are important considerations in effectively managing disruptions in PHEIs. In addition, a positive correlation is observed between the contingency plan and managing crises with both students (r = 0.685**) and staff (r = 0.575**). This suggests that having a well-developed contingency plan is associated with effective crisis management during disruptions.

When the values for each latent variable were examined, the high factor loadings showed that the observed variables and their respective latent variables had a strong relationship. Additionally, the path coefficients, which are depicted in the diagram, showed positive relationships, indicating a proportional association between the latent variables. These findings align with the principles of SEM, as discussed in Kline (2011), which emphasise the importance of high factor loadings and positive path coefficients in indicating valid and meaningful relationships within the model.

Since the construct in this study was made for the first time, it is expected that the structural relationships may not fit the data exactly. However, despite this limitation, certain fit indices met the recommended criteria, suggesting that the model has potential. To further enhance the model's validity and reliability, it is recommended to revise the measured variables that constitute the latent variables. By improving the measurement of these variables through refining the scale items or including additional variables, the factor loadings can be improved, leading to a more accurate representation of the latent constructs (Hair *et al.,* 2017).

By incorporating the recommendations for revising the measured variables, the model can be refined and enhanced, providing a more robust framework for understanding the relationships among the latent variables and their observed indicators. This iterative

process of model refinement is common in SEM research, as it allows for the continual improvement of the measurement model and the underlying theoretical constructs (Kline, 2011).

4.14 HYPHOTHESES

The study aimed to examine and test objectives and hypotheses, which were formulated based on the responses received from both students and staff members. These objectives and hypotheses were designed to explore and evaluate specific aspects related to the research topic. A summary of the hypotheses is presented in the table below, starting with the hypotheses for students, followed by the hypotheses for staff members. By examining these hypotheses, the study aims to contribute to the existing literature and provide practical implications for HEIs facing disruptions.

Research objectives	Hypothesis	Result	Conclusion
a. To investigate the level of preparedness of institutional leaders to address and resolve disruptive challenges, including but not limited to the COVID-19 pandemic.	H_0: There is no difference between the number of respondents who believe that institutions have developed and implemented crisis management plans compared to those that have not.	The binomial test result indicates a p-value of < 0.001. The null hypothesis claims that there are as many respondents who agree with the hypothesis as there are who do not.	Reject the null hypothesis. There is a significant difference in the terms of the number of respondents who believe that institutions have developed and implemented crisis management plans.
b. To examine the capability and capacity that institutional leaders developed in response to diverse disruptions.	H_O: There is no difference between institutions with resources, well-trained staff, and technologies in terms of the ability to handle modern-day disruptive challenges compared to institutions with limited resources and outdated technologies.	The binomial test result indicates a p-value of 0.869. The null hypothesis claims that there are as many respondents who agree with the hypothesis as there are who do not.	Accept the null hypothesis. There is no significant differences between institutions who are well resourced compared to those that are not in dealing with disruptive challenges.

Research objectives	Hypothesis	Result	Conclusion
c. To understand the experiences of students regarding different types of disruptions.	H_0: There is no difference in the level of adequate support and communication received during the COVID-19 disruption (in terms of Students having a more positive experience).	The binomial test result indicates a p-value of 0.004. The null hypothesis claims that there are as many respondents who agree with the hypothesis as there are who do not.	Reject the null hypothesis. There is a significant difference in the level of adequate support and communication received during the COVID-19 disruption (in terms of Students having a more positive experience).

Table 4. 28: Summary of students' hypotheses

As shown on Table 4.28 above, the study aimed to test students' hypotheses related to different aspects of crisis management and support in HEIs during the COVID-19 disruption. The first hypothesis examined the difference in the belief regarding the development and implementation of crisis management plans among respondents. The analysis using a binomial test revealed a significant difference ($p < 0.001$), indicating that a higher number of respondents believed that institutions had developed and implemented such plans.

The second hypothesis focused on the comparison between institutions with adequate resources, well-trained staff, and modern technologies versus institutions with limited resources and outdated technologies in their ability to handle disruptive challenges. The binomial test result showed no significant difference ($p = 0.869$) between the two groups, suggesting that the level of resources and technologies did not have a significant impact on institutions' ability to handle disruptions.

The third hypothesis explored the difference in the level of adequate support and communication received during the COVID-19 disruption and other disruptions, specifically focusing on students' experiences. The binomial test result indicated a significant difference ($p = 0.004$), implying that students had a more positive experience in terms of adequate support and communication during the disruption.

These findings highlight the importance of crisis management plans and adequate support in the PHEIs during disruptive events. The results align with previous literature emphasising the need for effective crisis management strategies and clear communication channels to ensure successful navigation of disruptions in educational settings (Mendy, Stewart & Van Akin, 2020:2; Reddy & Gupta, 2020:3793). The study provides empirical evidence supporting the significance of these factors in enhancing institutions' preparedness and responsiveness during crises.

#	Research objectives	Hypothesis	Results	Decision
1.	a. To investigate the level of preparedness of institutional leaders to address and resolve disruptive challenges, including but not limited to the COVID-19 pandemic.	H_0: There is no difference between Institutions with proactive leadership that has developed and implemented crisis management plans compared to institutions with reactive leadership.	The binomial test result for the average of the categories with a cut-off value of 3 has p-value < 0.001. There are significantly more respondents > 3. That is, there is a greater level of agreement with the statements.	Reject the null hypothesis. There is a significant difference between institutions with proactive leadership that has developed and implemented crisis management plans to institutions with reactive leadership.
2.	b. To examine the capability and capacity that institutional leaders developed in response to diverse disruptions.	H_0: There is no difference in an institution (with resources, well-trained staff, and technologies) being better equipped to handle modern-day disruptive challenges compared to an institution with limited resources and outdated technologies.	The binomial test result for the average of the categories with a cut-off value of 3 has p-value < 0.001. There are significantly more respondents > 3. That is, there is a greater level of agreement with the statements.	Reject the null hypothesis. There is a significant difference between well-resourced and under-resourced institutions when handling modern day disruptions.
3.	c. To understand the experiences of staff regarding different types of disruptions.	H_0: There is no difference in the level of adequate support and communication received during the COVID-19 disruption (in terms of Staff having a more positive experience).	The chi square test compares the distribution across the categories. The test results indicate ($\chi^2 = 181.489$, df = 3) $p < 0.001$, with higher frequencies relating to Good and Very Good.	Reject the null hypothesis. There are significantly more respondents with positive responses relating to the level of support and communication.

Table 4. 29: Staff summary of hypotheses

The first hypothesis aimed to investigate the level of preparedness of institutional leaders for addressing and resolving disruptive challenges. The analysis revealed a significant difference ($p < 0.001$) between institutions with proactive leadership that has developed and implemented crisis management plans compared to institutions with reactive leadership. This finding suggests that institutions with proactive leadership are better prepared to handle disruptions. The result aligns with previous literature emphasising the importance of proactive leadership in crisis management (Barton *et al.,* 2015:74; García-Álvarez, Soler & Achard-Braga, 2021; Paraskevas & Quek, 2019:9).

The second hypothesis explored the capability and capacity of institutional leaders to respond to disruptions based on their experiences during the disruptive period. The analysis indicated a significant difference ($p < 0.001$) between institutions that are well-equipped with resources, well-trained staff, and modern technologies compared to institutions with limited resources and outdated technologies. This finding implies that well-resourced institutions are better equipped to handle modern-day disruptive challenges. This result is consistent with research highlighting the role of resources and technologies in enhancing an organisation's capacity to manage disruptions (Bygballe, Dubois, & Jahre, 2023; Sheffi, 2007; Singh & Singh, 2019:2318).

The third hypothesis aimed to understand the experiences of staff regarding the diverse disruptions, specifically focusing on the level of adequate support and communication received. The χ^2 test indicated a significant difference ($p < 0.001$) among the response categories, with higher frequencies relating to good and very good experiences. This suggests that there were significantly more positive responses regarding the level of support and communication during the disruption. The finding aligns with previous studies emphasising the importance of effective support and communication in mitigating the negative impact of disruptions on staff (Green, Tappin, & Bentley, 2020:10; van Zoonen, Rice, & Ter Hoeven, 2022:341).

The results of the hypotheses provide empirical evidence supporting the significance of proactive leadership, adequate resources, and effective support and communication in

addressing and managing disruptive challenges in higher education institutions. These findings are consistent with the existing literature and highlight the importance of proactive strategies and resources in crisis management and student and staff support during disruptions.

4.15 DISRUPTION PREDICTION USING CLASSIFICATION TREE

In this subsection, a classification decision tree, also called a ‘classification tree’ is proposed for predicting disruption towards staying proactive in disruption management within higher education institutions.

A classification tree is a supervised machine-learning algorithm used for classification and regression. It is a structural mapping of binary decisions that lead to a decision about a class of an object – which is ‘the interpretation’ (ClarkLabs, 2022). A classification tree also provides confidence that the classification is correct. An example of a classification tree is a model that assigns potential customers of a company categories ‘purchaser’ and ‘non-purchaser’ based on factors or attributes such as income level, lifestyle, age, and other relevant factors. Thus, a classification tree is also called a decision tree because it leads to categorical decisions by labelling, recording, and putting variables in separate groups. A method called binary recursive partitioning is used to build a classification tree. This is an iterative method of dividing the data into parts and then dividing them further on each branch (FrontlineSolvers, 2022).

Molnar (2019) states that classification trees have become more popular in machine learning because they can fix the problems that linear regression and logistic regression models have when the relationship between features and results is not linear or when features interact with each other. A decision tree classifier divides a set of traits into groups based on certain cut-off values. In this study, the split is performed based on the concept of ‘Gini impurity’, creating subsets of the data with each instance belonging to one subset. Figure 4.15 depicts the splitting process from beginning to end, with the initial node being referred to as the "root node or parent," the intermediary subsets being

referred to as "internal or split nodes," and the final subsets being referred to as "terminal or leaf nodes".

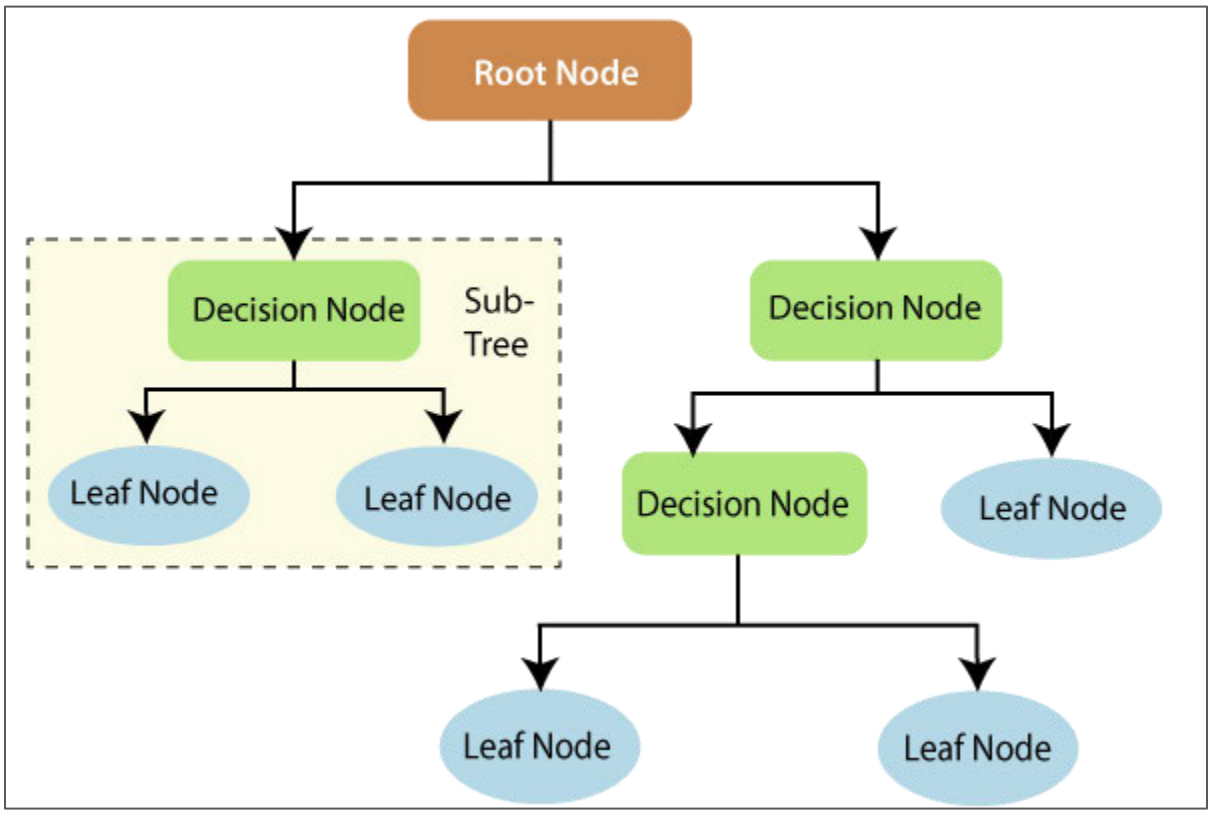


Figure 4.15: Classification Tree Diagram
Source: JavaPoint (2022)

The Gini impurity is a measure that is used to make decision trees and determine how the aspects of a dataset should split nodes to make the tree. It can help you do binary splits for targets that fall into categories. It is a common way to choose attributes when building decision trees. In this case, the problem is finding a partition with the least Gini impurity (Laber & Murtinho, 2019).

The steps in calculating the Gini impurity for problems with categorical targets are as follows:

$$Gini\ Impurity\ = 1 - Gain$$

$$= 1 - \sum_{j=1}^{n} P_j^2$$

In the decision tree algorithm, the Gini impurity determines the root note by selecting the attribute with the lowest Gini. The lower the Gini impurity value, the higher the homogeneity in the resultant data (subgroups), and the Gini impurity of zero implies a pure node. An attribute with a low Gini index should be preferred to a high Gini index. It only creates binary splits, and the classification tree algorithm uses the Gini index to create the binary splits.

The leaf node represents the final classification decision, in which case the nodes cannot be divided further. The average result of the training data in each leaf node is used to predict what will happen in that node. When figuring out the tree's results, we start with the root node, move on to the next nodes, and look at the edges to see which subsets we are looking at. When we get to the leaf node, the node tells us what will happen next. "AND" links all the edges together.

In the study's proposed model, 0 depicts 'no disruption' classification category while 1 represents the 'disruption'. The approach applies 5000 conditionally generated random potential outcome data associated with four key attributes, which include the potential impact, probability of occurrence, factor relevance to the higher education sector and familiarity of the institution with the factor. The model partitions the data (randomly) into 75% train data set and 25% test data to predict the binary outcomes (0 - no disruption, 1-disruption). The randomly generated data is provided in the additional attached document.

4.15.1 The Machine Learning (ML) model

This investigation utilised a supervised machine learning model to help institutional management predict potential disruption risk factors. The SPSS software was utilised to build a model based on four risk factors: potential impact, probability of occurrence,

warning index and relevance to the PHE sector. The diagram below (Figure 4.16) summarises the model obtained based on the simulated data.

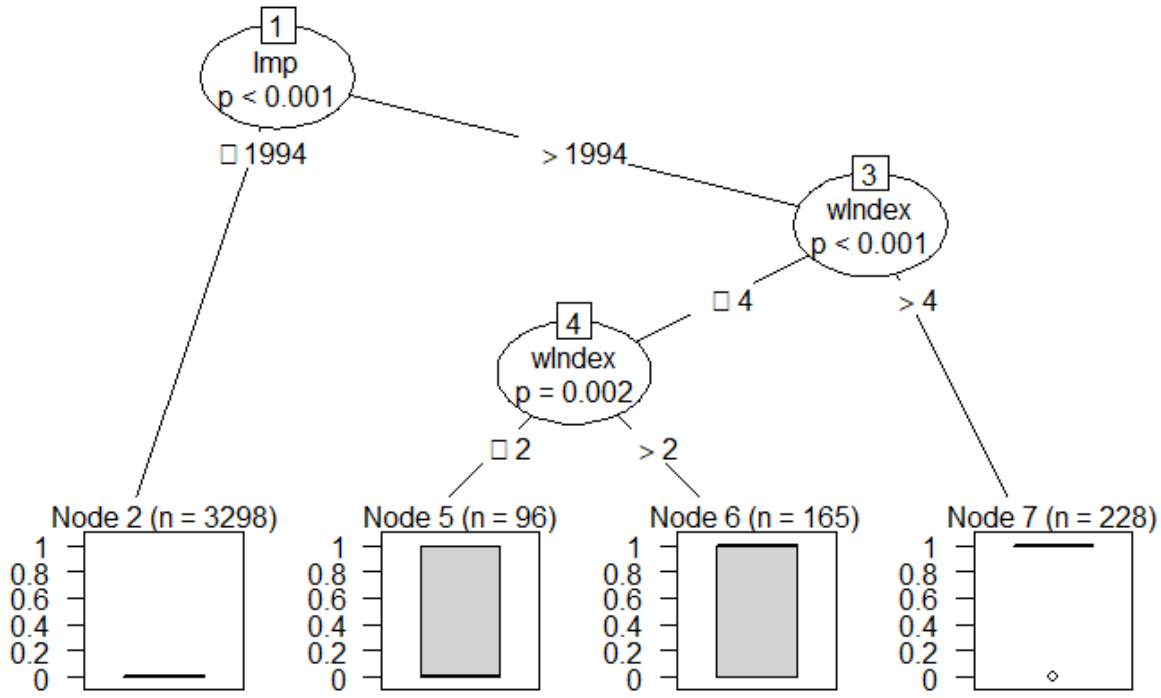


Figure 4.16: Classification Tree from Train Set
Source: Researcher constructed ML model

Based on the calculated Gini index at each split point of each attribute, the potential impact had the smallest Gini impurity (entropy). It was placed right on top of the tree diagram as the parent node. The smallest Gini index is associated with the attribute 'impact'. Hence impact forms the parent node of the 'classification tree'. The attribute with the second smallest Gini is a warning index. Thus, if the impact is less than 1,994, it will likely lead to no disruption (outcome of '0'). If the impact is greater than 1,994, then the warning index may need to be considered next. If the warning index is greater than 4 then the combination gives a high probability of a disruption (outcome of '1'). In the classification tree (ctree) diagram, the p-value indicates the significance of each attribute in the model.

For most scientific studies, the p-value threshold is 5% (0.05) – and if an attribute in the ctree model has a p-value less than 0.05, then it is significant in the model. The model

applies recursive partitioning based on the small Gini index until each path leads to the terminal node (leaf). The right-most leaf node is classified as a disruption with a very probability (almost 1). The two leaf nodes in the middle have relatively high chances of misclassification. The attribute ‘relevance’ was omitted from the resultant model implying that it is insignificant.

As indicated in the model prediction results in Appendix 4, the decision tree accuracy based on train data is 87.09%, while that on test data is 86.64%. The two values are not far apart, implying a minimal difference in prediction accuracy between the training and testing set.

4.15.2 Deductive orientation in Thematic Analysis

Deductive orientation in the thematic analysis involves coding and developing themes directed at existing concepts, ideas, or a theory which can be the study research questions. Using the deductive thematic approach the study followed the steps below:

- Generating initial themes (the words for the tentative themes come from a theory, framework or model) – the investigator needs to begin with an analysis framework;
- Reviewing codes to check if the codes are assigned to important parts of the data against the codebook or analysis framework;
- Defining and naming themes which involves working out the scope and focusing on each theme to refine the analysis framework; and
- Reviewing the codes.

This investigation applied a deductive thematic analysis as it considered the broad scope (underlying theory) and study objectives.

4.16 Discussion of significance

The statistical significance of the results obtained from the supervised machine learning model and thematic analysis is critical to understanding the findings' robustness and reliability. A detailed interpretation of the statistical significance of this study's models and analyses follows.

4.16.1 The significance of machine learning model results

The supervised machine learning model, developed using SPSS software, identified key risk factors—potential impact, probability of occurrence, and warning index—that influence the likelihood of disruptions in higher education institutions. The model's accuracy, based on both training data (87.09%) and test data (86.64%), indicates a high level of reliability in predicting disruptions.

a) **Gini index and significance:** At each split point of the classification tree, the Gini index determined the attribute significance. We positioned the attribute 'potential impact' with the smallest Gini impurity (entropy) as the parent node, underscoring its paramount significance in disruption prediction. The p-value further confirmed the significance of each attribute in the model, deeming those with p-values less than 0.05 as statistically significant.

b) **Accuracy and model validation:** The minimal difference in accuracy between the training and testing sets demonstrates the model's generalizability. This consistency suggests that the model is not overfitted and can effectively predict disruptions across different datasets.

4.16.2 Significance of thematic analysis results

The deductive thematic analysis provided qualitative insights into the experiences of staff and students during disruptions, which complemented the quantitative findings.

a) Themes and codes: We generated initial themes from existing theories and frameworks, then refined them through an iterative process of reviewing and naming codes. This methodical approach guarantees the theoretical soundness and grounding of the themes in the data.

b) Qualitative dimensions: The analysis revealed five key dimensions from staff and students' voices, adding depth to the quantitative results. These dimensions highlighted areas such as support adequacy, policy effectiveness, institutional innovativeness, and technology integration, which are crucial for effective disruption management.

4.16.3 Spearman's Rank Correlation Test

The Spearman's rank correlation test revealed significant positive correlations between various variables. These correlations underscore significant relationships, including the following:

- We aim to support adequacy and overall experience during disruptions.
- Ensure the effectiveness of guidelines or policies and ensure their adequacy.
- Institutional innovativeness and support adequacy.
- Technology integration and problem-solving capabilities.

These findings suggest that institutions excelling in these areas are better equipped to provide adequate support and respond effectively during disruptions.

4.16 CHAPTER CONCLUSION

This chapter delves into the analysis and interpretation of the quantitative and qualitative data obtained in Phase 1 of the research. It encompassed the examination of biographic and demographic information, cross-tabulations, reliability statistics, and thematic analysis. The combination of these methods provided a comprehensive understanding of the research data, offering valuable insights into the perspectives and experiences of staff and students during disruptive events.

The quantitative analysis utilised various statistical techniques, including cross-tabulations and the Spearman's rank correlation test, to explore relationships and associations between different variables. The results revealed significant positive correlations, indicating that higher levels of support, effective policies, institutional innovativeness, and technology integration are associated with better overall experiences and problem-solving capabilities during disruptions.

Using SPSS software, we developed a supervised machine learning model to predict potential disruption risk factors by building a classification tree based on four key attributes: potential impact, probability of occurrence, warning index, and relevance to the PHE sector. The model demonstrated high accuracy, with a minimal difference in

prediction accuracy between the training and testing sets, highlighting its reliability and generalizability.

The deductive thematic analysis added depth and richness to the quantitative findings, identifying five key dimensions that emerged from the voices of staff and students. This qualitative approach provided a nuanced understanding of the challenges and support mechanisms during disruptions, complementing the quantitative data.

We discussed key fit indices such as CMIN/DF, NFI, CFI, RMSEA, PCLOSE, Hoelter index, RFI, TLI, and IFI in detail. The results indicated that while most indices suggested a satisfactory fit for the models, some areas required further refinement, particularly for the staff model, which had an RFI value slightly below the recommended threshold.

To address these limitations, the model refinement process involved identifying misfitting paths, re-evaluating relationships, and making iterative adjustments to enhance the overall fit. The final models demonstrated significant improvements, providing a robust framework for predicting and managing potential disruptions in higher education institutions.

The chapter concluded by emphasizing the efficacy of the proposed classification decision tree model in predicting potential disruption risk factors. The integration of quantitative and qualitative analyses provided a holistic view of the data, enhancing the reliability and validity of the findings. The study's results highlight the importance of proactive risk management strategies and the need for continuous refinement of predictive models to address the complexities of disruption prediction in higher education.

Recommendations for future work

Future research should consider expanding the dataset to include diverse higher education institutions across different regions, incorporating additional risk factors, and conducting longitudinal studies to track the long-term effectiveness of disruption management strategies. Integrating advanced machine learning techniques and

qualitative comparative analysis could further enhance the accuracy and depth of insights, providing a comprehensive understanding of disruption management in the higher education sector.

CHAPTER 5: QUALITATIVE RESULTS - STATEMENT OF FINDINGS, INTERPRETATION AND DISCUSSION OF THE DATA

"I want to understand the world from your point of view. I want to know what you know in the way you know it. I want to understand the meaning of your experience, to walk in your shoes, to feel things as you feel them, to explain things as you explain them. Will you become my teacher and help me understand?"

— James P. Spradley

5.1 INTRODUCTION

This chapter presents list the key aspects of disruption management that PHE sector leaders believe are important. This qualitative study seeks to uncover the various factors, strategies, and approaches that leaders consider crucial in effectively managing and navigating disruptions within the higher education landscape.

Through interviews and discussions with PHEI leaders, this study purposes to capture their experiences, insights, and perspectives on disruption management. By analysing their narratives and extracting common themes and patterns, the study will identify the dimensions that leaders perceive as significant for successfully addressing and mitigating disruptions.

By better understanding the perspectives and experiences of PHEI leaders in relation to disruption management, this section makes a significant contribution to the study's aim of developing a comprehensive disruption management framework for PHE industry in South Africa. By examining the disruption experiences of leaders in PHEIs during the COVID-19 lockdown and post-lockdown periods, the research enhances the overall resilience, adaptability, and strategic preparedness of HEIs in effectively navigating and overcoming disruptions.

The current research focused on examining the disruption experiences of leaders, including executives, senior managers, managing directors, principals, and registrars, in South African PHEIs during the COVID-19 lockdown period. The study intends to capture the challenges and impacts faced by these leaders during the lockdown. In addition, post-

lockdown experiences were shared by the leaders, emphasising the contrast between the causes and effects of the COVID-19 pandemic and other disruptions that emerged immediately after the lockdown was lifted.

The post-lockdown period presented leaders with a unique set of challenges, including the economic effects of the pandemic and other disruptive factors. These leaders provided valuable insights into how their institutions navigated through this phase and adapted to the changing landscape. The contrast between the immediate aftermath of the lockdown and the ongoing effects of the pandemic shed light on the multifaceted nature of disruptions and the need for dynamic and agile responses from PHEIs.

By exploring the experiences of leaders during both the lockdown and post-lockdown periods, this research offers a comprehensive understanding of the disruptions faced by PHEIs in South Africa. These insights can inform strategic decision-making and the development of effective disruption management strategies that address not only the immediate crisis but also the long-term implications of disruptions in the higher education sector. Consequently, the unit of analysis was the disruptions these leaders encountered.

The qualitative phase (Stage 2) of this research project significantly enhances the existing knowledge base regarding disruption management within the higher education sector in South Africa. Firstly, this phase provides a comprehensive overview of disruptions in the education landscape, specifically from the viewpoint of senior management. This understanding shed light on the challenges and complexities faced by HEIs during disruptive periods. Secondly, the research identifies and elucidates unique dimensions of disruption management within the organisational context of South African higher education institutions. These dimensions capture the specific strategies, approaches, and considerations that are crucial for effectively managing disruptions and maintaining institutional resilience.

Furthermore, the findings from this phase, combined with the extensive literature review outlined in Chapter 2, contribute to the development of a comprehensive disruption

management framework tailored specifically for South African higher education institutions. This framework incorporates both the insights gained from senior management perspectives and the existing scholarly literature, providing practical guidance and strategic direction for PHEIs to effectively navigate disruptions. Importantly, this phase also addresses a significant gap in the literature pertaining to higher education in South Africa. Prior to this study, limited research existed that specifically examined disruption management from the standpoint of senior management in PHEIs. By exploring this novel perspective, the research enriches the understanding of disruption management in the South African higher education context and contributes to filling the research void.

5.2 DEMOGRAPHIC INFORMATION

The qualitative analysis of this study involves a summary of the demographic information of the management sample, establishment of the codes, themes, inherent relationship amongst the established codes, review of the codes, document matrix browser (DMB) and finally, the reviewed themes. The table (Table 5.1) and graph below (Figure 5.1) summarise the distribution of the management response data.

In the study's second phase, 19 participants were chosen using purposive selection. Participants comprised executives, department heads, and principals from several campuses around South Africa, representing six PHEIs. Table 5.1 indicates nine men and ten women participated in this study phase. The table also provides other participants' demographic information, such as their positions. All interviews were used in the study. This shows that the researcher considered all their views and experiences important in the analysis.

Participants	Position	Gender	Institution
P1	General Manager	Male	eBlack
P2	Principal	Male	eBlack
P3	Manager: Online Operations	Female	eBlack
P4	Senior Financial Manager	Male	eRed

Participants	Position	Gender	Institution
P5	Principal	Female	eBrown
P6	Managing Director	Female	eBrown
P7	Finance Manager	Female	eWhite
P8	Head of Academics	Female	eWhite
P9	New Business Development Manager	Male	eRed
P10	HR Manager	Female	eWhite
P11	ICT Manager	Male	eRed
P12	Assistant Registrar	Female	eRed
P13	Principal	Male	eBlue
P14	Finance Executive	Male	eGreen
P15	General Manager	Male	eRed
P16	Operations Manager	Male	eRed
P17	HR Executive	Female	eRed
P18	Managing Director	Female	eOrange
P19	Head of Academics	Female	eBlue

Table 5. 1: Demographical information of participants

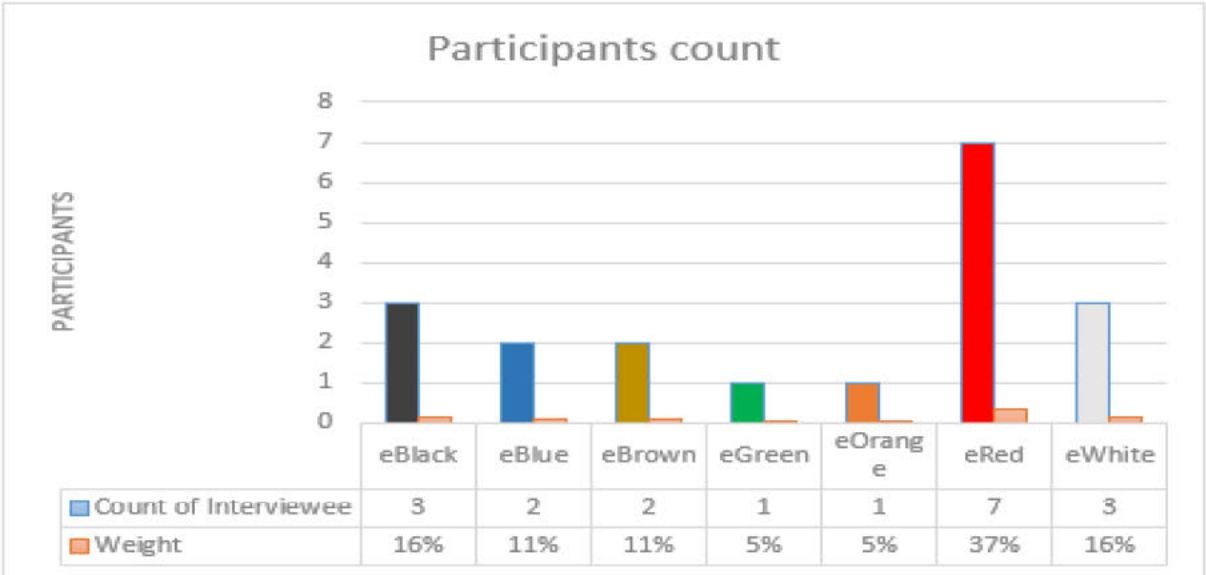


Figure 5. 1: Distribution of participant sample
Source: Researchers' own compilation

5.3 SAMPLE INFORMATION

The selection of a sample is an important phase in qualitative research to ensure that the study is representative of the target population. The population consisted of approximately 454 staff members in seniority or leadership roles. For this phase, a sample size of 19 individuals was deemed sufficient for conducting in-depth interviews. The principles of qualitative research, which place an emphasis on the value of depth and richness of information rather than statistical representativeness, served as a guide for choosing this sample. Qualitative studies often prioritise smaller sample sizes to gain a comprehensive understanding of participants' perspectives and experiences (Creswell, 2013).

While Guest, Bunce, and Johnson (2006:61) suggest that 6 to 12 interviews are typically sufficient for identifying meaningful themes, the context and objectives of the study were therefore considered. The study aimed to enhance the robustness and generalizability of the findings, providing a more representative portrayal of the experiences and challenges faced by leaders. In addition, the selection of a sample size of 19 was motivated by the desire to obtain a sufficient spread and balance of perspectives among PHEI leaders, allowing for a more in-depth and insightful investigation into the research topic.

The overview of the management sample indicates that the largest contribution to the sample was eRed followed by eBlack, eWhite, eBlue, eBrown, eGreen, and finally eOrange. In entity red, which oversees all other entities' financial and academic activities, selecting a larger sample size from this entity was crucial, as it is accountable for the organisation's overall functioning. Semi-structured, in-depth interviews were used to collect the data. A total of 782.20 minutes were spent in the interviews. Each interview lasted on average 41:10 minutes, and all of them were performed online using MS Teams, with no major issues arising.

This approach will help the researcher to comprehensively understand the organisations activities and functioning. According to Patton (2015), purposive sampling is a prevalent technique in qualitative research. The sample is selected based on a specific criterion or objective, such as selecting participants from eRed. In addition, Merriam and Tisdell (2016) assert that selecting a sample based on the pertinent characteristics of the target population might improve the quality and validity of the study's findings. Hence, picking a larger sample from eRed can provide valuable insights into the organisation's operation and ensure that the results represent the entire organisation. The analysis allocated equal weights to the institutions and the individual codes. The subsection below summarises the relationships among the key codes in the thematic analysis.

5.4 KEY CODE RELATIONSHIPS APPLIED IN THEMATIC ANALYSIS.

Some of the management responses are perceived to have inherent code relationships. The figures below display the relationships among the created codes perceived to be related in this study. Deductive thematic analysis is applied in this study. That is, the data is analysed with preconceived ideas about the study. The research objectives also guide the analysis. Following the data familiarisation process, codes were assigned to the documents and reviewed. Relationships amongst some codes were explored, established, and summarised in the hierarchical structure using MAXQDA creative coding tools. The hierarchical code relationships are provided in Appendix 6.1.

As depicted in Figure 5.2, the managers' responses on the PHE environmental factors that managers need to be aware of to monitor and minimise disruption impact effectively tended to fall into two subcategories, namely, internal and external. The managers' opinions on the following five questions could generally be subclassified as agreeing, disagreeing or neutral:

- Is there a written and developed policy and procedure document for disruption management?
- Is there a structure in your organisation developed to ensure quick and decisive actions during disruption?

- Are any management/staff members in your organisation trained for disruption management and what training would be relevant for disruption management?
- Are any managers in your organisation empowered and comfortable making conscious decisions and deliberate actions?
- Does your organisation have other resources required for disruption management apart from labour and what resources are they?

The managers who answered 'YES' to the question "Does your organisation have other resources required for disruption management apart from labour – and what resources are they?" also needed to indicate the type of resources the institution was equipped with to deal with disruption management. The question "Are there any variables or factors that can help predict disruption – and what are the non-predictable factors?" had responses that branched into 'predictable' and 'non-predictable'. The subsequent question further split the 'non-predictable' branch to indicate the solution strategies for planning, monitoring and managing disruption.

5.5 DATA ANALYSIS

A code matrix browser (CMB) in the MAXQDA software was used to analyse the common occurrences of codes in documents and reveal response themes. The CMB shows how the codes given to each document are set up. It shows how different document sections have been coded and how various section codes exist for each code (MAXQDA Team, 2020). The documents are listed in the columns, the codes are listed in the rows, and the symbols at the intersections indicate how many coded segments are coded with a certain code. So, the larger the symbol at an intersection, the greater the number of coded segments given to that code. This indicates that the coding topics are more prevalent in the examined document. The size and colour of each group of symbols in the matrix show how many individual document segments have been assigned to each code and subcode.

The findings of Stage 2 (qualitative data) of the research project are presented in Table 5.2, which illustrates the reference system used for reporting the results.

Table 5.2: Reference method used in qualitative phase (stage 2)

Example	00:32:28 P5
00:32:28	In order to accurately represent the quotes from the transcribed interviews, the timestamps indicating the minutes at which each participant made a particular statement were included. These timestamps serve as reference points to indicate the specific moments during the interview when the quotes were expressed. This ensures transparency and provides a clear understanding of the context in which each statement was made.
P5	Represent the participant and number. Details of participants are shared on table 4.5 above.
" .."	Semicolons are used to include direct quotes from participants, which enhances the depth and authenticity of the discussion.

The reference system used in this study is rooted in the comprehensive analysis of transcribed interviews. All 19 interviews were recorded and transcribed using MS Teams, adhering to a consistent format similar to the structure presented in Table 5.5. The transcriptions were then subjected to the rigorous thematic analysis process outlined in Section 5.4, which involved identifying and categorising key themes and dimensions. To ensure confidentiality and anonymity, all references to individuals' identities, specific PHEIs, affiliated companies, and software packages were replaced with pseudonyms. Throughout the study, all quotations were reproduced in their original form, providing a verbatim and original representation of the participants' perspectives.

Below is an illustration of themes for the question of what can make up the pillars of disruption management (Figure 5.2) and what has been identified by senior managers as factors aiding in disruption prediction.

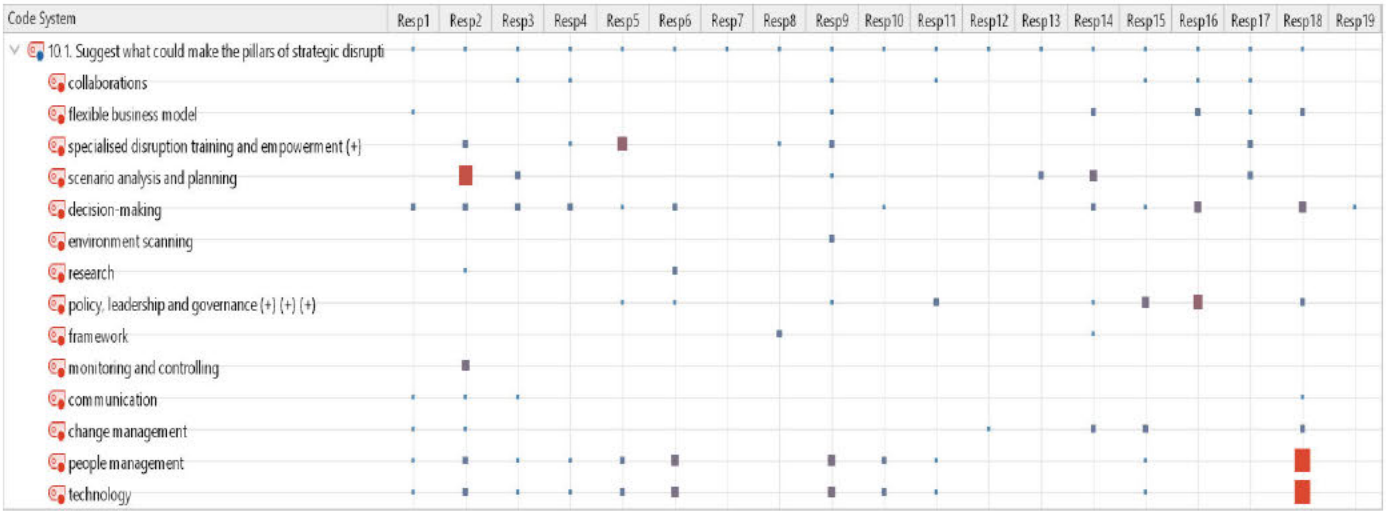


Figure 5.2: Themes for the suggested pillars of strategic disruption management

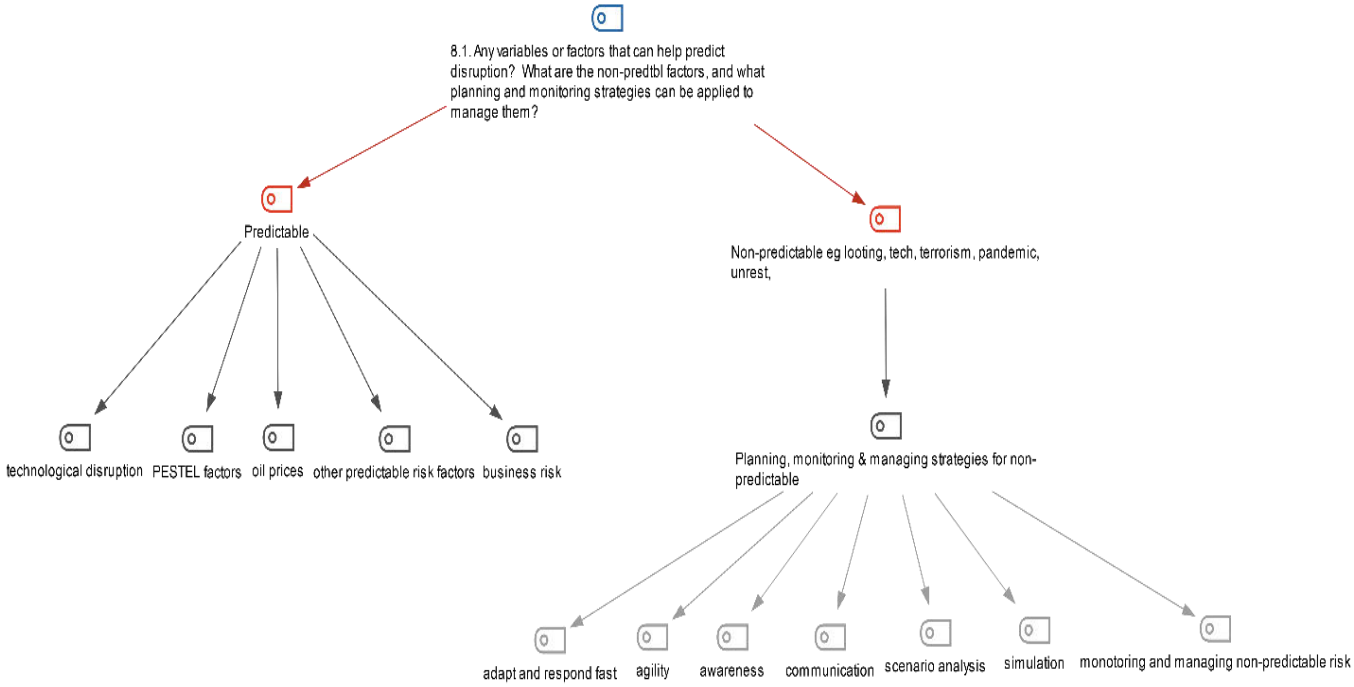


Figure 5.3: Factors aiding in disruption prediction

The data collected via the interview guide from 19 managers was visualised through the CMB. All the documents were read and re-read for familiarisation. A total of 14 codes (displayed in the left-most column above) were created and assigned to the documents. Thus, the documents' themes were visualised in a CMB. The CMB for question 10 is shown in Figure 5.3 above, with fourteen created codes for the question "Suggest what could make the pillars of strategic disruption management for PHEs". From the CMB above, 14 suggestions were made by the interviewed managers based on the identifiable codes created.

5.6 FINDINGS AND DISCUSSIONS

Participants shared valuable insights regarding important pillars for strategic disruption management in PHEs. One participant (00:32:28 P5) emphasised the significance of collaborations, highlighting that working together with external partners and stakeholders is crucial to effectively managing disruptions. This aligns with existing literature that

emphasises the importance of collaboration and partnerships in navigating complex and uncertain environments (Leal Filho *et al*., 2021:1; Trogemann, 2023:1).

Various participants (00:15:12 P7, 00:19:16 P8, 00:15:57 P10, & 00:13:45 P11) underscored the role of technology as a key pillar in disruption management. They recognised that leveraging technology solutions can enhance the organisation's ability to adapt, innovate, and respond to disruptions. Literature also supports the importance of technological advancements in enabling resilience and agility in the face of disruptions (Bharadwaj *et al.,* 2013; Munawar *et al.*, 2022).

Change management emerged as another significant pillar mentioned by participants (00:11:53 P5, 00:21:42 P14). They recognised that effectively managing change and ensuring smooth transitions are essential to navigating disruptions. Change management practices, such as communication, stakeholder engagement, and fostering a culture of adaptability, are important in promoting resilience and successful organisational responses to disruptions (Cameron & Green, 2019; Christensen, Wang, & Van Bever, 2013:8).

Another participant emphasised the importance of people as a pillar in disruption management (00:23:27 P17). Recognising that individuals play a central role in responding to and adapting to disruptions, focusing on their skills, capabilities, and wellbeing is essential. This aligns with literature that highlights the significance of human capital and leadership in effectively managing disruptions (Belhadjali & Abbasi, 2020).

Likewise, more segments of Participant 2 and 3's document suggest 'scenario analysis and planning', and more segments of Participant 18 suggest people empowerment make up the pillars of strategic disruption management. This is reflected by the quotes below:

- *"whenever there is a crisis, we usually do scenario planning…when we went on lockdown, we started doing scenario planning" (00:16:29 P2).*
- *"What we normally used to do was we used to sit in, discuss scenario planning" (00:29:11 P3).*

- *“And people have a voice, they are allowed to raise that and say what is working and that is not working” (00:17:53 P18).*

One principal weighed in, saying that she, too, thinks that having the right people in the right positions with passion in education is one of the strong pillars of disruptive management:

- *“for me the most important things is that support and empowerment, the teamwork, the collaboration and having the right people” (00:25:44 P5).*

It also became evident that technology is seen as a building block for strong disruption management in the HEI. This was confirmed by the general manager, who added:

,*"...technology. You know, that would be my main pillar if I thought about it, because technology is going to disrupt how we live"* (00:35:24 P1).

The insights from the participants shed light on several important themes for effectively dealing with disruptions in higher education institutions. Existing literature supports these themes, which include collaboration, technology, change management, people, scenario planning, and empowerment, offering practical implications for enhancing higher education institutions' ability to adapt and recover. The emphasis on collaboration underscores the crucial role of forming partnerships with external stakeholders to exchange resources, knowledge, and strategies. This collaborative approach can significantly improve an institution's ability to respond to disruptions by leveraging collective expertise and support. It suggests that institutions should actively seek and nurture partnerships with other educational organisations, industries, and government bodies to establish a strong support network.

Using technology is important for organisations to effectively manage disruptions by responding quickly and innovatively (Munir et al., 2022; Garrido-Moreno et al., 2024). This emphasises the importance of investing in technological resources and training. Focusing on implementing cutting-edge technology can enhance operational and educational processes, allowing organisations to remain adaptable and resilient. Recognising change

management as a critical pillar underscores the importance of effectively managing transitions during disruptions (Billups, 2024; Martinez & Farooqi, 2023; Ba et al., 2023). This includes clear communication, stakeholder engagement, and fostering a culture that embraces change.

Institutions must develop comprehensive change management strategies that include training for staff and students to ensure everyone is prepared and supported during transitions. Highlighting the importance of human capital, participants stressed the need for skilled, capable, and well-supported individuals. This suggests that institutions should concentrate on recruiting and retaining passionate and competent staff, providing continuous professional development, and ensuring the well-being of their workforce. Effective leadership is crucial, as it can inspire and guide individuals through disruptive periods (Benmira & Agboola, 2021). We also identified scenario planning and empowerment as key pillars. Scenario planning involves preparing for various potential future events, enabling institutions to develop flexible strategies (Settembre-Blundo et al., 2021). Empowerment ensures that all stakeholders have a voice and can contribute to decision-making processes. These practices foster a proactive and inclusive environment, enhancing the institution's ability to navigate uncertainties.

Some codes were assigned to segments across many documents (such as people management and technology), while others were only allocated to very few (such as environmental scanning and framework). Also, some participants contributed few discernible patterns (identifiable codes) to this study question, such as participants 7, 8, 12, 13, and 19. Based on the CMB visualisation above, the empirical data reveals that the variables that would make up the pillars of strategic disruption management for PHEs in order of relative importance as per the data used, would be as follows:

- Technology
- People management
- Decision-making
- Scenario analysis and planning
- Policy, leadership, and governance
- Specialised training and empowerment
- Collaborations
- Flexible business model
- Change management.
- Communication
- Monitoring and controlling
- Research
- Framework
- Environment scanning

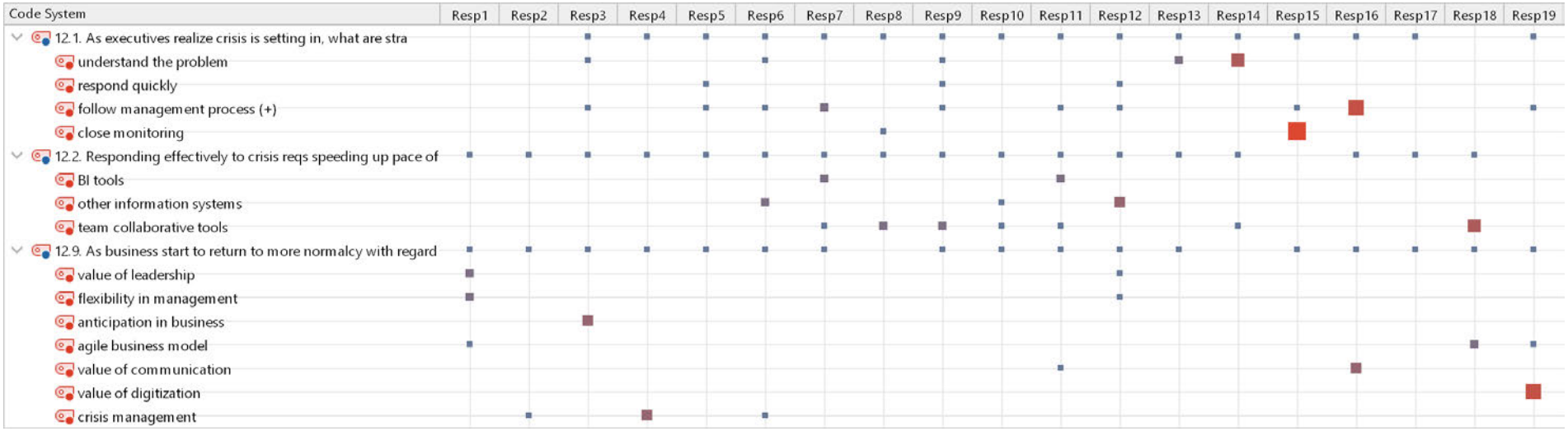


Figure 5.4: Themes for sub-questions 12.1, 12.2 and 12.9

Figure 5.4 shows the CMB visualisation for three sub-questions (12.1, 12.2 and 12.9).

Four codes were identified in the reviewed documents in question 12.1, three in question 12.2 and seven in question 12.9. The sub-questions are phrased as follows:
12.1. As executives realise that a crisis is setting in, what are the strategic steps or phases they should follow in responding to disruption?
12.2. Empirical evidence shows that responding effectively to a crisis requires speeding up the pace of decision-making. Are there any systems or processes that enhance the institution's timeliness of decisions?
12.9. As a business returns to more normalcy in how they operate, what should leaders retain from the crisis mode?

The identified themes have significant implications for managing disruptions in higher education institutions. Focusing on collaboration, technology, and scenario planning can help institutions build more resilient systems that can withstand and recover quickly from disruptions. Effective change management and the use of technology also enable institutions to adapt swiftly to changing circumstances and maintain continuity in education delivery (Manca & Delfino, 2021). Prioritising people and empowerment creates a supportive environment where staff and students feel valued and capable of contributing to the institution's success. Incorporating scenario planning ensures that institutions are prepared for a range of potential disruptions, allowing for more strategic and informed decision-making. Overall, these themes collectively enhance the institution's ability to proactively and effectively manage disruptions, ensuring sustainability and success in a rapidly changing environment.

Participants also emphasised the importance of agility and team collaboration in managing and responding to crises. One respondent highlighted agility as a key ingredient for better crisis response, stating that:

> *"the organisation needs to be quick in its response and be ready at all times"* (00:48:20 P1).

This indicates that being adaptable and responsive to unexpected situations is crucial for effective crisis management.

Another significant perspective came from the director, who emphasised the importance of team collaboration in effectively managing disruptions:

> *"...and then definitely collaboration. So, you have to be working with the team, and you need to be addressing the issues consistently"* (00:04:37 P18).

This suggests that a collaborative approach is essential for identifying and resolving challenges during times of crisis.

Collaboration is an important aspect of navigating disruptions in the HE sectors. It also entails forging partnerships with service providers in your sector or related industries who can assist you in keeping abreast of market trends and identifying new opportunities (Todeschini, Cortimiglia, Callegaro-de-Menezes, & Ghezzi, 2017:7). This goes hand-in-hand with agility and adaptability (Bachmann, Kurzmann, Gutierrez, & Neyer, 2020:123) to ensure that leaders in PHEIs can pivot their business strategy in response to disruptions, such as COVID-19 pandemic, by refocusing on a new service or product or targeting a new market or audience.

The insights shared by the participants highlight the importance of agility and collaboration in crisis management. These findings also suggest that HEIs should prioritise developing an agile mindset and fostering a collaborative culture to enhance their ability to respond to and manage disruptions effectively.

The CMB further shows that, of the three codes identifiable in the reviewed documents, understanding the cause of the problem, following a defined management process, and close monitoring are more popular relatively when compared to the act of responding as the strategic steps that managers must follow in responding to disruption. The suggested systems and/or processes enhancing the institution's timeliness of decisions include using business intelligence (BI) tools, team collaboration tools and other information systems, which all appeared popular in this study sample. The study sample (managers) seemed not to be as familiar with or willing to contribute to the question on the lessons learnt from the crisis mode. A few document segments across all the participants were allocated codes specifically concerning this question. However, identifiable codes include the 'value of leadership', 'management flexibility', 'anticipation of events in business', 'maintaining agile

business models', 'valuing communication and digitisation', and the ability to implement 'crisis management'.

The CMBs for the remaining questions in the interview guide are provided in Appendix 5.2. The most prevalent theme in the definition of 'disruption management' across all the participating managers was an 'event impacting the flow of business and education environment'.

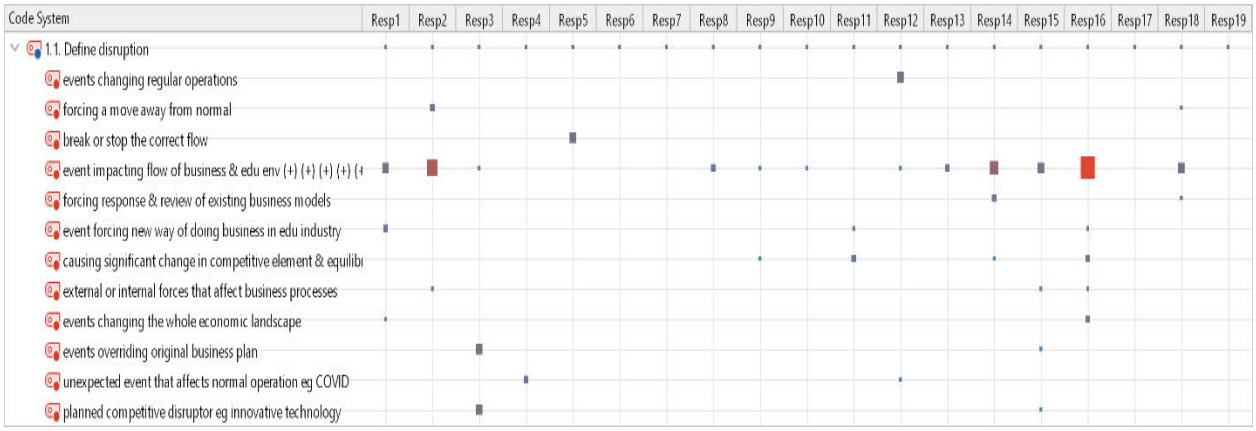


Figure 5.5: Disruption definition

However, they were many other suggested definitions of the term, but they all point in the same direction. This is illustrated by the below points from participants:

- *"For me, disruption has to do with what is currently the norm. So if you used to do something in this way, how does somebody come up with a new way of doing things that can disrupt or disrupt the business processes?" (00:03:07 P1).*
- *"I think disruption is a significant shift in the way the industry or market that an organisation operates in is changing and is consistently challenging the status quo or the business models that are currently in play" (00:01:42 P14).*

According to Figure 5.6 (CMB for procedures and processes for managing when disruption occurs), several suggested procedures and processes exist.

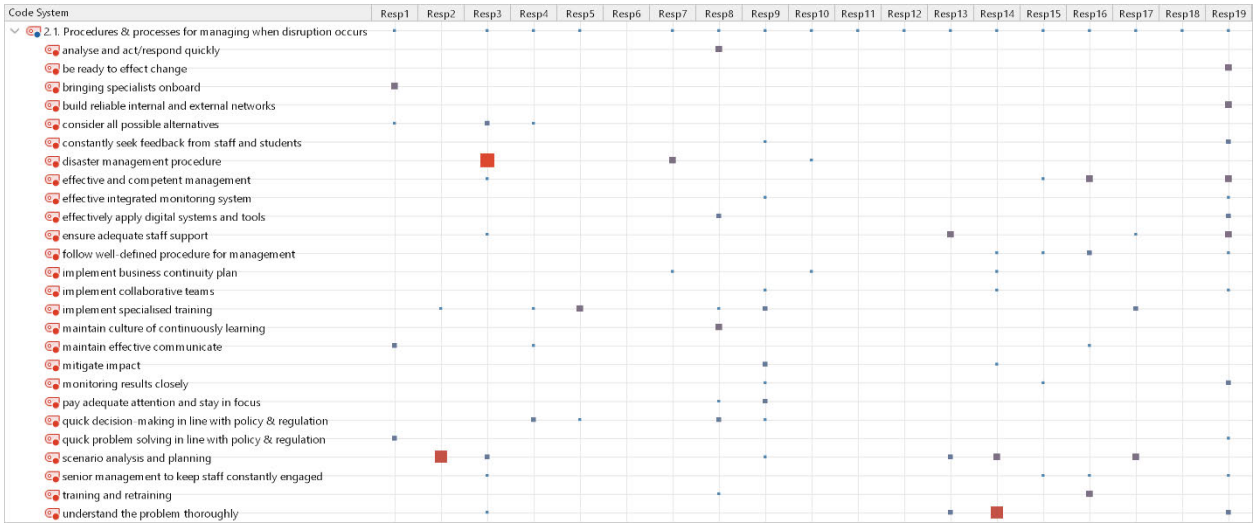


Figure 5.6: Policies and procedures for managing disruption

However, the most popular was ‘scenario analysis and planning’, ‘understanding the problem thoroughly’, ‘disaster management structure’, ‘specialised disruption management training’ and ‘effective and competent management’.

Nevertheless, the participant group suggested many traits, characteristics and values expected of business leaders during disruption (such as COVID-19). However, many document segments featured the following: effective people management; quick decision-making; holistic scenario planning; understanding business environments well and being aware; understanding processes; dealing with problems decisively; critiquing situations thoroughly; learning new ways fast; taking the front seat in disruption (being a disruptor rather than being disrupted); and the ability to make difficult decisions and move on.

The findings revealed a range of qualities that were consistently mentioned across different document segments. For instance, effective people management emerged as a critical trait, with participants emphasising

> *"the importance of leaders who listen to their teams and understand their abilities and capabilities*" (00:06:47 P8).

This aligns with the literature, which highlights the significance of empathetic and inclusive leadership styles that foster collaboration and engage employees during times of uncertainty (Montaudon-Tomas, Gutiérrez-González, Pinto-López, & Malcón-Cervera, 2021:54). Quick decision-making was also highlighted as essential, reflecting

the need for leaders to make prompt and effective choices amidst rapidly changing circumstances. This aligns with research that emphasises the importance of agile decision-making in crisis situations (Yap *et al.* 2014:1535).

Another view reflected on the importance of leaders who possess a sense of fearlessness and a willingness to explore uncharted territories during times of disruption:

> *"someone who's not afraid of the unknown and willing to venture down that path and lead the organisation into a road less taken"* (00:08:13 P7).

This signifies the need for leaders who can embrace ambiguity and navigate through uncertain circumstances with confidence. Leaders who are unafraid of the unknown demonstrate a level of resilience and adaptability, allowing them to take calculated risks and explore innovative approaches that may deviate from conventional paths.

In the context of disruption, the quote suggests that leaders should be open to unconventional strategies and be willing to challenge existing norms and practises. They should possess a pioneering mindset, capable of envisioning new possibilities and leading their organisation towards unexplored avenues of growth and success. This notion aligns with the literature on transformational leadership, which emphasises the importance of leaders who can inspire and motivate their teams to embrace change, challenge the status quo, and pursue innovative solutions (Weng, Huang, Chen, & Chang, 2015:2). Furthermore, in line with Herbst (2021), this finding highlights the significance of cultivating a mindset that encourages leaders to venture outside their comfort zones and embrace ambiguity. By doing so, leaders can nurture an innovative culture and equip their organisations to effectively navigate disruption.

Participants emphasised the importance of being able to solve issues quickly and critically analyse situations. This suggests the need for leaders who can analyse complex situations, make tough choices, and implement solutions effectively (Bryant, 2003:2). Learning new ways quickly and being proactive disruptors were highlighted as valuable traits. Leaders who embrace innovation, adapt to new technologies, and seek out unconventional approaches can help organisations thrive in disruptive environments (Smith & Tushman, 2005:522).

One participant recognised the significance of leaders possessing a comprehensive understanding of organisational systems during times of disruption as well environmental factors which may affect students:

> *"I would say a strong understanding of systems and the political, social, and economic environment of which both staff and students are exposed to"* (00:09:06 P19).

Expanding on this quote, it underscores the importance of leaders who can grasp the intricacies of how different components within an organisation interconnect and function as a cohesive system. Leaders with a strong understanding of systems and environmental factors can navigate complex organisational dynamics, identify bottlenecks, and optimise workflows to drive efficiency and effectiveness.

The literature on organisational effectiveness and management supports the significance of having a strong understanding of systems and processes. It highlights that effective leaders possess the ability to analyse, design, and improve systems and processes to drive organisational performance and adaptability (Davenport, 1993). Leaders who can effectively manage and align systems and processes are better equipped to navigate disruptions, identify opportunities for innovation, and lead their organisations towards sustainable success.

The participants' perspectives align with existing literature on leadership during disruption, providing further support for the importance of these traits and characteristics in effectively managing crises and leading organisations through turbulent times.

The interviewed group identified three subcategories of potential internal factors that the institutional leaders will need to be aware of in the future: system crash, academic disruptions, and innovations.

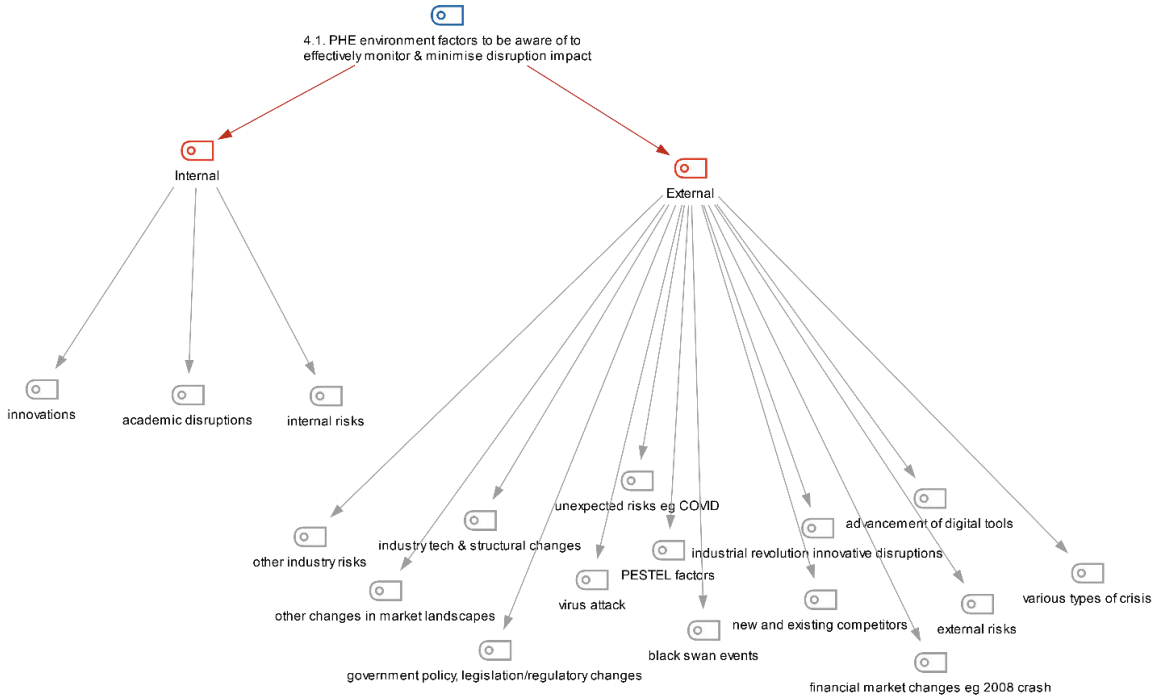


Figure 5.7: PHE environment factors

Several potential external factors were identified in the response themes, including the industrial revolutions, industry structural changes, competitor risks, virus attacks, black swan events, other unexpected events, political, economic, social, technological, environmental, and legal (PESTEL) factors.

In discussing the predictable factors, one participant (00:28:01 P8) highlighted the role of technology in enhancing predictability while also mentioning the unforeseen effects of social and political factors such as the Russia-Ukraine situation on food inflation:

> *"no one predicted with Russia-Ukraine the effect it would have on food inflation".*

Another participant (00:07:01 P9) emphasised the impact of market and economic risks on the middle class, leading to dropouts in the academic institution they manage:

> *"a lot of people are dropping out of what you might call the middle class because of the impact of inflation".*

Recent research suggests that business owners and the middle class, who make up a sizable number of PHEI student populations, will continue to face issues in the future due to disruptive causes (Maota & Naidoo, 2022:10). Furthermore, several reports and

studies (Centre for Development and Enterprise, 2020; Resbank, 2021; Treasury, 2022; University of Cape Town, 2022) have examined the negative effects of high inflation and interest rates on the middle class and small businesses, as well as the difficulties faced by students in gaining access to higher education as a result. In light of the current disruptive landscape, these results highlight the importance of taking preventative actions to alleviate the economic stresses felt by institutions, middle-class individuals, and ambitious students.

On the other hand, the frustration expressed by the principal (00:08:48 P13) from eBlue revolved around the political influences on the business and the challenges posed by loadshedding. This participant also mentioned the long hours of loadshedding and the high fuel costs, which contribute to operational expenses that could otherwise be invested in improving the quality of education. These insights shed light on the various factors that disrupt the higher education sector and the consequent challenges faced by academic institutions.

Scholars have highlighted the significance of anticipating and addressing potential disruptions as well as developing resilience in educational institutions (Bartusevičienė, Pazaver, & Kitada, 2021:151; Vakilzadeh, & Haase, 2021:1). Furthermore, understanding the economic implications of disruptions, such as inflation and market risks, is essential for maintaining stability and sustainability in HEIs (Ebrahim, Inderwildi, & King, 2014:9; Werner *et al.,* 2021:9; Shang, Li, & Zhang, 2021:3). By incorporating these insights into a comprehensive disruption management framework, academic institutions can enhance their ability to navigate and mitigate the impacts of various disruptions.

Another executive (00:04:51 P14) highlighted the importance of staying informed about new market entrants as a critical environmental factor. Another participant (00:08:45 P17) emphasised the need for leaders to anticipate and prepare for unforeseen events, often referred to as "*black swan*" events, that may disrupt their plans. Furthermore, another participant (00:49:00 P6) mentioned the impact of the war in Russia-Ukraine on the market supply of solar panels and the subsequent price fluctuations in the oil market, which have presented challenges for the industry.

To effectively manage disruptions in the higher education sector, leaders must remain vigilant and responsive to environmental factors that can influence their organisations. The dynamic nature of markets requires continuous monitoring of emerging competitors, trends, and technologies (Jain, Nauck, Poppensieker & White, 2020:7).

Being proactive and adaptable allows leaders to navigate market disruptions and seize opportunities for growth and innovation. Equally, it is crucial for HEIs to prioritise client retention strategies, as research consistently demonstrates that acquiring new clients costs twice as much as retaining existing ones (Verhoef, Kannan, & Inman, 2015:2).

On another note, the concept of "black swan" events highlights the importance of considering low-probability but high-impact occurrences that can significantly disrupt business operations (Taleb, 2007). Incorporating scenario planning and risk assessment techniques can help leaders identify potential "black swan" events and develop contingency plans (Olivares-Aguila, & Vital-Soto, 2021:7).

The example of the war in Russia-Ukraine and its impact on the supply of solar panels demonstrates the interconnectedness of global markets and the need for organisations to anticipate and respond to geopolitical risks. Additionally, the volatile nature of the oil market, with significant price changes, underscores the importance of understanding and managing commodity price risks.

By considering these insights and adopting proactive strategies, leaders in the higher education sector can enhance their ability to navigate environmental disruptions and maintain resilience and sustainability in their organisations.

The themes in the participants' data reveal that most participants either disagree or are unsure if a written and developed policy and procedure document exists for guiding disruption management in the PHEIs:

- *"No, I don't believe it is. There may be, but I'm not aware of it" (00:13:44 P9).*
- *"I'm actually not 100% sure" (00:08:10 P11).*
- *"Not that I'm aware of... But there is an immediate kind of, uh, let's get together. Let's think about it". (00:20:02 P13)*

- *"Well, we don't have policies labelled disruption management, Okay, but we do have policies dealing with the principles of disruption" (00:09:45 P15).*
- *"So, so not at all. I mean, we don't have anything like that" (00:07:50 P18).*

The findings suggest that while some participants perceive the presence of a structure in their organisations to ensure quick and decisive actions during disruptions, there is ambiguity regarding the training and preparedness of organisational staff and management to handle such situations, particularly within higher education institutions (PHEIs).

The lack of distinct themes and the spread of codes across the 'agree,' 'neutral (not sure),' and 'disagree' subcategories indicate a varied perception among participants regarding the level of preparedness within their organisations. However, it is notable that a significant number of participants from PHEIs lean towards agreement with the statement that managers in the institutions feel empowered and comfortable making conscious decisions on disruption management.

	eBlack	eBlue	eBrown	eGreen	eOrange	eRed	eWhite	Total
6.2. During disruption, are the institution's managers empowered and feel comfortable to make conscious decisions and take deliberate actions?	18.8%	6.3%	6.3%	18.8%	6.3%	31.3%	12.5%	100%
Agree								
I know of some	5.9%	0%	0%	35.3%	0%	58.8%	0%	100%
Believe	0%	0%	25.0%	25.0%	0%	50.0%	0%	100%
Definitely	0%	0%	20.0%	40.0%	0%	40.0%	0%	100%
Yes	5.9%	0%	0%	35.3%	0%	58.8%	0%	100%
Disagree								
do not believe	0%	0%	0%	0%	0%	0%	0%	0%
No	5.9%	0%	0%	35.3%	0%	58.8%	0%	100%
Neutral								

I do not know	0%	0%	0%	0%	0%	0%	0%	0%
Maybe	0%	0%	25.0%	25.0%	0%	50.0%	0%	100%
SUM	7.50	1.25	5.00	31.25	1.25	51.25	2.50	100
N = Documents/Speakers	21.05	10.53	5.26	15.79	5.26	26.32	15.79	100

Table 5.3: Question 6.2

One participant expressed his view regarding a lack of training on disruption management and the expectation that, as a leader, it was expected to deal with disruption during the COVID-19 pandemic:

> "*For now, the assumption is that, as a leader, you should be able to deal with disruption. You should be empowered to deal with disruption. But sometimes you're not"* (00:27:02 P2).

In agreement, another participant indicated that often campuses were not entirely empowered:

> *"because everyone's got a fear of making the wrong decision"* (00:09:57 P10)

and had to wait for directives from the head office.

In contrast, one managing director alluded to the fact that although she is aware that her team is not trained to deal with disruptions (00:19:17 P6), she, as a:

> *“leader at Entity Brown, has a very clear mandate regarding which decisions and authority rules [she] can make within [her] own mandate" (00:21:06 P6).*

Consequently, she would also intuitively know when to escalate to her line manager or seek advice from a team of experts within the group.

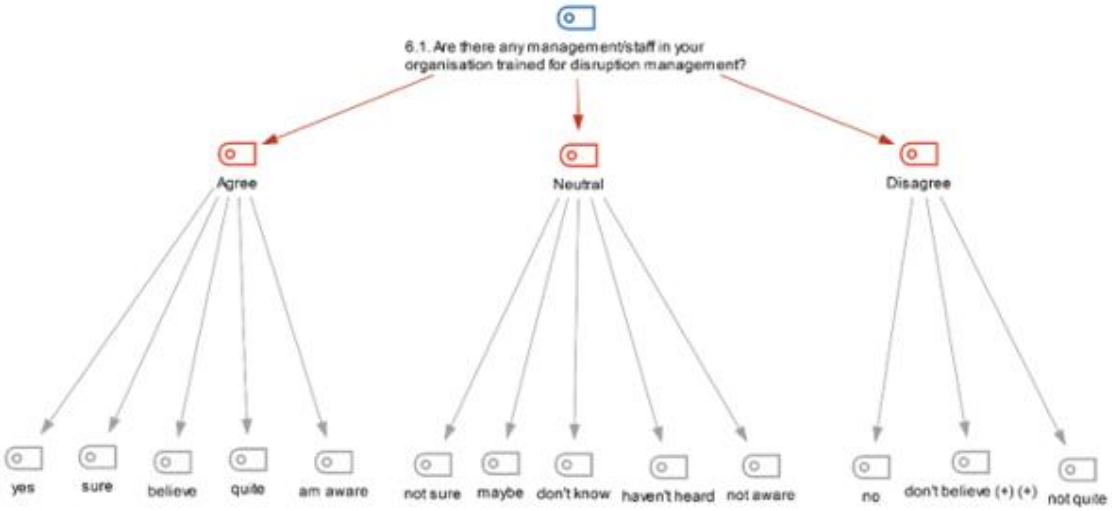


Figure 5.8: Trained staff

This observation raises important questions about the extent to which organisations, specifically PHEIs, have invested in training and equipping their staff and management with the necessary skills and knowledge to effectively manage disruptions. The absence of clear themes suggests a potential gap in understanding and awareness regarding the specific strategies and protocols required to navigate disruptive events. The literature on organisational crisis management and preparedness provides valuable insights into this topic. It emphasises the importance of developing proactive approaches to crisis management, including training programs, simulation exercises, and the establishment of crisis response teams (Liu-Lastres, Schroeder, & Pennington-Grey, 2019:4; Paraskevas, Altinay, McLean, & Cooper, 2013:9). These measures help organisations enhance their ability to detect, respond to, and recover from disruptions effectively.

In the context of HEIs, research has highlighted the need for proactive planning and preparedness to address potential disruptions (Eckel & King, 2020:166; Ronkowitz & Ronkowitz, 2021:1; Oleksiyenko et al., 2022:2; Wardman, 2020:1093). This includes the development of crisis management plans, clear communication channels, and the cultivation of a resilient organisational culture that values adaptability and agility. The presence of larger red dots in the 'agree' subcategory for the statement regarding managers feeling empowered and comfortable making conscious decisions on disruption management suggests that some PHEIs may have made progress in

empowering their leaders to take decisive actions during disruptions. However, further investigation is needed to understand the specific mechanisms and practises that contribute to this perception of empowerment.

The findings highlight the need for further exploration of the training and preparedness of organisational staff and management for handling disruptions, particularly within HEIs. The literature on crisis management provides valuable insights and best practices that organisations can consider when developing strategies to enhance their readiness for disruptions. The themes on whether the institutions have other resources required for disruption management reveal that the institutions have other resources for handling disruption, such as effective LMS systems, financial resources, infrastructure, and other technologies (see Figure 5.9).

However, a common observation among participants is the absence of a dedicated business intelligence tool or system within PHEIs that could facilitate disruption prediction and management;

> *"so basically there's a lack of systems, intelligence systems that could proactively or predict or tell you of any disruption before it can happen"* (00:26:44 P6).

In agreement, one participant alluded to the fact that:

> *"the experience this year within the institution and the organisation has not been great. Based on the system that failed and some of the functionality not working or assisting the business to make informed decisions and take care of the client"* (00:27:42 P1).

Such a tool would enable organisations to proactively identify and address potential disruptions before they escalate.

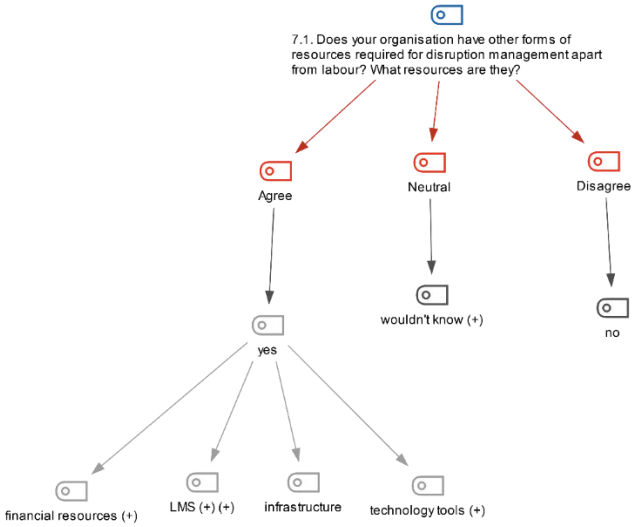


Figure 5.9: Resources and capabilities

The CMB on ‘how institutions ensured that the organisations made available resources to help in responding to disruption and speed up the pace of decision-making’ reveal that the organisations under study commonly implemented established disaster management committees, flexible business model, specialised and online training.

The predictable potential disruption factors revealing solid themes in the reviewed documents include the PESTEL factors and commodity prices. Participants identified several non-predictable risks, including terrorism, looting, technological disruption, disaster, the pandemics (such as COVID-19) and social unrest. The participants, through the analysis themes, suggest ‘adaptation and quick response, agility, awareness, effective communication (with both internal and external stakeholders), scenario analysis and simulation’ as the planning, monitoring, and managing strategies for the non-predictable risk factors.

Participants suggested, as innovative strategies to be implemented by modern managers for effective management of disruption, the following: advanced monitoring and digital tools, flexibility, innovativeness and staying ahead of others in terms of leading disruption as a proactive measure. Participants also suggested environmental scanning, adopting a ‘learning organisation’ model, flexible budgets, risk prediction, agility, and adaptable systems.

During the COVID-19 period, the implementation of the new student system, Wakanda, intended to enhance the student experience, turned out to be a self-disruptive endeavour and posed significant challenges for PHEIs. Participants expressed their frustrations and concerns regarding the system:

> *"We are drowning at the moment with the Wakanda system"* (00:36:27 P6),

highlighting issues related to improper configuration and its overall disruptive impact on business operations.

One common theme among participants was the lack of skills and resources to effectively monitor and manage the disruption caused by the Wakanda system;

> *"we don't have skills or resources to monitor the whole disruption process, such that we don't know when it's going to end"* (00:29:19 P2).

This resulted in uncertainty about the duration and mitigation strategies to minimise the disruption's length and impact. Participants expressed a sense of helplessness, as they were unable to determine when the disruption would end or how to effectively address its effects.

While the intention behind implementing the Wakanda system was to streamline processes within the technical space, participants acknowledged that the execution did not go according to plan. Despite the aim of making operations easier *("intention for it to make life easier"* 00:23:32 P3), the system's implementation created challenges that had not been anticipated. The participants' frustration was a result of this misalignment between the intended benefits and the actual result.

Furthermore, one participant pointed out that any system change inherently carries disruptive consequences. The introduction of the Wakanda system resulted in staff fatigue and a sense of exhaustion due to the ongoing challenges and adjustments required:

> *"In fact, in any company, when you change a system, it is very disruptive, and, I think, in part due to the Wakanda system, I think a lot of staff sort of are very fatigued by it"* (00:10:52 P5).

This highlights the toll that disruptive system changes can have on individuals within an organisation.

The participants' accounts regarding the disruptive nature of the Wakanda system align with existing literature on the challenges associated with system implementations. Research by the Institute of Internal Auditors emphasises the importance of proper system configuration and change management strategies to minimise disruption and enhance successful system adoption. It is important for PHEIs to carefully plan and consider the potential impact of system changes to mitigate unintended consequences and staff fatigue (ISACA, 2020; The IIA, 2020:2).

The frustrations and negative experiences shared by participants underscore the significance of addressing the disruptive effects of system implementations. It is essential for PHEIs to prioritise change management processes, provide adequate support and resources, and ensure proper configuration and testing of new systems to minimise disruption and optimise user experiences.

Participants also reflected on several lessons learnt from the recent disruption experience. The CMB themes show some of the lessons gained by the interviewed managers as the importance of preparedness of the entire institution at any given point for such events and knowing how to use tools to understand hindsight and, most importantly, insight and future. One manager elaborated on the significance of having change agents in place, fostering decision-making, being more social, and enabling the socialisation of customers:

> *"Lesson learned: where things worked beautifully, we had brilliant change agents in place, and where we lacked, we didn't have them. So, to change the profile of our people, we have to get more change-embracing people. Foster decision-makers into those areas... in hindsight, we probably would have done that" (00:33:26 P17).*

Other themes indicate the value of staying in control when a disruption occurs, managing different scenarios, ensuring transparency in dealing with disruption, collaboration and effectively engaging customers and other internal and external

stakeholders. The following participants provide a more in-depth illustration of this point:

- *“And I'm also talking about scenario planning, which is one of the things that we need to always be doing and is an ongoing process. You can't stop scenario planning in the education space or in our environment because you need to always play all scenarios” (00:10:32 P2).*
- *“So I think probably the biggest lesson is always, always collaborate” (00:32:33 P5).*
- *“I think for me, it's really about communication since we have open lines of communication and are creating transparency about what the disruption is and what the likely impact is going to be. And I think by very quickly identifying which areas of the business are likely to be impacted and then how to respond and boost up the resources and the support in those areas to ensure that there's not a sliding performance, and then obviously to continue to grow the other areas that are not impacted. Yeah. So I think communication and transparency would be key” (00:27:49 P14).*

Other strong themes reveal the importance of training staff, applying timely decisions, good management and monitoring systems, agile operations, adequately addressing key aspects, quick decision-making, and ensuring adequate staff support during such times. This is echoed by one general manager, who emphasised the importance of organisational agility, preparedness, and the well-being of human capital resources during times of disruption:

> *“The lesson we’ve learned is that as an organisation, we need to be quick. In responding and being ready at all times, you need resources to think about the next disruptions that may happen. Um, two, as an organisation, did you take care of your people in those difficult times as a human capital resource?” (00:48:29 P1)*

It is important for PHEIs to respond swiftly and be proactive in anticipating future disruptions (Jia, Chowdhury, Prayag, & Chowdhury, 2020:11). This includes allocating resources to proactively address potential challenges and consider alternative

scenarios (Sahebjamnia, Torabi, & Mansouri, 2015:14). Additionally, PHEIs should prioritise the welfare of their employees during difficult times. Taking care of human capital resources entails providing necessary support, ensuring their well-being, and fostering a supportive work environment (Mihalache & Mihalache, 2022:295). This approach not only enhances resilience but also improves employee engagement and productivity (Tzenios, 2019:23).

This study also utilised code frequency displays to analyse, per each institution and in percentage terms, the themes established from each participant's institution. The table below shows the code frequencies for the suggested 'pillars of strategic disruption management for PHEIs' for the institutions under investigation.

	eBlack	eBlue	eBrown	eGreen	eOrange	eRed	eWhite	Total
10.1. What would you suggest being the pillars of strategic disruption management for higher education institutions, given past experiences?	22.2%	5.6%	5.6%	16.7%	5.6%	27.8%	16.7%	100%
Collaborations	14.3%	0%	0%	28.6%	0%	57.1%	0%	100%
flexible business model	10.0%	0%	0%	20.0%	20.0%	50.0%	0%	100%
specialised disruption training and empowerment (+)	14.3%	0%	42.9%	0%	0%	35.7%	7.1%	100%
scenario analysis and planning	50.0%	10.0%	0%	0%	0%	40.0%	0%	100%
decision-making	37.0%	3.7%	3.7%	18.5%	14.8%	18.5%	3.7%	100%
environment scanning	0%	0%	0%	0%	0%	100%	0%	100%
Research	100%	0%	0%	0%	0%	0%	0%	100%
policy, leadership and governance (+) (+) (+)	5.3%	0%	5.3%	52.60%	15.8%	21.1%	0%	100%
Framework	0%	0%	0%	0%	0%	33.3%	66.7%	100%

monitoring and controlling	100%	0%	0%	0%	0%	0%	0%	100%
Communication	75.0%	0%	0%	0%	25.0%	0%	0%	100%
change management	20.0%	0%	0%	30.00%	20.0%	30.0%	0%	100%
people management	27.6%	0%	6.9%	3.40%	34.5%	20.7%	6.9%	100%
Technology	27.6%	0%	6.9%	3.40%	34.5%	20.7%	6.9%	100%
SUM	28.50	2.00	6.50	13.50	16.50	27.50	5.50	100.00
N = Documents/Speakers	21.05	10.53	5.26	15.79	5.26	26.32	15.79	100.00

Table 5.4: Code frequencies for the suggested 'pillars of strategic disruption management for PHEIs' concerning each institution

From Table 5.4, it is evident that the reviewed documents of participants from the different institutions carry different opinions on what should constitute the pillars of disruption management. However, caution should be taken as the code frequency table assumes equal weighting for each code and each institution that has taken part in the interview process.

Based on Table 5.4, themes for eBrown favour specialised disruption training and empowerment and other related components, while eWhite participants prefer effective framework implementation. eGreen is leaning more towards change management, collaborations, policy leadership, and governance. eBlack and eRed want the disruption management strategy within their institutions to have more pillars. However, eBlack is leaning more towards the pillars 'scenario analysis and planning', 'effective decision-making', 'research', 'communication' and 'monitoring and controlling'. At the same time, eRed has more preference in their 'strategy mix' for collaborations, flexible business model, framework, specialised disruption training and empowerment, scenario analysis and planning, environmental scanning and change management.

The rest of the tables for code frequencies are shared in Appendix 5.3. From the table for the code frequencies for 'contextualised disruption definition', the most popular definitions of disruption, reflecting themes from at least three institutions, are:

- Disruption is an event impacting the flow of business and the education environment, and
- Disruption is an ‘event forcing new way of doing business in the education industry.’

From the table for code frequencies for the suggested basic procedures and processes for managing disruption, eBlack, eBlue, eRed, and eWhite suggest a list containing more elements for basic procedures and processes for managing disruption. The entity eBrown suggests quick decision-making in line with policy, regulation, and implementation of specialised training. The entity eGreen suggests effective and competent management, following well-defined procedures for management, effective communication, monitoring results closely, and keeping the staff engaged constantly. The code frequencies for the rest of the interview questions are displayed in the Appendices.

5.7 INTEGRATION WITH EXTERNAL THEORETICAL FRAMEWORKS

The study's qualitative results identified important factors for effectively managing disruptions, including collaboration, technology, change management, people, scenario planning, and empowerment. We can further enhance these findings and place them within the broader context of disruption management by incorporating established theoretical frameworks, demonstrating their connection to existing literature in this area.

Resilience theory

Understanding resilience theory is essential for comprehending how organizations can withstand, adjust, and flourish in the face of challenges. Mayar et al. (2022) and Arreguín-Sánchez (2022) defines resilience as the ability of a system to absorb disruptions and undergo reorganisation while maintaining its core function, structure, identity, and feedback mechanisms.

The qualitative findings from participants highlight the importance of resilience by:

Working together with external partners and stakeholders enhances a company's capacity to overcome challenges by pooling resources and expertise to navigate through tough disruptions (Henry, 2024; Leal Filho et al., 2021; Trogemann, 2023). Embracing technological progress is crucial for building resilience as it enables organisations to swiftly adjust to new circumstances and uphold continuity in operations and educational delivery (Silva et al., 2023).

Change management theories

Change management theories, like Kotter's 8-Step Change Model (Kotter, 1996), offer a framework for effectively managing transitions during disruptions. Kotter's model emphasises the importance of creating urgency, building strong coalitions, developing a vision and strategy, communicating the vision, empowering action, achieving short-term wins, consolidating gains, and anchoring new approaches in the culture.

The qualitative findings support these principles

- Change management: Participants emphasised the need for clear communication, stakeholder engagement, and promoting a culture of adaptability—important components of Kotter's model (Kuffuor et al., 2024; Ziataki, 2023).
- People: Recognising the central role of individuals in responding to disruptions and focusing on their skills, capabilities, and well-being is crucial. This aligns with the need to empower action and build on change (Moosavi et al., 2022; Shekarian & Mellat, 2021).

Scenario planning and strategic foresight

Theories on scenario planning and strategic foresight emphasise the need to prepare for different potential future situations to improve decision-making when the outcome is uncertain. Cordova-Pozo and Rouwette (2023) explains that scenario planning includes identifying driving forces, exploring possible futures, and creating strategic responses.

The qualitative research supports this approach

- Scenario Planning: Participants highlighted the significance of analysing and planning for potential future events and developing adaptable strategies (Cordova-Pozo & Rouwette, 2023).
- Empowerment: Making sure all stakeholders have a voice and can contribute to decision-making processes creates a proactive and inclusive environment, which improves the institution's ability to navigate uncertainties (Doten-Snitker et al., 2021).

Contingency theory

According to contingency theory, there is no one-size-fits-all approach to managing an organization. The best course of action depends on various internal and external factors. Lerionka and Kimaku (2023) suggest that achieving organisational effectiveness involves aligning the organization's characteristics, including its structure, with its unique situation.

This study's findings support this theory in several ways

- Adaptability: Participants stressed how important it is to be able to change and adapt to deal with disruptions. This fits with the idea that organisations should be able to change their ways of doing things to fit the needs of the situation (Lozada-Contreras et al., 2022).
- Customisation of strategies: The emphasis on scenario planning and customising responses to specific disruptions highlights the need for tailored strategies that are contingent upon the specific context and challenges faced by the institution.

The Resource-Based View (RBV) theory

The RBV theory focuses on the strategic resources a company has that can give it a competitive advantage. According to Barney (1991), these resources need to be valuable, rare, inimitable, and non-substitutable (VRIN) to maintain a competitive advantage.

Qualitative findings highlight the importance of resources in disruption management

- Human Capital: Recognizing people as a central pillar aligns with the RBV theory and emphasizes the value of skilled and capable human resources in providing a competitive edge during disruptions (Dwikat et al., 2023; Muriuki, 2023).
- Technological Resources: Emphasising technology highlights the role of valuable and unique technological resources in enhancing the institution’s ability to adapt and respond to disruptions effectively.

Implications of integrated theoretical frameworks

When we consider resilience theory, it becomes clear that working together and using technology is important for creating systems that can withstand and adjust to disruptions. This foundation supports the necessity for strong partnerships and technological infrastructure. Kotter's 8-Step Change Model emphasises the significance of change management practices that were emphasised by participants. Effective communication, involving stakeholders, and empowering individuals are essential for successfully navigating transitions. Scenario planning and strategic foresight theories stress the importance of preparing for various potential futures.

The research on scenario planning and empowerment aligns with these theories, underscoring the need for thorough planning and inclusive decision-making. Contingency theory, which affirms the necessity of adaptable and flexible management strategies specifically designed to address specific disruptions and contexts, further emphasises the study's emphasis on scenario planning and customised responses.
The RBV theory emphasizes the importance of leveraging valuable human and technological resources to gain a competitive advantage in managing disruptions, which is consistent with the study's emphasis on technology and people as key pillars.

5.7 CHAPTER CONCLUSION

In conclusion, the qualitative findings from the research study shed light on several key pillars and themes related to disruption management. Technology emerged as a crucial pillar, highlighting its significance in addressing disruptions effectively. Change management was also recognised as a vital aspect, emphasising the need for PHEIs to adapt and manage change during disruptive events. The role of people, including

leaders and staff, was emphasised, particularly the importance of their skills, agility, and collaboration in crisis management.

Insights from leaders emphasised the importance of various strategies and approaches, such as scenario analysis and planning, understanding the problem thoroughly, having a well-defined disaster management structure, specialised training in disruption management, and effective and competent management. The qualities of fearless leaders and their willingness to explore uncharted territories during disruptions were highlighted as crucial for success. Participants did, however, also express challenges and frustrations related to the impact of politics on business operations, difficulties brought about by outside factors like load shedding, conflicts, cost of living and the lack of specialised business intelligence tools or systems within PHEIs for disruption prediction and management. There was a recognition of the need for better training and preparedness among organisational staff and management to handle disruptions, particularly in the context of the COVID-19 pandemic.

Overall, the qualitative findings revealed a mix of positive perceptions regarding the presence of structures and empowered decision-making in managing disruptions within PHEIs, along with identified areas for improvement and innovative strategies to enhance disruption management. Participants also acknowledged the lack of abilities and resources for efficiently monitoring and managing disruptions as well as the disruptive effects of system changes. These findings highlight the complex nature of disruption management and provide valuable insights for PHEIs and leaders in developing effective strategies and approaches to handle disruptions more efficiently in the future.

CHAPTER 6: FINDINGS AND CONCLUSION

"Research is creating new knowledge." - Neil Armstrong

6.1 INTRODUCTION

This chapter provides a summary discussion of the study findings. It juxtaposes the existing literature findings and the triangulated results of the collected quantitative and qualitative data. It finally provides recommendations for higher education leadership. The summary conclusions and recommendations are linked to the study objectives outlined in chapter one. The conclusion derives from both the reviewed literature and the main study analysis results.

6.2 SUMMARY OF THE FINDINGS OF THE STUDY

This section summarises the study findings by comparing the literature to the main findings through a triangulation approach. A discussion of the literature findings is provided first before comparing them to the juxtaposed results of the quantitative study from the groups, namely, the student and staff groups. The qualitative study results on management opinions complete the 360-degree approach to the investigation. The contributing elements' results help establish a framework for managing disruption by private higher education institutions.

However, as study objective 1.4(c) points out the need for a proactive approach to disruption management, a machine learning-aided disruption risk prediction model, which is constructed as illustrated in chapter four (Section 4.4.1) is discussed in this section.

The study used a data triangulation approach to gain a comprehensive understanding of the research topic. By integrating quantitative and qualitative methods, the study aimed to explore the overall experience and adequacy of support from both staff and student perspectives, as well as gather insights from leaders regarding disruption management. Following Kimmons' (2022:1) framework on data triangulation, a sequential explanatory mixed-methods design was adopted, beginning with quantitative data collection and analysis. The subsequent collection of qualitative data served to complement and expand upon the quantitative findings, providing a more

nuanced and comprehensive understanding of the phenomena under investigation (Creswell, 2008).

The findings from the data triangulation process revealed valuable insights into the overall experience, adequacy of support, and perspectives of leaders within the research context.

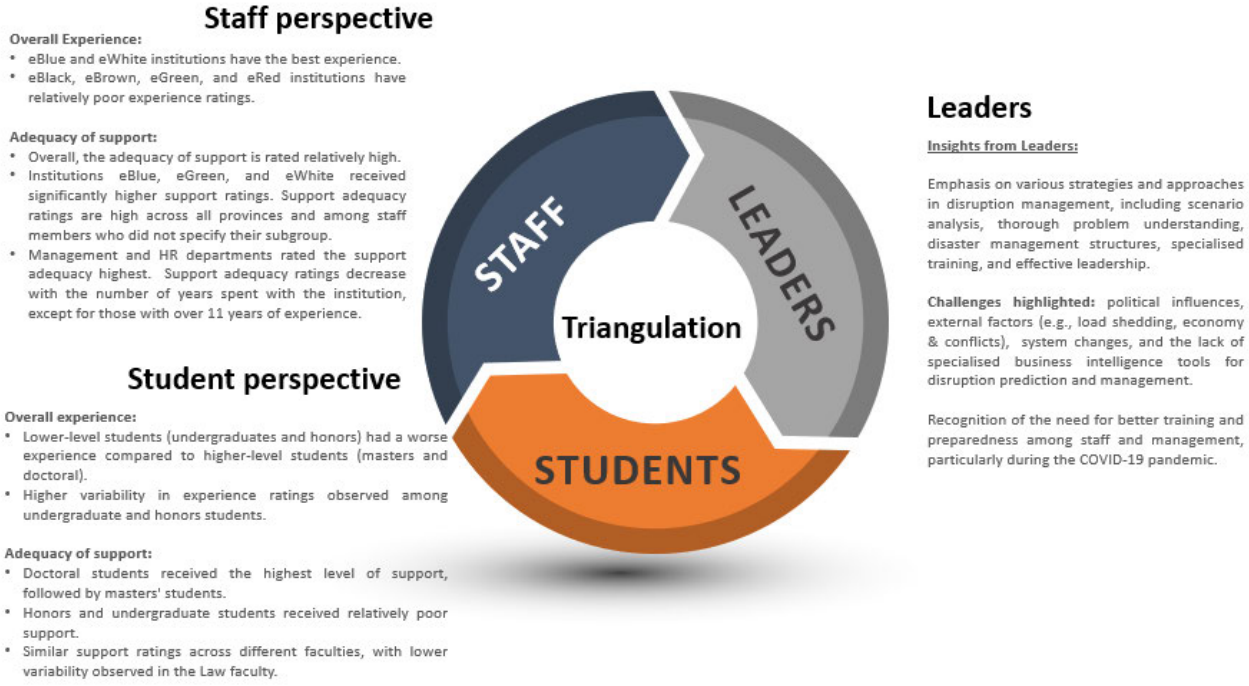


Figure 6.1 : Data triangulation summary

Overall Experience: From the staff perspective, the evaluation of institutions revealed divergent ratings in terms of experience. Notably, eBlue and eWhite institutions were regarded as having the most favourable experience, while eBlack, eBrown, eGreen, and eRed institutions received comparatively lower ratings. This disparity suggests differences in the perceived quality of experiences among staff members across these institutions.

Turning to the student's perspective, a discernible pattern emerged in relation to the level of study. Lower-level students, namely undergraduates and honours students, reported a less favourable experience compared to their counterparts at higher levels of study, specifically masters and doctoral students. This disparity in experiences highlights the potential influence of academic progression on the quality of educational

encounters. Furthermore, it is worth noting that undergraduate and honours students exhibited higher variability in their ratings, indicating a broader range of experiences within this student cohort.

The contrasting perspectives of staff and students regarding their experiences provide valuable insights for educational institutions. Understanding the factors contributing to variations in staff experiences can inform strategies to enhance the working environment and support mechanisms for staff members. Similarly, addressing the disparities in student experiences based on academic level can guide efforts to provide tailored support and improve the overall educational experience for all students. By considering and addressing these factors, institutions can work towards creating an inclusive and supportive working and learning environment that promotes positive experiences for both staff and students alike.

Adequacy of Support: The findings from the staff perspective revealed a predominantly positive assessment regarding the adequacy of support. Institutions such as eBlue, eGreen, and eWhite garnered notably higher support ratings, indicating a favourable perception among staff members. This pattern held consistent across different provinces and among staff who did not specify their subgroup affiliation. Noteworthy variations emerged when examining support adequacy ratings among different departments, with management and human resources (HR) departments receiving the highest ratings. However, an intriguing trend emerged in relation to the number of years spent with the institution. Generally, support adequacy ratings exhibited a declining trend with increasing tenure, except for individuals with over 11 years of experience, suggesting a potential shift in perception or experience at that particular milestone.

Regarding the student perspective, doctoral students reported the highest level of support, highlighting the positive experiences of these advanced-level learners. Master's students also expressed a relatively favourable perception of support, albeit to a lesser extent. In contrast, honours and undergraduate students conveyed relatively lower levels of support, indicating potential areas for improvement in addressing their specific needs. Notably, when analysing support ratings across various faculties, a similar level of support was reported, suggesting a consistent

experience across disciplinary domains. The law faculty, in particular, exhibited lower variability in support ratings, indicating a relatively consistent perception of support within that academic unit.

These findings provide valuable insights into the perceptions and experiences of both staff and students regarding the adequacy of support. Such insights can inform strategic interventions and initiatives aimed at enhancing support structures and addressing specific areas where improvements are warranted. Moreover, these findings contribute to the scholarly discourse on support systems within educational institutions, shedding light on the nuanced dynamics between support adequacy and variables such as tenure, academic level, and disciplinary affiliation.

Insights from Leaders: Leaders in the field of disruption management espoused a multifaceted approach encompassing scenario analysis, problem understanding, disaster management structures, specialised training, and effective leadership. While confronting challenges stemming from political influences, economic factors, system changes, and the absence of specialised business intelligence tools, leaders underscored the importance of enhanced training and preparedness, particularly in the context of the COVID-19 pandemic. Their insights provide a foundation for scholarly discourse and inform the development of strategies that foster organisational resilience in the face of disruptions.

By employing a data triangulation approach and integrating quantitative and qualitative data, the study provided a comprehensive and robust understanding of the research topic, contributing valuable insights for future research and practise in the field of disruption management.

Using a data triangulation methodology in this study was crucial for augmenting the accuracy and dependability of the results. Triangulation, the practice of using various data sources or approaches to investigate a phenomenon, enables a more thorough and nuanced comprehension of the research subject. The study used triangulation to combine quantitative data collected through surveys with qualitative data obtained from interviews. We also incorporated the viewpoints of several stakeholder groups, including staff, students, and leaders.

The collected quantitative data from staff and students offered a comprehensive picture of their experiences and perspectives about the handling of disruptions in higher education institutions. This data facilitated the identification of overarching trends and patterns, including the disparities in support and expertise observed among various institutions and academic levels.

The interviews with leaders in disruption management provided detailed insights and contextual understanding that supplemented the quantitative findings. Direct quotations from participants enriched the conversation, offering a deeper and more authentic understanding of the issues and tactics adopted by institutions.

In analysis, triangulation refers to the process of validating findings by examining and comparing both quantitative and qualitative data from different perspectives. The quantitative data revealed a difference in the level of support and experience between staff and students. Qualitative insights from leaders and participants further elucidated and contextualized this difference.

The use of triangulation in this study increased its validity by ensuring that the results were backed by different data sources and perspectives, thereby enhancing its reliability. Furthermore, it improved reliability by doing cross-verification of findings, thereby decreasing the probability of bias or inaccuracy.

Practical implications: By integrating various data sources, we achieve a thorough understanding of disruption management, enabling the creation of plans that effectively cater to the requirements and viewpoints of all parties involved. This technique guarantees that the results are not only strong but also directly applicable to shaping policies and practices in higher education institutions.

The study utilised data triangulation to provide a more comprehensive and precise understanding of the intricate aspects related to disruption management in higher education. The careful adherence to methodological principles in this work bolsters the trustworthiness of its findings and establishes a solid basis for future investigations and applications in the field.

6.2.1 Findings from the reviewed literature

6.2.1.1 Overall experience

According to empirical evidence, the COVID-19 lockout was especially difficult for students who had never taken an online course previously (Ronkowitz & Ronkowitz, 2021:194). Meeting students' social and emotional needs in a digital world were also identified as a persistent issue of worry in the study investigating the pandemic's impact on students' mental health (Lakhan *et al.,* 2020). When researchers looked at the staff, they found that most educators had experienced a lot of stress and burnout during COVID-19 (Rubilar & Oros, 2021:1). This was especially the case for those who had less experience with online teaching (Mosleh, Kasasbeha, Alijawarneh, Alrimawi & Saifah, 2022:1). Both academic and non-academic workers experienced significant breakdowns and burnout because of the increased pressures placed on them at work and at home. It is safe to say that the COVID-19 epidemic changed the dynamics of just about every aspect of human existence (Abramson, 2022:1).

Globally, many recent higher education graduates are jobless due to rising unemployment caused by COVID-19 and other factors such as loadshedding, economic pressure, and political conflicts. The current students, especially those in their senior year, may feel more anxious. While most students are satisfied with their educational experiences, many wonder if it is worth the time and money (Lederman, 2021:1).

When looking at the managers in an organisation, who are responsible for the running of an organisation, depending on their background, some managers may be adept at change management and adjusting to unexpected events, while others may have more difficulty. Some people may have thought there were safety nets in the form of processes and policies, while others may not have coped because they lacked a formal framework and an easily understood map. However, it is widely acknowledged that adapting to change and managing disruption is one of the most difficult aspects of running an organisation (Hemmingsen, 2017:1). Many leaders have the impression that they are inadequately prepared to cope with disruptions (Development Dimension International, 2021:16).

6.2.1.2 Overall support

The COVID-19 pandemic and the resulting lockdown measures have posed numerous challenges for students and academic staff worldwide (Winter, Costello, O'Brien, and Hickey, 2021:238). The pandemic has disrupted the traditional modes of learning and teaching (Schleicher, 2021:4), and it has had profound impacts on physical and mental health (EAPA-SA, 2022:1; García-Álvarez, Soler & Achard-Braga, 2021:1; Visser & Law-van Wyk, 2021:229), academic progress, and financial stability of students and their families. Financial challenges are among the most significant problems students have faced during the pandemic (Negash *et al.*, 2021:2). Many students have lost part-time jobs, and their families have experienced reduced income due to the economic downturn. This situation has made it difficult for some students to afford basic needs such as rent, food, and academic resources, thus affecting their ability to concentrate on their studies.

The lockdown measures have also led to social isolation, and many students have had to study and cope independently. This has impacted their mental health, as they have been cut off from their social support networks and faced increased stress and anxiety (Lakhan *et al.,* 2020). Connectivity challenges have also been a significant issue, particularly for students who live in rural areas or low-income households. The shift to online learning has required students to have reliable Internet access and appropriate devices, which is not feasible for some students. Frequent loadshedding and power outages in South Africa have made this challenge far more difficult.

Staff at PHEIs have also faced challenges during the pandemic, such as increased workloads and pressures, concerns about their health and safety, and the need to adapt to new teaching methods. Overall, the COVID-19 pandemic has had far-reaching impacts on the higher education sector and addresses the challenges faced by students. Staff will require a coordinated and sustained effort by institutions, governments, and society. The above said, during the pandemic, universities like Harvard, Stanford, and MIT launched a programme to help students and faculty cope with stress, improve their mental health, and maintain social connections (Harvard, 2020; MIT, 2022; Stanford, 2022).

Many HEIs saw the challenges their employees and students were having with Internet connectivity during the pandemic and took measures to help, including offering free data, zero-rated access to websites, emergency relief funding for other needs such as accommodation and food, laptop loans, and free data offerings (Arizona State University, 2023; UKZN, 2023; University of California, 2020; University of Pittsburg, 2023; University of Texas, 2023).

6.2.2 Overview of the study

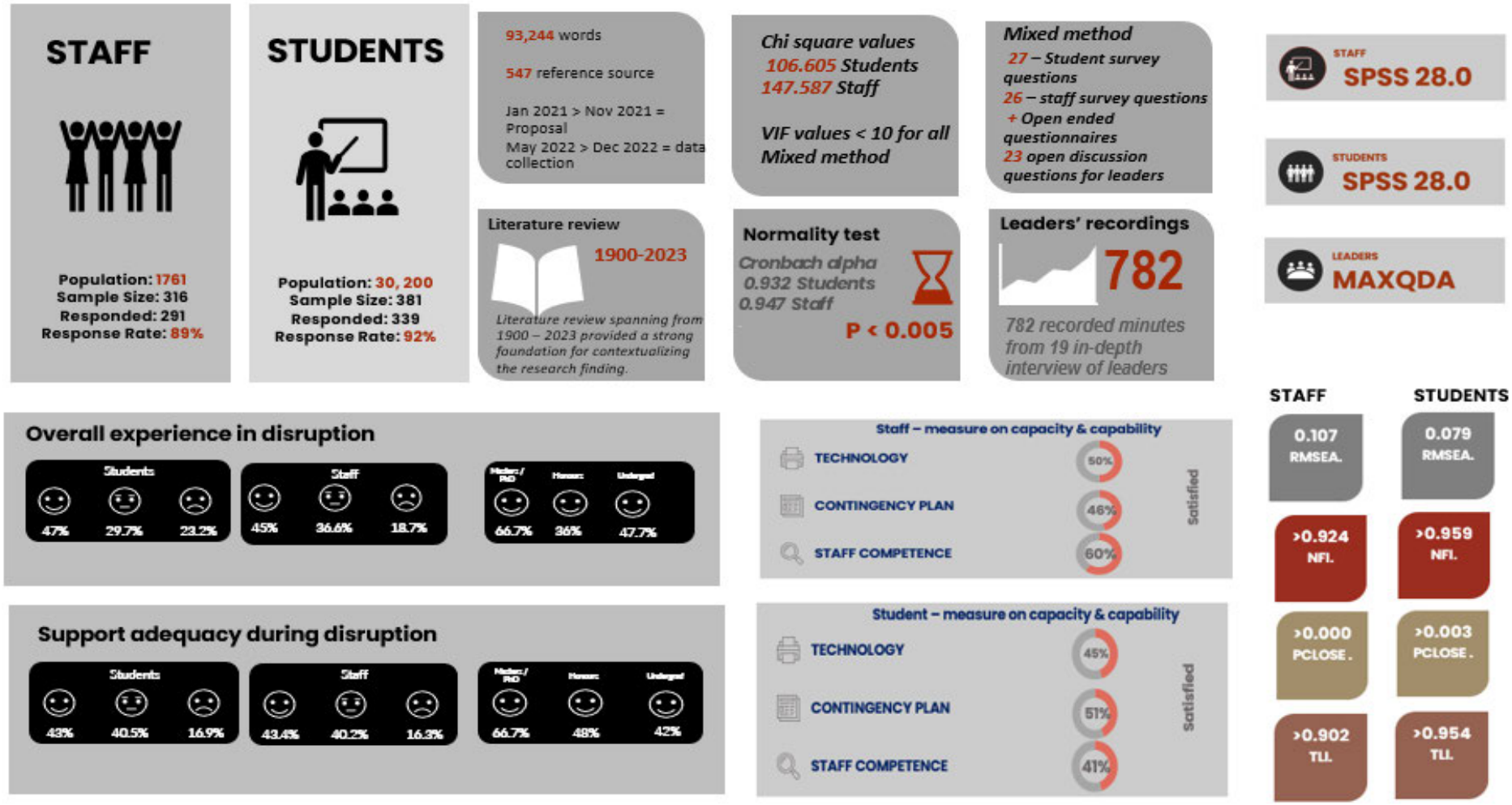


Figure 6.2: Infographic of the study
Source: Researcher own compliation

The figures presented above offer a comprehensive glimpse into the study, encapsulating key findings and pertinent summary of chosen statistical information. Through these, a holistic view of the research emerges, providing valuable insights and providing the significance of the study's outcomes. This study makes a important academic contribution by investigating the impact of COVID-19 pandemic disruptions on staff, students, and leaders in higher education institutions. The primary objective was to develop a comprehensive disruption framework that would serve as a roadmap for leaders to effectively navigate and manage these disruptions. To build a strong foundation for the study, an extensive review of relevant literature spanning from 1900 to 2023 was conducted, incorporating key theoretical perspectives from the field. By adopting a mixed-methods approach encompassing both quantitative and qualitative analyses, the study aimed to provide a holistic understanding of the phenomenon under investigation. The findings shed light on the diverse experiences and varying satisfaction levels among different stakeholder groups, underscoring the significance of tailored support strategies. The quantitative analysis, conducted using SPSS 28.0, yielded statistically significant results, which were further validated by acceptable variance inflation factor (VIF) values, thus affirming the alignment of the findings with the conceptual framework.

The integration of theoretical lenses within the conceptual framework allowed for a comprehensive analysis of the research problem, enabling policymakers and practitioners in higher education institutions to develop evidence-based strategies informed by established theoretical perspectives. In the end, this study contributes to the existing body of knowledge by providing valuable insights into the impact of disruptions in higher education and offering a conceptual framework that can guide effective decision-making and planning in the face of future challenges.

6.2.3 Comparison of student and staff results

The summary statistics and the histograms for the student data reflect that, in general, students had a moderate experience during the COVID-19 pandemic. The data indicate that students' support from their institutions was inadequate. This could be linked to the fact that students had a better experience while not getting adequate support or doing any learning activities such as assessments from home. This could

be because some learners come from underprivileged families while others have poor network infrastructure in their areas of residence, which compromises their experiences. Another factor which could be uncontrollable by the institution includes a lack of family support. The students suggest that the institutional teaching and learning policies and guidelines support, to some extent, disruption management. Other factors could influence students to say they received less support during the COVID-19 pandemic. For example, lack of technology or Internet access - some students may not have access to reliable technology Internet access, making it challenging to participate in online learning and access support services. It could also potentially be limited interaction with faculty and staff.

The transition to online learning during the COVID-19 pandemic has presented challenges in providing adequate support to students, as limited interactions and reduced availability of institutional services have hindered their access to necessary assistance. Budget constraints and the need to operate remotely have led to the reduction of support services, exacerbating students' perception of receiving insufficient support. Additionally, the difficulties associated with adapting to online learning, coupled with heightened stress and mental health concerns, further contribute to students' sense of inadequate support.

The COVID-19 pandemic has introduced significant financial challenges for students, leading to their perception of inadequate support in managing these difficulties. Students are grappling with the economic repercussions of the pandemic, and they may feel that the support provided by institutions is insufficient to address their financial needs. The pandemic's overall effects on students have been complicated, so institutions must be aware of these circumstances and proactively provide the assistance required for student success. Research by Negash *et al*. (2021:2) highlights the detrimental effects of the pandemic on students and their families' financial well-being. Additionally, a survey conducted by the Pew Research Centre reveals that a considerable proportion of households believe it will take several years to recover financially to pre-pandemic levels (Horowitz, Brown, & Minkin, 2021:1). These findings indicate that financial strain may be one of the prominent challenges faced by students in the HEIs under study. Consequently, institutions should address

these concerns by implementing appropriate measures to support students during this challenging period.

Some students have expressed a sense of loss regarding the personal interaction and support they previously received from professors and peers in the traditional classroom setting. They believe that the remote learning format has resulted in reduced engagement and interaction with professors and peers, ultimately hindering their effective learning. Students' dissatisfaction may stem from a lack of comprehension of educational systems or difficulties in communication (Özüdoğru, 2021:321). Additionally, some students have felt that HEIs have not provided adequate resources or support to help them succeed in the remote learning environment. It is important to acknowledge that students' experiences and perspectives can vary significantly, and the reasons mentioned above may not capture the full range of their concerns. The COVID-19 pandemic has disrupted traditional educational approaches, necessitating a swift transition to online learning for many institutions (Mpungose, 2020:1). This transition has created challenges for students, particularly those who are unaccustomed to online learning. The isolation caused by the pandemic has added an extra layer of difficulty, making it harder for students to engage with their studies.

The COVID-19 pandemic has presented significant challenges for students, particularly those unfamiliar with online learning. According to Leal Filho *et al.* (2021:1), the pandemic has created a sense of isolation for many people, including students, who now have to study independently. This isolation has made it harder for students to get the support they need, and many have struggled to stay motivated and focused. Also, students not used to learning online have had difficulty getting used to this new way of learning. Ronkowitz and Ronkowitz (2021:194) also confirm that students who had never taken an online class found the experience challenging. They may have struggled with technical issues or found it difficult to manage their time effectively. The lack of face-to-face interaction with teachers and classmates has also made it harder for students to stay engaged and motivated. However, PHEIs have been trying to provide support and resources to help students adapt to this new mode of education.

The students' data suggests that the institutional teaching and learning policies and guidelines do support, to some extent, the management of disruption but also to a limited extent. The experience level with students amongst the different institutions was quite different, as the experience in some institutions was worse than others. However, the individual institutions did not consistently rate highly in all the metrics. For instance, eBlack, eBrown and eWhite, rated highly overall, had a poor rating in some of the variables applied. This potentially indicates different factors playing a part in different institutions. However, for most of the variables considered in the study, eBrown, eBlack, and eWhite outscored their counterparts regarding performance in management disruption.

Perhaps the adopted disruption management framework could borrow from what these institutions are getting right about managing disruptions to their operations. However, the good rating could be attributable to factors such as the institution's size (determining its manageability) and the effectiveness and efficiency of service delivery. Institutions with very large student numbers had lower ratings. Students in Gauteng and KZN come from a province with many students, impacting manageability. When the institution has many students, they are more likely to encounter more challenges in managing disruption, such as the COVID-19 pandemic.

According to Nwachukwu, Winchester, Das, and Hagan (2021:20), larger institutions may struggle to provide personalised support and resources to each individual student. Due to the sheer number of students on campus, they may find it more challenging to implement and enforce safety protocols and guidelines, such as social distancing and mask-wearing. Also, bigger institutions may have more complicated and connected systems, making responding quickly and effectively to changes and disruptions harder. Furthermore, the scale of disruptions can be more significant in larger institutions as the spread of infections can be more widespread, as reported by Park, Adegun, and Venkatraman (2021:307). This is because the disruption may affect more people, including students, faculty, staff, and support workers. This can make it more important for different departments and stakeholders in the institution to talk to each other and work together, which can be hard in larger organisations.

Some areas had other factors impacting their ability to manage disruption. For instance, effectively, KZN experienced floods and riots, which affected students, while

Gauteng experienced taxi strikes. Also, students in more rural provinces tended to have poor experiences. An example of the single learner in Northern Cape (NC) who consistently provided poor ratings could be due to the remoteness and rural setting and the frustration of being isolated from other students. This disadvantages the learners regarding peer engagement (especially in collaborative work) and with the lecturers. However, more developed institutions would offer more technologically advanced tools making it easier to support the learners virtually.

Based on empirical evidence, students in more rural provinces may not do as well with online education. These students may have difficulty engaging in online learning due to a lack of access to technology and the Internet (Reddy Moonasamy & Naidoo, 2022:83). Bok and Mostert (2020:7) also observed that when it comes to online learning, students in remote locations may encounter additional challenges, such as limited transportation and other resources. These problems could lead to bad feelings like loneliness, lack of interest, and a drop in academic performance. PHEIs need to identify and address the specific difficulties experienced by students in remote regions and strive to ensure that these students have access to the resources and services they need to be successful in online learning. By doing so, PHEIs can ensure that students from all backgrounds, regardless of where they live or their family's financial situation, have access to the same quality education.

The doctoral and Master's students have consistently rated the institution's capacity, capabilities, and efforts towards managing disruption issues highly, while the situation is the opposite for honours and Year 3 undergraduate students. Several possible reasons could explain the difference in the ratings at different levels of study. The institutions could be providing greater/special support to the masters and PhD students because of the heightened demands of their studies. Concern about finding work and succeeding in that employees are just other examples of the many worries that plague graduating seniors, according to the research (Tremblay *et al*., 2017; Van den Berghe *et al*., 2014).

The masters and doctorate students may have greater access to academic support, such as mentoring and supervision from their academic advisor, which may have helped them to adapt to the disruption caused by the pandemic. However, this could

also be to do with the greater independence of students at higher levels. Students at master's and doctorate-level students may have greater autonomy (Koohang *et al*., 2015), independence and the ability to adapt to their studies (Knowles, 1970). This could enable them to adapt to remote learning and other changes brought on by the pandemic (Garrisson & Kanuka, 2004).

The higher-level students also have more self-directed learning, which may make it easier to adapt to remote learning and other changes brought on by the pandemic. Master's and doctorate students tend to have more experience and skills in research and analysis, which may have helped them to adapt to the disruption caused by the pandemic. Nevertheless, the master's and doctorate students are frequently given more access to technology, and other resources, including specialised facilities or dedicated staff, which may have helped them to adapt to the disruption caused by the pandemic. Third-year undergraduate and honours students could be frustrated by the pressure and increased academic demands, which may encompass more challenging coursework, longer assignments, higher expectations for independent research and critical thinking, and the fact that they are in a final year towards graduation. In addition, third-year and honours students may face more difficulty finding internships or employment opportunities that align with their field of study and career goals.

However, the above finding, indicating that black and Indian students are less satisfied with institutional support during the COVID-19 pandemic, is concerning and warrants further investigation. Previous research has indicated that students from marginalised racial groups may experience additional challenges and stressors that impact their academic success and well-being (Smith & Bae, 2020; Belgrave, Townsend, Cherry, Cunningham & Lashley, 2018). Moreover, the COVID-19 pandemic has disproportionately affected communities of colour, exacerbating existing health, economic, and social disparities (CDC, 2021). This may be particularly relevant to black and Indian students, who may face additional stressors and challenges during this time.

Furthermore, research has shown that institutional support, such as academic advising, mentoring, and financial assistance, can significantly promote the success and well-being of students from underrepresented groups (Harper & Gasman, 2008;

Hurtado, Newman, Tran & Chang, 2020). Therefore, PHEIS need to examine their policies and practices, identify potential barriers to support marginalised students, and develop targeted interventions to promote equity and inclusion for all students during this challenging time.

Gender did not seem to reflect any significant underlying patterns of distribution. However, the males had relatively higher scores than the female students. Several factors could make female students less satisfied with institutional support than male students during the COVID-19 pandemic. Female students may be more likely to face socioeconomic challenges such as poverty, food insecurity and lack of access to technology, making it more difficult for them to succeed in remote learning. Female students in South Africa commonly have more responsibilities for childcare, which may have made it more difficult for them to balance their coursework with other responsibilities.

Previous research has highlighted the unique challenges and stressors that female students may experience, such as gender discrimination, unequal access to resources, and the burden of caregiving responsibilities (Shields & Behrman, 2017; Laffitte, 2020). Female students may have faced gender bias or discrimination in their coursework and interactions with educators, which may have affected their satisfaction with institutional support. Female learners may also have limited access to leadership opportunities, which may have hindered their ability to succeed in their field of study. Moreover, the COVID-19 pandemic has disproportionately affected women, who are more likely to experience job loss, caregiving responsibilities, and other economic and social stressors (McKee-Ryan, Song, Wanberg & Kinicki, 2020).

The students are generally quite positive about the future capacity of the institution. The institutions investigated also rated well in ensuring technology capacity and integration to their operations, innovativeness, the competence of their staff and institutional future relevance and compatibility. Still, the overall rating was low for ‘ability to devise contingency plan’, ‘management’s flexibility’, ‘problem-solving’ and ‘ability to manage out crisis’. The other variables that reflected poor outlook include the ‘effectiveness of institutional guidelines’ and ‘other aspects’ that were not captured by the variables applied in the research instrument.

The students' responses on the potential of the institution based on the relevance and compatibility of the institution with future requirements, management flexibility, management competence and flexibility, ability to devise contingency plans, staff competence and technological improvement all reflect positively. Higher education institutions faced several challenges related to problem-solving covering remote learning, limited resources, government rules and restrictions, technical difficulties adapting to a hybrid model, the mental health of staff and students, less engagement and limited flexibility.

With many students and faculty members forced to work from home, higher education institutions had to quickly adapt to remote learning, which presented several technical and logistical challenges. Many private higher education (PHE) institutions were operating with limited resources due to the economic impact of the pandemic. This made it difficult for them to invest in new technology or hire additional staff to support remote learning. Students may have experienced technical difficulties with remote learning, such as connectivity issues or accessing course materials. The Higher Education institutions also had to adapt to a hybrid online and in-person learning model, adding challenges in terms of technology and infrastructure. The pandemic also significantly impacted students' mental health and well-being, which presented additional challenges for higher education institutions. The DHE's policies may have made it harder for the institution to respond quickly and creatively to the disruption caused by COVID-19. The institution engages the department for guidance on various matters, including curriculum provision, examination, and policies. Institutional leaders were also stressed, which could have impacted their technological prudence and reduced their IQ levels.

The rating for the institution's technology integration provided a positive reflection and partly contributed to the good overall rating by students during the COVID-19 period. By the start of the COVID-19 crisis, the institutions under study had already started harnessing collaborative online tools for students and work teams, making it smoother to transition to online learning and working modes. Evidence shows that the institutional leadership was good. Strong and visionary leadership can provide good and clear direction and guidance for technology initiatives within a private higher

education institution. Leaders who understand the importance of technology in education and are willing to invest in it can help to facilitate its implementation. A robust IT infrastructure contributed to effective support by harnessing the technology. This could include reliable Internet connectivity, robust servers, network security, and the IT team.

Professional development for faculty and staff might have also facilitated the effective use of technology in the private higher education institutions being studied. Training and support for new technologies may help the PHE institutions' employees feel more comfortable and confident using them. Collaboration among faculty, staff, and students perhaps helped to facilitate the use of technology in private higher education institutions. In many PHE institutions, they encourage collaboration on technology-related projects and initiatives which may help effectively utilise the available IT tools, generate new ideas, and support the use of new technologies.

The PHE institutions' rating on capacity was overall good, as reflected in the results. This could partly be because the institutions under study have consistently shown a very strong financial management model over the past five years. The institutions had also fostered a culture of innovation, evidenced by the technological evolution in learning systems, which helped it navigate the pandemic crisis.

The institutions' relevance and compatibility with the future are rated relatively high too. Almost all the PHEs involved in this study are taking steps to embrace the Fourth Industrial Revolution (i4.0 tools), including Artificial Intelligence, Data Science (particularly harnessing Big Data and Real-time tools), Cloud Computing, Internet of Things, Immersive World and others, which are effectively improving the agility of the businesses while refining their models to match future demands. The PHEs also continuously reviewed learning programs while providing ongoing staff training and lifelong learning programs (supporting the culture of a 'learning organisation').

The institutions are making remarkable efforts to foster a culture of innovativeness with notable progress through their research and development (R&D) departments' work. Nevertheless, the institutions' model appears quite futuristic. In addition to marking progress towards embracing 4IR tools, they partnered with a local mobile

network provider to allow students to access the Internet without needing data. Some institutions' systems were built with a light mode version, effectively supporting mobile access. They are also implementing smooth collaborative tools such as blackboard and MS Team tools for supporting smooth interaction between students' groups and staff members.

The institutional and management flexibility rating in dealing with disruption is quite low for many subunits that responded to the study. This could be because the institutions are not yet embracing design thinking in crafting their business models. Although efforts are being made, the institutions are still behind in implementing big data analytics, IoT and AI-aided operational models. For instance, they are not yet effectively harnessing predictive analytics (like skills forecasting) to forecast industry future skill needs so that they keep up-to-date to provide the most relevant skills for the new market while maintaining agility. The institutions are also not yet transforming towards becoming industry disruptors. They are not taking a front seat in innovation within their domain.

In some cases, students and staff would score the institutions poorly on management flexibility rating because management may have established workable solutions to adapt to the need for disruption, which may end up with conflicting interests, for instance, as students may view some of the solutions negatively. However, they had the potential to improve institutional operations. For instance, online graduations, online exams and poor networks for some students in some areas.

The institutional leadership and management support were rated quite good, possibly due to many factors, including effective communication, Empathic listening, integrated approach, high leadership experience, and so on. Most of the institutional leaders are well experienced, with years of experience stretching over ten years. Modern-day technology tools support the institutional leadership for the PHEs under study, as highlighted in the technological capacity and integration ratings highlighted in their technological capacities and integration ratings.

Likewise, the overall results for the staff indicate moderate-to-good experience across all applied measures or variables except for the poor reflection on staff experience

post-COVID. However, caution must be taken in the interpretation since this reflects the results of all sampled staff. Analysis that drills into individual, organisational units such as provincial operations, departments, role categories, different levels, and any other specific categorical variables of interest reveal the underlying distributions in the data. Visually, staff responses were generally less widely spread across the question scoring scales than the students.

The detailed analysis of the staff data for each variable according to each institution reflects that the institutions ‘eBlack’, ‘eBlue’, ‘eGreen’ and ‘eWhite’ consistently outperformed other institutions based on their staff ratings on various measures of experience during disruption. The departments ‘management’, human resources (HR), and IT indicated better overall experience than others for most of the measured variables while considerably low for Group Support Services, Research and Operations departments. For most variables, the rating tended to decrease with an increase in the number of years that the staff have spent within the institution, except for those who have been there for longer than 11 years. Although the difference is very small, the ratings for the academic staff appear marginally higher than those of the non-academic. A small number of staff members did not indicate the province from which they come, but the subgroup seemed to consistently rate their experience quite high, together with the provinces GP, KZN and WC. The EC province consistently scored low.

Most of the possible explanations related to the students apply to the staff. Still, it would be vital to consider the situation from the staff member's perspective of serving the student. One potential explanation for non-academic staff is that they were hands-on in addressing COVID-19 cases at their sites, increasing employee pressure and stress. Commonly, academic staff have greater exposure to technology tools due to the nature of their roles, making them better cope with the work-from-home mode. Non-academic staff may have different work responsibilities than academic staff. It may not be as well-equipped to work remotely or adapt to the changes brought on by the pandemic.

Non-academic staff may have limited access to the technology and resources needed to work remotely, making it more challenging to perform their duties. For instance,

most staff could have been using office desktop computers than laptops which could have been used by academic staff. They may also have limited access to training and professional development opportunities, making adapting to new technologies and work practices more difficult. Non-academic staff may have limited access to support services, such as counselling or mentoring, which can make it more difficult for them to cope with the stress and uncertainty of the pandemic. In addition, the non-academic staff may have limited networking opportunities, making it more difficult for them to connect with their colleagues and feel a sense of belonging to the institution.

The decreasing rating by staff concerning their years spent in the institution could be explained by the fact that as employees spend more years, they often become tasked with more roles which may increase the challenges, stress and depression. However, with experience over 11 years, the staff member is likely already promoted to a high position with certain financial and other non-financial benefits (such as more leave days and various non-financial forms of motivation).

Institutional managers indicated that the leaders of PHEIs need to be aware of internal and external environmental factors to monitor and minimise disruption impact effectively. Most managers reflect that they ‘do not agree’ or ‘are not sure’ if a written and developed policy and procedure document for disruption management exists. However, more managers concur that a structure exists in their institutions to ensure quick and decisive actions during disruption. Most institutional managers also indicated that they are unsure if any staff members or managers received training for managing disruption. More managers agree that there are managers in their institutions who feel empowered and comfortable making conscious decisions and deliberate actions. The institutional leaders also concurred that, besides human capital, other resources exist for aiding disruption management, including effective LMS systems, financial resources, other infrastructure, and technologies.

Leaders suggested the PESTEL factors and commodity price as the most common predictable disruptive factors. Further, they suggested implementing established disaster management committees, a flexible business model, specialised and online training, the Wakanda student management system, business continuity plans, contingency plans and backups, and adequate planning for responding quickly and

managing disruption when it occurs. PHEI leaders also suggested other innovative strategies for effective disruption management such as advanced monitoring and digital tools, flexibility, staying ahead of others in terms of leading disruption as a proactive measure, new environmental scanning tools, risk prediction tools, agility, adaptable systems and adopting a ‘learning organisation’ model.

Managers' response themes highlight the importance of the preparedness of the entire institution at any given point for disruption events. In addition, they indicate that knowing how to use modern analytic tools to understand hindsight and, most importantly, insight and future. Nevertheless, other opinions’ themes indicate the value of staying in control when a disruption occurs, managing different scenarios, ensuring transparency in dealing with disruption, and effectively engaging customers and other internal and external stakeholders. Managers also reveal that it is vital to provide relevant staff training, make timeous decisions, apply monitoring systems, ensure agile institutional operations, and continuously ensure adequate staff support during such times.

The managers’ opinions also pinpoint leaders' ability to analyse the causes of organisational problems before beginning to seek solutions. Leaders must clearly define and follow the defined management process and closely monitor situations. The managers also suggested systems and/or processes for enhancing the institution’s timeliness of decisions, which incorporate utilising business intelligence (BI) tools, team collaboration tools and other information systems, which all appeared popular in this study sample. Managers share that lessons learnt from the COVID-19 disruption experience include understanding the value of leadership, management flexibility, being able to anticipate events in business, the importance of maintaining agile business models, effective communication, advancing digitisation, and the ability of leaders to implement crisis management.

Managers suggest procedures and processes for managing disruption, the most popular being scenario analysis and planning, understanding problems thoroughly and quickly before action, a disaster management structure in the organisation, and implementing specialised disruption management training. The managers’ group also suggested several traits, characteristics and values expected of business leaders

during disruption (such as COVID-19). However, many document segments featured the following; effective people management, quick decision-making, holistic scenario planning, understanding business environments well and being aware, understanding processes, dealing with problems decisively, critiquing situations thoroughly, learning new ways fast, taking the front seat in disruption (being a disruptor rather than being disrupted), ability to make difficult decisions and move on. The interviewed group identified three subcategories of potential internal factors that the institutional leaders will need to be aware of in the future: system crash, academic disruptions, and innovations. Several potential external factors were identified in the response themes, including the industrial revolutions, industry structural changes, competitor risks, virus attacks, black swan events, other unexpected events, and political, economic, social, technological, environmental, and legal (PESTEL) factors.

The themes in the data reveal that most participants either disagree or are unsure if a written and developed policy and procedure document exists for guiding disruption management in the PHEIs. However, more participants believe that a structure exists in their organisation to ensure quick and decisive actions when disruption occurs. It is generally not so clear if there are organisational staff or management that have been trained to handle disruption or crisis within PHEIs as there are no distinct themes, and the codes assigned to the documents are spread across the 'agree', 'neutral (not sure)' and 'disagree' subcategories. However, there are more larger red dots for the 'agree' subcategory for the 'managers in the institutions empowered and who feel comfortable making conscious decisions on disruption management'.

This is reflected in Figure 6.3:

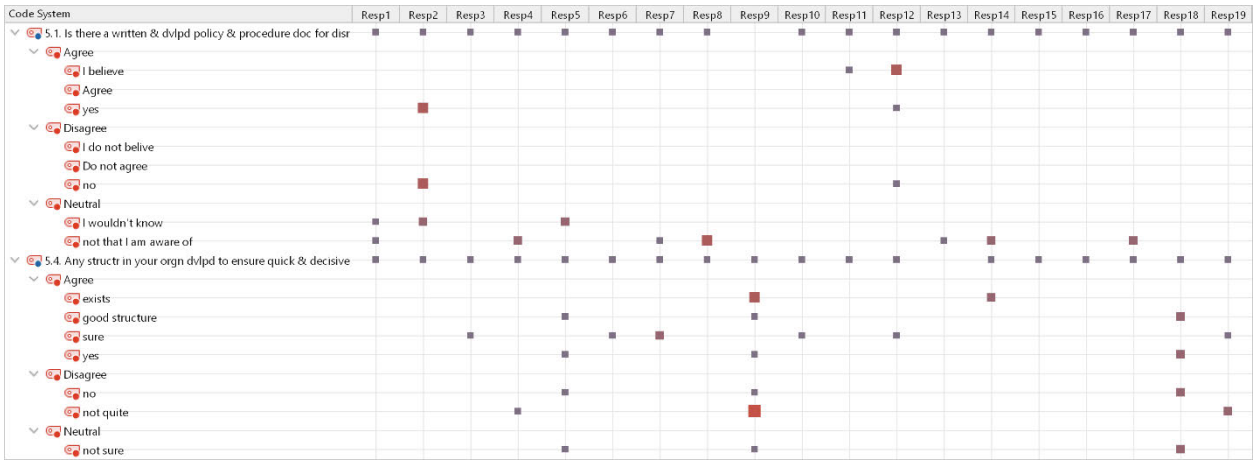


Figure 6.3: Written policies and procedure

6.2.4 Summary comparison of quantitative versus qualitative results

There were numerous touchpoints between the quantitative and qualitative analysis results. Commonly, the disruption brought unfavourable experiences for the students, staff and managers. Most students, staff and managers point to the deficiency in a guiding framework for disruption management, while the subsamples express the varying degree of deficiency of different framework elements.

6.2.5 Key similarities and differences between literature evidence and study results

6.2.5.2 Pillars of disruption management

Successfully navigating unpredictable events and keeping operations running requires effective disruption management. Collaboration, a flexible business model, research, monitoring and controlling, communication, people management, change management, and technology are all highlighted as crucial to effective disruption management in the literature and the study results. PHEIs might collaborate and share their resources to reduce the effects of disruptions (Leal Filho *et al.,* 2021:1). Institutions that have adopted a flexible company model are better able to respond to market changes and keep their doors open (Naidu, 2022).

Planning for business continuity can help PHEIs ensure they will keep operating during a disruption (Baba, Watanabe, Nagaishi & Matsumoto, 2014:298). The ability to quickly adjust to changing circumstances and make the required adjustments in the face of disruptions is tied directly to the quality of people management and the organisation's approach to change management. Gathering and sharing information with stakeholders is impossible without research, monitoring and control, and communication (Herlianto & Kusuma, 2020:6423). In addition, technology plays a crucial role in disruption management by allowing businesses to automate procedures and have remote access to data to keep operations running smoothly.

6.2.5.2 Prediction of disruption risk

In response to changes in the outside world, PHEIS must find disruption-related risks and take steps to reduce them. The literature and the study results support the

necessity of studying PESTEL factors (political, economic, social, technological, environmental, and legal) to identify potential disruptions and their effects. PHEIs must conduct a business risk assessment to analyse potential risks and vulnerabilities and implement risk mitigation strategies. PHEIs can establish contingency plans and prepare for potential disruptions using scenario analysis (Deloitte, 2019a:1, Steyn, 2022:1). Although technology evolves swiftly and can cause considerable disruptions in various industries, technological disruption is also critical to incorporate into any disruption management strategy. By studying PESTEL elements, assessing business risks, doing scenario analysis, and staying current with technological advances, PHEIs can design effective disruption management plans that allow them to react to changes and retain business continuity.

Even though the literature evidence and the study results talk about things that can cause disruptions, like market trends, market dynamics, commodity prices, economic conditions, geopolitical risks, regulatory changes, and cybersecurity concerns, the results are different. Literature evidence is usually more general and theoretical. It looks at trends and patterns in various fields and situations. In contrast, research findings tend to be more particular and empirical, focusing on the experiences of a specific organisation or industry. For instance, while data from the literature may highlight the significance of the technological change in disruption management, study results provide concrete examples of how technological disruption has affected the PHEIs under consideration. In addition, while literature research may suggest anticipated drivers of disruption and their potential impact, study results may provide more in-depth insights into how organisations have been affected and what specific solutions they have used to manage the disruption.

6.2.5.3 Non-predictable factors

Both the literature and the study's results show how important it is for businesses to have contingency plans in place for when disruptions happen. Unpredictable disruption factors, such as black swan events (Taleb, 2007), must be considered when building disruption management strategies. Although it may be impossible to predict the occurrence of black swan events, PHEIs can prepare for them by having flexible business models (Ghoshal, 1987), maintaining business continuity plans (Järveläinen, 2020:1967), investing in technology (Munawar, Mojtahedi, Hammad, Kouzani, and

Mahmud, 2022), considering cybersecurity (Verhoef & Coetser, 2021), and developing effective crisis communication strategies (Eldridge, Hampton & Marfell, 2020:50).

When planning to deal with disruptions, PHEIs must consider things that cannot be predicted, like changes in customer preferences, human factors, social unrest, and unstable markets. However, the results of the literature and studies vary when it comes to analysing these traits. For example, research results may provide case studies of PHEIs impacted by specific unrest or looting, whereas literature evidence may indicate regulatory changes as a significant unpredictability component of disruption. Similarly, while data from the literature may emphasise the significance of shifting client preferences, study results may reveal how PHEIs have reacted to specific developments in consumer behaviour.

6.2.5.4 Assumptions: other specifications of the model

Analysis of the literature shows that PHEIs need to think about tools like data analytics, agility, collaboration, innovation, and design thinking when making strategies for managing disruptions. But the methods and results of the literature and studies vary when analysing these traits. For example, the results of a study show how businesses could use binary classification of the outcome and scenario planning to predict disruptions and plan how to deal with them. Similarly, while the literature may propose scenario planning to prepare for interruptions, the study results also demonstrate how PHEIs have considered utilising scenario planning to construct effective contingency plans.

6.2.5.5 Prediction variables

The prediction variables of potential impact (Imp), probability of occurrence (Prob), relevance to the education industry sector (Rel), and warning index (wIndex) are useful in developing a recommendation tool for the education industry sector in the study result. These variables can be used to assess the potential impact of disruptive events on the industry, the likelihood of occurrence and relevance to the sector. By combining these variables, the warning index can be calculated, serving as an early warning system for potential disruptions.

The findings suggest that businesses in the education industry sector can benefit from using these variables to develop effective disruption management strategies that consider both the potential impact and probability of occurrence of disruptions and their relevance to the industry. Furthermore, the warning index can help businesses prioritise their resources and develop contingency plans for potentially disruptive events, thereby minimising their impact on operations. In this domain, the findings highlight the importance of using data-driven approaches to disruption management in the education industry sector and the potential of these variables as a recommendation tool for businesses in this industry.

6.2.5.6 Prediction models

Prediction models are becoming increasingly useful for institutions that want to manage the risks of disruptive events. While literature reviews have identified intelligent scheduling (Gajanayake & Pemarathne, 2020:523) and "personalised learning" (Bhutoria, 2022:2; Trojer, Ambele, Kaijage & Dida, 2022:75) as effective tools for disruption management, study results have also demonstrated the usefulness of risk models and machine learning-assisted prediction models. These models can assist PHEIs in predicting the probability and potential impact of interruptions, identifying early warning indications and creating effective contingency plans.

Prediction models have the potential to be a useful and helpful tool for businesses seeking to mitigate the risks associated with disruptive events, and firms should explore adding these models to their disruption management plans. By analysing vast quantities of data and recognising patterns and trends, these models can assist PHEIs in making more informed decisions and allocating resources more efficiently. In addition, by adding real-time data and machine learning algorithms, these models can adapt to changing conditions and produce increasingly accurate forecasts over time.

6.2.5.7 Preparation and planning

Both the literature and research findings have emphasised the significance of resource planning and tabletop simulations in disruption management. In the literature, this strategy is often recommended for businesses to set up effective response plans for a wide range of possible disruptions. Furthermore, based on the literature, businesses have reported improved preparedness and response capabilities due to engaging in

tabletop simulations. Similarly, the literature and research findings have highlighted the significance of effective resource planning and managerial capability in disruption management. This involves identifying essential resources, such as staff, equipment, and supplies, and making contingency plans to ensure their availability during a disruption. Good resource planning and management can enable PHEIs to continue operations during disruptions and minimise the impact on customers and other stakeholders. Both the literature and the study results indicate the need for tabletop simulations and resource planning as critical components of disruption management. PHEIs should consider implementing these tactics into their disruption management strategies.

The study results show that "raw play" is an effective way to deal with disruptions. This strategy involves making up simulated interruptions and testing how well backup plans and other ways to deal with them work. By looking at how these simulations turned out, PHEIs can find possible flaws in their response plans and make the necessary changes to be better prepared for disruptions. The results suggest that "raw play" could be a useful tool for PHEIs that want to improve their strategy for dealing with disruptions. Also, "raw play" can help PHEIs set up better ways for different departments and stakeholders to talk to each other and work together, which improves their overall ability to react. Overall, "raw play" can benefit PHEIs seeking to enhance their disruption management methods. These institutions should consider adding this strategy to their overall risk management frameworks.

6.2.5.8 Environmental factors

External factors - Literature evidence and study results emphasise the significance of external factors, such as education trends, industrial revolutions, global outlooks, industry technology, the DHET pulse review, market changes, financial market changes, and cyberattacks, in disruption management. However, the emphasis placed on these elements varies across the two sources. Evidence from the literature focused on broad macroeconomic trends and their possible effects on the education industry, such as the Fourth Industrial Revolution and global economic projections. In contrast, study results emphasised industry-specific issues, such as technological advancements and legislative changes, as well as more urgent concerns, such as cyberattacks. In addition, research findings frequently highlight the need for real-time

monitoring and response to these external elements instead of relying primarily on long-term strategic planning.

Internal factors - Literature shows that internal audit reports can point out problems and opportunities for improvement in an organisation's systems and procedures. System improvements and measuring performance can help find potential problems before they become big deals. This allows for proactive management and corrective action. Employee well-being measures can provide insight into possible problems with workplace culture and morale, whereas financial performance data can help uncover financial strains that may lead to disruption. By monitoring and responding to these internal causes, businesses can prevent disruptions from escalating and negatively affecting business operations.

Even though both the study results and the literature show that internal innovations and other internal risks, like system crashes, are internal factors that leaders need to be aware of to track disruptions better and lessen their effects, these are not the only ones. Internal innovation can lead to new technologies or methods, bringing about unknown risks and problems. System failures can also greatly affect how a business runs, which shows how important it is to have good IT management to lessen its impact. By knowing about these possible risks and disruptors, leaders can deal with them in advance and ensure the deployment goes smoothly and works well.

6.2.5.9 Disruption management procedures

According to the research, essential components of disruption management include identifying potential disruptors, assessing risk, developing a contingency plan, testing it, and monitoring and reviewing it (PWC, 2019; Teece, 2018). While the study's results indicate that by analysing problems, organisations can identify potential disruptions and take proactive measures to prevent or mitigate their impact, the results also indicate that by analysing problems, organisations can identify potential disruptions and take proactive measures to prevent or mitigate their impact. It is essential to act and react swiftly to prevent disruptions from increasing and negatively impacting the organisation. Organisations can predict and respond to disruptions more effectively by constructing internal and external networks and analysing all feasible solutions. When interruptions occur, disaster management processes, personnel assistance, and

teamwork can help organisations efficiently manage the situation. Finally, training, retraining, and monitoring can help guarantee that organisations are prepared for disruptions and can quickly react to changing conditions.

6.2.5.10 Planning, monitoring, and managing strategies for non-predictable

Based on the literature, creating a flexible strategy allows organisations to adapt to unexpected changes and respond quickly to disruptions. Monitoring the external environment helps organisations identify potential risks and opportunities and adjust their strategy accordingly. Building a crisis team is essential for managing disruptions because it ensures clear roles and responsibilities exist. Therefore, the organisation can coordinate its response better. Then, learning from the past can help organisations identify areas for improvement and develop better strategies for managing future disruptions.

On the other hand, study results have shown that being adaptable and agile allows organisations to respond quickly to unexpected changes and disruptions. Awareness of the external environment and potential risks can help organisations identify potential threats and opportunities. Effective communication is essential for managing disruptions, as it allows for the precise and timely dissemination of information to key stakeholders. Monitoring and managing non-predictable risks involves continuously evaluating and managing potential risks, while scenario analysis and simulation can help organisations prepare for potential disruptions and develop effective response strategies.

6.2.5.11 Strategic steps to follow in responding to disruption

The literature review results emphasise the importance of being prepared and having a response plan. At the same time, both the literature and the study results highlight the need for a deep understanding of the disruption or problem, ongoing evaluation, and learning from disruptions to continuously improve response strategies. By following these steps, PHEIs can more effectively manage disruptions and mitigate their impact on operations and overall performance.

6.2.5.12 Processes that enhance the institution's timeliness of decisions

Literature and study findings indicate that technological tools, such as business intelligence (BI) and team communication software, can enhance an organisation's capacity to make timely decisions during disruptions. These solutions allow real-time access to data and enable remote collaboration, which is particularly crucial when face-to-face meetings and interactions are limited. In addition, having good communication mechanisms in place, such as regular check-ins with team members and stakeholders, can help ensure that all parties are aware of and on the same page regarding the optimal course of action during a disruption. By utilising these technologies, PHEIs can increase their reactivity and agility in the face of disruption.

6.2.5.13 Key principles in managing disruptions

Literature has discussed how important some basic rules are for dealing with disruptions. Preparation is important to ensure an institution has the resources, plans, and strategies to deal with any problem. Agility and flexibility enable PHEIs to rapidly adapt to changing conditions, which can be crucial for minimising the effects of disruption. Good communication and collaboration ensure that all stakeholders are informed and engaged in the disruption management process, enhancing responsiveness and decision-making. Resilience is the capacity of an institution to recover rapidly from disruption and resume normal functioning. Learning from disruptions enables institutions to identify areas for improvement and adopt reforms to manage future disruptions more effectively.

While the study's findings highlighted several critical principles for efficiently handling disruptions, these principles were not exhaustive. These ideas include using hindsight to learn from past problems, staying in control of the situation, and being open and honest throughout the process. Accurate information and a comprehensive understanding of the disruptors must guide decision-making. It is important to act quickly, plan for different possibilities, and talk to customers to ensure their needs are met to lessen the effects of disruption. In addition to having a robust system and keeping operations nimble, training employees and making prompt decisions are also crucial. Employee assistance is vital for maintaining morale and ensuring everyone works towards a common objective. By adhering to these principles, institutions can manage disruptions more effectively and emerge from the experience stronger.

6.2.6 Experiences and reflection

The study helped the researcher to move past reservations about triangulated studies, particularly in a blend of methodological, data and investigator triangulation. The most challenging aspect was to eliminate personal bias from the study. The investigator did not want to lead the participants by empathizing and attempted at all costs to maintain a neutral position. The study also presented the first opportunity (it was the first time) for the participants to have a serious conversation about the issue of disruption management in their learning/work environment. The investigation has identified key issues to disruption management within PHEs which the researcher hopes to find practically address with the rest of the relevant stakeholders.

6.2.7 Disruption prediction model

In the supervised ML-aided disruption risk prediction model applying four variables (potential impact, probability of occurrence, warning index and relevance to the PHE sector) utilising hypothetical data, the events/a combination of events that can lead to disruption (‘outcome 1’) is established. The prediction accuracy is tested for both the training and testing sets – which were both acceptable. The relevance and warning index were found to be insignificant in the model at a threshold p-value of 5%. The logistic regression model is a potential disruption prediction model applied in the reviewed literature.

Both the training set and test set prediction accuracy was found to be satisfactory: 87.09% and 86.64%, respectively, for the decision tree based on training data. On the other hand, a review of the relevant literature shows that the "classification tree" model is better than logistic regression when predicting binary outcomes. The following section explains the study's recommendations to institutional leadership based on the literature review synthesis and the primary data analysis.

6.3 RECOMMENDATIONS

6.3.1 Proposed Disruption Management Framework (DMF)

A disruption management framework (DMF) is proposed in this study, which includes 14 key pillars. The framework comprises the pillars, written policy document, standard guidelines, procedures, and processes for managing disruption when it occurs while mitigating risk to the institution. The key components (pillars) of the DMF are (1)

technology, (2) people management, (3) decision-making, (4) scenario analysis and planning, (5) policy, leadership and governance (6) specialised training and empowerment (7) collaborations (8) flexible business model (9) change management (10) communication (11) monitoring and controlling (12) research (13) framework (14) environment scanning. The proposed disruption management framework is the ‘Final Framework Input’ (column 3) in the below table.

Disruption Management Framework

Reviewed literature	Main Study	Final Framework Input
1. Pillars of Disruption Management		
• Collaboration and community building	• Collaborations	• Collaborations
• Flexible working arrangements	• flexible business model	• Flexible business model
• Training and professional developments	• specialised disruption training and empowerment	• specialised disruption training and empowerment
• -	• scenario analysis and planning	• scenario analysis and planning
Business continuity planning	-	• Business continuity planning
• -	• decision-making	• decision-making
• Diversification	• -	• Diversification
• -	• environment scanning	• environment scanning
• Agility	• -	• Agility
• -	• Research	• research
• Partnerships	• -	• Partnership
• -	• policy, leadership, and governance	• policy, leadership, and governance
• People support	• -	• People support
• -	• Framework	• framework
• Risk management	• -	• Risk management
• Monitoring mechanisms	• monitoring and controlling	• monitoring and controlling
• Communications	• Communication	• communication
• Change management	• change management	• change management
• People management	• people management	• people management
• Technology	• Technology	• technology
2. Prediction of Disruption Risk		
2.1. Predictable factors: Examples		
• PESTEL factors	• PESTEL factors	• PESTEL factors
• Scenario analysis and risk management	• business risk	• business risk
• Market trends	• -	• Market trends
• -	• Commodity prices	• Commodity prices
• Technological changes	• technological disruption	• Technological changes
• Market dynamics	• -	• Market dynamics
• -	• other predictable risk factors	• other predictable risk factors
• Economic conditions	• -	• Economic conditions
• Geopolitical risks	• -	• Geopolitical risks
• Regulatory changes	• -	• Regulatory changes
• Cybersecurity risks	• -	• Cybersecurity risks

Reviewed literature	Main Study	Final Framework Input
2.2. Non-predictable factors: Examples		
• Black swan events	• -	• Black swan events
• -	• Looting	• Looting
• Technological disruption	• technological disruption	• Technological disruption
• Changing customer preferences	• -	• Changing customer preferences
• -	• Terrorism	• Terrorism
• Human factors	• -	• Human factors
• -	• Pandemic	• -
• Market volatility	• -	• Market volatility
• -	• Unrest	• -
• Regulatory changes	• -	• Regulatory changes
• -	• Disaster	• Disaster
2.3. Disruption prediction: For predictable disruption factors		
Assumptions: These are the collection of explicitly stated (or implicitly premised), conventions, choices, and other specifications of a model		
• -	• Certain disruption risks are predictable	Certain disruption risks are predictable
• Data analytics	• -	Data analytics
• -	• Binary classification of the outcome: Two possible categorical outcome '1' for disruption and '0' for no disruption	Binary classification of the outcome: Two possible categorical outcome '1' for disruption and '0' for no disruption
• Scenario planning	• Scenario planning	Scenario planning
• Agility	• -	• Agility
• Continuous monitoring	• -	• Continuous monitoring
• Collaboration and info exchange	• -	• Collaboration and info exchange
• Innovation, future, and design thinking	• -	• Innovation, future, and design thinking
Prediction variables: Are the variables used to predict the dependent or outcome variable		
• -	• Potential impact (Imp), probability of occurrence (Prob), relevance to the education industry sector (Rel), and warning index (wIndex)	• Potential impact (Imp), probability of occurrence (Prob), relevance to the education industry sector (Rel), and warning index (wIndex)
• Environmental factors	• -	• Environmental factors
• Market and technological trends	• -	• Market and technological trends
• Historic and market data	• -	• Historic and market data
Prediction model: Is a model used to predict future events or outcomes by analysing patterns in a given set of input data.		
• -	• ML- aided prediction model based on four variables (Imp, Prob, Rel and wIndex)	• ML- aided prediction model based on four variables (Imp, Prob, Rel and wIndex)

Reviewed literature	Main Study	Final Framework Input
• -	• Risk Model ~ M(Imp, Prob, Rel, wIndex)	• Risk Model ~ M(Imp, Prob, Rel, wIndex)
• Intelligent scheduling	• -	• Intelligent scheduling
• -	• -	• -
Final model specification: Specification is the process of determining which variables to include and exclude from a model.		
	• Final model included Imp, Prob and wIndex	• Final model included Imp, Prob and wIndex
3. Preparing for, planning, and managing disruption		
3.1 Preparation and planning		
• Tabletop simulation (literature)	• Simulation and role play	• Simulation and role play
• Resource planning	• Resource planning	• Resource planning
• -	• Management capacity	• Management capacity
• Training for staff and management	• Training for staff and management	• Training for staff and management
• -	• Policy documents and standard guidelines	• Policy documents and standard guidelines
• -	• A disruption management structure/ A disruption management committee	• A disruption management structure/ A disruption management committee
• -	• Defined procedures and processes to follow when disruption occurs	• Defined procedures and processes to follow when disruption occurs
• -	• Adopting an agile and adaptable business model	• Adopting an agile and adaptable business model
• -	• Having backups/ Business continuity plan (BCP)/ Contingency plan	• Having backups/ Business continuity plan (BCP)/ Contingency plan
• -	• Plan for emergencies/ Putting redundancies / Flexible budgeting	• Plan for emergencies/ Putting redundancies / Flexible budgeting
• -	• Being equipped/Preparing all relevant resources	• Being equipped/Preparing all relevant resources
3.1. Environment factors do leaders need to be aware of to better monitor and minimise disruption impact		
	External factors	
• PESTEL factors	• PESTEL factors	• PESTEL factors
• Early warning signs	• -	• Early warning signs
• -	• advancement of digital tools	• advancement of digital tools
• -	• black swan events	• black swan events
• -	• external risks	• external risks
• -	• financial market changes, e.g. 2008 crash	• financial market changes, e.g. 2008 crash
• -	• government policy, legislation/regulatory changes	• government policy, legislation/regulatory changes
• Education trends	• -	• Education trends
• -	• industrial revolution, innovative disruptions	• industrial revolution, innovative disruptions

Reviewed literature	Main Study	Final Framework Input
• Global outlook and risks	• -	• Global outlook and trends
• -	• industry tech & structural changes	• industry tech & structural changes
•	• new and existing competitors	• new and existing competitors
• DHET pulse review	•	• DHET pulse review
• -	• other changes in market landscapes	• other changes in market landscapes
• -	• other industry risks	• other industry risks
• -	• unexpected risks, e.g. COVID	• unexpected risks, e.g. COVID
• -	• various types of crises	• various types of crises
• -	• virus attack	• virus attack
Internal factors	**Internal factors**	
• Employee and students' well-being and feedback	• -	• Employee and students' well-being and feedback
• -	• academic disruptions	• academic disruptions
• Financial performance	• -	• Financial performance
• -	• internal innovations	• internal innovations
• -	• other internal risks, e.g. system crash	• -
• Reports (audit reports, management reports)	• -	• Reports (audit reports, management reports)
3.2. Basic procedures and processes for managing		
• Identify possible disruptor	• -	• Identify possible disruptor
• -	• analyse the problem and act/respond quickly	• analyse the problem and act/respond quickly
• Evaluate risk	• -	• Evaluate risk
• -	• be ready to effect change	• be ready to effect change
• Create a contingency and mitigation plan	• -	• Create a contingency and mitigation plan
• -	• bringing specialists onboard	• bringing specialists onboard
• Test the plan	• -	• Test the plan
• -	• build reliable internal and external networks	• build reliable internal and external networks
• Monitor and review	• -	• Monitor and review
• -	• consider all possible alternatives	• consider all possible alternatives
• -	• constantly seek feedback from staff and students	• constantly seek feedback from staff and students
• -	• disaster management procedure	• disaster management procedure
	• effective and competent management	• effective and competent management
	• effective integrated monitoring system	• effective integrated monitoring system
	• effectively apply digital systems and tools	• effectively apply digital systems and tools
	• ensure adequate staff support	• ensure adequate staff support
	• follow well-defined procedures for management	• follow well-defined procedures for management

Reviewed literature	Main Study	Final Framework Input
	• implement business continuity plan	• implement business continuity plan
	• implement collaborative teams	• implement collaborative teams
	• implement specialised training	• implement specialised training
	• maintain a culture of continuously learning	• maintain a culture of continuously learning
	• maintain effective communication	• maintain effective communication
	• mitigate impact	• mitigate impact
	• monitoring results closely	• monitoring results closely
	• pay adequate attention and stay in focus	• pay adequate attention and stay in focus
	• quick decision-making in line with policy & regulation	• quick decision-making in line with policy & regulation
	• quick problem-solving in line with policy & regulation	• quick problem-solving in line with policy & regulation
	• scenario analysis and planning	• scenario analysis and planning
	• senior management to keep staff constantly engaged	• senior management to keep staff constantly engaged
	• training and retraining	• training and retraining
	• understand the problem thoroughly	• understand the problem thoroughly
3.3. Planning, monitoring & managing strategies for non-predictable		
• Create a flexible strategy	• -	• Create a flexible strategy
• -	• adapt and respond fast	• adapt and respond fast
• Monitor the external environment	• -	• Monitor the external environment
• -	• Agility	• agility
• Crisis communication and team	• -	• Crisis communication and team
• -	• Awareness	• awareness
• Learning from the past	• -	• Learning from the past
	• Communication	• communication
	• monitoring and managing non-predictable risk	• monitoring and managing non-predictable risk
	• scenario analysis	• scenario analysis
	• simulation	• simulation
3.4. Strategic steps or phases to follow in responding to disruption		
• Disruption comprehension	• understand the problem	• Disruption comprehension
• Evaluate the situation	• -	• Evaluate the situation
• -	• respond quickly	• respond quickly

Reviewed literature	Main Study	Final Framework Input
• Prepare a response strategy	• -	• Prepare a response strategy
• -	• follow management process	• follow management process
• Action the response	• -	• Action the response
• -	close monitoring	• close monitoring
• Assess the response	• -	• Assess the response
• Learn from the disruption	• -	• Learn from the disruption
3.5. Systems or processes that enhance the institution's timeliness of decisions		
• BI tools	• BI tools	• BI tools
• other information systems	• other information systems	• other information systems
• team collaborative tools	• team collaborative tools	• team collaborative tools
• Communication channels	• -	• Communication channels
3.6. Key principles		
• Preparedness	• Preparedness	• preparedness
• Agility	• -	• Agility
• -	• hindsight and insight	• hindsight and insight
• -	• stay in control	• stay in control
• Flexibility	• -	• Flexibility
• Communication	• -	• Communication
• -	• Transparency	• transparency
• Resilience	• -	• Resilience
• -	• act with speed	• act with speed
• Collaboration	• -	• Collaboration
• -	• managing scenarios	• managing scenarios
• Learning	• -	• Learning
	• engage customers	• engage customers
	• train staff	• train staff
	• timely decisions	• timely decisions
	• good system	• good system
	• engaging internally and externally	• engaging internally and externally
	• agile operations	• agile operations
	• appropriately addressing key aspects	• appropriately addressing key aspects
	• decision-making	• decision-making
	• staff support	• staff support

Table 6. 1: Proposed DMF

Discussion of the proposed Disruption Management Framework (DMF)

The proposed Disruption Management Framework (DMF) for private higher education institutions (PHEIs) incorporates a comprehensive and multidimensional approach to managing disruptions. It consists of 14 key pillars: technology, people management, decision-making, scenario analysis and planning, policy, leadership and governance, specialised training and empowerment, collaborations, a flexible business model, change management, communication, monitoring and controlling, research, and environment scanning. This framework provides a structured and systematic approach to managing disruptions, aiming to enhance the institution's resilience and adaptability.

The DMF is unique in that it comprehensively addresses both predictable and non-predictable disruption factors. It addresses predictable factors such as technological changes, market trends, and geopolitical risks through scenario planning and data analytics. Flexible strategies and continuous monitoring manage non-predictable factors like black swan events, looting, terrorism, and pandemics. By integrating both types of factors, the DMF ensures that institutions are well-prepared for a wide range of potential disruptions. Its holistic approach combines proactive measures like scenario analysis and planning with reactive measures such as crisis communication and team coordination. This dual approach enables institutions to effectively anticipate and mitigate risks while also responding swiftly to unforeseen events.

Inclusion of external factors

The DMF highlights the importance of taking external factors into account when managing disruptions. External disruptions, such as floods, riots, and other natural or human-made disasters, can have a significant impact on institutional operations. These events can cause damage to infrastructure, disrupt communication, create security risks, and affect the physical safety of staff and students. To tackle these challenges, the DMF includes external risk assessments in its strategy. This entails monitoring external risks, such as changes in the financial market, shifts in government policies, and global trends, and incorporating these assessments into the institution's planning and decision-making processes. By doing so, institutions can develop more resilient strategies that address both internal and external threats.

Value and benefits

The suggested DMF offers various unique benefits and values for managing disruption in PHEIs. It takes a holistic approach by addressing both predictable and non-predictable factors, providing a comprehensive strategy for handling a wide range of disruptions. The framework balances proactive planning and scenario analysis with reactive crisis management, ensuring institutions are prepared for both expected and unexpected events. The DMF also emphasizes the role of technology, leveraging data analytics, machine learning, and other technological tools to improve disruption prediction and response. The DMF prioritises people management and empowerment, ensuring the support of staff and students to maintain morale and productivity during disruptions. The framework promotes collaboration and partnerships, recognising that effective disruption management often requires coordinated efforts across different stakeholders and sectors. Additionally, the DMF fosters a culture of continuous learning and improvement through regular monitoring, evaluation, and feedback, ensuring that institutions remain agile and adaptable in the face of changing circumstances.

A broader picture and practical implications

The DMF not only helps PHEIs prepare for disruptions, but it also improves their overall ability to withstand and continue operating. By involving various stakeholders, such as regulators, sponsors, industry partners, and government entities, the framework ensures a more thorough and inclusive approach to managing disruptions. This inclusiveness promotes a shared understanding of risks and collaborative efforts to lessen them. Additionally, the DMF's focus on being adaptable and agile allows institutions to quickly adjust to changing circumstances. Whether dealing with technological disruptions, economic changes, or natural disasters, the DMF provides institutions with the necessary tools and strategies to effectively navigate these challenges. This flexibility is essential for maintaining continuity in education and ensuring the well-being of staff and students.

External factors, impact, and stakeholder inclusion

The potential effects of outside influences, such as floods and riots, on how institutions respond and manage their strategies are substantial. These external disruptions can make the challenges faced by institutions even more difficult, requiring solid

emergency plans and adaptable management strategies. For example, floods can damage buildings and disrupt communication, while riots can create security concerns and affect the safety of staff and students. Institutions need to include assessments of outside risks in their plans for managing disruptions, making sure they are ready to handle a wide range of situations. By taking into account outside influences, institutions can create stronger strategies that address both inside and outside threats. Also, involving various stakeholders in the process of managing disruptions adds to the overall effectiveness of the plan. Stakeholders such as students, sponsors, parents, local communities, and outside partners bring important perspectives and resources that can strengthen the institution's response to disruptions. Including these stakeholders in planning and decision-making means that the strategies developed will be well-rounded and take into account all possible impacts.

The recommended DMF for PHEIs is a robust and versatile strategy that addresses the complex nature of disruptions in today's educational landscape. Through careful planning, proactive and reactive measures, and the participation of various stakeholders, the framework offers a resilient and adaptable strategy for handling disruptions. This holistic approach not only prepares institutions for diverse challenges but also fosters a culture of continuous improvement and collaboration, ensuring the long-term sustainability and prosperity of PHEIs.

The DMF is a summary outline of the key guidelines for principles, processes and procedures recommended for PHEIs implementation to mitigate the impact of and manage any disruptions when they occur. Amongst the managers' recommendations is the disruption risk prediction summarised below. However, it should be noted that this framework is generalised and may need to be contextualised to address specific types of disruptions effectively.

6.3.2 ML-aided disruption prediction model

It is of paramount importance that PHEIs implement predictive tools for disruption risk. Predictive tools help institutions to forecast predictable risks as a proactive measure for forecasting disruption risks. Therefore, the study recommends a machine learning-aided risk prediction model (classification tree). The model below is constructed based on four variables: potential impact, probability, the relevance of the factor to the

industry sector, and factor warning index. The figure for the disruption risk prediction model is provided in Section 4.4.1. The study also recommends the implementation of strong leadership skills that implement strategies for enhanced management of disruptive events when they occur.

6.3.3 High competence in leadership

This section summarises some of the key competencies of future leaders, which are vital for effective disruption management while ensuring agility and change transition. Mdluli and Makhupe (2017) summarised the key management competencies. They emphasised that leadership competencies for industry 4.0 must include the following five quotients: Emotional Quotient (EQ), Digital Quotient (DQ), Agility and Adaptability Quotient (AAQ), Socio-cultural Quotient (SCQ) and Creativity and innovative Quotient (CIQ).

Mdluli and Makhupe (2017) described the current leadership panorama and the necessity for leading in the present day and future to radically evolve so that they can cope particularly with the rapid technological and other disruptions of modern-day business. Mdluli and Makhupe (2017) identify the relevant additional competencies required to augment traditional manager competencies.

Intelligence Quotient (IQ)

The Intelligence Quotient (IQ) of leaders refers to their ability to apply critical thinking and reason to develop critical solutions to business challenges. IQ enables organisational leaders to swiftly absorb and comprehend new concepts and business models, allowing them to keep up with the changing nature of modern enterprises and marketplaces.

Emotional Quotient (EQ)

According to Mdluli and Makhupe (2017), as technology continues to revolutionise, more and more future leaders are experiencing a leadership crisis as they lead in an increasingly turbulent, uncertain, complex, and ambiguous environment. This increases stress levels and challenges managers to be able to manage under intense and complex situations, which calls for higher EQ.

Digital Quotient (DQ)

Future leaders may find DQ the most important leadership skill since digitally savvy executives can encourage quick adaptation and change by incorporating digital knowledge and mindset into the organisation's strategy (Accenture, 2018). In the contemporary business environment, leaders must predict the evolution of societal and technological trends while constantly realigning the organisation’s objectives to be "the disruptor" in the industry instead of following industry trends or being disrupted.

Agility and adaptability quotient (AAQ)

Being agile and adapting to market changes is key in a modern leader's work. As consumer needs, shopping behaviour, and expectations are changing rapidly in the market, leaders must be able to adapt quickly by intelligently shifting business resources to opportunity areas and crafting new business strategies. Changes may also result in new legislation, changes in cultural environments, and taking on new business assignments all demand. This all calls for a high level of flexibility from leaders and to be nimble and agile. According to Mdluli and Makhupe (2017), in today's business world, leaders who are not flexible are doomed to fail. This is because too rigid formal plans can become ineffective. After all, new technologies' emergence results in strategic redundancy. This means that agile leaders who clearly understand their future strategic direction need to react quickly to crises or seize opportunities as they arise.

Socio-Cultural Quotient (SCQ)

To succeed, today's leaders must be well-versed in cultural norms, adept at bridging differences, and aware of one's own cultural biases and social context. Business leaders in the digital age need cultural awareness, cross-cultural abilities, cultural metacognition (or mindfulness), and social intelligence (Zhu, Cooper & Li, 2020). Leaders in this position must be sensitive to and capable of working with people from various cultural backgrounds. This is more crucial than ever in today's globalised economy, where clients span oceans, cultures, and generations. As a result, leading with cultural understanding is essential in today's global economy.

6.3.4 Strategies to better manage disruption in PHE institutions

Based on the analysis of managers' opinions, managers have recommended several strategies for better management of disruption in the PHE sector when it occurs. The suggested strategies include promoting collaborative decision-making, the culture of a continuously learning organisation, smart, lean and flexible operations and implementation of design thinking in all organisations' designs. The subsection below summarises design thinking as a strategy, its principles and the implementation process.

6.3.5 Design thinking implementation

In today's modern corporate world, design thinking is more important than ever. The theory behind a design thinking framework is that it is possible to get a competitive edge through distinctiveness and new thinking methods by taking a user-centric, hands-on approach to addressing problems.

6.3.5.1 Implementation of new ideas concerning strategy imperatives

Today, design thinking is critical in helping leaders align design solutions with customer needs and organisational strategy while driving business growth. Commonly, the incremental iteration of the design thinking process is refined towards improving the experience of the customers in line with the organisation's strategy. This explains why the design process is a collaborative experience involving internal and external stakeholders while underpinning the empathy principle. A strategic mindset helps designers develop a design strategy framework that contributes to improved client relationships, better user experiences, and aligning projects with business results. Two terms married in the design thinking process are 'design strategy' and 'corporate strategy'. When describing the intersection of corporate strategy with design thinking, we use the phrase "design strategy," where "corporate strategy" refers to the conventional approach businesses and other organisations use to define, prioritise, and ultimately achieve their long-term objectives and goals.

When applied to problem-solving, design thinking is a methodology that involves the end-users and focuses on finding solutions. Those who think strategically at any level of an organisation or design team routinely seek out and participate in endeavours that contribute to the growth and success of the whole. Strategic thinking entails

looking at the large picture to choose the best action for a group or company. From a design viewpoint, strategic thinking encourages designers to view the design process as a problem-solving mechanism, beginning with identifying the problem and continuing to collaborate with the client and the team to find a solution.

6.3.5.2 Implementing strategic thinking in design

Developing and carrying out a plan of action is an artistic and scientific endeavour. Assessment, comprehension, learning, execution, and ongoing outcome checking provides a valuable framework for putting strategic thought into the design. Like any other skill, a strategic mindset can be developed through repeated practice.

6.3.5.3 Implementing design thinking in the Digital Era

Many technological advancements collectively termed the 4th industrial revolution tools enhance design thinking in the digital era. Several 4IR tools have shown an impact to design thinking processes. This section summarises some key technology tools that have taken design thinking to a higher level.

Beyond the cloud

When it comes to cloud computing, business leaders need to do more than talk about it; they need to implement it. The cloud is an important part of any future vision but is no longer a brand-new idea. It's no more a matter of "Should we utilise the cloud?" but rather "How can we use the cloud?" due to the pervasiveness of on-demand technology in today's decisions. Even more so, the cloud is not a single concept. SaaS, PaaS, public cloud, and private cloud have unique characteristics and advantages, and the chances for businesses to leverage them are just as varied. The next step is to put cloud computing to use and develop a strategy for integrating cloud capabilities into IT solutions and operations to maximise business value.

Design for analytics

Using business intelligence and big data analytics tools requires company executives to ask the right questions and plan accordingly. Businesses no longer have trouble with insufficient data but may have trouble with insufficient relevant data. When determining the company's long-term goals, executives often lack the big data they

need to make informed decisions. As much as the next generation of software needs to improve the current functionalities, it must also be built with analytics in mind.

Relationships at scale

By developing digital relationships rather than merely conducting business to expand beyond e-commerce and marketing, companies must rethink their digital strategies. Although the number of digital interactions with consumers has grown thanks to mobile technology, social networks, and context-based services, most businesses are still working to develop a more in-depth understanding of their customer's demographics, interests, and purchasing habits. Although these interconnections may offer novel customer service models or distribution routes, they are only a small part of the overall possibilities. Managing connections with customers at scale is made possible by digital, making it a crucial new strategy for consumer engagement and loyalty.

Seamless collaboration

The business needs to rethink the way its workers do their duties. As the popularity of social media sites has increased, so has the incentive to work together. In response to users' shifting social behaviours and the rising expectation that all apps will be "social," businesses are innovating their approaches to the user interface. Yet, businesses can boost output by integrating social and collaborative channels into their existing workflows rather than relying on them as stand-alone tools. The new strategy involves implementing social and collaborative applications company-wide.

Active defence

Defences must be tailored to each threat to counteract cyberattacks. Despite a growing emphasis on protecting digital companies, IT teams often find it difficult to keep up with the rapid developments in security technologies. The transition to active defence, risk-based methods to security management, analytics-driven event detection, and reflex-like incident response is not yet happening on a large scale, even though businesses know that endpoint protection is insufficient. The delayed adoption of existing solutions is the main obstacle, even though these technologies are evolving quickly, and communities are forming to reveal the risks. The primary difficulty facing IT is keeping up with current security best practices, learning about the new active defence options, and facing the reality of the road ahead.

Data velocity

Executives have been inundated with data showing how the amount of information available for analysis is growing exponentially. Articles detailing the vast array of "external" data buried in everything from tweets and blogs to sensor outputs and cell phone location data have been sent into their inboxes. Yet data velocity—the rate at which data can be gathered, sorted, and analysed to provide insights that managers can act on rapidly—is the next perspective on data that deserves attention. When instantaneous feedback becomes the norm, corporate executives will rely more and more on faster data speeds to stay ahead of the competition.

Software-defined networking

In the final stretch of virtualization, after seeing returns on server virtualization and early signs of success with storage virtualization, organisations should shift their focus to network virtualization to maximise the benefits of server and storage virtualization and get the most out of their infrastructure over the long term. Software-defined networking (SDN) has the potential to significantly alter the adaptability with which organisations and IT function, much like other virtualization technologies. Even though networking appears to be a simple technology, it has the potential to revolutionise businesses. By adopting SDN, enterprises can realise their dreams of becoming innovative institutions.

Digital-physical blur

Smart objects, devices, and robots are giving us greater insight into and control over the physical world by bringing it online. This new layer of connected intelligence is more than just the "Internet of Things"; it enhances workers, streamlines operations, and brings machines into everyday life. This gives consumers more agency than ever before. Nowadays, consumers are armed with a wealth of information and have the power to shape their environment through conversation and action. Companies now have real-time connections to the outside world, enabling robots and humans to respond to events promptly and intelligently.

From workforce to crowdsource

The rise of the "borderless" company is what this alludes to. The Internet has made it possible to expand your company's workforce to include anyone with access to the

network. Any company may benefit from this strategy because it provides access to a massive, versatile workforce that is not only better equipped to solve some of the problems that businesses struggle with today but will often do so for free. Due to advancements in cloud computing, social networking, and collaborative tools, businesses have access to a global labour force with abundant skills and a strong desire to contribute. Directing these energies towards productive commercial ends is difficult, but the potential payoff is enormous.

Data supply chain

Although data technologies are advancing rapidly, their adoption has been largely piecemeal. As a result, there is a significant underutilization of enterprise data. Data ecosystems are notoriously difficult to navigate due to the prevalence of data silos within them, reducing the value that can be derived from an organisation's data. Companies cannot completely tap into their data's potential unless they manage it more like a supply chain, making it possible for the information to move smoothly and productively across the company and, eventually, to the company's ecosystem of partners.

Harnessing hyperscale

After over a decade of software advancement, hardware is again at the forefront of innovation due to the increasing need for more powerful and efficient data centres. Companies of all sizes will feel the cost-cutting effects of "hyperscale" innovation in their data centres. Still, as they digitise their operations, a growing number will view such infrastructure as crucial to achieving their growth objectives.

Business of applications

The software development process is undergoing a shift. Enterprises are quickly transitioning from applications to apps, much like the consumer world has done. IT developers will always be needed to tailor huge, complicated business software systems, release upgrades and patches, and massive service enterprises. Yet, a dramatic movement has recently been towards less complex, more modular applications as businesses seek to increase operational agility. What should the CIO and CEO think about this? Soon, they will have to ascertain who will be responsible

for what in terms of app development within their new digital companies and how they may alter the whole app creation process.

Architecting resilience

In today's highly connected world, organisations must meet the ever-increasing expectations of their employees and other stakeholders. The CIO's office is not the only place affected by the move to accommodate shifting priorities. Hence, maintaining business as usual and preventing the depreciation of brand value often hinges on having an "always on" IT infrastructure, secure business processes, and efficient business economics. So, modern IT managers must ensure their systems are functional and built to fail.

A foundation in automation

Businesses are automating routine procedures out of necessity. Think about the increasing data volumes' impact on complexity. Businesses know that it is in their best interest to cut down on it's in their best interest to reduce redundancies and streamline processes.

Software that learns

The ability to self-evolve and create discoveries is where software intelligence shines. Businesses that use large amounts of data to discover and categorise relationships, the building blocks of machine learning, can gain a competitive advantage. Automated software upgrades mean less work for developers, and market research can help you find ways to draw in more customers with better goods and services.

Modern mathematics and numerous statistical approaches, including clustering trees, probability theory, dynamic systems, and deep learning, are just a few of the many fundamental disciplines that make up machine learning, which is not a single technology or technique but rather a subject of computational science. Data scientists draw from all of these disciplines to identify the suite of algorithms, or ensemble, that constitutes the best match for the use case, which may include anything from Bayesian networks to probabilistic forests. All of these algorithms share the ability to acquire

new knowledge through observation and experimentation. They gain wisdom, allowing their software to improve progressively and even contribute new insights to the field.

Scaling intelligence through cognitive computing

Cognitive computing is the final stage of the software intelligence maturity curve. It is the pinnacle of rule-based and machine-learning techniques and other cutting-edge tools for producing highly contextual software intelligence at a massive scale. Computing systems with cognitive abilities may detect, process, and respond to their surroundings. Hence, it allows computers to see their surroundings, gather relevant data, processes it, and respond accordingly. Because of their ability to use more data and acquire more insights for greater contextual understanding, cognitive computing systems can now begin to solve problems that are particularly ambiguous, unclear, and undefined problems that have previously been left solely to the formidable cognitive capabilities of humans.

Immersive world

The immersive world, which incorporates augmented reality (AR) and virtual reality (VR) is harnessed in modern design thinking projects to explore design ideas virtually before they can be taken into real life.

6.3.4 Effectively managing in the digital world

Several principles can allow a modern manager to lead an organisation to success. Managers are, today, challenged to implement futuristic, agile (resilient) models, embrace 4IR tools and effectively manage their organisations in the digital world. For instance, they must embrace the Internet of Things (IoT) devices, including sensors, to sense potential disaster risks. In the modern business world, there are sound management principles to ensure competitiveness in the market. Below is a summary of some of those principles:

6.3.4.1 Improved reporting and performance monitoring (real-time reporting)

Historically businesses used end-of-year reporting and business reviews for performance measurement. Financial accountants would share reports on the

business's overall performance at the end of a year, with interim reports commonly produced quarterly or semi-annually. Such reporting intervals were so long that if things were not working out for the firm, they would have worsened by the end of the annum. So, reporting in a long time interval during challenging times in business would resemble conducting a ‘post-mortem’. If things were too bad, carrying on for a long time without an opportunity to drill deep into the problem and make a quick review would not be okay for business. Businesses can apply real or near-real-time reporting with the 4IR technological inventions and innovations. Real-time reporting allows managers to spot problems in business faster and take corrective actions. With advanced analytics and reporting systems, businesses can predict expected future outcomes with some degree of accuracy by applying machine learning-aided predictive tools. Businesses can also make use of real-time performance monitoring. Cloud-based business intelligence, big data and dashboards tools have grown in popularity, aided by automation tools to support the real-time monitoring objective of businesses.

6.3.4.2 Integrated systems and capturing all digital trace

Some of the traditional systems that firms applied in the past were subject to criticism> These systems were disintegrated, and individual, organisational departments operated in silos. These disintegrated systems have numerous disadvantages to the business as they do not allow the seamless sharing of files and information across individual departments. Today, firms commonly adopt well-integrated IT systems that enable sharing of records by different parts of the entity. Managers can effectively manage their organisations if it becomes easier to share information, particularly regarding decision-making, collaborations, and company-wide processes such as monitoring fraud or total quality management (TQM) processes.

6.3.4.3 Harnessing big data tools

Big data technology allows firms to better their markets and consumer behaviour patterns than ever before, allowing firms to arrive at better-informed decisions. The ability to derive meaningful insights from big data has broadened business possibilities in the modern world. Companies now have an opportunity to understand and use data from various sources, including some previously impossible sources. Big data has also

prompted businesses to comfortably handle and analyse data in (previously) unconventional file formats. Companies can now access and explore data from their supply chain, including web-based and social media data. Therefore, for managers to effectively manage their businesses in the digital world, they must exploit the opportunities presented by big data technology.

6.3.4.4 Robotics and automation technology

Robots are digital technology devices that can work just like humans in some tasks. A robot utilises machine learning algorithms to execute tasks that a person would do. Robots are increasingly being used as automation tools in many businesses today, particularly in boring, repetitive tasks. Robots provide many advantages in some cases, like minimising human accidents, fatigue and many others. Automation tools are also used in some organisational tasks to avoid human beings repeating structured tasks so that they can focus on key aspects of their roles. Automating macros are created to trigger task execution at certain preset time intervals, for instance, to automate reporting in a business. Managers can harness robots and automation tools to improve the operational efficiency of their business.

6.3.4.5 Embracing 'Internet of Things' (IoT) technology

The development of IoT technology has made it possible for devices to communicate with one another through a network. More and more organisations across various sectors are adopting IoT strategies to boost productivity, gain deeper insights into customers' needs, make more informed decisions, and ultimately grow their businesses worth.

According to Gazis (2021), the Internet of Things (IoT) is a network that allows computers (over a billion tech gadgets), mechanical and digital machines, objects, animals, and people to exchange data with one another and with other devices in the network without the need for human or computer interaction. A "thing" can be anything from a farm animal equipped with a biochip transponder to a person with an implanted heart monitor to a mobile phone to a drone to a vehicle (an automobile) equipped with built-in sensors to alert the driver when tyre pressure is low for the Internet of Things (IoT).

6.3.4.5 Machine learning (ML) and Artificial intelligence (AI)

ML and AI are other facets of 4IR that contribute massively to the performance of some industry giants, such as Netflix and Google. ML and AI are helping managers to drive businesses in a very different way from the past. With the help of AI, companies can use evolutionary computation and data mining to look through online communities and other places for good people to hire. Human resource planning is one area where AI has proven useful; by making it cheaper to reassign and reorganise activities inside an organisation, AI enables the dynamic optimization of organisational functions to adapt to shifting internal and external situations. To further aid firms in their strategic planning, ML facilitates re-analysis and recognition of patterns in data acquired from various existing decision support systems (DSS).

ML and AI offer excellent capacity and capability for fast computation with massive volumes of the data subject to several possible business scenarios. However, by simulating and quantifying the outcomes of each business strategy, AI may help executives plan for and measure corporate performance, allowing them to better uncover the best solutions in their sectors.

AI can help organisations bypass the human element bias in product promotion management and optimization. Efficient and effective product promotion will optimize the business sales and returns, by helping managers to know, for instance, when, where, and how to promote the company products. Thus, the promotion timing needs to be set right in the planning. Historically, promotional calendars were usually planned for months and involved some guesswork. With the help of AI-powered tools like the HIVERY Trade Promotion Optimization tool, businesses can now remove human error from their sales forecasts, leading to more reliable revenue growth. This is because the new technology can gather data from many different sources and turn it into insights that can be used.

AI and ML are technologies within the computer science domain that are related to each other and are used to create intelligent systems. As defined by Java Tpoint (2020), we can broadly distinguish between the two as follows; Machine learning (ML)

is a type of artificial intelligence (AI) that lets machines learn from data without being told to do so. Conversely, AI refers to the broader technological concept applied to create intelligent machines that simulate human thinking capability and behaviour.

In the highly competitive new business world, firms are challenged to embrace new technology to advance their business operations and facilitate creative consumer experiences beyond customer expectations. Businesses need to exploit opportunities offered by personalised online shopping experiences of customers and curated targeted ads. Modern business leaders must be able to lead their organisations towards AI-powered category management tools to improve business sales. Category management tools help organisations and their leaders to accurately predict business sales based on the tracked behaviour patterns of consumers fuelled by machine learning. ML and AI are helping businesses predict customer behaviour and try to provide more customized product offerings and improved customer experience (CX).

Managing and optimizing business workspaces is often a challenging task for managers. Business managers need to be able to optimize operational space and minimise overheads. Business leaders, particularly for wholesale and retail as well as manufacturing, need to get smarter about maximising every square foot of space in a store both at macro and micro levels. At the macro level, store-wide space allocation needs to be optimal while on-site, such as shelf planning, must also be optimized at the micro level. Macro and micro-level workspace planning is key to minimising organisational expenses and maximising revenues and profit while achieving the best comprehensive customer experience. Historically, businesses have meticulously scrutinised their workspaces and carefully planned them through manual methods. Art and science, when activated and applied by modern leaders with the help of a hybrid of artificial and human intelligence, is an indispensable tool for creating a better world. AI and ML-assisted Next Generations (Next-Gen) merchandising solutions could help implement relevant and future-proof solutions to solve workspace problems and make strategic decisions quickly. These processes were timeous in the past. Therefore, business operational space decisions such as store assortment and space mix, shopfloor layout and shelf design are informed by insights from the right technology. On the other hand, executives who understand the potential of artificial intelligence

may use it to improve personnel management, succession planning, staffing, and overall employee activity organisation across all Industry 4.0 functions.

Based on the Amrop Report (2022), there are nine facets expected of the AI-wise leader that can allow the leader to exploit AI's opportunities by optimally combining the power of technology and human elements. The Amrop Report indicates that AI-wise leaders must be able to facilitate innovation and embrace collaboration between humans and AI to positively transform business operations, markets, industries, and the workforce by utilising the following traits:

Trait	Description
Mobilizer	Inspiring people towards an envisioned future
Social builder	Upholding human interaction
Humanist	Valuing the creativity of people
Mediator	Uniting humans and AI in a common quest
Navigator	Building bridges in the AI ecosystem
Explorer	Using AI to sharpen the competitive edge
Sense maker	Emphasising clarity in AI design and processes
Architect	Analysing, diagnosing, designing
Guardian	Safeguarding the integrity of AI design and maintenance
Disruptor	Promote a culture of innovativeness – be a 'frontier of innovation' in their domains

Table 6. 2: Key traits of future leaders

Thus, AI-wise leaders must be able to harness AI-powered technology to envision a more meaningful future, project and illustrate to other organisational stakeholders what the technology-powered future would look like while they also guide and enable their organisations to pursue the envisioned goal. The global firms that constitute the frontiers of technological innovations are challenging leaders and all senior management to play their role in championing economic transformation through embracing and cultivating powerful collaboration between human and artificial intelligence in their businesses to facilitate the transformation of operations, markets and their industries. They are expected to envision a meaningful future for their organisations. They show organisational stakeholders what the future powered by technology would look like and guide and enable their organisation to pursue the envisioned goal, instilling profitable progress and making society a better place to live.

Despite the perceived potential of 4IR tools, to most managers, these tools are still a black box that needs building trust. Trust can be established when leaders help to envision the organisation on opportunities presented by these tools. Many companies' managers are not yet implementing these tools because they fear the unknown and lack knowledge. Therefore, leaders should take responsibility and carry the onus to envision and guide the rest of the organisation through the transformation process. While 73% of respondents to the 2017 PwC CEO Pulse survey report highlighted the need for governance and standards to oversee AI, 76% highlighted a lack of transparency (and the potential for bias) as hindering its adoption in their company.

6.3.4.6 Leaders likely to thrive and realise success in their businesses in industry 4.0

Ranjen (2019) defines four types of leaders who are highly likely to thrive and realise success in their businesses in industry 4.0 as 'data-driven decisive', 'disruption drivers', 'talent champions', and 'social supers', which are summarised below:

Data-driven decisive

It is argued widely that today's top-performing firms are 'analytics driven' and rely mostly on data-driven decisions. Due to the latest technological advancements (4IR technological tools), firms can now use 'big data' tools for real- or near-real-time business performance monitoring, reporting and operational decisions and drive their long-term strategies. Big data refers to large complex data from structured and unstructured datasets, which is difficult to handle using traditional systems. Today, firms use big data analytics to analyse customer data across all sources to make better business decisions. Firms now operate more online, and enormous volumes of data about customers' behaviour are generated. The global expansion of Internet access, Internet of Things (IoT) technology, artificial intelligence, smart devices, social media, and other factors have changed the business and dynamics of markets, which calls for improved skill sets for managers and leaders.

Most C-level executives in digitally powered organisations are overcoming business challenges by taking methodical, data-focused approaches to short-term and strategic decision-making. Empirical evidence indicates that most organisations whose

leaders/managers are embracing and capitalising on Industry 4.0 opportunities to better understand markets are already reaping the economic benefits.

Disruption drivers or disruptors

Today, managers must be at the fore of technological innovations for their organisations to stay relevant and succeed. Disruption drivers know that spending money on disruptive innovations could allow their companies to stand out. These leaders are driven, creative, willing to try new things, and sure of themselves. This gives them an edge when dealing with the unknowns in the new zone. Disruption drivers are more prepared to explore, find new advanced solutions and implement disruptive technologies in their organisations through defined processes. Disruption drivers often want to make data-driven decisions with input from diverse stakeholders.

Talent champions

Modern leaders need to be talent champions to implement digital transformation effectively. They should be willing to address all aspects of human capital effectively, such as investing in employee training and retraining for the new industry 4.0 work environments. The executives of industry 4.0 organisations need motivational tools and techniques to keep their staff geared toward the objectives. They need an optimised blend of talent and technology to get the best results from the technological transformation.

Social supers

Leaders of industry 4.0 firms also need to adopt approaches that ensure their technological implementation and transformation are viewed positively by the community in which they operate – in other words, the responsibility to do good in the community is important. Social supers bring up social initiatives that benefit the community and are fundamental to their businesses. Companies led by social entrepreneurs develop faster than those whose leaders have not struck a balance between doing good and making a profit. Their employees are more likely to be ready for the digital revolution (Deloitte, 2019b). Usually, these companies are much more open to providing training for their staff.

Other technological leaders have noted that organisations and their leaders need to adopt a continuous learning business model to stay in the front in bringing in transformations that make them have agile and optimal systems. They, too, need the capacity and capability to lead when the context changes and be adaptive to market and environmental changes quickly. Thus, business leaders must stay aware of all market trends and transformational changes.

6.4 LIMITATIONS OF THE STUDY

This study on disruption management for private higher education institutions has some limitations. The study's findings cannot be generalisable to other institutions because of organisational structure and context differences. Furthermore, the study may not cover all possible disruptions, as there may be unforeseeable events that could have a significant impact on the institutions. However, the model proposed in this study serves as a generalised model. The study may also be limited in scope, focusing on a specific type of disruption or a specific country (this study concentrated largely in South Africa), which may not reflect the broader context. The data collection and analysis processes for Stages 1 and 2 of this study were intensive, time-consuming, and necessitated the involvement of peers and experts. Eskom's loadshedding and power outages caused many delays and rescheduled appointments for the study, which slowed down the project's progress.

Private higher education institutions are market sensitive as they rely heavily on tuition, so customer perception is very important to them. The managers involved in the study may have been hesitant to provide their true perception of how the institution responded to disruption due to concerns about the potential consequences of their views. These concerns may have been influenced by factors such as the policies of the PHEIs or the views of their boards of directors regarding their response strategy. As a result, the managers may have responded more aligned with the institution's official position than their true perceptions.

An opposing viewpoint could be that using self-reported data from managers and staff could result in bias, as it's possible that individuals may portray their institution's response in a more positive way. Also, the study's focus on South African private higher education institutions might restrict the relevance of the results to other areas

with varying socio-economic and political situations. Recognising these constraints offers a more fair assessment of the study's results and emphasises the importance of additional research to confirm the findings in different settings.

Generalizability of limitations

The specific conditions of South African institutions may impact the applicability of the model to institutions in other regions. South Africa's distinct socio-economic issues, regulations, and historical background influence how institutions handle changes. This means that while the model provides important ideas, it might not work exactly the same way in regions with different institutions, resources, and pressures. Further research should test the model in various settings to determine its broad applicability and identify any necessary adjustments to adapt it to different situations.

Strategies used to mitigate bias and improve the analysis's objectivity

The researchers acknowledge the possibility of bias and take it into account when interpreting the results. To improve the objectivity of the analysis, they used several strategies throughout the study, such as triangulation, using multiple data collection methods, and involving diverse stakeholders.

Triangulation:

Triangulation is the use of multiple data sources or methods to verify findings. In this investigation, data triangulation involved combining quantitative data from surveys with qualitative data from interviews. This method helps ensure that the findings are strong and not dependent on just one data source. Triangulation improves the results' trustworthiness by providing a more well-rounded understanding of the research topic from various perspectives.

Multiple data collection methods:

The research employed a combination of quantitative and qualitative approaches for data collection. We obtained quantitative data by administering structured surveys to both staff and students, which produced measurable and comparable results. On the other hand, we gathered qualitative data through extensive interviews with leaders and stakeholders, which provided detailed insights and context. The use of both methods ensures a more comprehensive and unbiased analysis.

Involvement of diverse stakeholders:

Involving a diverse group of people, such as staff, students, and leaders, is important to ensure that the research encompasses a variety of viewpoints. This inclusiveness helps reduce the potential bias that could result from only focusing on one specific group. By taking into account the perspectives of different stakeholders, the research offers a comprehensive understanding of how private higher education institutions manage disruptions.

Peer review and expert consultation:

Throughout the data gathering and examination, the researchers sought feedback from colleagues and field specialists. Peer review was important for uncovering possible biases and areas for improvement that the researcher may not notice. Input from experts helped ensure that the methods and interpretations are in line with established practices and theories, thereby strengthening the neutrality of the analysis.

Anonymity and confidentiality:

In order to promote truthful and impartial feedback, the research made sure that all participants remained anonymous and their information was confidential. We employed this method to minimise the impact of social desirability bias, which may pressure respondents to give answers they believe are more acceptable than their genuine opinions.

Clear and transparent methodology:

The research used a method that was simple to understand and follow, providing a comprehensive outline of every stage of gathering and examining data. The research's full disclosure of procedures allowed for the replication and review of results, fostering confidence in the reliability of the findings.

Acknowledgment of limitations:

The research acknowledges its limitations, such as possible prejudices and the unique setting of South African private higher education institutions. By openly addressing these limitations, the study offers a more candid and analytical assessment of the

results, enabling readers to take these factors into account when interpreting the findings.

Iterative process of model refinement:

The machine learning model went through a process of refinement in an iterative manner. This included regularly reviewing and adjusting the model based on analysis and feedback to ensure that the final model accurately represents the data and reduces bias. These strategies aim to minimise bias and improve the objectivity and reliability of the findings. Using multiple methods, involving diverse stakeholders, and transparently documenting the research process all contribute to a more balanced and comprehensive understanding of disruption management in private higher education institutions.

6.5 AREAS FOR FURTHER RESEARCH

The development of the disruption framework for PHEIs in South Africa can be further refined and developed into a practical model that can be used as a practitioner's tool. This would allow PHEIs to look at and improve their frameworks for dealing with disruptions, making them better able to handle them when they happen. Future research could also consider a more diverse research population by including additional PHEIs in South Africa or other parts of the world and other stakeholders such as regulators, sponsors, industry, and the government. This would give a complete picture of how different stakeholders and countries see and deal with disruptions in PHEIs and what they have learnt from them.

Comparing the applied machine learning model to this study to other alternative models (such as logistic regression, neural networks, or ensemble methods) could improve prediction results. Although the machine learning model has advanced predictive capabilities, logistic regression offers a more straightforward and easier-to-interpret approach that can be valuable in various situations. By comparing these models, it is possible to determine the most effective techniques for predicting disruption risks and enhancing the solidity of the predictive framework. The effectiveness of various models in predicting disruptions and their practical implementation in higher education institutions should be the subject of further studies.

Additionally, researchers should also delve deeper into understanding unpredictable elements, such as black swan events, and creating strong management and mitigation strategies. This might involve studying past disruptions, interviewing industry experts, and planning for potential scenarios to better prepare institutions for unexpected challenges. In summary, forthcoming research should aim to expand and validate this framework in various contexts and regions. This includes testing the framework's applicability and the efficacy in different higher education institutions worldwide, as well as in other sectors where non-profit and for-profit organizations operate. This would promote a better understanding of managing disruption and improving resilience in various sectors and enhance the generalizability of the findings. Researchers should also consider gathering feedback from a variety of stakeholders, such as students, staff, regulators, sponsors, and industry partners, to enhance and refine the framework.

It is also important for future studies to embrace generative research methods, as they provide numerous benefits for validating and fine-tuning the disruption management framework. The iterative and adaptable nature of generative research allows for continuous refinement based on feedback and emerging data, ultimately leading to a more robust and effective strategy. Additionally, involving stakeholders from diverse backgrounds in collaborative workshops and co-design sessions will help identify critical components, gather feedback, and iteratively refine the framework for effective disruption management.

6.6 CONTRIBUTIONS TO THE STUDY

The study offers several significant contributions and innovations that have the potential to transform the field of knowledge in disruption management for higher education institutions. Educational institutions face new challenges in managing disruptions, and these findings offer valuable insights into effective strategies to lessen their impact. By delving deep into the complexities of disruption management, this study also lays the foundation for the development of comprehensive frameworks and models that can guide decision-making processes in the face of unforeseen disruptions. Furthermore, the research highlights the importance of collaboration and partnership between educational institutions and various stakeholders, such as government agencies, industry leaders, and community organisations, in effectively

addressing disruption challenges. With its comprehensive approach and innovative solutions, this study marks a significant step forward in enhancing the resilience and adaptability of higher education institutions to disruptions, ensuring the continuity of education even in times of uncertainty.

6.6.1. Comprehensive Disruption Management Framework (DMF)

The research suggests a complete system for managing disruptions (DMF) that brings together different important elements, including technology, personnel management, decision-making, scenario analysis, planning, and resource distribution. By incorporating these essential elements into the framework, higher education institutions can effectively navigate and mitigate disruptions, ensuring minimal disruption to the learning environment. With a focus on proactive measures, the DMF empowers policymakers and institutional leaders with a robust toolkit that facilitates efficient decision-making, rapid response, and effective recovery. This comprehensive approach offers a valuable reference for stakeholders, guiding them in developing strategies to safeguard their institutions and maintain the continuity of education in the face of unexpected challenges.

6.6.2. Empirical insights

The study provides practical knowledge based on real-world data collected via both numerical and descriptive methods. By meticulously examining and analysing an extensive range of information gathered from students, faculty members, and administrators across various educational institutions, the research provides a comprehensive and nuanced understanding of the challenges and effective strategies employed to navigate interruptions. This invaluable information is important for devising and implementing successful, tailored plans and guidelines that cater specifically to the unique demands and circumstances encountered in colleges and universities worldwide. The insights gleaned from this study serve as an indispensable resource for educational authorities, policymakers, and stakeholders, fostering a more efficient and resilient educational ecosystem that can adeptly address interruptions and ensure optimal learning experiences for all.

6.6.3. Identifying key predictive and non-predictive factors

The research delves into a comprehensive analysis of various factors that can significantly impact disruption management. These factors encompass a range of influential elements, including technological advancements, market dynamics, and unforeseen events such as black swan events, riots and instances of looting. By comprehensively breaking down these factors, organisations are able to gain a deep understanding of the intricacies involved in effectively managing disruptions. Moreover, this diligent examination allows organisations to strategically prioritise their risk management efforts and allocate their valuable resources with optimal efficiency. Through this holistic approach, organisations can navigate the complex landscape of disruption management, ensuring resilience and sustainable success amidst a rapidly evolving business environment.

6.6.4. Methodological contribution

The study employs both quantitative analysis and qualitative insights in order to examine and analyse the topic at hand. This methodology emphasizes the importance of integrating various research methods to gain a thorough and complete understanding of intricate subjects such as disruption management using a mixed-methods approach. This approach allows for a more nuanced exploration and offers deeper insights into the complexities surrounding this field of study.

6.7 Future research and validation

Realising the urgent need for thorough confirmation and further investigation of the important research objectives c, d, and f, this excellent study presents a new idea that makes these important objectives the main focus of future research efforts.

6.7.1 The objective is to validate the predictive factors

Future research endeavors should focus primarily on meticulously establishing and validating the various predictive factors already identified. We will accomplish this arduous task by employing highly sophisticated statistical methodologies and cutting-edge machine learning models. We will thoroughly examine these models through an extensive array of datasets from diverse colleges and universities as part of the validation process. The primary objective of such a rigorous evaluation is to gauge the

utmost accuracy and unwavering dependability of these models and their respective predictions.

6.7.2 Validation of non-predictive factors and mitigation strategies (objective d)

Further research is imperative and of utmost importance in order to thoroughly validate and authenticate the non-predictive elements that have been previously identified due to their significant impact in various diverse environments and organizations. It is very important for scientists and experts to carefully create and test specific plans to deal with these unpredictable factors, making sure they work well in real life. This is all for the benefit of the fields and sectors in question.

6.7.3 The development and testing of a Disruption Management Framework (objective f)

Future studies should focus on creating an improved framework for managing disruptions, drawing from the findings of this research. We will then test the framework in various real-life scenarios at various colleges and universities to determine its effectiveness in handling disruptions. We will consider input from those involved to strengthen and ensure the relevance of the framework.

The current study provides a fundamental understanding and offers a thorough plan for handling disruptions in higher education. Future research should concentrate on confirming the factors identified in the study and the proposed plan. These efforts will add more support to the study's impact on the field and help improve the ability of higher education institutions to handle disruptions effectively.

6.6 CONCLUSION

The experience brought by COVID-19 to the PHEIs necessitated an investigation of this nature. The study sought to embrace the fundamentals of a guiding framework with the benefits of the Fourth Industrial Revolution with the idea of creating futuristic PHEIs. The study applied a mixed-methods approach to understanding the experiences of students and staff while syphoning managers' opinions to constitute the input to the framework and model construction. The results of this investigation would improve if future studies sufficiently addressed the limitations stated above.

REFERENCES

Accenture. 2018. *The Digital Talent Gap—Are Companies Doing Enough?* Available online: https://www.accenture.com/_acnmedia/pdf-77/accenture-2018-digital-talent-gap-report.pdf Accessed 19 Jan 2023

Adelzadeh, A., Malumisa, S. & Benecke, J. 2021. *COVID-19 and South Africa's future economic outlook. Applied Development Research Solutions* (ADRS) Available online: https://adrs-global.com/resources/static/downloads/adrs_report_on_covid_19_and_SA_future_economic_outlook.pdf Accessed 29 Dec 2021

Adetiba, T.C., 2019, October. Massification of higher education in South Africa, the good, the bad and the ugly. *In Proceedings of International Academic Conferences* (No. 9410873). International Institute of Social and Economic Sciences.

Adhikari, B. and Safaee Chalkasra, L.S., 2023. Mobilizing private sector investment for climate action: enhancing ambition and scaling up implementation. Journal of Sustainable Finance & Investment, 13(2), pp.1110-1127. tandfonline.com

Africa News. 2022*. Covid-19: Morocco bans flights from China.* Available online: https://www.africanews.com/2023/01/01/covid-19-morocco-bans-flights-from-china// Accessed 04 Jan 2023

Agrawal, S., De Smet, A., Lacroix, S. & Reich, A. 2020. *To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now*. McKinsey Insights (Issue May)

Agri SA. 2022. *Disruptive loadshedding poses long-term risks to the agricultural sector and economy.* Available online: https://agrisa.co.za/media/disruptive-load-shedding-poses-long-term-risks-to-the-agricultural-sector-and-economy Accessed 29 Dec 2022

Aguilar, F.J. 1967. *Scanning the business environment*. New York, NY: Macmillan.

Akers, B. 2020. *A new approach for Curbing College. Tuition inflation report*. New York, NY: Manhattan Institute for Policy Research.

Akor, E.U. 2008. Government intervention in higher education in South Africa: policy options (Doctoral dissertation). Pretoria: University of Pretoria.

Aksu, S.P., Aksoy, M.U., Gurcuoglu, E.A. and Erenel, A.S., 2022. Development and psychometric evaluation of the contraceptive attitude questionnaire. Journal of Nursing and Midwifery Sciences, 9(1), pp.16-16. sid.ir

Akukwe, T. I. 2018. Political Instability and Higher Education in Africa: The Case of South Sudan. Journal of Studies in Education, 8(4), 40-49. https://doi.org/10.5296/jse.v8i4.14012

Alao, B.B. and Gbolagade, O.L., 2020. Coronavirus pandemic and business disruption: The consideration of accounting roles in business revival. International Journal of Academic Multidisciplinary Research.

Alberto, I.C., Jiao, Y. & Zhang, X., 2021. Too hot or too cold to study? The effect of temperature on student time allocation. *Economics of Education Review*, 84:102152.

Ali, W. 2020. Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. Higher Education Studies, 10(3):16-25.

Allais, S. & Marock, C. 2020. Educating for work in the time of Covid-19: Moving beyond simplistic ideas of supply and demand. *Southern African Review of Education*, 26(1): 62-79.

Almeida, F. 2018. Strategies to perform a mixed methods study. *European Journal of Education Studies* 5(1), 137–151. https://doi.org/10.5281/ZENODO.1406214

Altay, N. and Pal, R., 2023. Coping in supply chains: a conceptual framework for disruption management. The International Journal of Logistics Management, 34(2), pp.261-279.

Altbach, P. G., Reisberg, L., & Rumbley, L. E. 2019. Trends in global higher education: Tracking an academic revolution. The United Nations Educational, Scientific and Cultural Organization (UNESCO).

Amenta, C., Destri, A.M.L., Levanti, G. and Di Betta, P., 2022. The challenges underlying firm revival and resilience in the Post-COVID-19 phase. In COVID-19 and Communities: The University of Palermo's Voices and Analyses During the Pandemic (pp. 53-73). Cham: Springer International Publishing. researchgate.net

American Psychological Association. 2020. *Ethical Principles of Psychologists and Code of Conduct*. Washington, DC: American Psychological Association.

Amrop Report. 2022. Wise Leadership and AI: New Intelligence, New Leadership. Available online: https://www.amrop.com/news-insights/articles/wise-leadership-and-ai-new-intelligence-new-leadership/ Accessed 10 Jan 2023

An, B.Y. and Tang, S.Y., 2020. Lessons from COVID-19 responses in East Asia: Institutional infrastructure and enduring policy instruments. The American Review of Public Administration, 50(6-7), pp.790-800. sagepub.com

Ananthakrishnan, B. Atluri, V. Krishnamurthy, H. & Muthiah, S. 2018. How disruptive technologies are opening up innovative opportunities in services. Available online: https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/how-disruptive-technologies-are-opening-up-innovative-opportunities-in-services Accessed 19 April 2021

Anderson, J. & Rainie, L. 2020*. Concerns about democracy in the digital age*. Available online: https://www.pewresearch.org/internet/2020/02/21/concerns-about-democracy-in-the-digital-age/ Accessed 24 Dec 2022

Anderson, Kerry A. 2020. Utilising social media within incident response programmes. *Journal of Business Continuity & Emergency Planning*, 14(2):136-141.

Apple. 2022. *Apple reports fourth-quarter results.* Available online: https://www.apple.com/za/newsroom/2022/10/apple-reports-fourth-quarter-results/ Accessed 29 Dec 2022

Arizona State University. 2023. *Student emergency fund*. Available online: https://sst.asu.edu/student-emergency-fund Accessed 19 Jan 2023

Arreguín-Sánchez, F., 2022. Ecosystem Resilience. In Holistic Approach to Ecosystem-Based Fisheries Management: Linking Biological Hierarchies for Sustainable Fishing (pp. 73-86). Cham: Springer International Publishing. [HTML]

Ashioya, S. 2014. The challenges of strategy implementation at the Ministry of East African Affairs, Commerce and Tourism: State Department of East African Affairs in Kenya. *Unpublished MBA project.* Nairobi, Kenya: University of Nairobi.

Ayuk, P.T. & Koma, S.B., 2019. Funding, access and quality conundrum in South African higher education*. African Journal of Public Affairs*, 11(1):176-195.

Ba, Z. D. H., Wang, Q., Chen, C., Liu, Z., Peh, L. L. C., & Tiong, R. L. K., 2023. Change management of organizational digital transformation: a proposed roadmap for building information modelling-enabled facilities management. Buildings. mdpi.com

Baba, H., Watanabe, T., Nagaishi, M. & Matsumoto, H., 2014. Area business continuity management, a new opportunity for building economic resilience. *Procedia Economics and Finance*, 18:296-303.

Baber, H., 2020. Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *Journal of Education and e-learning Research*, *7*(3) 285-292.

Bach, K. *New data shows long Covid is keeping as many as 4 million people out of work*. Available online: https://www.brookings.edu/research/new-data-shows-long-covid-is-keeping-as-many-as-4-million-people-out-of-work/ Accessed 25 Dec 2022

Badat, S. 2017. Free Higher Education in South Africa. Why not? *International Higher Education*, (63) 22-23.

Badenhorst, A.J. 2019. *This is how South Africa can handle the growing demand for higher education.* Available online: https://www.usb.ac.za/usb_insights/this-is-how-south-africa-can-handle-the-growing-demand-for-higher-education/. Accessed 26 Dec 2022

Bajarin, T. 2022. *Apple's key to success goes beyond products and services and includes world-class operations*. Available online: https://www.forbes.com/sites/timbajarin/2022/08/09/apples-key-to-success-goes-beyond-products-and-services-and-includes-world-class-operations/?sh=58037e2022ec Accessed 29 Dec 2022

Baker, J., Wagner, J., & Yuan, H. (2020). Do social media reveal vaccine sentiment? Journal of Health Communication, 25(10), 808-814.

Baker, S.R., Bloom, N., Davis, S.J., Kost, K., Sammon, M. & Viratyosin, T., 2020. The unprecedented stock market reaction to COVID-19. The review of asset pricing studies, 10(4), 742-758.

Bal, P.M. & Izak, M., 2021. Paradigms of flexibility: a systematic review of research on workplace flexibility. *European Management Review*, *18*(1), 37-50.

Bao, W. 2020. COVID-19 and online teaching in higher education: A case study of Peking University. *Human Behavior and Emerging Technologies*, 2(2):113-115.

Barnwell, G. *The psychological and mental health consequences of climate change in South Africa*. Available online: https://cer.org.za/wp-content/uploads/2021/09/CER-Export-Report-Garret-Barnwell-Final-30-August-2021-2.pdf Accessed 26 Dec 2022

Barr, B.A. and Miller, S.F., 2013. Higher Education: The Online Teaching and Learning Experience. *Online submission*.

Barton, M.A., Sutcliffe, K.M., Vogus, T.J. & DeWitt, T., 2015. Performing under uncertainty: Contextualized engagement in wildland firefighting. *Journal of Contingencies and Crisis Management*, *23*(2), pp.74-83.

Bartusevičienė, I., Pazaver, A. & Kitada, M., 2021. Building a resilient university: ensuring academic continuity—transition from face-to-face to online in the COVID-19 pandemic. WMU Journal of Maritime Affairs, 20(2), 151-172

Bashir, A., Bashir, S., Rana, K., Lambert, P. & Vernallis, A. 2021. Post-COVID-19 adaptations; the shifts towards online learning, hybrid course delivery and the

implications for biosciences courses in the higher education setting. *Frontiers in Education*, 6: 711619, August

BBC. 2022. *Ukraine tensions: Russia stages military drills with Belarus*. Available online: https://www.bbc.com/news/world-europe-60327930 Accessed 23 Dec 2022

Beach, B., Clay, K., & Saavedra, M., 2022. The 1918 influenza pandemic and its lessons for COVID-19. Journal of Economic Literature. nber.org

Belhadjali, M. & Abbasi, S., 2020. COVID-19: The role of leadership in response to disruption. *International Journal for Innovation Education and Research*, *8*(8), 362-365.

Benmira, S. & Agboola, M., 2021. Evolution of leadership theory. BMJ leader. bmj.com

Bergen, N. & Labonté, R., 2020. “Everything is perfect, and we have no problems”: detecting and limiting social desirability bias in qualitative research. Qualitative health research. dspacedirect.org

Besser, A., Flett, G. L., & Zeigler-Hill, V. 2022. Adaptability to a sudden transition to online learning during the COVID-19 pandemic: Understanding the challenges for students. Scholarship of Teaching and Learning in Psychology, 8(2), 85–105. https://doi.org/10.1037/stl0000198

Bhamra, R., Dani, S. & Burnard, K. 2011. Resilience: The concept, a literature review and future directions. *International Journal of Production Research*, 49(18):5375-5393

Bhandari, R. Robles, C & Farrugia, C. 2018. *International higher education: shifting mobilities, policy challenges, and new initiatives*. Global Education monitoring team. Institute of International Education (USA). Available online: https://unesdoc.unesco.org/ark:/48223/pf0000266078 Accessed 29 Dec 2022

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. MIS Quarterly, 37(2), 471-482

Bhutoria, A. 2022. Personalized education and artificial intelligence in United States, China, and India: A systematic review using a human-in-the-loop model. Computers and Education: *Artificial Intelligence*,100068.

Billups, E. S., 2024. Some Nonprofit Leaders Lack Strategies to Support Financial Change Management in an Organization for Sustainability. waldenu.edu

Bleazard, D. & Lourens, A. 2015. Implementing an enrolment planning model at a university of technology. *South African Journal of Higher Education*, 29(6):39-57.

Bloomberg, L. D. & Volpe, R. J. 2012. *Designing and conducting mixed methods research*. London: Sage.

Bloomberg. 2023. *Google invests R7 billion in ChatGPT rival developer*. Available online: Google invests R7 billion in ChatGPT rival developer (mybroadband.co.za) Accessed 05 Feb 2023

Blumberg, B.F., Cooper, D.R. & Schindler, P.S. 2014. Business research method. New York: McGraw-hill education.

Boateng, R. & Amankwaa, A. 2016. The impact of social media on student academic life in higher education. *Global Journal of Human-Social Science*, 16(4):1-8.

Bok, C. & Mostert, M. 2020. Challenges faced by rural students during COVID-19 lockdown in South Africa. *Education as Change*, 24(1) 1-11

Boomsma, A., Hoyle, R.H. and Panter, A.T., 2012. The structural equation modeling research report.

Bozkurt, A., Karakaya, K., Turk, M., Karakaya, Ö. & Castellanos-Reyes, D., 2022. The Impact of COVID-19 on Education: A Meta-Narrative Review. TechTrends, 66(5), 883-896.

Braun, V. & Clarke, V. 2019. Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exercise and Health, 11(4), 589-597.

Braun, V. & Clarke, V., 2012. *Thematic analysis*. American Psychological Association.

Braun, V. & Clarke, V., 2021. Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research*, *21*(1), pp.37-47.

Brenya, B., 2024. Higher education in emergency situation: blended learning prospects and challenges for educators in the developing countries. Journal of Applied Research in Higher Education. [HTML]

Brown, J. & Kurzweil, M. 2017. *The complex universe of alternative postsecondary credentials and pathways.* Cambridge, MA: American Academy of Arts and Sciences.

Brown, J. & Weintrop, J. 2018. Key performance indicators: A critical component of strategic planning. *Journal of Business Strategy*, 39(6):28-35.

Brown, T. & Wyatt, J. 2010. Design thinking comes of age. *Harvard Business Review*, 88(6):84-92.

Browne, M.W. & Cudeck, R. 1993. *Alternative ways of assessing model fit.* Available online: http://amosdevelopment.com/webhelp/pclose2.html. Accessed 14 April 2023

Browne, M.W. and Cudeck, R., 1993. 1 993. Alternative ways of assessing model fit. Testing structural equation models, pp.136-162.

Bryant, S. E. 2003. The role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. Journal of Leadership & Organizational Studies, 9(4), 32-44.

Bryman, A. 2016. *Social research methods*. Cape Town: Oxford University.

Buckner, E. 2017. The worldwide growth of private higher education: cross-national patterns of higher education institution foundings by sector. *Sociology of Education*, 90(4):296-314.

Bucy, M., Hall, S., Yakola, D. & Dickson, T. 2017. *Disruption, friction and change: The hallmarks of a true transformation*. Available online: https://www.mckinsey.com/capabilities/rts/our-insights/disruption-friction-and-change-the-hallmarks-of-a-true-transformation Accessed 19 Dec 2022

Buehring, J. & Bishop, P.C. 2020. Foresight and design: new support for strategic decision making. *She Ji: The Journal of Design, Economics, and Innovation*, 6(3):408-432.

Burt, C. 2022. *Why 50% of Gen Z students say they see less value in college degrees*. Available online: https://universitybusiness.com/why-50-of-gen-z-students-say-they-see-less-value-in-college-degrees/ Accessed 27 Dec 2022

Business Tech. 2021. *The chances of employment in South Africa based on your level of education.* Available online: https://businesstech.co.za/news/business/495113/the-chances-of-employment-in-south-africa-based-on-your-level-of-education/ Accessed 26 Dec 2022

Business Tech. 2022. *University price hikes planned for South Africa – as the government looks at new model*. Available online: https://businesstech.co.za/news/government/554986/university-price-hikes-planned-for-south-africa-as-government-looks-at-new-model/ 27 Dec 2022

Bygballe, L.E., Dubois, A. & Jahre, M. 2023. The importance of resource interaction in strategies for managing supply chain disruptions. *Journal of Business Research*, 154:113333.

Byrne, B.M., 2016. *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. routledge.

Calitz, E. & Fourie, J. 2016. The historically high cost of tertiary education in South Africa. *Politikon*, 43(1):149-154.

Cameron, E. & Green, M., 2019. Making sense of change management: A complete guide to the models, tools and techniques of organizational change. Kogan Page Publishers.

Canyon, D. 2021. Simplifying complexity with strategic foresight and scenario planning. *Security Nexus*, 22. Available online: https://dkiapcss.edu/nexus_articles/simplifying-complexity-with-strategic-foresight-and-scenario-planning/ Accessed 19 Dec 2022

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., *et al.* 2020. The psychological impact of the COVID-19 epidemic on college students in China. Psychol. Res. 287:112934. doi: 10.1016/j.psychres.2020.112934

Carolissen, R. 2022. Reflections on the race inquiry at Stellenbosch University. Online available: https://www.universityworldnews.com/post.php?story=20221026144729579 Accessed 24 Dec 2022

Casula, M., Rangarajan, N. & Shields, P. 2021. The potential of working hypotheses for exploratory deductive research. *Quality & Quantity*, 55(5):1703-1725.

Catastrophic Contangion. 2022. *A global challenge exercise*. Available online: https://www.centerforhealthsecurity.org/our-work/exercises/2022-catastrophic-contagion/ Accessed 29 Dec 2022

CDC. 2021. *Health equity considerations and racial and ethnic minority groups. Centers for Disease Control and Prevention*. Available online: https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/race-ethnicity.html Accessed 2 Jan 2023

Chakravarthy, B.S. 1982. Adaptation: a promising metaphor for strategic management. *Academy of Management Review,* 7(1):35-44.

Changyue, Z. 2022. *Chinese students in US see first decline in 10 years: think tank*. Available online: https://www.globaltimes.cn/page/202209/1276358.shtml Accessed 30 Dec 2022.

Chelishcheva, E., 2023. Innovation in the Yoga and Ayurveda Industry: exploring the role of technology and entrepreneurship. theseus.fi

Chesbrough, H. & Rosenbloom, R.S. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3):529-555.

Chetty, R. & Pather, S. 2015. *Challenges in higher education in South Africa. Telling stories differently: Engaging 21st century students through digital storytelling*. Available online:

https://www.researchgate.net/publication/305213223_Challenges_in_Higher_Education_in_South_Africa/citations Accessed 11 Dec 2022

Chia, E.S. 2016. Singapore's smart nation program. Enablers and challenges. In 2016 *11th System of Systems Engineering Conference* (SoSE) (pp. 1-5). IEEE, June

Chigurupati, A., Thibaux, R. & Lassar, N. 2016, January. Predicting hardware failure using machine learning. In *2016 Annual Reliability and Maintainability Symposium* (RAMS) (pp. 1-6). IEEE.

Choo, C.W. 1993. *Environmental scanning: acquisition and use of information by chief executive officers in the Canadian telecommunications industry*. Toronto: University of Toronto.

Christensen, C.M., Raynor, M.E. & McDonald, R. 2015. *What is disruptive innovation*? Available online: https://hbr.org/2015/12/what-is-disruptive-innovation Accessed 19 Nov 2022

Christensen, C.M., Wang, D. & Van Bever, D., 2013. Consulting on the Cusp of Disruption. Harvard business review, 91(10), pp.106-114

Christensen, T. & Gornitzka. 2017. Reputation management in complex environments - a comparative study of university organizations. *Higher Education Policy,* 30:123-140. doi: 10.1057/s41307-016-0010-z

Chu, T.F. 2020. The Complex Challenge of Foreign Interference in Research Administration and Compliance. *Research Management Review*, 24(1):n1.

Clarke, V. and Braun, V., 2013. Successful qualitative research: A practical guide for beginners. *Successful qualitative research*, 1-400.

Cloete, N., and P. Maasen. 2015. “Roles of Universities and the African University Context.” In Knowledge Production and Contradictory Functions in African Higher Education, edited by N. Cloete, P. Maasen, and T. Bailey. Cape Town: African Minds.

CNET. 2022. *Six million people have died from COVID*. Available online: https://www.cnet.com/health/six-million-people-have-died-from-covid/. Accessed 26 Dec 2022

Coetzee, J., Neneh, B., Stemmet, K., Lamprecht, J., Motsitsi, C. & Sereeco, W. 2021. South African universities in a time of increasing disruption. *South African Journal of Economic and Management Sciences*, 24(1):1-12.

Collins Dictionary. 2023. *Definition of 'permacrisis'*. Available online: https://www.collinsdictionary.com/dictionary/english/permacrisis Accessed 3 Jan 2023

Collins Dictionary. 2023. *Definition of 'poly-crisis'.* Available online: https://www.collinsdictionary.com/dictionary/english/polycrisis#:~:text=(%CB%88p%C9%92l%C9%AA%CB%8Ckra%C9%AAs%C9%AAs%20),Collins%20English%20Dictionary. Accessed 9 Jan 2023

Cordova-Pozo, K. & Rouwette, E. A. J. A., 2023. Types of scenario planning and their effectiveness: A review of reviews. Futures. sciencedirect.com

Coronel, G. 2021. *Revenue diversification in higher education*. Available online: https://www.linkedin.com/pulse/revenue-diversification-higher-education-gustavo-coronel/ Accessed 21 Dec 2022

Costley, K.C., 2014. The Positive Effects of Technology on Teaching and Student Learning. *Online submission*.

Council on Higher Education. 2004. *Framework for programme accreditation*. Pretoria: CHE.

Council on Higher Education. 2016. *South African higher education reviewed: Two decades of democracy*. Available online: http://www.che.ac.za/sites/default/files/publications/CHE_South%20African%20 higher%20education%20reviewed%20-%20electronic_0.pdf Accessed 27 Dec 2022

Council on higher education. 2022. *Programme accreditation*. Available online: https://www.che.ac.za/focus-areas/programme-accreditation Accessed 28 Dec 2022

Coyne, E., Carter, V., & Davis, P. (2020). Academic Leadership: Changing Conceptions, Identities and Experiences in Higher Education. Palgrave Macmillan.

Creswell, J.W. & Plano Clark, V.L. 2011. *Designing and conducting mixed methods research.* London: Sage.

Creswell, J.W. 2013. Qualitative inquiry and research design: Choosing among five approaches. Los Angeles, CA: Sage.

Creswell, J.W. 2014. *Research design: qualitative, quantitative, and mixed methods approaches*. London: Sage.

Creswell, J.W. 2018*. Research design: qualitative, quantitative, and mixed methods approaches*. London: Sage.

Cross, N. 2007. From a design science to a design discipline: Understanding designerly ways of knowing and thinking. *Design Issues*, 17(3):8-19.

CWUR. 2022. *Global 2000 list by the Center for World University Rankings*. Available online: https://cwur.org/2022-23.php Accessed 29 Dec 2022

Damadam, S., Zourbakhsh, M., Javidan, R. & Faroughi, A. 2022. An intelligent IoT based traffic light management system: deep reinforcement learning. *Smart Cities*, 5(4):1293-1311.

Daniel, J. 2020. Education and the COVID-19 pandemic. Prospects, 49, 91–96.

Dash, G. & Paul, J., 2021. CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. Technological Forecasting and Social Change. sciencedirect.com

Davenport, T.H., 1993. Process innovation: reengineering work through information technology. Harvard Business Press.

Davids, N. & Waghid, Y. 2019. 4. On the polemic of private higher education in South Africa: Accentuating criticality as a public good. *Philosophy and Theory in Higher Education*, 1(3):75-93.

Davis, H.E., Assaf, G.S., McCorkell, L., Wei, H., Low, R.J., Re'em, Y., Redfield, S., Austin, J.P. & Akrami, A. 2021. Characterising long COVID in an international cohort: 7 months of symptoms and their impact. *EClinical Medicine*, 38:101019.

De Jager, E. & R.S. Baard. 2019. Does 'free' higher education in South Africa make economic sense? *South African Journal of Higher Education*, 33(6):70-91.

De Sousa, E.B.G. Alexandre, B. Mello, R.F. Falcão, T.P. Vesin, B & Gašević. D. 2021. Applications of learning analytics in high schools: a systematic literature review. Journal of Frontiers in Artificial Intelligence. Available online: https://www.frontiersin.org/articles/10.3389/frai.2021.737891/full Accessed 5 Jan 2023

Del-Castillo-Feito, C., Blanco-González, A. & González-Vázquez, E. 2019. The relationship between image and reputation in the Spanish public university. *European Research on Management and Business Economics*, 25(2):87-92.

Deloitte. 2019a. *Scenario planning and wargaming for the risk management toolkit*. Available online: https://deloitte.wsj.com/articles/scenario-planning-and-wargaming-for-the-risk-management-toolkit-01555376533 Accessed 29 Dec 2022

Deloitte. 2019b*. Four leadership personas succeeding in the Fourth Industrial Revolution: Social supers; talent champions; data-driven decisions and disruption drivers*. Available online: https://www2.deloitte.com/us/en.html Accessed 19 Dec 2022

Dennis, E. 2018. Socioeconomic status and career decision making. *Journal of Career Development*, 45(1), 33-45

Denzin, N. K. 2012. Triangulation 2.0. Journal of Mixed Methods Research, 6, 80–88. doi:10.1177/1558689812437186

Department of Higher Education and Training. 2016a. *Regulations for the registrations of private higher education institutions 2016. A guide for completing the annual report (Guide APX-03).* Available online: https://www.dhet.gov.za/Private%20Higher%20Education%20Institutions/Guide%20APX-03.pdf Accessed 29 Dec 2022

Department of Higher Education and Training. 2016b. Higher Education Act 101 of 1997: Regulations for the registration of private higher education institutions.

31 March 2016. *Government Gazette* (No. 39880), Notice No. 383. Pretoria: Government Printers.

Department of Higher Education and Training. 2021. *Post-School education and training monitor – Macro-indicator trends*. Available online: https://www.dhet.gov.za/Planning%20Monitoring%20and%20Evaluation%20Coordination/Post-School%20Education%20and%20Training%20Monitor%20-%20Macro-Indicator%20Trends%20-%20March%202021.pdf 28 Dec 2022

Department of Higher Education and Training. 2021. *Report on the evaluation of the 2019 universities' research output.* Available online: https://www.dhet.gov.za/Policy%20and%20Development%20Support/Research%20outputs%20report%202021_final.pdf Accessed 29 Dec 2022

Department of Higher Education and Training. 2022. *Draft policy for the recognition of South African higher education institutional types*. Available online: https://www.dhet.gov.za/Policy%20and%20Development%20Support/22%2008%2003%20Policy%20on%20Recognition%20of%20South%20African%20Higher%20Education%20Instituional%20Types_docx.pdf Accessed 29 Dec 2022

Department of Higher Education and Training. 2022b *Skills supply and demand in South Africa. Labour Market intelligence research programme*. Available online: https://www.dhet.gov.za/Planning%20Monitoring%20and%20Evaluation%20Coordination/Report%20on%20Skills%20Supply%20and%20Demand%20in%20South%20Africa%20-%202022%20%281%29.pdf Accessed 27 Dec 2022

Department of Higher Education and Training. 2022c. *Finalisation of the Critical Skills List – Technical report*. Online available: https://www.dhet.gov.za/Planning%20Monitoring%20and%20Evaluation%20Coordination/2022%20Technical%20Report%20Finalisation%20of%20the%20Critical%20Skills%20List.pdf Accessed 26 Dec 2022

DeVellis, R.F. 2003. Scale development: Theory and application (2nd edn.). Thousand Oaks, CA: Sage Publications. PMid:14558062

Devi, L.L., 2017. Political instability and its influence on higher education: A study of students' perceptions in Manipur University. International Journal of Humanities and Social Science Studies, 3(5), 300-307.

Dhawan, S. 2020, "Online learning: a panacea in the time of COVID-19 crisis", Journal of Educational Technology, Vol. 49 No. 1, 5-22.

Diana, F. 2015. *Future thinking*. Available online: https://frankdiana.net/2015/07/20/future-thinking/ Accessed 19 Dec 2022

Digital Dubi. 2022. *Dubai blockchain strategy*. Available online: https://www.digitaldubai.ae/initiatives/blockchain Accessed 21 Dec 2022

Dillard, M. 2018. *The path of creative disruption: A foundation for sustainable change.* Available online: https://thesystemsthinker.com/the-path-of-creative-disruption-a-foundation-for-sustainable-change/ Accessed 19 Nov 2022

Dorn, E., Dua, A., Law, J & Ram, J. 2020. *Higher education enrolment: Inevitable decline or online opportunity.* Available online: https://www.mckinsey.com/industries/public-and-social-sector/our-insights/higher-education-enrollment-inevitable-decline-or-online-opportunity Accessed 19 Dec 2022

Doten-Snitker, K., Margherio, C., Litzler, E., Ingram, E. and Williams, J., 2021. Developing a shared vision for change: Moving toward inclusive empowerment. Research in Higher Education, 62, pp.206-229. nsf.gov

Dube, R. & Castro, M. 2019. Massive Power Outages Turn Deadly in Venezuela. Available online: https://www.wsj.com/articles/massive-power-outages-turn-deadly-in-venezuela-11552243705 Accessed 13 Jan 2023

Dwikat, S. Y., Arshad, D., & Mohd Shariff, M. N., 2023. Effect of competent human capital, strategic flexibility and turbulent environment on sustainable performance of SMEs in manufacturing industries in palestine. Sustainability. mdpi.com

Dwivedi, Y.K., Hughes, L., Kar, A.K., Baabdullah, A.M., Grover, P., Abbas, R., Andreini, D., Abumoghli, I., Barlette, Y., Bunker, D. & Kruse, L.C., 2022. Climate change and COP26: Are digital technologies and information

management part of the problem or the solution? An editorial reflection and call to action. *International Journal of Information Management*, *63*, p.102456.

EAPA-SA. 2022. *There is a need to support employees' mental health.* Available online: https://www.eapasa.co.za/there-is-a-need-to-support-employees-mental-health/ Accessed 29 Dec 2022

Ebrahim, Z., Inderwildi, O.R. & King, D.A., 2014. Macroeconomic impacts of oil price volatility: mitigation and resilience. Frontiers in Energy, 8, 9-24.

Eby, K. 2019. *The power of iterative design and process*. Available online: https://www.smartsheet.com/iterative-process-guide Accessed 28 Dec 2022

Eckel, P. D., & King, J. E. (2020). Higher education leadership and the COVID-19 pandemic: Responding to the crisis. Higher Education Research and Development, 39(5), 914-917.

Eisenstein, L. *Compliance in higher education: What is the board's role?* Available online: https://www.boardeffect.com/blog/compliance-higher-education-what-boards-role/ Accessed 25 Dec 2022

Eldridge, C.C., Hampton, D. & Marfell, J. 2020. Communication during crisis. *Nursing Management,* 51(8):50-53.

Ellis, M.E. & Steyn, G.M. 2014. The regulatory context in private higher education in South Africa. *Mediterranean Journal of Social Sciences*, 5(20):258-258.

Ellis, M.E. 2012. *Managing a private higher education institution within the current higher regulatory context in South Africa.* (Doctoral dissertation). Pretoria: University of South Africa. http://hdl.handle.net/10500/6033

Eswaran, V. 2019. The business case for diversity in the workplace is now overwhelming. Available online: https://www.weforum.org/agenda/2019/04/business-case-for-diversity-in-the-workplace/ Accessed 1 April 2023

Etemad, H., 2020. Managing uncertain consequences of a global crisis: SMEs encountering adversities, losses, and new opportunities. Journal of International Entrepreneurship. springer.com

Evans, S. & Bahrami, H., 2020. Super-flexibility in practice: Insights from a crisis. Global Journal of Flexible Systems Management. springer.com

Eye Witness News. 2022. *KFC to temporarily close some stores due to power cuts.* Available online: https://ewn.co.za/0001/01/01/kfc-to-temporarily-close-some-stores-due-to-power-cuts Accessed 29 Dec 2022

Eyisi, D., 2016. The usefulness of qualitative and quantitative approaches and methods in researching problem-solving ability in science education curriculum. *Journal of education and practice*, *7*(15), 91-100.

Fani, S.V. & Subriadi, A.P., 2019. Business continuity plan: examining of multi-usable framework. Procedia Computer Science, 161, 275-282.

Fava, M. 2022. *How much of the ocean has been explored*? Available online: https://oceanliteracy.unesco.org/ocean-exploration/ Accessed 29 Dec 2022

Feilzer, M. 2010. Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research*, 4(1):6-16.

Felix, A. A., 2021. Integrating Geography teaching and learning using Information and Communication Technology. ufs.ac.za

Fink, A. 2018. *Conducting research literature reviews: from the Internet to paper*. London: Sage.

Fisher, M.E., Dorner, M.A., Maghzi, K.S., Achieng-Evensen, C., Whitaker, L.C., Hansell, F., St. Amant, J. and Gapinski, S.M., 2021. Liminality, disruption, and change: A prismatic look at pandemic education. *Prospects*, *51*(1-3), 523-540.

Foko, B. 2015. *Closing South Africa's high-skilled worker gap: Higher education challenges and pathways*. Midrand: African Development Bank Group.

Fombrun, C.J. 1996. *Reputation: realizing value from the corporate image*. Boston, MA: Harvard Business School Press.

Forbes. 2017. *The importance of business diversification.* Available online: https://www.forbes.com/sites/forbesagencycouncil/2017/08/09/the-

importance-of-business-diversification/?sh=40956daa3846 Accessed 29 Dec 2022

Gajanayake, C.L.T.H. & Pemarathne, W.P.J. 2020. *Automate timetable scheduling with AI: A review*. General Sir John Kotelawala Defence University. 13th International Research Conference (pp.523-528).

Gallos, J.V. & Bolman, L.G., 2021. Reframing academic leadership. John wiley & sons.

García-Álvarez, D., Soler, M.J. & Achard-Braga, L. 2021. Psychological well-being in teachers during and post-Covid-19: Positive psychology interventions. Frontiers in Psychology, 12:5971

García-Morales, V.J., Garrido-Moreno, A. & Martín-Rojas, R., 2021. The transformation of higher education after the COVID disruption: Emerging challenges in an online learning scenario. Frontiers in psychology, 12. 616059.

Garrido-Moreno, A., Martín-Rojas, R. and García-Morales, V.J., 2024. The key role of innovation and organizational resilience in improving business performance: A mixed-methods approach. International Journal of Information Management, 77, p.102777. sciencedirect.com

Garrison, D. R. & Kanuka, H. 2004. Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.

Garwe, E.C. 2014. Retrospect and prospect of private higher education provision in Africa. *Proceedings of the 12th International Conference on Private Higher Education in Africa*. Available online: https://www.academia.edu/36617684/Retrospect_and_Prospect_of_Private_Higher_Education_Provision_in_Africa_Proceedings_of_the_12_th_International_Conference_on_Private_Higher_Education_in_Africa Accessed 24 Dec 2022

Gasper, A.M.D.S & Soares, J.M.A.C. 2021. Factors influencing the choice of higher education institutions in Angola*. International Journal of Educational Administration and Policy Studies*, 13(1):23-39.

Gaur, U., Majumder, M.A.A., Sa, B., Sarkar, S., Williams, A. & Singh, K., 2020. Challenges and opportunities of preclinical medical education: COVID-19 crisis and beyond. SN comprehensive clinical medicine, 2(11), 1992-1997.

Gazis, A. 2021. What is IoT? The Internet of Things explained. Available online: https://www.researchgate.net/publication/352189699_What_is_IoT_The_Internet_of_Things_explained Accessed 19 Jan 2023

Genç, R. 2017. the importance of communication in sustainability & sustainable strategies. *Procedia Manufacturing,* 8:s512-515. doi:https://doi.org/10.1016/j.promfg.2017.02.065.

Geschwind, L. & Broström, A., 2022. To be or not to be a technical university: organisational categories as reference points in higher education. Higher Education. springer.com

Ghadge, A., Er, M., Ivanov, D. and Chaudhuri, A., 2022. Visualisation of ripple effect in supply chains under long-term, simultaneous disruptions: a system dynamics approach. International Journal of Production Research, 60(20), pp.6173-6186. tandfonline.com

Ghiga, I., Richardson, S., Álvarez, A.M.R., Kato, M., Naidoo, D., Otsu, S., Nguyen, P.T., Nguyen, P.N. and Nguyen, T., 2021. PIPDeploy: Development and implementation of a gamified table top simulation exercise to strengthen national pandemic vaccine preparedness and readiness. Vaccine, 39(2), pp.364-371. sciencedirect.com

Ghoshal, S. 1987. An organizing framework. *Strategic Management Journal*, 8(5):245-440.

Gilmartin, M., Coppari, P.R. and Phelan, D., 2023. Promising precarity: The lives of Dublin's international students. In (Un) Settled Sojourners in Cities (pp. 111-128). Routledge. maynoothuniversity.ie

Giner-Sorolla, R., Montoya, A.K., Reifman, A., Carpenter, T., Lewis Jr, N.A., Aberson, C.L., Bostyn, D.H., Conrique, B.G., Ng, B.W., Schoemann, A.M. and Soderberg, C., 2024. Power to detect what? Considerations for planning and evaluating sample size. Personality and Social Psychology Review, 28(3), pp.276-301. sagepub.com

Giousmpasoglou, C., Marinakou, E. & Zopiatis, A., 2021. Hospitality managers in turbulent times: the COVID-19 crisis. International Journal of Contemporary Hospitality Management, 33(4), 1297-1318.

Gire, S. 2017. The role of social media in the Arab Spring. *Pangaea Journal,* 27:1-10.

Gonzales, M., Roberts, M. and Tegano, S., 2022. School leadership during COVID-19: Implications for school leadership preparation programs. Journal of school administration research and development, 7(2), pp.93-102.

Goudarzi, G. R. & Alizadeh, H. 2016. The impact of internal audit function on financial performance of the firms. *Journal of Finance and Accounting*, 4(3), 85-89.

Gov. 2022. *National Development Plan 2030*. Available online: https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf Accessed 29 Dec 2022

Gowing, N. and Langdon, C., 2015. Thinking the Unthinkable: A New Imperative for Leadership in the Digital Age (pp. 1–56). UK: Chartered Institute of Management Accountants.

Goyayi, M. 2022. *Why tackling graduate unemployment in SA is important for post-covid19 economic recovery*. Available online: https://ddp.org.za/blog/2022/06/03/why-tackling-graduate-unemployment-in-sa-is-important-for-post-covid19-economic-recovery/. Accessed 27 Dec 2022

Greeff, M., Mostert, K., Kahl, C. & Jonker, C. 2021. The # FeesMustFall protests in South Africa: Exploring first-year students' experiences at a peri-urban university campus. *South African Journal of Higher Education*, 35(4):78-103.

Green, E.L. 2019. *Universities face federal crackdown over foreign financial influence*. Available online: https://www.nytimes.com/2019/08/30/us/politics/universities-foreign-donations.html Accessed 24 Dec 2022

Green, N., Tappin, D. & Bentley, T., 2020. Working from home before, during and after the Covid-19 pandemic: implications for workers and organisations. *New Zealand Journal of Employment Relations*, *45*(2), pp.5-16.

Greenhalgh, T., Wherton, J., Papoutsi, C., Lynch, J., Hughes, G., Hinder, S., Fahy, N., Procter, R. & Shaw, S., 2017. Beyond adoption: a new framework for theorizing and evaluating nonadoption, abandonment, and challenges to the scale-up, spread, and sustainability of health and care technologies. *Journal of medical Internet research*, *19*(11), p.e8775.

Greer, A. 2014. *Increasing inclusivity in the classroom*. Available online: https://cft.vanderbilt.edu/guides-sub-pages/increasing-inclusivity-in-the-classroom/. Accessed 30 Dec 2022

Gross, D.P. & Sampat, B.N. 2022. Crisis innovation policy from World War II to COVID-19. *Entrepreneurship and Innovation Policy and the Economy*, 1(1):135-181.

Guest, G., Bunce, A. & Johnson, L. 2006. How many interviews are enough? *Field Methods,* 18(1):59-82.

Gunawan, J., 2015. Ensuring trustworthiness in qualitative research. *Belitung Nursing Journal*, *1*(1), 10-11.

Gurin, P. 2020. COVID-19, colleges and universities: Preparing for the “new normal”. Change: The Magazine of Higher Learning, 52(3), 7-14.

Gurung, B., Shrestha, S. & Shrestha, S. 2021. Remote learning: Challenges and strategies during COVID-19 pandemic. *International Journal of Scientific and Research Publications,* 11(1), 68-73.

Gutiérrez, V. & Del Pino, A.D. 2021. The impacts of social media in higher education institutions: how it evolves social media in universities. In *Improving university*

reputation through academic digital branding (pp. 47-65). New York, NY: IGI Global.

Gutiérrez-Villar, B., Alcaide-Pulido, P. & Carbonero-Ruz, M. 2021. Measuring a University's Image: Is Reputation an Influential Factor? *Education Sciences*, 12(1):19-27.

Habib. A. 2018. Are South African universities under assault? Available online: https://www.wits.ac.za/news/latest-news/in-their-own-words/2018/2018-03/are-south-african-universities-under-assault.html Accessed 1 April 2023

Hahang, E., Bayraktar, S. & Jiménez, A. 2022. "Early evidence of leadership skills and strategies in managing the impact of COVID-19 pandemic in the hospitality industry", Cross Cultural & Strategic Management, Vol. 29 No. 3, 493-515. https://doi.org/10.1108/CCSM-03-2021-0041

Hajikazemi, S., Ekambaram, A., Andersen, B. & Zidane, Y.J. 2016. The Black Swan–Knowing the unknown in projects. *Procedia-Social and Behavioral Sciences*, 226:184-192.

Hajjar, S.T., 2018. Statistical analysis: internal-consistency reliability and construct validity. International Journal of Quantitative and Qualitative Research Methods, 6(1), 27-38.

Hamad, S. 2007. *Creativity: method or magic?* Available online: https://www.sciencedirect.com/topics/neuroscience/inductive-reasoning Accessed 11 Jan 2023

Hanson, M. 2022. *Average cost of college and tuition*. Available online: https://educationdata.org/average-cost-of-college Accessed 29 Dec 2022

Hari, A., Nardon, L., & Zhang, H., 2023. A transnational lens into international student experiences of the COVID-19 pandemic. Global Networks. nih.gov

Harper, S. R. & Gasman, M. 2008. Moving beyond access: College success for low-income, first-generation students. *The Journal of Higher Education*, 79(3):369-397.

Harraf, A. 2015. Organizational agility. Available online: https://clutejournals.com/index.php/JABR/article/download/9160/9152/35359 Accessed 10 April 2022

Harris, A. & Jones, M., 2020. COVID 19–school leadership in disruptive times. *School Leadership & Management*, *40*(4), 243-247.

Harvard. 2020. *Report of the task force on managing student mental health*. Available online: https://www.harvard.edu/wellbeing/wp-content/uploads/sites/9/2022/10/report_of_the_task_force_on_managing_student_mental_health.pdf Accessed 29 Dec 2022

He, J. & Xin, C. 2021. Developing an AI-Powered Chatbot to support the administration of middle and high school cybersecurity camps. *Journal of Cybersecurity Education, Research and Practice*, 2021(1):6-21

He, Z., Huang, H., Choi, H. & Bilgihan, A., 2023. Building organizational resilience with digital transformation. *Journal of Service Management*, *34*(1), 147-171.

Helm, S. 2007. The role of corporate reputation in determining investor satisfaction and loyalty. *Corporate Reputation Review*, 10(1):22-37.

Hemmingsen, R. 2017. *Change*: *A leader's perspective - 5 overcoming common challenges with followers*. Available online: https://mlpp.pressbooks.pub/undertherushes/chapter/overcoming-common-challenges-with-followers/ Accessed 19 Dec 2022

Hemsley-Brown, J. 2012. The best education in the world: reality, repetition or cliché? International students' reasons for choosing an English university. *Studies in Higher Education*, 37:1005-1022. doi: 10.1080/03075079.2011.562286

Hemsley-Brown. Hemsley-Brown, J. Melewar, T.C. Nguyen, B. Wilson E.J. (Eds). 2016. Exploring brand identity, meaning, image, and reputation (BIMIR) in higher education. *Journal of Business Research*, 69 (8):3019-3022, Special section.

Henry, L. A., 2024. Navigating disruptive times: How cross-sector partnerships in a development context built resilience during the COVID-19 pandemic outbreak. Business & Society. sagepub.com

Henry, M. 2018. *How the weather affects your international study experience.* Available online: https://www.studyinternational.com/news/weather-climate-international-student/ Accessed 26 Dec 2022

Herbst, T.H.H. 2021. *Reimagining leadership and repositioning leaders*. Available online: https://www.intechopen.com/chapters/78757 Accessed 9 Jan 2023

Herlianto, H.R. & Kusuma, G.P. 2020. IoT-based student monitoring system for smart school applications. *International Journal*, 8(9):6423-6430

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. 2020. The difference between emergency remote teaching and online learning. Educause Review. Available online: https://er.educause.edu/articles/2020/3/thedifference-between-emergency-remote-teaching-and-online-learning. Accessed 15 April 2022.

Hommel, U. 2020. Universities need to prepare better for high risk crises. Available online: https://www.universityworldnews.com/post.php?story=20200302103912399 Accessed 4 Jan 2021

Hoque, A., & Alam, M. S. 2020. Higher education in the time of COVID-19: The search for a new paradigm in crisis management. Journal of Education and Practice, 11(12), 123-132.

Hoque, M.J., Ahmed, M.R., Uddin, M.J. & Faisal, M.M.A. 2020. Automation of Traditional Exam Invigilation using CCTV and Bio-Metric. *International Journal of Advanced Computer Science and Applications*, 11(6):22-37.

Horowitz, J.M., Brown, A & Minkin, R. 2021. *A year into the pandemic, long-term financial impact weighs heavily on many Americans*. Available online: https://www.pewresearch.org/social-trends/2021/03/05/a-year-into-the-pandemic-long-term-financial-impact-weighs-heavily-on-many-americans/ Accessed 19 Dec 2022

Hu, W., Lim, K.Y.H. & Cai, Y. 2022. Digital Twin and Industry 4.0 enablers in building and construction: a survey. *Buildings*, 12(11):2004

Hugos, M.H. 2018. *Essentials of supply chain management*. 4th ed. London: Wiley

Hunter, M.J.M.K. 2019. *The impact of political instability on international tourism in the garden route.* Available online: https://iiespace.iie.ac.za/bitstream/handle/11622/325/Matthew-John%20McKenzie%20Hunter%20research%20report%202019.pdf?sequence=1&isAllowed=y Accessed 30 Dec 2022

Hurtado, S., Newman, C.B., Tran, M.C. & Chang, M.J. 2020. Achieving equity in faculty diversity: Toward a transformative vision and agenda. *Journal of Higher Education*, 91(5):545-569.

Iftode, D. 2019. Generation Z and learning styles. *SEA–Practical Application of Science*, 7(21):255-262.

IIE. 2018. *Time to act on higher education act amendments to broaden student choice*. Available online: https://www.iie.ac.za/time-to-act-on-higher-education-act-amendments-to-broaden-student-choice Accessed 25 Dec 2022

IIEP-UNESCO. 2020. *What price will education pay for COVID-19?* International Institute for Planning website. Available online: https://www.iiep.unesco.org/en/what-price-will-education-pay-covid-19-13366 Accessed 29 Dec 2022

IMF. 2022. *Beating European energy crisis*. Available online: https://www.imf.org/en/Publications/fandd/issues/2022/12/beating-the-european-energy-crisis-Zettelmeyer Accessed 29 Dec 2022

Info BRICS. 2022. *South Africa to Assume the BRICS Presidency in 2023*. Available online: South Africa to Assume the BRICS Presidency in 2023 (infobrics.org) Accessed 29 Dec 2022

International Labour Organization. 2020. *Teleworking during the COVID-19 pandemic and beyond: A practical guide*. Paris: ILO.

ISACA. 2020. *Plan for successful system implementations*. Available online: https://www.isaca.org/resources/isaca-journal/issues/2020/volume-2/plan-for-successful-system-implementations Accessed 08 Jan 2023

ISACA. 2022. *The changing information systems landscape creates new IT risk.* Available online: https://www.isaca.org/resources/isaca-journal/issues/2022/volume-5/the-changing-information-systems-landscape-creates-new-it-risk Accessed 08 Jan 2023

Ivancheva, M.P., Swartz, R., Morris, N.P., Walji, S., Swinnerton, B.J., Coop, T. & Czerniewicz, L. 2020. Conflicting logics of online higher education. British *Journal of Sociology of Education*, 41(5):608-625.

Ivančić, V., Mencer, I., Jelenc, L. & Dulčić, Ž. 2017. Strategy implementation–external environment alignment. *Management: Journal of Contemporary Management Issues,* 22 (Special Issue):51-67.

Jain, R ., Nauck, F., Poppensieker, T., & White, O. 2020. Meeting the future: Dynamic risk management for uncertain times. Available online: https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/meeting-the-future-dynamic-risk-management-for-uncertain-times#/ Accessed: 19 Jan 2023

Janresseger. 2014. *The danger of Creative disruption as a school reform theory.* Available online: https://janresseger.wordpress.com/2014/06/30/the-danger-of-creative-disruption-as-a-school-reform-theory/ Accessed 18 Nov 2022

Järveläinen, J. 2020. Understanding the stakeholder roles in business continuity management practices. A study in public sector. *Hawaii International Journal*. Doi: httpd://10.24251/hicss.2020.241

Java Tpoint. 2020. *Types of Machine Learning.* Available online: https://www.javatpoint.com/types-of-machine-learning Accessed 20 Jan 2023

Jeong, I., Jean, R.J.B., Kim, D. & Samiee, S. 2022. Managing disruptive external forces in international marketing. *International Marketing Review*, In Press.

Jia, X., Chowdhury, M., Prayag, G. & Chowdhury, M.M.H., 2020. The role of social capital on proactive and reactive resilience of organizations post-disaster. International Journal of Disaster Risk Reduction, 48, p.101614.

Jick, T. D. 1979. Mixing qualitative and quantitative methods: Triangulation in action. Administrative Science Quarterly, 24(4), 602-611.

Joburg Water. 2022. *Loadshedding affects water supply.* https://www.joburg.org.za/media_/Pages/Media/Media%20Statements/2020%20Media%20Statements/September%202020/Load-shedding-affects-water-supply.aspx Accessed 28 Dec 2022

Johnson, E. 2019. *Education deserts*. Available online: https://www.insidehighered.com/news/2019/12/20/access-higher-education-tilts-heavily-toward-urban-areas Accessed 02 Jan 2023

Johnson, J.L., Adkins, D. & Chauvin, S., 2020. A review of the quality indicators of rigor in qualitative research. *American journal of pharmaceutical education*, *84*(1).

Johnson, R. B. & Onwuegbuzie, A. J. 2004. Mixed methods research: a research paradigm whose time has come. *Educational Researcher*, 33(7)14-26.

Johnson-Laird, P. 2010. Deductive reasoning. *Wiley Interdisciplinary Reviews: Cognitive Science*, 1(1):8-17

Jones, S. 2019. Venezuela blackout: what caused it and what happens next? Available online: https://www.theguardian.com/world/2019/mar/13/venezuela-blackout-what-caused-it-and-what-happens-next Accessed 11 Feb 2023

Jongbloed, B., Vossensteyn, H., Vught, F.V. & Westerheijden, D.F. 2018. Transparency in higher education: The emergence of a new perspective on higher education governance. In *European higher education area: The impact of past and future policies* (pp. 441-454). Springer, Cham.

Jung, N. & Seock, Y. (2016). The impact of corporate reputation on brand attitude and purchase intention. *Fashion and Textiles,* 3:1-15. doi: 10.1186/s40691-016-0072-y

Jurenka, R., Stareček, A., Vraňaková, N. & Cagaňova, D. 2018. The learning styles of the generation group Z and their influence on learning results in the learning process. In 2018 *16th International Conference on Emerging e-Learning Technologies and Applications* (ICETA), November, (pp. 251-260). IEEE.

Kato, S., Galán-Muros, V. & Weko, T. 2020. *The emergence of alternative credentials*. Available online: https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP(2020)4&docLanguage=En Accessed 19 Dec 2022

Katsaliaki, K., Galetsi, P., & Kumar, S., 2022. Supply chain disruptions and resilience: A major review and future research agenda. Annals of Operations Research. springer.com

Kaur, H., Adar, E., Gilbert, E. & Lampe, C. 2022. *Sensible AI: Re-imagining Interpretability and Explainability using Sensemaking Theory*. arXiv preprint arXiv:2205.05057.

Kelly, J.T., Campbell, K.L., Gong, E. & Scuffham, P. 2020. The Internet of Things: Impact and implications for health care delivery. *Journal of Medical Internet Research*, 22(11):e20135

Khallaf, R., Khallaf, L., Anumba, C.J. & Madubuike, O.C. 2022. Review of Digital Twins for Constructed Facilities. *Buildings*, 12(11):2029.

Khamis, M., Prinz, D., Newhouse, D., Palacios-Lopez, A., Pape, U. & Weber, M. 2021. *The early labor market impacts of covid-19 in developing countries: Evidence from high-frequency phone surveys*. Washington, DC: World Bank.

Khan, I.S., Kauppila, O., Fatima, N. & Majava, J. 2022. Stakeholder interdependencies in a collaborative innovation project. *Journal of Innovation and Entrepreneurship*, 11(1):1-17.

Khatib, V.E. 2017. *Harnessing the power of partnerships in a disruptive world*. Available online: https://www.thenationalnews.com/business/technology/harnessing-the-power-of-partnerships-in-a-disruptive-world-1.622645 Accessed 21 Dec 2022

Khuluvhe, M. & Netshifhefhe, E. 2021. *Funding and expenditure trends in post-school education and training.* Available online: https://www.dhet.gov.za/Planning%20Monitoring%20and%20Evaluation%20Coordination/Funding%20and%20expenditure%20trends%20in%20PSET%20Report%20-%20June%202022.pdf Accessed 30 Dec 2022

Khumalo, B. 2017. The Impact of Political Instability on Higher Education in Zimbabwe. Journal of Education and Practice, 8(23), 144-150.

Kilkki, K., Mäntylä, M., Karhu, K., Hämmäinen, H. & Ailisto, H. 2018. A disruption framework. *Technological Forecasting and Social Chan*ge, 129:275-284.

Kim, J. & Jung, H.S., 2022. The effect of employee competency and organizational culture on employees' perceived stress for better workplace. International Journal of Environmental Research and Public Health, 19(8), p.4428

Kim, M. 2016. Crisis management in higher education: Leadership roles and responses. Journal of Educational Administration, 54(3), 273-289

Kline, R.B., 2011. Principles and practice of structural equation modeling (3. Baskı). *New York, NY: Guilford*, *14*, pp.1497-1513.

Knowles, M. S. 1970. *The modern practice of adult education: Andragogy versus pedagogy*. Bristol: Association Press.

Kodama, S., Campbell, M., Tanaka, M. & Inoue, Y. 2022. Understanding Japan's response to the COVID-19 pandemic. *Journal of Medical Ethics*, 48(3):173-173

Kolko, J. 2015. *Design thinking comes of age*. Available online: https://cdn.fedweb.org/fed-42/2892/design_thinking_comes_of_age.pdf Accessed 2 Jan 2023

Koohang, A., Paliszkiewicz, J. & Goluchowski, J. 2015. Differences in learning styles and technology acceptance among undergraduate and graduate students. *Journal of Educational Technology Development and Exchange*, 8(1), 1-14.

Koonin, L.M., 2020. Novel coronavirus disease (COVID-19) outbreak: Now is the time to refresh pandemic plans. Journal of business continuity and emergency planning, 13(4), 298-312.

Koornhof, C. 2020. 'Financial sustainability: Universities' business model must be sufficiently flexible to survive drastic change, writes UP Finance Director'. *University of Pretoria News*, 8 October. Available at: https://www.up.ac.za/news/post_2927485-financial-sustainability-universities-business-model-must-be-sufficiently-flexible-to-survive-drastic-change-writes-up-finance-director- Accessed: 25 March 2021.

Kothari, C.R. 2004. Research methodology: Methods and techniques. (2nd Ed.). New Delhi: New Age international ltd.

Kracov, D. A., 2021. Preparing for Disease X. Food and Drug Law Journal. fdli.org

Krammer, S.M., 2022. Navigating the New Normal: Which firms have adapted better to the COVID-19 disruption?. *Technovation*, *110*, p.102368.

Krishnan, L., Ogunwole, S. M., & Cooper, L. A., 2020. Historical insights on coronavirus disease 2019 (COVID-19), the 1918 influenza pandemic, and racial disparities: illuminating a path forward. Annals of internal medicine. acpjournals.org

Kristanto, A. & Pradana, H.D. 2021. Brain-based online learning design in the disruptive era for students in university. *Journal of Educational and Social Research*, 11(6):277-277

Kuffuor, O., Aggrawal, S., Jaiswal, A., Smith, R.J. and Morris, P.V., 2024. Transformative Pathways: Implementing Intercultural Competence Development in Higher Education Using Kotter's Change Model. Education Sciences, 14(7), p.686. mdpi.com

Kuglitsch, M. Albayrak, A. Aquino, R. Craddock, A. Edward-Gill, J. Kanwar, R. Koul, A. Ma, J. Marti, A. Menon, M. Pelivan, I. Toreti,A. Venguswamy, R. Ward, Elena. T. Xoplaki, E. Rea, A & Luterbacher. J. 2021. Artificial Intelligence for Disaster Risk Reduction: *Opportunities, challenges, and prospects*, 71(1). Available online: https://public.wmo.int/en/resources/bulletin/artificial-intelligence-disaster-risk-reduction-opportunities-challenges-and Accessed 02 Jan 2023

Kwiek, M. 2016. From growth to decline? Demand-absorbing private higher education when demand is over. In *A global perspective on private Higher Education* (pp. 53-79). Delhi: Chandos Publishing.

Kyi, K.K. 2022. Factors influencing international students' choice to study abroad in a developing country: The case of Vietnam National University, Hanoi (Doctoral dissertation). Hanoi: Vietnam National University.

Laffitte, L. 2020. A systematic review of gender-based barriers to academic and career advancement in science, technology, engineering, and mathematics. *Journal of Women and Minorities in Science and Engineering*, 26(3):237-277.

Lagmay, E.A.D. & Rodrigo, M.M.T. 2022. The impact of extreme weather on student online learning participation. *Research and Practice in Technology Enhanced Learning*, 17(1):1-21.

Lattimer, J. M., & Bidjerano, T. 2021. Pandemic Pedagogy: Exploring the Impact of COVID-19 Disruption on Student and Faculty Perceptions of Higher Education. Journal of Education and Learning, 10(2), 32-45. https://doi.org/10.5539/jel.v10n2p32

Lauder, H. & Mayhew, K. 2020. Higher education and the labour market: an introduction. *Oxford Review of Education*, 46(1):1-9.

Lawrence, M., Homer-Dixon, T., Janzwood, S., Rockstöm, J., Renn, O. and Donges, J.F., 2024. Global polycrisis: the causal mechanisms of crisis entanglement. Global Sustainability, 7, p.e6. cambridge.org

Leal Filho, W., Lange Salvia, A., Abubakar, I.R., Mifsud, M., Azadi, H., Sharifi, A., LeVasseur, T., Luetz, J.M., Velazquez, L., Singh, P. and Pretorius, R., 2022. Impacts of the COVID-19 Pandemic on Routines of Higher Education Institutions: A Global Perspective. Sustainability, 14(21), p.14105.

Leal Filho, W., Wall, T., Rayman-Bacchus, L., Mifsud, M., Pritchard, D.J., Lovren, V.O., Farinha, C., Petrovic, D.S. & Balogun, A.L. 2021. Impacts of COVID-19 and social isolation on academic staff and students at universities: a cross-sectional study. *BMC Public Health*, 21(1):1-19.

Lederman. 2021. *Despite positive experiences, students question value of college*. Available online: https://www.insidehighered.com/news/2021/07/07/students-see-less-value-college-despite-positive-experiences Accessed 27 Dec 2022

Lee, Y.J. 2017. Understanding higher education institutions' publicness: do public universities produce more public outcomes than private universities? *Higher Education Quarterly*, 71(2):182-203.

Leedy, P.D. & Ormrod, J.E. 2015. *Practical research: Planning and design.* Eleventh edition. Edinburgh Gate: Pearson Education.

Lerionka, P.M. and Kimaku, P., 2023. STRATEGIC ALIGNMENT AND PERFORMANCE OF PRIVATELY OWNED MEAT PROCESSING COMPANIES IN NAIROBI COUNTY, KENYA. International Journal of Social Sciences Management and Entrepreneurship (IJSSME), 7(2). sagepublishers.com

Leuhusen, F.C.A.P. 2017. *Why revenue diversification matters* (Doctoral dissertation, University of Pennsylvania). Philadelphia: University of Pennsylvania.

Levy, D.C. 2013. The decline of private higher education. *Higher Education Policy,* 26(1):25-42.

Liedtka, J. 2015. Perspective: Linking design thinking with innovation outcomes through cognitive bias reduction. *Journal of Product Innovation Management*, 32(6), 925-938.

Liedtka, J. 2018. Why design thinking works. *Harvard Business Review*, 96(5):72-79.

Lim, B. 2022. Coronavirus disruptions to the private higher education sector in Malaysia. In J. S. McKeown, K. Bista & R. Y. Chan (Eds.), *Global higher education during COVID-19: Policy, society, and technology* (pp. 92-103). STAR Scholars. https://starscholars.org/product/global-education/

Lincoln YS, & Guba EG. 1985. *Naturalistic Inquiry*. Sage Publications: Newbury Park, CA.

Lindaas O.E & Pettersen, K.A. 2016. Risk analysis and Black Swans: two strategies for de-blackening, *Journal of Risk Research*, Available online:

file:///C:/Users/tmaota/Downloads/RiskanalysisandBlackSwansLindaasandPettersen.pdf

Liu, B.F., Shi, D., Lim, J.R., Islam, K., Edwards, A.L. and Seeger, M., 2022. When crises hit home: How US higher education leaders navigate values during uncertain times. *Journal of Business Ethics*, *179*(2), 353-368.

Liu, J. M. & Peng, R. J., 2024. Mobility repertoires: How Chinese overseas students overcame pandemic-induced immobility. International Migration Review. sagepub.com

Liu, X., Liu, J., Zhong, X. & Zhang, J. 2020. Tele-education in the COVID-19 pandemic: A case study of remote teaching at Zhejiang University. *Journal of Educational Technology Development and Exchange*, 13(1), 1-14.

Liu-Lastres, B., Schroeder, A. & Pennington-Gray, L., 2019. Cruise line customers' responses to risk and crisis communication messages: An application of the risk perception attitude framework. Journal of travel research, 58(5), 849-865

Lorber, M. *SA students rejected by universities can explore other options*. Online available: https://www.iol.co.za/education/sa-students-rejected-by-universities-can-explore-other-options-ccdb8580-a54a-457e-9c6a-b1e930307c66 Accessed 29 Dec 2022

Lord, J. 2022. *Why is recruitment and retention in the university sector more difficult than other sectors?* Available online: https://www.timeshighereducation.com/campus/why-recruitment-and-retention-university-sector-more-difficult-other-sectors Accessed 30 Dec 2022

Lozada-Contreras, F., Orengo-Serra, K.L. and Sanchez-Jauregui, M., 2022. Adaptive customer relationship management contingency model under disruptive events. Journal of Advances in Management Research, 19(2), pp.198-219. researchgate.net

Mabizela, M. 2006. *Recounting the state of private higher education in South Africa.* In: N.V. Varghese (Ed.), Growth and expansion of higher education in Africa (pp.131-166). Paris:IIEP-UNESCO.

Madi Odeh, R.B., Obeidat, B.Y., Jaradat, M.O., Masa'deh, R.E. and Alshurideh, M.T., 2023. The transformational leadership role in achieving organizational resilience through adaptive cultures: the case of Dubai service sector. International Journal of Productivity and Performance Management, 72(2), pp.440-468. fardapaper.ir

Manca, S. & Delfino, M., 2021. Adapting educational practices in emergency remote education: Continuity and change from a student perspective. British Journal of Educational Technology. [HTML]

Maota, T. & Naidoo, V. 2022. Response of Private Higher Education Leadership to Pandemic Crisis. *Research Highlights in Language, Literature and Education,* 2:127-148.

Maresh-Fuehrer, M.M. & Smith, R. 2016. Social media mapping innovations for crisis prevention, response, and evaluation. *Computers in Human Behavior*, 54:620-629.

Markides, C.C. 1997. *To diversify or not to diversify*. Available online: https://hbr.org/1997/11/to-diversify-or-not-to-diversify Accessed 19 Dec 2022

Marshall, J., Roache, D. and Moody-Marshall, R., 2020. Crisis leadership: A critical examination of educational leadership in higher education in the midst of the COVID-19 pandemic. International Studies in Educational Administration, 48(3), pp.30-37. thecommonwealth.org

Martinez, J. and Farooqi, M.A., 2023. Change Management Strategies in Organizational Restructuring: Navigating Uncertainty for Sustainable Success. Abbottabad University Journal of Business and Management Sciences, 1(01), pp.31-42. austjournals.com

Martinez-Acosta, V.G. & Favero, C.B. 2018. A discussion of diversity and inclusivity at the institutional level: The need for a strategic plan. *Journal of Undergraduate Neuroscience Education*, 16(3):A252

Martín-Miguel, J., Prado-Román, C., Cachón-Rodríguez, G. & Avendaño-Miranda, L.L. 2020. Determinants of reputation at private graduate online schools. Sustainability, 12(22):9659.

Matarazzo, J.M. & Pearlstein, T. 2016. Leadership in disruptive times*. IFLA journal*, 42(3):162-178.

Mayar, K., Carmichael, D. G., & Shen, X., 2022. Resilience and systems—a review. Sustainability. mdpi.com

Mbous, Y.P.V., Mohamed, R. & Rudisill, T.M. 2022. International students challenges during the COVID-19 pandemic in a university in the United States: A focus group study. *Current Psychology*, 71:1-13.

McBride, K. 2020. *Training and development in a Post-COVID-19 workplace.* Available online: https://trainingindustry.com/blog/strategy-alignment-and-planning/training-and-development-in-a-post-covid-19-workplace-cptm/ Accessed 23 Dec 2022

McCarthy, J. 2020*. Understanding why climate change impacts women more than men*. Available online: https://www.globalcitizen.org/en/content/how-climate-change-affects-women/. Accessed 26 Dec 2022

McKee-Ryan, F., Song, Z., Wanberg, C. R. & Kinicki, A. J. 2020. Psychological and physical well-being during unemployment: A meta-analytic study. *Journal of Applied Psychology*, 105(3), 237-264.

McKeever, M. 2017. Educational inequality in apartheid South Africa. *American Behavioral Scientist*, 61(1):114-131.

McNamara, A., 2021. Crisis management in higher education in the time of Covid-19: The case of actor training. Education Sciences, 11(3),132.

McTighe, J. 2021. *It's time for Curriculum Mapping 3.0*. Available online: https://www.solutiontree.com/blog/its-time-for-curriculum-mapping-3-0/ Accessed 3 Jan 2023

Mdluli, S. & Makhupe, O. 2017. *Defining leadership competencies needed for the fourth industrial revolution: leadership competencies 4.0*. Johannesburg: Bank Seta South Africa.

Meddeb, H., Abdellaoui, Z. & Houaidi, F. 2023. Development of surveillance robot based on face recognition using Raspberry-PI and IOT. *Microprocessors and Microsystems*, 96:104728.

Mendy, A. Stewart, M.L & Van Akin, K. 2020. A leader's guide: Communicating with teams, stakeholders, and communities during COVID-19. Available online: https://www.mckinsey.com/~/media/mckinsey/business%20functions/people%20and%20organizational%20performance/our%20insights/a%20leaders%20guide%20communicating%20with%20teams%20stakeholders%20and%20communities%20during%20covid%2019/a-leaders-guide-communicating-with-teams-stakeholders-and-communities-during-covid-19-vf.pdf Accessed 10 April 2023.

Merriam, S.B. & Tisdell, E.J. 2016. *Qualitative research: A guide to design and implementation.* San Francisco, CA: Jossey-Bass.

Messick, S. 1989*. Validity. Educational measurement*. New York, NY: American Council on Education and Macmillan.

Metcalfe. M. 2022. *Youth unemployment on the rise among those with post-matric qualifications.* Available online: https://www.youtube.com/watch?v=3SScufiY3R0 Accessed 25 Dec 2022

Mfingwana, N., 2023. Learning Management Systems within a South African university: lecturers' experiences and extent of use during and post COVID-19. wits.ac.za

Mfingwana, N., 2023. Learning Management Systems within a South African university: lecturers' experiences and extent of use during and post COVID-19. wits.ac.za

Mhlanga, D. and Moloi, T., 2020. COVID-19 and the digital transformation of education: What are we learning on 4IR in South Africa?. Education sciences, 10(7), p.180.

Mihalache, M. & Mihalache, O.R., 2022. How workplace support for the COVID-19 pandemic and personality traits affect changes in employees' affective commitment to the organization and job-related well-being. Human resource management, 61(3), 295-314.

Milton. S & Barakat. S. 2016. Higher education as the catalyst of recovery in conflict-affected societies. *Globalisation, Societies and Education*, 14(3):403-421, Doi: 10.1080/14767724.2015.1127749

Mintzberg, H. 1993. *Structure in fives: Designing effective organizations*. London: Prentice-Hall.

Mishra, N.P., Das, S.S., Yadav, S., Khan, W., Afzal, M., Alarifi, A., Ansari, M.T., Hasnain, M.S. & Nayak, A.K. 2020. Global impacts of pre-and post-COVID-19 pandemic: Focus on socio-economic consequences. *Sensors International*, 1:100042.

MIT. 2022. *MIT Now. COVID-19 policies and information*. Available online: https://now.mit.edu/ Accessed 2 Jan 2023

Mncube, V., Mutongoza, B.H. and Olawale, E., 2021. Managing higher education institutions in the context of COVID-19 stringency: Experiences of stakeholders at a rural South African university. Perspectives in Education, 39(1): 390-409.

Montaudon-Tomas, C., Gutiérrez-González, M.A., Pinto-López, I.N. & Malcón-Cervera, C., 2021. Identifying the Theoretical Foundations for Common Good Leadership. Ethics, Economics and Common Goods, 18(2):41-79.

Moosavi, J., Fathollahi-Fard, A.M. and Dulebenets, M.A., 2022. Supply chain disruption during the COVID-19 pandemic: Recognizing potential disruption management strategies. International Journal of Disaster Risk Reduction, 75, p.102983. nih.gov

Moosavi, J., Fathollahi-Fard, A.M. and Dulebenets, M.A., 2022. Supply chain disruption during the COVID-19 pandemic: Recognizing potential disruption management strategies. International Journal of Disaster Risk Reduction, 75, p.102983. nih.gov

Moran, J. W. 2021. Design Thinking for Business: Innovation and Growth. Wiley

Moreno, M. Victoria, Benito Úbeda, Antonio F. Skarmeta & Miguel A. Zamora. 2014. How can we tackle energy efficiency in IoT based smart buildings? *Sensors*, 14(6):9582-9614. https://doi.org/10.3390/s140609582

Morgan-Trimmer, S. & Wood, F. 2016. Ethnographic methods for process evaluations of complex health behaviour interventions. *Trials*, 17(1):1-11.

Mpungose, C.B., 2020. Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. Humanities and social sciences communications, 7(1), pp.1-9.

Mufune, P., & Mnkeni, I. 2019. Assessing the Impact of Student Protests on Higher Education Institutions in South Africa. International Journal of Educational Development, 67, 1-10. https://doi.org/10.1016/j.ijedudev.2019.102104

Munir, M., Jajja, M.S.S. and Chatha, K.A., 2022. Capabilities for enhancing supply chain resilience and responsiveness in the COVID-19 pandemic: exploring the role of improvisation, anticipation, and data analytics capabilities. International Journal of Operations & Production Management, 42(10), pp.1576-1604. lboro.ac.uk

Muriuki, B. K., 2023. Influence of Strategic Human Capital on the Relationship Between Dynamic Capabilities, Firm Innovation and Competitive Advantage of Restaurants in Nairobi City …. uonbi.ac.ke

Musselin, C. 2018. New forms of competition in higher education. *Socio-Economic Review*, 16(3):657-683.

Myburgh, Z. & Calitz, T.M. 2022. Quality management of programme reaccreditation at private higher education institutions in South Africa. The Independent *Journal of Teaching and Learning*, 17(2):91-106.

NAFSA. 2020. Fall 2020 Survey: *Financial Impact of COVID-19 on international education*. Available online: https://www.nafsa.org/policy-and-advocacy/policy-resources/fall-2020-survey-financial-impact-covid-19-international-education Accessed 28 Dec 2022

Nahar, R., Khan, F. & Hassan, F. 2020. Impact of Covid-19 on Private Higher Educational Institutions (PHEIs) in Bangladesh: Challenges and Policy Responses. *AIUB Journal of Business and Economics*, 17(2):191-218.

Naidoo, P. & Cartwright, D., 2022. Where to from here? Contemplating the impact of COVID-19 on South African students and student counseling services in higher education. Journal of College Student Psychotherapy. figshare.com

Naidu, S. 2022. Threats and tensions for open, flexible, and distance learning post COVID-19. *Distance Education*, 43(3):3349-352, DOI: 10.1080/01587919.2022.2088482

Napier, A.D. 2017. *Culture matters: using a cultural context of health approach to enhance policy-making*. Available online: https://www.euro.who.int/__data/assets/pdf_file/0009/334269/14780_World-Health-Organisation_Context-of-Health_TEXT-AW-WEB.pdf Accessed 19 Dec 2022

National Student Financial Aid Scheme. 2020. *Revised National Student Financial Aid Scheme Strategic plan for the fiscal years 2020/21 – 2024/25.* Available online: https://www.nsfas.org.za/content/downloads/NSFAS%20UPDATE%20%20STRATEGIC%20PLAN%202020-2025%20-31012022-signed.pdf Accessed 28 Dec 2022

Nayak, B., Bhattacharyya, S.S. and Krishnamoorthy, B., 2023. Integrating the dialectic perspectives of resource-based view and industrial organization theory for competitive advantage–a review and research agenda. Journal of Business & Industrial Marketing, 38(3), pp.656-679. researchgate.net

Ndlovu, S.G., Ndebele, N.C. & Mlambo, V.H. 2022. The role of distance learning in South African higher education institutions during COVID-19 Period: Challenges and Perspectives. *Academia*, 27/28:54-73.

Negash, S., Kartschmit, N., Mikolajczyk, R.T., Watzke, S., Matos Fialho, P.M., Pischke, C.R., Busse, H., Helmer, S.M., Stock, C., Zeeb, H. & Wendt, C. 2021. Worsened financial situation during the COVID-19 pandemic was associated with depressive symptomatology among university students in Germany: Results of the COVID-19 international student well-being study. *Frontiers in Psychiatry*, 17:2298.

Nehrebecka, N., 2021. COVID-19: stress-testing non-financial companies: a macroprudential perspective. The experience of Poland. Eurasian Economic Review. springer.com

NERSA. 2021. *Principles to determine prices in the electricity supply industry*. Available online: https://www.nersa.org.za/wp-content/uploads/2022/01/Principles-to-determine-prices-in-the-Electricity-Supply..pdf Accessed 28 Dec 2022

Nesbit, J & Mulhere, K. 2022. *Colleges are hiking tuition this fall amid sky-high inflation*. Available online: https://money.com/colleges-increase-tuition-inflation/ Accessed 20 Dec 2022

Netolicky, D.M., 2020. School leadership during a pandemic: navigating tensions. *Journal of Professional Capital and Community*, *5*(3/4), 391-395.

Neumeyer, X., Santos, S.C. and Morris, M.H., 2020. Overcoming barriers to technology adoption when fostering entrepreneurship among the poor: The role of technology and digital literacy. IEEE Transactions on Engineering Management, 68(6), pp.1605-1618. [HTML]

Ngcamu, B. S. 2017. The effects of leadership traits on transformation: A case study of a South African University. *The Journal for Transdisciplinary Research in Southern Africa*, 13(1). Available online: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=Kf0FJR4AAAAJ&citation_for_view=Kf0FJR4AAAAJ:IWHjjKOFINEC Accessed 19 Dec 2022

Ngonyama, T.L. 2016. *Skills shortages and challenges in the employment of foreign professionals in the selected KwaZulu-Natal higher education institutions*. (Doctoral dissertation). Durban: UKZN.

Nicholas, E. 2022. *Where does the phrase "When America sneezes, the World catches cold" originate?* Available online: https://theculturetrip.com/north-america/usa/articles/where-does-the-phrase-when-america-sneezes-the-world-catches-cold-originate/ Accessed 18 Dec 2022

Nkosi, N. 2023. *716,000 graduates apply for R350 grant.* Available online: https://www.sowetanlive.co.za/news/south-africa/2023-02-16-716000-graduates-apply-for-r350-grant/ Accessed 15 Feb 2023

Nocco, B. W. & Stulz, R. M. 2020. Enterprise risk management: Theory and practice. *Journal of Applied Corporate Finance*, 32(4):8-22.

Norman, D. A. & Nielsen, J. 2013. *The design of everyday things.* London: Basic Books.

Nowell, L.S., Norris, J.M., White, D.E. & Moules, N.J., 2017. Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*, *16*(1), p.1609406917733847.

Nwachukwu, C., Winchester, N., Das, I. & Hagan, T. 2021. The COVID-19 pandemic: Considerations for large public institutions of higher education. *Journal of Public Health Management and Practice*, 27(S1):17-22.

O'Keeffe, P. 2020. *Flexible and adaptive responsiveness. Disruptive lessons from higher education in refugee contexts*. Available online https://www.proudpen.com/book/the-impact-of-covid19-on-the-international-education-system/flexible-and-adaptive-responsiveness-disruptive-lessons-from-higher-education-in-refugee-contexts/ Accessed 12 may 2022.

OECD. 2020. *Quality infrastructure in 21st century Africa*. Available online: https://www.oecd.org/dev/Africa-Quality-infrastructure-21st-century.pdf Accessed 26 Dec 2022

OECD. 2022. *Key to resilient supply chains*. Available online: https://www.oecd.org/trade/resilient-supply-chains/identify-potential-risks/ Accessed 29 Dec 2022

Office Dictionary. 2022. *What is planning fallacy?* Available online: https://officedictionary.com/planning-fallacy/ Accessed 2 Jan 2023

Ojo, O., Kareem, M.K., Odunuyi, S. & Ugwunna, C. 2022. an Internet-of-Things based real-time monitoring system for Smart Classroom. *Journal of the Nigerian Society of Physical Sciences*, 27:297-309.

Olaniran, B. & Williams, I. 2020. Social Media Effects: Hijacking Democracy and Civility in Civic Engagement. In *Platforms, Protests, and the Challenge of Networked Democracy* (pp. 77-94). Chapaign: Palgrave Macmillan.

Oleksiyenko, A., Mendoza, P., Riaño, F.E.C., Dwivedi, O.P., Kabir, A.H., Kuzhabekova, A., Charles, M., Ros, V. & Shchepetylnykova, I., 2022. Global crisis management and higher education: Agency and coupling in the context of wicked COVID-19 problems. Higher Education Quarterly.

Olivares-Aguila, J. & Vital-Soto, A., 2021. Supply Chain Resilience Roadmaps for Major Disruptions. Logistics, 5(4), 78.

O'Mahoney, L.L., Routen, A., Gillies, C., Ekezie, W., Welford, A., Zhang, A., Karamchandani, U., Simms-Williams, N., Cassambai, S., Ardavani, A. & Wilkinson, T.J. 2023. The prevalence and long-term health effects of Long Covid among hospitalised and non-hospitalised populations: A systematic review and meta-analysis. *E Clinical Medicine*, 55:101762.

Orlando, B., Tortora, D., Pezzi, A. and Bitbol-Saba, N., 2022. The disruption of the international supply chain: Firm resilience and knowledge preparedness to tackle the COVID-19 outbreak. Journal of International Management, 28(1), p.100876. nih.gov

Ostergaard, S.F & Nodrlund, A.G. 2019. *The 4 biggest challenges to our higher education model – and what to do about them*. Available online: https://www.weforum.org/agenda/2019/12/fourth-industrial-revolution-higher-education-challenges/ Accessed 15 Dec 2022

Othmana, Z., Rahimb, N. & Sadiqc, M., 2020. The human dimension as the core factor in dealing with cyberattacks in higher education. Int. J. Innov. Creat. Chang, 11(1), pp.1-19.

Ovie, G., 2022. Crisis Response in Higher Education: Insights from Educational Leaders. Journal of Educational Thought/Revue de la Pensée Educative, 55(1), 43-68.

Ozanne, L.K., Chowdhury, M., Prayag, G. & Mollenkopf, D.A., 2022. SMEs navigating COVID-19: The influence of social capital and dynamic capabilities on organizational resilience. Industrial Marketing Management, 104:116-135.

Özüdoğru, G. 2021. Problems faced in distance education during Covid-19 Pandemic. *Participatory Educational Research*, 8(4):321-333.

Pallant, J., 2020. *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. McGraw-hill education (UK).

Paraskevas, A. & Quek, M., 2019. When Castro seized the Hilton: Risk and crisis management lessons from the past. *Tourism Management*, *70*, pp.419-429.

Paraskevas, A., Altinay, L., McLean, J. & Cooper, C., 2013. Crisis knowledge in tourism: Types, flows and governance. Annals of Tourism Research, 41, 130-152

Parast, M. M., 2022. Toward a contingency perspective of organizational and supply chain resilience. International Journal of Production Economics. [HTML]

Park, J. J. H., Adegun, O. K. & Venkatraman, N. 2021. Implications of COVID-19 for the higher education ecosystem: A review of the literature. *Journal of Information Technology Education: Research*, 20, 299-326.

Paterson, M. 2021. *Institutional viability threatened by student debt crisis*. Available online: https://www.universityworldnews.com/post.php?story=20210512182820424 Accessed 29 Dec 2022

Patience, J.J. & Nel, D. 2021. Municipal infrastructure management and its impact on service delivery in the City of Ekurhuleni. *Africa's Public Service Delivery and Performance Review*, 9(1):a508. https://doi.org/10.4102/apsdpr.v9i1.508

Patton, M. Q. 1990. Qualitative evaluation and research methods. Thousand Oaks, CA: Sage

Patton, M. Q. 2015. *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

Paul, S.K., Sarker, R. & Essam, D. 2016. Managing risk and disruption in production-inventory and supply chain systems: A review. *Journal of Industrial and Management Optimization,* 12(3):1009-1029.

Phiri, C., Mpundu, G,. Chama, E,. Ngandu, E,. Mwanza, E.L,. Aluckal, E,. Peediackel, A.G,. Sebastian, A,. Gera, M,. Mohan, N., Hanney, I., Karry-Aly, A., Rathod, U,. Thottumkal, N.S & Abraham, A. 2021. An assessment of the impact of electricity power outages on university students' life, Lusaka, Zambia. *Canadian Journal of Health Research*. Available online: https://www.researchgate.net/publication/350524976_An_assessment_of_the_impact_of_Electricity_Power_Outages_on_University_Students%27_life_Lusaka_Zambia_A_University_perspective_study Accessed 24 Dec 2022

Plakhotnik, M.S., Volkova, N.V., Jiang, C., Yahiaoui, D., Pheiffer, G., McKay, K., Newman, S. & Reißig-Thust, S., 2021. The perceived impact of COVID-19 on student well-being and the mediating role of the university support: evidence from France, Germany, Russia, and the UK. Frontiers in Psychology, p.2663.

Plewa, C., Ho, J., Conduit, J. & Karpen, I.O. 2016. Reputation in higher education: A fuzzy set analysis of resource configurations. *Journal of Business Research*, 69(8):3087-3095

Polity. 2022. *Interest rates increased by 75bps - biggest hike since 2002.* Available online: https://www.polity.org.za/article/interest-rates-increased-by-75bps---biggest-hike-since-2002-2022-07-21 Accessed 19 Dec 2022

Prinsloo, R.C. 2005, April. Making education responsive to prior learning. In Paper delivered at the *29th European Universities Continuing Network* (EUCEN) Conference, Bergen (pp. 28-30).

Prodjomaroeto, T. & Muhyidin, A. 2020. Disrupting Higher Education: Assessing the Impact of COVID-19 on Higher Education Institutions in Indonesia and the United States. *Jurnal Pendidikan Dan Pembelajaran,* 27(2). Doi: http://dx.doi.org/10.17977/um047v27i22020p048

Psacharopoulos, G. & Patrinos, H.A. 2018. Returns to investment in education: a decennial review of the global literature. *Education Economics*, 26(5):445-458.

Pu, G., Li, S. & Bai, J. 2022. Effect of supply chain resilience on firm's sustainable competitive advantage: a dynamic capability perspective. *Environmental Science and Pollution Research*, 33(2):1-18.

Purcell, W.M. & Lumbreras, J. 2021. Higher education and the COVID-19 pandemic: navigating disruption using the sustainable development goals. *Discover Sustainability*, 2(1):1-16

PWC. 2019. *Risk and disruption in the global power sector*. Available online: https://www.pwc.com/gx/en/industries/power-utilities/risk-and-disruption-in-the-global-power-sector.html Accessed 19 Dec 2022

Quin, T., Limbu, B., Beerens, M. & Specht, M. 2021. *HoloLearn: Using holograms to support naturalistic interaction in virtual classrooms*. Available online https://research.tudelft.nl/en/publications/hololearn-using-holograms-to-support-naturalistic-interaction-in- Accessed 10 May 2022

Qureshi, F.H. & Khawaja, S. 2021. The growth of private higher education: an overview in the context of liberalisation, privatisation and marketisation. *European Journal of Education Studies,* 8(9):45-54.

Radic, A., Law, R., Lück, M., Kang, H., Ariza-Montes, A., Arjona-Fuentes, J.M. & Han, H., 2020. Apocalypse now or overreaction to coronavirus: The global cruise tourism industry crisis. Sustainability, 12(17), 6968.

Ragab, M.A. & Arisha, A. 2018. Research methodology in business: A starter's guide. Management and organizational studies, 5(1):1-14

Rahayu, S., Sugiarto, T., Ludiro, M.A.D.U. and Subagyo, A., 2017. Application of principal component analysis (PCA) to reduce multicollinearity exchange rate currency of some countries in Asia period 2004-2014. *International Journal of Educational Methodology*, *3*(2), pp.75-83.

Rahi, S. 2017. Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. International *Journal of Economics & Management Sciences*, 6(2):1-5.

Raj, A., Sharma, V., Shukla, D.M. & Sharma, P., 2023. Advancing supply chain management from agility to hyperagility: a dynamic capability view. *Annals of Operations Research*, 1-32.

Ralston, S.J. 2021. Higher education's microcredentialing craze: A postdigital-Deweyan critique. *Postdigital Science and Education*, 3(1):83-101.

Rasiah, R., Kaur, H. & Guptan, V., 2020. Business continuity plan in the higher education industry: University students' perceptions of the effectiveness of academic continuity plans during COVID-19 pandemic. Applied System Innovation, 3(4), 51

Readacted. 2022. *It's starting, Bill Gates announces the next pandemic date and outbreak location.* Available online: https://www.youtube.com/watch?v=Qk9Nd4uhJQg Accessed 29 Dec 2022

Reddy Moonasamy, A. & Naidoo, G.M., 2022. Digital Learning: Challenges experienced by South African university students' during the COVID-19 pandemic. *The Independent Journal of Teaching and Learning*, 17(2):76-90

Reddy, B.V. & Gupta, A., 2020. Importance of effective communication during COVID-19 infodemic. *Journal of family medicine and primary care*, *9*(8), p.3793.

Resbank. 2022. *Monetary policy*. Available online: https://www.resbank.co.za/en/home/what-we-do/monetary-policy Accessed 27 Dec 2022

Reuters. 2022. *Chinese military will send troops to Russia for joint exercise*. Available online: https://www.reuters.com/world/china/chinese-military-will-send-troops-russia-joint-exercise-2022-08-17/ Accessed 23 Dec 2022

Rhee, M. & Mehra, S. 2013. Managing operational proactiveness to facilitate functional area alignment and enhance business performance. *Seoul Journal of Business,* 19(2):45.

Rice, M. 2023. *58 Edtech companies changing the way we learn*. Available online: https://builtin.com/edtech/edtech-companies Accessed 12 Jan 2023

Ries, E. 2011. *The lean startup: how today's entrepreneurs use continuous innovation to create radically successful businesses*. Bristol: Crown Business.

Rimbach, J. 2021. *We analyzed financial data for NJ private college and rated them. Many are struggling*. Available online: https://www.northjersey.com/in-depth/news/2021/06/07/nj-education-private-colleges-financial-health-risk-struggles-covid/5213751001/ Accessed 28 Dec 2022

Ritchie, H. Gan, N. McCarthy. Wang, S & Zhang, M. 2022. *Leaked notes from Chinese health officials estimate 250 million COVID-19 infections in December*. Available online: https://edition.cnn.com/2022/12/23/china/china-covid-infections-250-million-intl-hnk/index.html Accessed 29 Dec 2022

Rodríguez-Abitia, G., Martínez-Pérez, S., Ramirez-Montoya, M.S. and Lopez-Caudana, E., 2020. Digital gap in universities and challenges for quality education: A diagnostic study in Mexico and Spain. Sustainability, 12(21), p.9069. mdpi.com

Rodríguez-Pose, A., 2020. Institutions and the fortunes of territories. Regional Science Policy & Practice. sciencedirect.com

Ronkowitz, K. & Ronkowitz, L.C., 2021. Online education in a pandemic: Stress test or fortuitous disruption?. American Journal of Economics and Sociology, 80(1),187-203.

Rose, F. 2016. *Disruption disrupted.* Available online: https://www.milkenreview.org/articles/disruption-disrupted Accessed 24 Dec 2022

Rose, J. & Johnson, C.W., 2020. Contextualizing reliability and validity in qualitative research: Toward more rigorous and trustworthy qualitative social science in leisure research. *Journal of leisure research*, *51*(4), 432-451.

Ruiz-Morris, M. A., 2023. A Phenomenological Inquiry of Senior Executive Leaders' Experience About Public Higher Education Funding. [HTML]

SABC. 2023. *Free State leads the class of 2022 at 88.5%* Available online: https://www.sabcnews.com/sabcnews/free-state-leads-the-class-of-2022-at-88-5/ Accessed 20 Jan 2023

Sahebjamnia, N., Torabi, S.A. & Mansouri, S.A. 2018. Building organizational resilience in the face of multiple disruptions. *International Journal of Production Economics*, 197:63-83

Sahebjamnia, N., Torabi, S.A. & Mansouri, S.A., 2015. Integrated business continuity and disaster recovery planning: Towards organizational resilience. European Journal of Operational Research, 242(1), 261-273.

Sainani, K.L. 2014. Explanatory versus predictive modeling. *PM&R*, 6(9):841-844.

Saleem, S.M.G. & Gouse, H.S.M. 2018. Constructive disruption in medical education. *Health Sciences*, 7(6):141-149.

Salihu, M.J. 2020. Demographic change and transition in Southeast Asia: Implications for higher education. *Universal Journal of Educational Research*, 8(2):678-688.

Sari, M.W., Ciptadi, P.W. & Hardyanto, R.H. 2017, April. Study of smart campus development using internet of things technology. In *IOP Conference Series: Materials Science and Engineering*, 190(1):012032).

Sathyanarayana, S. and Mohanasundaram, T., 2024. Fit Indices in Structural Equation Modeling and Confirmatory Factor Analysis: Reporting Guidelines. Asian Journal of Economics, Business and Accounting, 24(7), pp.561-577. articleproms.com

Sato, S.N., Condes Moreno, E., Rubio-Zarapuz, A., Dalamitros, A.A., Yañez-Sepulveda, R., Tornero-Aguilera, J.F. and Clemente-Suárez, V.J., 2023. Navigating the new normal: Adapting online and distance learning in the post-pandemic era. Education Sciences, 14(1), p.19. mdpi.com

Saunders, M., Lewis, P. & Thornhill, A. 2016. *Research methods for business students.* 7th ed. Edinburgh Gate: Pearson Education.

Schleffer, G & Miller, B. 2021. *The political effects of social media platforms on different regime types*. Available online: https://tnsr.org/2021/07/the-political-effects-of-social-media-platforms-on-different-regime-types/ Accessed 24 Dec 2022

Schleicher, A. 2020. *The Impact of COVID-19 on Education: Insights from Education at a Glance 2020*. OECD Publishing. Available online: https://www.oecd.org/education/the-impact-of-covid-19-on-education-insights-education-at-a-glance-2020.pdf Accessed 19 Nov 2022

Scholes, R. & Engelbrecht, F. 2021. *Climate impacts in southern Africa during the 21st Century*. Report for Earthjustice and the Centre for Environmental Rights. Global Change Institute. Johannesbuyrg: University of Witwatersrand.

Schumacker, R.E. & Lomax, R.G. 2010. *A beginner's guide to structural equation modeling.* Third edition. New York, NY: Routledge, Taylor & Francis Group.

Schwartz, E.I. 2013. *Coming to the big screen: How Steve Jobs was done in by the innovator's dilemma.* Available online: https://www.innosight.com/insight/coming-to-the-big-screen-how-steve-jobs-was-done-in-by-the-innovators-dilemma/ Accessed 28 Dec 2022

Scott, C. 2021. Managing higher education for a changing regulatory environment. *Public Administration and Policy*, 24(1):7-20.

Sehoole, C & Adeyemo, K.S. 2016. Access to, and success in, Higher Education in post-apartheid South Africa. Journal of Higher Education in Africa/ Revue de l'enseignement supérieur en Afrique. 14, No. 1 (2016): 1-18

Serdyukov, P. 2017. Innovation in education: what works, what doesn't, and what to do about it?. Journal of Research in Innovative Teaching & Learning.

Settembre-Blundo, D., González-Sánchez, R., Medina-Salgado, S. and García-Muiña, F.E., 2021. Flexibility and resilience in corporate decision making: a new sustainability-based risk management system in uncertain times. Global Journal of Flexible Systems Management, 22(Suppl 2), pp.107-132. springer.com

Shagrir, L. 2015. Working with students in higher education–professional conceptions of teacher educators. *Teaching in Higher Education*, 20(8):783-794.

Shah, M., Vu, H.Y. & Stanford, S.A. 2019. Trends in private higher education in Australia. *Perspectives: Policy and Practice in Higher Education*, 23(1):5-11.

Shammi, M., Bodrud-Doza, M., Islam, A.R.M.T. & Rahman, M.M., 2020. COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh. Heliyon, 6(5), p.e04063.

Shang, Y., Li, H. & Zhang, R., 2021. Effects of pandemic outbreak on economies: evidence from business history context. Frontiers in Public Health, 9, p.632043.

Shange, N.S. 2018*. Experiences of students facing financial difficulties to access higher Education in the case of the University of KwaZulu-Natal.* (Doctoral dissertation). Durban: UKZN.

Sharma, A., Borah, S. B., & Moses, A. C., 2021. Responses to COVID-19: The role of governance, healthcare infrastructure, and learning from past pandemics. Journal of business research. nih.gov

Shatilo, O. 2019. The impact of external and internal factors on strategic management of innovation processes at company level. *Ekonomika*, 98(2):85-96.

Shekarian, M. and Mellat Parast, M., 2021. An Integrative approach to supply chain disruption risk and resilience management: a literature review. International Journal of Logistics Research and Applications, 24(5), pp.427-455. freepaper.me

Shields, K. 2022. Leading innovation. Available online: https://ecampusontario.pressbooks.pub/leadinginnovation/chapter/chapter-10-leading-innovation/ Accessed 10 April 2022

Shields, S. A. & Behrman, E. L. 2017. Women's educational and occupational experiences: Implications for work-family conflict. In M. K. Underhill & E. L. Riggle (Eds.), *Gender roles: A Sociological Perspective* (pp. 167-193). Routledge.

Shufutinsky, A., Long, B., Sibel, J.R. & Burrell, D.N., 2021. Shock leadership: Leading amidst pandemics and other chaotic change. In Global perspectives on change management and leadership in the post-COVID-19 era (136-159). IGI Global

Silva, M.E., Pereira, M.M. and Hendry, L.C., 2023. Embracing change in tandem: Resilience and sustainability together transforming supply chains. International Journal of Operations & Production Management, 43(1), pp.166-196. [HTML]

Simpson, A. and Lourenco, M., 2020. A year of disruption and chaos in higher education. University Museums and Collections Journal, 12(1), pp.6-11.

Singh, A. & Das, R. 2019. Virtual and augmented reality applications in design: A review. *Journal of Mechanical Design*, 141(9), 091701.

Singh, D. & Tustin, D. 2022. Stakeholder Perceptions and Uptake of Private Higher Education in South Africa. *International Journal of African Higher Education*, 9(1):21-52.

Singh, D. & Tustin, D., 2022. Stakeholder Perceptions and Uptake of Private Higher Education in South Africa. International Journal of African Higher Education. ajol.info

Singh, N.P. & Singh, S. 2019. "Building supply chain risk resilience: role of big data analytics in supply chain disruption mitigation", Benchmarking: An International Journal, Vol. 26 No. 7, pp. 2318-2342.

Smith, J. A., & Osborn, M. 2015. Interpretative phenomenological analysis. In J. A. Smith (Ed.), Qualitative psychology: A practical guide to research methods (3rd ed., pp. 53-80). Sage Publications.

Smith, S.A. 2022. *Japan has weathered COVID-19 better than many, but problems persist.* Available online: https://www.cfr.org/in-brief/japan-covid-19-pandemic-response-restrictions-two-years Accessed 27 Dec 2022

Smith, W. A. & Bae, S. 2020. On being marginalized and socially isolated: The impact of the COVID-19 pandemic on Black and Latinx college students. *Journal of Diversity in Higher Education*, 13(4):305-314

Smith, W. K., & Tushman, M. L. 2005. Managing strategic contradictions: A top management model for managing innovation streams. Organization Science, 16(5), 522-536

Sofaer, S. 1999. Qualitative methods: what are they and why use them? *Health Services Research*, 34(5.2):1101.

Šola, H.M. & Zia, T. 2021. Social media and students' choice of higher education institution. *European Journal of Management and Marketing Studies*, 6(4):47-58.

Solarino, A. M. & Aguinis, H., 2021. Challenges and best-practice recommendations for designing and conducting interviews with elite informants. Journal of Management Studies. wiley.com

Soll, J.B., Milkman, K.L. & Payne, J.W. 2015. Outsmart your own biases. *Harvard Business Review*, 93(5):64-71.

South Africa. 1965. Correspondence Colleges Act, No. 59, Supplementary Issue No. 31.

South Africa. 1997. Higher Education Act No. 101 of 1997.

South Africa. 2010. Higher Education Laws Amendment Act No 26 of 2010.

South African Government. 1996. The Constitution of the Republic of South Africa, Act No. 108. Pretoria.

South African Government. 2023. Support to business. Available online: https://www.gov.za/covid-19/companies-and-employees/support-business Accessed 2 April 2023

Stander, E. & Herman, C. 2017. Barriers and challenges private higher education institutions face in the management of quality assurance in South Africa. *South African Journal of Higher Education*, 31(5):206-224.

Stanford. 2020. *How extreme heat affects learning.* Available online: https://fsi.stanford.edu/news/how-extreme-heat-affects-learning. Accessed 26 Dec 2022

Stanford. 2022. *Stanford Vaden health services*. Available online: https://vaden.stanford.edu/virtualwellbeing/tips Accessed 27 Dec 2022

Startz, D. 2020. *Coronavirus poses serious financial risks to US universities*. Online available: https://www.brookings.edu/blog/brown-center-

chalkboard/2020/04/21/coronavirus-poses-serious-financial-risks-to-us-universities/ Accessed 29 Dec 2022

Stats SA. 2015. *Education costs continue to outstrip inflation*. Available online: https://www.statssa.gov.za/?p=4460 Accessed 28 Dec 2022

Stats SA. 2021. *Youth still find it difficult to secure jobs in South Africa.* Available online: https://www.statssa.gov.za/?p=14415 Accessed 26 Dec 2022

Stats SA. 2022. *South Africa's youth continues to bear the burden of unemployment.* Available online: https://www.statssa.gov.za/?p=15407 Accessed 29 Dec 2022

Steigenberger, N., 2016. Organizing for the big one: A review of case studies and a research agenda for multi-agency disaster response. Journal of Contingencies and Crisis management, 24(2): 60-72.

Stepan, A. 2013. *Massive open online courses (MOOC) Disruptive impact on higher education.* Concordia: Simon Frazer University.

Steyn, J. 2022. *Black Swan risk management for projects*. Available online: https://www.ownerteamconsult.com/black-swan-risk-management-for-projects/ Accessed 30 Dec 2022

Stoloff, M. L., Delgado, K. H., & Schmitt, A. 2021. An exploration of college student experiences during the COVID-19 pandemic. Journal of College Student Development, 62(1), 1-7.

Stowe, K. & Komasara, D. 2016. An analysis of closed colleges and universities. *Planning for Higher Education*, 44(4):79.

Stucomm. 2020. *Why your students drop out – and how you can stop them.* Available online: https://stucomm.com/blog/why-your-students-drop-out-and-how-you-can-stop-them/ Accessed 19 Dec 2022

Subotzky, G. 2003. Symbolism and substance: towards an understanding of change and continuity in South African higher education. *Globalization and Reform in Higher Education*, 25:164-193.

Sürücü, L. & MASLAKÇI, A., 2020. Validity and reliability in quantitative research. Business & Management Studies: An International Journal, 8(3), 2694-2726.

Swartz, R., Ivancheva, M., Czerniewicz, L. & Morris, N.P. 2019. Between a rock and a hard place: Dilemmas regarding the purpose of public universities in South Africa. *Higher Education*, 77(4):567-583.

Swedberg, R. 2020. *Exploratory research. The production of knowledge: Enhancing progress in social science*. Cambridge: Cambridge University.

Szemzo, H., Mosquera, J., Polyák, L. & Hayes, L. 2022. Flexibility and adaptation: creating a strategy for resilience. *Sustainability*, 14:2688.

Taleb, N.N. 2007. *The Black Swan: The impact of the highly improbable*. Available online: https://www.goodreads.com/book/show/242472.The_Black_Swan Accessed 21 Dec 2022

Talmage-Rostron, M. 2022. *Skills supply and skills demand in the South African economy*. Available online: https://insights.nexford.org/skills-supply-and-skills-demand-in-the-south-african-economy Accessed 26 Dec 2022

Tamrat, W & Fetene, G.T. 2014. *Contributions and challenges of private higher education institutions (PHEIs) in Ethiopia: The views of instructors and administrators.* Available online: https://www.researchgate.net/publication/326548292_Contributions_and_challenges_of_Private_Higher_Education_Institutions_PHEIs_in_Ethiopia_The_views_of_instructors_and_administrators Accessed 24 Dec 2022

Tamrat, W. & Teferra, D. 2020. Private higher education in Ethiopia: risks, stakes and stocks. *Studies in Higher Education*, 45(3):677-691.

Tamrat, W., 2021. Enduring the impacts of COVID-19: experiences of the private higher education sector in Ethiopia. Studies in Higher Education. researchgate.net

Tamrat. 2021. *COVID-19 has dealt a blow to Ethiopia's private higher education institutions*. Available online: https://theconversation.com/covid-19-has-dealt-a-blow-to-ethiopias-private-higher-education-institutions-153398 Accessed 29 Dec 2022

Tankou Epse Nukunah, C.N., Bezuidenhout, A. & Furtak, A. 2019. The contribution of a private higher education institution to the South African higher education landscape. *South African Journal of Higher Education*, 33(1):283-300.

Tariq, M.U. 2015. Hypothetico-deductive method: A comparative analysis. JOBARI, 7:228-31.

TechCentral. 2022. *South Africa passes 200 days of loadshedding in 2022.* Online available: https://techcentral.co.za/south-africa-passes-record-200-days-of-load-shedding-in-2022/218888/ Accessed 28 Dec 2022

Tee, M., Rasli, A., Toh, J.S.S.K., Abas, I.H., Zhou, F. & Liew, C.S. 2022. A Delphi method on the positive impact of COVID-19 on higher education institutions: Perceptions of academics from Malaysia. *Frontiers in Psychology*, 13:447-458.

Teece, D.J. 2018. Business models and dynamic capabilities. *Long Range Planning*, 51(1), 40-49

Temoso, O. & Myeki, L.W. 2022. Estimating South African higher education productivity and its determinants using Färe-Primont Index: Are historically disadvantaged universities catching up? *Research in Higher Education*, 13:1-22.

Terada, Y. 2021. *New research makes a powerful case for PBL.* Available online: New research explores the impact of PBL | Edutopia Accessed 10 Jan 2023

The Futures School. 2021. *What is future thinking?* Available online: https://thefuturesschool.com/2021/11/what-is-futures-thinking/ Accessed 19 Dec 2022

The IIA. 2020. *IT Change management – Critical for organizational success, 3rd edition.* Available online: https://iia.no/wp-content/uploads/2020/02/2020-GTAG-IT-Change-Management.pdf Accessed 29 Dec 2022

Tien, N. H., Ngoc, N. M., Trang, T. T. T., & Mai, N. P., 2022. Sustainable Development of Higher Education Institutions in Developing Countries: Comparative Analysis of Poland and Vietnam.. Contemporary economics. econstor.eu

Tigges, M., Ipert, C. & Mauer, R. 2022, October. Leveraging design thinking towards the convergence of AI, IoT and Blockchain: Strategic drivers and human-centered use cases. In *HCI International 2022-Late Breaking Papers. Design, User Experience and Interaction*: 24th International Conference on Human-Computer Interaction, HCII 2022, Virtual Event, June 26–July 1, 2022, Proceedings (pp. 147-162). Champaign: Springer International.

Time. 2022. *As Chinese tourists prepare to travel again, some countries close their doors.* Available online: https://time.com/6243967/covid-travel-restrictions-china/. Accessed 04 Jan 2023

Tjønneland, E.N. 2017. *Crisis at South Africa's universities–what are the implications for future cooperation with Norway?* CMI Brief. Available online: https://www.cmi.no/publications/file/6180-crisis-at-south-africas-universities-what-are-the.pdf Accessed 29 Dec 2022

Tremblay, K., Croteau, A. M. & Bilodeau, H. 2017. Final-year students' employability skills: An exploratory study. *Journal of Teaching and Learning for Graduate Employability*, 8(1):1-17.

Trizano-Hermosilla, I. & Alvarado, J.M., 2016. Best alternatives to Cronbach's alpha reliability in realistic conditions: congeneric and asymmetrical measurements. *Frontiers in psychology*, *7*, p.769.

Trochim, W. M. K. 2006. *Research methods knowledge base*. Cincinnati, OH: Atomic Dog Publishing.

Trochim, W.M.K. & Donnelly, J.P. 2008. *The research methods knowledge base.* New York, NY: Cengage Learning.

Trogemann, G. 2023. Radical collaboration. Available online: https://www.undp.org/blog/radical-collaboration Accessed 18 April 2023

Trojer, L., Ambele, R.M., Kaijage, S.F. & Dida, M.A. 2022. A review of the Development Trend of Personalized learning Technologies and its Applications. *International Journal of Advances in Scientific Research and Engineering*, 8(11):75-91

Tse, Y.K., Zhang, M., Akhtar, P. & MacBryde, J., 2016. Embracing supply chain agility: an investigation in the electronics industry. *Supply Chain Management: An International Journal.*

Tucker, L.R. and Lewis, C., 1973. A reliability coefficient for maximum likelihood factor analysis. Psychometrika, 38(1), pp.1-10.

Tzenios, N., 2019. The Impact of Health Literacy on Employee Productivity: An Empirical Investigation. Empirical Quests for Management Essences, 3(1), 21-33

Udacity. 2020. *Udacity/Us*. Available online: https://www.udacity.com/us Accessed 10 Dec 2022

Ugwire. 2022. *Top private universities in South Africa.* Available online: https://ugwire.com/top-private-universities-south-africa/ Accessed 28 Dec 2022

UNICEF. 2020. *The challenge*. Available online: https://www.unicef.org/southafrica/education Accessed 20 Dec 2022

United Nations. 2022. *Climate change the greatest threat the world has ever faced, UN expert warns.* Available online: https://www.ohchr.org/en/press-releases/2022/10/climate-change-greatest-threat-world-has-ever-faced-un-expert-warns Accessed 28 Dec 2022

United Nations. 2022. *Together we can build a culture of safety and health at work*. Available online: https://www.un.org/en/un-chronicle/together-we-can-build-culture-safety-and-health-work Accessed 29 Dec 2022

University of California. 2020. *The University of California's next phase of improving student basic needs.* Available online: https://regents.universityofcalifornia.edu/regmeet/nov20/s1attach.pdf Accessed 29 Dec 2022

University of Kwazulu-Natal. 2023. *Zero-rated data to specific UKZN sites*. Available online: https://ics.ukzn.ac.za/zero-rated-data-to-students-staff-and-applicants-to-specific-ukzn-

sites/#:~:text=All%20registered%20students%20and%20staff,visit%20these%20specific%20UKZN%20sites. Accessed 19 Jan 2023

University of Pittsburgh. 2023. *Borrow a device for remote learning, teaching or work*. Available online: https://www.technology.pitt.edu/remotedevices Accessed 11 Jan 2023

University of Texas. 2023. *The Higher Education Emergency Relief Fund (HEERF).* Available online: https://onestop.utexas.edu/heerf/ Accessed 11 Jan 2023

University World News. 2022. *Pandemic sees spike in private education enrolment*. Available online: https://www.universityworldnews.com/post.php?story=20220413091022372 Accessed 29 Dec 2022

Vacek, J., Wimmer, M. A. & Prochazka, D. 2019. A systematic literature review on artificial intelligence and big data analytics in business and management. *Journal of Business Research*, 98:404-417. https://doi.org/10.1016/j.jbusres.2019.01.026

Vakilzadeh, K. & Haase, A., 2021. The building blocks of organizational resilience: A review of the empirical literature. Continuity & Resilience Review, 3(1), 1-21.

Van Broekhuizen, H. 2016. Graduate unemployment and higher education institutions in South Africa. Bureau for Economic Research and Stellenbosch *Economic Working Paper*, 8:16.

Van den Berghe, L., Vansteenkiste, M., Cardon, G., Kirk, D. & Haerens, L. 2014. Research on self-determination in physical education: Key findings and proposals for future research. *Physical Education and Sport Pedagogy*, 19(1), 97-121.

van der Laan, L. & Yap, J. 2016. Foresight and Strategic Thinking Enabling Valuable Strategy. In *Foresight & Strategy in the Asia Pacific Region* (pp. 91-107). Singapore: Springer.

Van Schalkwyk, R.D. 2011. *The impact of leadership practices on service quality in private higher education in South Africa.* (Master of Commerce Dissertation). Pretoria: University of South Africa.

Van Wyk, R.B. & Dlamini, C.S. 2018. The impact of food prices on the welfare of households in South Africa. *South African Journal of Economic and Management Sciences*, 21(1):1-9.

van Zoonen, W., Rice, R.E. & Ter Hoeven, C.L., 2022. Sensemaking by employees in essential versus non-essential professions during the COVID-19 crisis: A comparison of effects of change communication and disruption cues on mental health, through interpretations of identity threats and work meaningfulness. *Management communication quarterly*, *36*(2), pp.318-349.

Varghese, N.V. (ed.). 2006. *Growth and expansion of private higher education in Africa* (pp. 27-54). Paris: UNESCO, International Institute for Educational Planning.

Venkatesan, R., 2024. Impact of Financial Management Practices on Performance Measurement of Small and Medium Enterprises in Tamil Nadu. SEDME (Small Enterprises Development, Management & Extension Journal), p.09708464241254164. [HTML]

Verhoef, P.C., Kannan, P.K. & Inman, J.J., 2015. From multi-channel retailing to omni-channel retailing: introduction to the special issue on multi-channel retailing. Journal of retailing, 91(2), 174-181.

Visagie, R. 2012. *Methodological rigour and ethics of accountability within a qualitative framework.* Emoyeni Research Collaborations*,* Pretoria.

Visser, M. & Law-van Wyk, E. 2021. University students' mental health and emotional well-being during the COVID-19 pandemic and ensuing lockdown. *South African Journal of Psychology*, 51(2):229-243.

Voorde, M.V.D. 2022. Current threats to global academic collaboration. Cadmus, The War in Ukraine. *Global Perspectives on Causes & Consequences,* 7:237-246, July.

Wade, M. & Hulland, J. 2020. Review: The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly*, 44(2), 377-408.

Wall, K. 2021. The right to functioning urban infrastructure – A review. *Town and Regional Planning*, 79: 55-66.

Waller, R.E., Lemoine, P.A., Mense, E.G., Garretson, C.J. & Richardson, M.D. 2019. Global higher education in a VUCA world: Concerns and projections. *Journal of Education and Development,* 3(2):73.

Wang, M., Sha, Z., Huang, Y., Contractor, N., Fu, Y. & Chen, W. 2018. Predicting product co-consideration and market competitions for technology-driven product design: a network-based approach. *Design Science*, 4:12-18.

Wang, Z., Zhang, M., Wang, D., Song, C., Liu, M., Li, J., Lou, L. & Liu, Z. 2017. Failure prediction using machine learning and time series in optical network. *Optics Express*, 25(16):18553-18565.

Wardman, J.K., 2020. Recalibrating pandemic risk leadership: Thirteen crisis ready strategies for COVID-19. Journal of Risk Research, 23(7-8), 1092-1120.

Watkins, M.W., 2018. Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology*, *44*(3), 219-246.

Weng, R.H., Huang, C.Y., Chen, L.M. and Chang, L.Y., 2015. Exploring the impact of transformational leadership on nurse innovation behaviour: A cross-sectional study. Journal of nursing management, 23(4), 427-439.

Werner, M.J.E., Yamada, A.P.L., Domingos, E.G.N., Leite, L.R. & Pereira, C.R., 2021. Exploring organizational resilience through key performance indicators. Journal of Industrial and Production Engineering, 38(1), 51-65.

Whitelaw, L.A. & Garcia-Lorenzo, L. 2017. Creative disruption: the everyday innovation practices of intrapreneurs at a technology company. In *Academy of Management Proceedings* (2017, No. 1: 12869). January. Academy of Management.

Williams, K.M. & Corwith, A. 2021. Beyond Bricks and Mortar: The efficacy of online learning and community-building at College Park Academy during the COVID-19 pandemic. *Education and Information Technologies*, 26(5):5055-5076.

Wolff, S. 2023. *Ukraine war: despite Russian setbacks, an end to the conflict is not yet in sight.* Available online: https://theconversation.com/ukraine-war-despite-

russian-setbacks-an-end-to-the-conflict-is-not-yet-in-sight-197145 Accessed 06 Jan 2023

Woolf, D. 2018. *Five warning signs for higher education. Forbes*. Available online: https://www.forbes.com/sites/forbestechcouncil/2018/09/27/five-warning-signs-for-higher-education/?sh=5dd5c5f71ef2 Accessed 30 Dec 2022

Work Safe. 2018. *Six steps to risk management*. Available online: https://worksafe.nt.gov.au/__data/assets/pdf_file/0007/686635/guide-six-steps-to-risk-management.pdf Accessed 29 Dec 2022

World Economic Forum. 2022a. *These are the best universities in emerging economies*. https://www.weforum.org/agenda/2022/12/best-universities-emerging-economies-list/ Accessed 29 Dec 2022

World Economic Forum. 2022b. The Global Risks Report 2022 17th Edition. Available online: https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf Accessed 3 April 2023

World Economic Forum. 2023a. *Davos 2023: What you need to know about geopolitics.* Available online: https://www.weforum.org/agenda/2023/01/geopolitics-globalization-davos-2023/ Accessed 19 Jan 2023

World Economic Forum. 2023b. Seizing the momentum to build resilience for a future of sustainable inclusive growth. Available online: https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/seizing-the-momentum-to-build-resilience-for-a-future-of-sustainable-inclusive-growth#/ Accessed 3 April 2023

Yap, K., Nazri, M., Bakar, A., Zaki, A., Kamalrudin, M. & Sidek, S., 2014. A review on agile decision making in crisis management. A Review On Agile Decision Making In Crisis Management, 26(4):1535-1541.

Ying, Y. 2002. A new approach to developing and validating survey instruments: An example in the information systems field. *Journal of Information Technology Theory and Application*, 4(2):1-23.

Yoda, H. 2021. *The long history of Japan's tidying up*. Available online: https://www.newyorker.com/culture/cultural-comment/the-long-history-of-japans-tidying-up Accessed 28 Dec 2021

Yong, E. 2018. When the next plaque hits. The Atlantic, 58-59

Younis, H. and Elbanna, S., 2023. Teaching in times of crisis: The impact of the COVID-19 pandemic on higher education. Innovations in education and teaching international, 60(4), pp.451-462. tandfonline.com

Zhang, M.F., Dawson, J.F. and Kline, R.B., 2021. Evaluating the use of covariance-based structural equation modelling with reflective measurement in organizational and management research: A review and recommendations for best practice. British Journal of Management, 32(2), pp.257-272. wiley.com

Zhu, Y., Cooper, B. & Li, S. 2020. Examining the relationship between cross-cultural training and cultural intelligence development. International Journal of *Intercultural Relations*, 77: 62-72. https://doi.org/10.1016/j.ijintrel.2020.01.005

Ziataki, E., 2023. Navigating change: lessons learned from implementing a change management plan to improve team performance. theseus.fi

Zimmer, T. 2016. The importance of education for the unemployed. *Indiana Business Review*, 91(1):9-16.

Zou, P., 2024. Adopting the Contingency Theory Lens: An Examination of Effective Management Practices in Chinese Graduate Education-A Case Study of Nanchang University. Pacific International Journal. rclss.com

APPENDIX 1.1: RELIABILITY TESTS

Pilot study summary
Reliability test: Student vs staff data

Alpha reliability = 0.8739
Standardised alpha = 0.7704
Reliability deleting each item in turn:

	Alpha	Std. Alpha	r (item, total)
Q1	0.8817	0.8067	-0.5563
Q2	0.8752	0.7768	0.0468
Q3	0.8836	0.8125	-0.7373
Q4	0.8667	0.7481	0.5415
Q5	0.8896	0.7979	-0.4278
Q6	0.8956	0.8165	-0.8331
Q7	0.8600	0.7337	0.8257
Q8	0.8579	0.7314	0.8791
Q9	0.8782	0.7944	-0.3141
Q10	0.8827	0.8187	-0.8681
Q11	0.8564	0.7268	0.9711
Q12	0.8668	0.7424	0.7250
Q13	0.8654	0.7493	0.5674
Q14	0.8660	0.7505	0.5875
Q15	0.8582	0.7293	0.9312
Q16	0.8565	0.7371	0.8135
Q17	0.8565	0.7371	0.8135
Q18	0.8648	0.7468	0.5837
Q19	0.8622	0.7417	0.6630
Q20	0.8612	0.7403	0.7087
Q21	0.8612	0.7403	0.7087
Q22	0.8600	0.7388	0.7801
Q23	0.8606	0.7409	0.7631
Q24	0.8600	0.7420	0.7465
Q25	0.8590	0.7392	0.7798
Q26	0.8733	0.7674	0.2366
Q27	0.8896	0.7974	-0.3624
Q28	0.8754	0.7799	0.0260
Q29	0.8776	0.7784	-0.0076

Staff Pilot Reliability Test

Alpha reliability = 0.901
Standardised alpha = NaN
Reliability deleting each item in turn:

	Alpha	Std. Alpha	r (item, total)
Q1	0.9048	NaN	-0.2008
Q2	0.9000	NaN	0.3284
Q3	0.9021	0.812	NaN
Q4	0.9099	NaN	-0.3891
Q5	0.9033	NaN	-0.0323
Q6	0.9019	NaN	0.1381
Q7	0.9103	NaN	-0.4403
Q8	0.8944	NaN	0.6270
Q9	0.8929	NaN	0.7029
Q10	0.8967	NaN	0.5329
Q11	0.9076	NaN	-0.7178
Q12	0.8887	NaN	0.9517
Q13	0.8864	NaN	0.8925
Q14	0.8972	NaN	0.5022
Q15	0.8881	NaN	0.8954
Q16	0.8932	NaN	0.7081
Q17	0.8911	NaN	0.7868
Q18	0.8968	NaN	0.5672
Q19	0.8996	NaN	0.3544
Q20	0.8905	NaN	0.8560
Q21	0.8867	NaN	0.9158
Q22	0.8862	NaN	0.9170
Q23	0.8875	NaN	0.8501
Q24	0.8870	NaN	0.8764
Q25	0.8881	NaN	0.9758
Q26	0.9050	NaN	-0.3295
Q27	0.9084	NaN	-0.2352
Q28	0.9076	NaN	-0.7178
Q29	0.9061	NaN	0.0449

Student Pilot Reliability Test

Main study summary
Reliability test: Student

	Section	Number of Items	Cronbach's Alpha
B13	Institution's competence	6	0.918
C17	Institution's capability and capacity	4	0.898
All items included		20	0.947

Case Processing Summary

		N	%
Cases	Valid	271	79.9
	Excluded[a]	68	20.1
	Total	339	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
0.947	20

Reliability test: Staff

	Section	Number of Items	Cronbach's Alpha
B13	Institution's competence level in dealing with disruption	6	0.907
C17	Capability and Capacity developed by	4	0.886

Case Processing Summary

		N	%
Cases	Valid	196	67.4
	Excluded[a]	95	32.6
	Total	291	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
0.907	6

Case Processing Summary

		N	%
Cases	Valid	262	90.0
	Excluded[a]	29	10.0
	Total	291	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
0.886	4

APPENDIX 1.2: FACTOR ANALYSIS

Staff

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			Bartlett's Test of Sphericity		
	Section	Approx. Chi-Square		df	Sig.
B13	Institution's competence level	0.873	735.771	15	< 0.001
C17	Capability and Capacity developed by	0.815	615.374	6	< 0.001

Component Matrix[a]

B13	Component
	1
Problem solving	0.810
Technology integration in support of smooth learning	0.732
Managing out the crisis	0.851
Structure and policy formulation	0.848
Innovativeness	0.866
Other	0.847

Component Matrix[a]

C17	Component
	1
Technology	0.804
Support	0.921
Staff competence	0.841
Contingency plan	0.891

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Students

	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		Bartlett's Test of Sphericity		
	Section	Approx. Chi-Square		df	Sig.
B13	Institution's competence	0.918	1126.194	15	< 0.001
C17	Institution's capability and capacity	0.812	819.606	6	< 0.001

Component Matrix[a]

B13	Component
	1
Problem solving	0.879
Technology integration	0.792
Managing out the crisis	0.855
Structure and policy formulation	0.846
Innovativeness	0.860
Other	0.830

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Component Matrix[a]

C17	Component
	1
Technology	0.818
Support	0.927
Staff competence	0.856
Contingency plan	0.902

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

APPENDIX 2.1: STUDENT CORRELATIONS

			Can you rate your institution's overall experience in disruption management?	Did you get adequate support during the disruption period?	Kindly rate the institutions level of student support during disruption	Does your institution have a clear guidelines in place for managing disruptive challenges?	Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?	Problem solving	Technology integration in support of smooth learning	Managing out the crisis	Structure and policy formulation	Innovativeness	Other	Kindly rate the model of the establishment of your institution in terms of relevance or compatibility with future requirements	Kindly rate your institution/institutional management's innovativeness	Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change	Technology	Support	Staff competence	Contingency plan	What was your experience with the institution during the Covid-19 disruption period?	What was your experience like after transitioning to online learning during the Covid-19 lockdown?
Spearman's		Correlation Coefficient	--																			
	Overall experience	Sig. (2-tailed)																				
		N	337																			
		Correlation Coefficient	,685**	--																		
	Adequacy of support	Sig. (2-tailed)	0.000																			
		N	335	336																		
		Correlation Coefficient	,684**	,674**	--																	
	Kindly rate the institutions level of student support during disruption	Sig. (2-tailed)	0.000	0.000																		
		N	336	335	337																	
		Correlation Coefficient	,658**	,657**	,600**	--																
	Does your institution have a clear guidelines in place for managing disruptive challenges?	Sig. (2-tailed)	0.000	0.000	0.000																	
		N	334	332	333	334																
		Correlation Coefficient	,624**	,583**	,602**	,686**	--															
	guide or policy's effectiveness	Sig. (2-tailed)	0.000	0.000	0.000	0.000																
		N	336	335	336	334	337															
		Correlation Coefficient	,597**	,588**	,635**	,665**	,613**	--														
	Problem solving	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000															
		N	336	335	336	333	336	337														
		Correlation Coefficient	,532**	,546**	,567**	,538**	,505**	,637**	--													
	Technology integration	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000														
		N	319	318	320	316	319	320	320													
		Correlation Coefficient	,612**	,591**	,623**	,664**	,593**	,703**	,645**	--												
	Managing out the crisis	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000													
		N	316	315	317	314	317	317	313	317												
		Correlation Coefficient	,581**	,530**	,598**	,617**	,602**	,676**	,579**	,687**	--											
	Structure and policy formulation	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000												
		N	317	316	318	314	317	318	313	311	318											
		Correlation Coefficient	,572**	,583**	,551**	,580**	,577**	,700**	,608**	,657**	,659**	--										
	Innovativeness	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000											
		N	320	319	321	317	320	321	314	314	316	321										
		Correlation Coefficient	,556**	,515**	,503**	,539**	,503**	,677**	,545**	,611**	,667**	,657**	--									
	Other	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000										
		N	296	295	297	294	297	297	290	291	293	294	297									
		Correlation Coefficient	,540**	,516**	,526**	,602**	,571**	,554**	,586**	,656**	,584**	,616**	,584**	--								
	Kindly rate the model of the establishment of your institution in terms of relevance or compatibility with future requirements	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		N	329	328	329	326	329	329	313	310	311	314	295	330								
		Correlation Coefficient	,630**	,592**	,637**	,668**	,607**	,697**	,677**	,705**	,657**	,702**	,646**	,688**	--							
	Institutional innovativeness	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
		N	333	332	333	330	333	333	316	313	314	317	296	329	334							
		Correlation Coefficient	,627**	,565**	,610**	,638**	,603**	,680**	,663**	,676**	,636**	,632**	,651**	,653**	,781**	--						
	management's level of flexibility	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
		N	334	333	334	331	334	334	318	315	315	318	296	329	333	335						
		Correlation Coefficient	,539**	,536**	,534**	,567**	,498**	,606**	,699**	,591**	,571**	,581**	,585**	,552**	,649**	,661**	--					
	Technology	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
		N	331	330	331	328	331	332	315	312	313	316	293	325	328	329	332					
		Correlation Coefficient	,593**	,579**	,668**	,623**	,620**	,710**	,653**	,657**	,692**	,633**	,656**	,602**	,693**	,721**	,711**	--				
	Support	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					
		N	321	320	322	318	321	322	311	309	310	313	290	315	318	319	322	322				
		Correlation Coefficient	,506**	,525**	,570**	,573**	,525**	,650**	,504**	,570**	,570**	,516**	,537**	,475**	,605**	,611**	,538**	,747**	--			
	Staff competence	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
		N	320	319	320	317	320	321	308	307	308	311	291	315	317	318	321	317	321			
		Correlation Coefficient	,590**	,575**	,620**	,630**	,567**	,685**	,629**	,685**	,665**	,658**	,655**	,643**	,701**	,721**	,647**	,774**	,725**	--		
	Contingency plan	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
		N	321	320	321	318	321	322	310	309	311	313	290	316	318	319	322	318	319	322		
		Correlation Coefficient	,578**	,624**	,537**	,556**	,560**	,562**	,507**	,529**	,567**	,576**	,532**	,569**	,603**	,577**	,508**	,608**	,522**	,601**	--	
	Experience during COVID-19	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
		N	332	331	332	330	333	332	315	313	313	316	295	325	329	330	329	319	318	319	333	
		Correlation Coefficient	,435**	,451**	,399**	,428**	,395**	,366**	,361**	,370**	,365**	,404**	,372**	,413**	,462**	,457**	,354**	,344**	,329**	,419**	,550**	--
	What was your experience like after transitioning to online learning during the Covid-19 lockdown?	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
		N	330	329	330	328	331	330	313	311	311	314	293	323	327	328	328	318	317	318	331	331

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX 2.2: STAFF CORRELATIONS

			Can you rate your institution's overall experience in disruption management?	Did you get adequate support during the disruption period?	If your answer to question 8 is YES, kindly rate the institutions level of staff support during disruption	Does your institution have a guide or policy in place for managing disruptive challenges?	Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?	Problem solving	Technology integration in support of smooth learning	Managing out the crisis	Structure and policy formulation	Innovativeness	Other	Kindly rate your institution/institutional management's innovativeness (1- Very poor,2- Poor,3- Neutral,4 -Good,5- Very good)	Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change (1- Very poor,2- Poor,3- Neutral,4- Good,5- Very good)	Kindly rate the institution's capability and capacity to deal with disruption with respect to each of the factors below:	Technology	Support	Staff competence	Contingency plan	What was your experience like after transitioning to work from home during the Covid- 9 lockdown ?	Do you think that is important to manage disruptions in future in order to minimise the negative impact on your work?
Spearman's	Can you rate your institution's overall experience in disruption management?	Correlation	--																			
		Sig. (2-tailed)																				
		N	290																			
	Did you get adequate support during the disruption period?	Correlation	,548**	--																		
		Sig. (2-tailed)	0.000																			
		N	288	289																		
	If your answer to question 8 is YES, kindly rate the institutions level of staff support during disruption	Correlation	,455**	,631**	--																	
		Sig. (2-tailed)	0.000	0.000																		
		N	128	128	128																	
	Does your institution have a guide or policy in place for managing disruptive challenges?	Correlation	,467**	,501**	,242**	--																
		Sig. (2-tailed)	0.000	0.000	0.006																	
		N	287	286	126	288																
	Kindly rate your institution's guide or policy's effectiveness in dealing with disruption management?	Correlation	,481**	,403**	,413**	,588**	--															
		Sig. (2-tailed)	0.000	0.000	0.000	0.000																
		N	286	285	127	284	287															
	Problem solving	Correlation	,510**	,475**	,454**	,467**	,491**	--														
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000															
		N	285	284	123	283	283	286														
	Technology integration in support of smooth learning	Correlation	,320**	,402**	,260**	,385**	,369**	,492**	--													
		Sig. (2-tailed)	0.000	0.000	0.003	0.000	0.000	0.000														
		N	287	286	125	285	285	284	288													
	Managing out the crisis	Correlation	,556**	,495**	,323**	,441**	,576**	,695**	,562**	--												
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000													
		N	289	288	127	287	287	286	288	290												
	Structure and policy formulation	Correlation	,440**	,481**	,205*	,412**	,530**	,563**	,550**	,683**	--											
		Sig. (2-tailed)	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000												
		N	289	288	127	287	287	286	288	290	290											
	Innovativeness	Correlation	,421**	,427**	,290**	,389**	,469**	,556**	,530**	,582**	,671**	--										
		Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000											
		N	289	288	127	287	287	286	288	290	290	290										
	Other	Correlation	,516**	,510**	,404**	,528**	,558**	,625**	,485**	,647**	,659**	,716**	--									
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000										
		N	198	198	82	196	195	197	197	198	198	198	198									
	Kindly rate your institution/institutional management's innovativeness (1- Very poor,2- Poor,3- Neutral,4 -Good,5- Very good)	Correlation	,516**	,423**	,318**	,361**	,437**	,498**	,513**	,565**	,552**	,644**	,570**	--								
		Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000									
		N	265	265	114	263	262	261	263	265	265	265	182	266								
	Kindly rate your institution/institutional management's level of flexibility on dealing with disruption and change (1- Very poor,2- Poor,3- Neutral,4- Good,5- Very good)	Correlation	,524**	,477**	,463**	,438**	,462**	,583**	,417**	,600**	,557**	,486**	,533**	,687**	--							
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000								
		N	262	262	113	260	260	258	260	262	262	262	180	263	263							
	Kindly rate the institution's capability and capacity to deal with disruption with respect to each of the factors below:	Correlation	,587**	,498**	,363**	,464**	,549**	,601**	,468**	,608**	,553**	,568**	,605**	,689**	,722**	--						
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000							
		N	260	260	111	258	257	256	258	260	260	260	181	260	257	261						
	Technology	Correlation	,334**	,332**	,235*	,343**	,325**	,445**	,662**	,489**	,477**	,440**	,446**	,451**	,361**	,449**	--					
		Sig. (2-tailed)	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
		N	266	266	114	264	263	262	264	266	266	266	182	266	263	261	267					
	Support	Correlation	,511**	,510**	,426**	,470**	,500**	,636**	,560**	,633**	,601**	,599**	,664**	,574**	,549**	,617**	,664**	--				
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					
		N	263	263	114	261	260	259	261	263	263	263	180	263	260	258	264	264				
	Staff competence	Correlation	,448**	,420**	,274**	,351**	,403**	,499**	,437**	,482**	,557**	,527**	,553**	,399**	,430**	,519**	,495**	,699**	--			
		Sig. (2-tailed)	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
		N	264	264	114	262	261	260	262	264	264	264	180	264	261	259	265	263	265			
	Contingency plan	Correlation	,517**	,540**	,347**	,470**	,516**	,530**	,573**	,575**	,637**	,536**	,629**	,584**	,497**	,580**	,595**	,761**	,655**	--		
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
		N	263	263	114	262	260	259	261	263	263	263	180	263	260	258	264	262	264	264		
	What was your experience like after transitioning to work from home during the Covid-19 lockdown ?	Correlation	,160**	,208**	,205*	,206**	,288**	,277**	,324**	,253**	,276**	,341**	,343**	,214**	,237**	,278**	,265**	,331**	,344**	,290**	--	
		Sig. (2-tailed)	0.009	0.001	0.029	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
		N	265	265	114	263	262	261	263	265	265	265	181	265	262	260	266	263	264	263	266	
	Do you think that is important to manage disruptions in future in order to minimise the negative impact on your work?	Correlation	0.014	,128*	0.098	0.042	0.034	,159**	0.059	0.033	0.083	0.082	0.073	0.076	0.107	0.110	0.075	0.084	0.083	0.050	0.107	--
		Sig. (2-tailed)	0.821	0.037	0.298	0.498	0.584	0.010	0.341	0.593	0.176	0.184	0.328	0.218	0.083	0.077	0.224	0.175	0.180	0.415	0.082	
		N	266	266	114	264	263	262	264	266	266	266	182	266	263	261	267	264	265	264	266	267

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX 3: CHI SQUARE TESTS

Students

	Chi-Square	df	Asymp. Sig.
Which province do you come from ?	911,988	8	< 0.001
Kindly indicate your level of study	469,635	2	< 0.001
Kindly indicate the faculty in which you are undertaking your studies	193,809	4	< 0.001
Gender	195,272	2	< 0.001
Race	423,581	4	< 0.001
In your opinion, what could be the most important approach for dealing	119,713	4	< 0.001
Can you rate your institution's overall experience in disruption manage	73,757	4	< 0.001
Did you get adequate support during the disruption period?	168,881	4	< 0.001
Kindly rate the institutions level of student support during disruption	151,344	3	< 0.001
Does your institution have a clear guidelines in place for managing dis	150,641	4	< 0.001
Kindly rate your institution's guide or policy's effectiveness in dealing w	205,033	4	< 0.001
Problem solving	97,644	4	< 0.001
Technology integration in support of smooth learning	71,781	4	< 0.001
Managing out the crisis	141,123	4	< 0.001
Structure and policy formulation	103,604	4	< 0.001
Innovativeness	123,502	4	< 0.001
Other	173,118	4	< 0.001
Kindly rate the model of the establishment of your institution in terms c	126,818	4	< 0.001
Kindly rate your institution/institutional management's innovativeness	62,587	4	< 0.001
Kindly rate your institution/institutional management's level of flexibility	86,836	4	< 0.001
Technology	79,867	4	< 0.001
Support	84,149	4	< 0.001
Staff competence	63,470	4	< 0.001
Contingency plan	121,696	4	< 0.001
What was your experience with the institution during the Covid-19 disru	109,147	4	< 0.001
What was your experience like after transitioning to online learning dur	107,112	4	< 0.001

Staff

	Chi-Square	df	Asymp. Sig.
In which city is your office located?	539,704	4	< 0.001
What is the most appropriate category for your role within the institution?	3,214	1	0.073
Which department is most appropriate for your role within the institution?	164,412	8	< 0.001
How many years of experience in total do you have in the institution?	109,887	5	< 0.001
In your opinion, what could be the most important approach for dealing with disr	175,299	4	< 0.001
Can you rate your institution's overall experience in disruption management?	103,138	4	< 0.001
Did you get adequate support during the disruption period?	144,547	4	< 0.001
If your answer to question 8 is YES, kindly rate the institutions level of staff sup	110,625	3	< 0.001
What should a policy for an institutional disruption management entail?	496,000	4	< 0.001
Does your institution have a guide or policy in place for managing disruptive chal	178,181	4	< 0.001
Kindly rate your institution's guide or policy's effectiveness in dealing with disrup	116,990	4	< 0.001
Problem solving	162,566	4	< 0.001
Technology integration in support of smooth learning	128,840	4	< 0.001
Managing out the crisis	131,621	4	< 0.001
Structure and policy formulation	129,207	4	< 0.001
Innovativeness	142,690	4	< 0.001
Other	123,414	4	< 0.001
Kindly rate your institution/institutional management's innovativeness (1- Very po	150,466	4	< 0.001
Kindly rate your institution/institutional management's level of flexibility on dealing	145,308	4	< 0.001
Kindly rate the institution's capability and capacity to deal with disruption with res	164,996	4	< 0.001
Technology	107,813	4	< 0.001
Support	130,129	4	< 0.001
Staff competence	190,981	4	< 0.001
Contingency plan	137,667	4	< 0.001
What was your experience like after transitioning to work from home during the	181,489	3	< 0.001
How would you expect the institution to manage disruptions in future in order to	65,767	4	< 0.001
Do you think that is important to manage disruptions in future in order to minimise	695,828	4	< 0.001
In your opinion, what would you propose to be included in a disruption managem	117,647	4	< 0.001

APPENDIX 4: MODEL CONDITIONAL INFERENCE TREE AND MODEL PREDICTION ACCURACY

Conditional inference tree with 4 terminal nodes

Response: Outcome
Inputs: Imp, Rel, wIndex
Number of observations: 3787

1) Imp <= 1994; criterion = 1, statistic = 1340.749
  2)* weights = 3298
1) Imp > 1994
  3) wIndex <= 4; criterion = 1, statistic = 45.733
    4) wIndex <= 2; criterion = 0.998, statistic = 11.294
      5)* weights = 96
    4) wIndex > 2
      6)* weights = 165
  3) wIndex > 4
    7)* weights = 228

Table 4.7: Conditional inference tree

The decision tree accuracy on training: 0.870874[[1]]

TrainPred	0	1
0	3298	0
0.291667	68	28
0.551515	74	91
0.763158	54	174

The decision tree accuracy on testing: 0.8664468[[1]]

TestPred	0	1
0	1051	0
0.291667	24	4
0.551515	25	27
0.763158	13	69

Table 4.8: Prediction accuracy summary

APPENDIX 5: CROSS TAB

Staff

Crosstab – adequacy of support

			How many years of experience in total do you have in the institution?						Total
			2 to 4 years	5 to 7 years	6 to 8 years	9 to 11 years	> 11 years	Other	
Did you get adequate support during the disruption period?	Strongly disagree	Count	5	0	0	1	1	3	10
		% within How many years of experience in total do you have in the institution?	4.6%	0.0%	0.0%	5.0%	4.0%	5.0%	3.5%
	Disagree	Count	11	4	6	6	0	6	33
		% within How many years of experience in total do you have in the institution?	10.2%	8.5%	20.7%	30.0%	0.0%	10.0%	11.4%
	Neutral	Count	38	24	10	6	10	29	117
		% within How many years of experience in total do you have in the institution?	35.2%	51.1%	34.5%	30.0%	40.0%	48.3%	40.5%
	Agree	Count	41	11	12	7	6	18	95
		% within How many years of experience in total do you have in the institution?	38.0%	23.4%	41.4%	35.0%	24.0%	30.0%	32.9%
	Strongly agree	Count	13	8	1	0	8	4	34
		% within How many years of experience in total do you have in the institution?	12.0%	17.0%	3.4%	0.0%	32.0%	6.7%	11.8%
Total		Count	108	47	29	20	25	60	289
		% within How many years of experience in total do you have in the institution?	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
				Significance	99.9% Confidence Interval		Significance	99.9% Confidence Interval	
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	37,816[a]	20	0.009	,010[b]	0.007	0.013			
Likelihood Ratio	41.311	20	0.003	,006[b]	0.004	0.009			
Fisher-Freeman-Halton Exact Test	33.768			,013[b]	0.009	0.017			
Linear-by-Linear Association	,815[c]	1	0.367	,373[b]	0.357	0.389	,190[b]	0.177	0.203

N of Valid Cases	289

a. 12 cells (40,0%) have expected count less than 5. The minimum expected count is ,69.

b. Based on 10000 sampled tables with starting seed 58924060.

b. The standardized statistic is -,903.

Students

Did you get adequate support during the disruption period? * Kindly indicate the faculty in which you are undertaking your studies

Crosstab

			Kindly indicate the faculty in which you are undertaking your studies					
			Faculty of Commerce	Faculty of Education	Faculty of Humanities & Social Sciences	Faculty of Information and Communications Technology	Faculty of Law	Total
Did you get	Strongly dis	Count	8	2	10	5	0	25
		% within Ki	5.0%	6.7%	18.2%	8.9%	0.0%	7.8%
	Disagree	Count	19	1	1	6	0	27
		% within Ki	11.8%	3.3%	1.8%	10.7%	0.0%	8.4%
	Neutral	Count	70	10	20	20	11	131
		% within Ki	43.5%	33.3%	36.4%	35.7%	57.9%	40.8%
	Agree	Count	55	14	12	20	7	108
		% within Ki	34.2%	46.7%	21.8%	35.7%	36.8%	33.6%
	Strongly ag	Count	9	3	12	5	1	30
		% within Ki	5.6%	10.0%	21.8%	8.9%	5.3%	9.3%
Total		Count	161	30	55	56	19	321
		% within Ki	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
				Significance	99.9% Confidence Interval		Significance	99.9% Confidence Interval	
					Lower Bound	Upper Bound		Lower Bound	Upper Bound
Pearson Chi-Square	37,368[a]	16	0.002	,004[b]	0.002	0.005			
Likelihood Ratio	37.930	16	0.002	,003[b]	0.001	0.005			
Fisher-Freeman-Halton Exact Test	32.567			,005[b]	0.003	0.007			
Linear-by-Linear Association	,325[c]	1	0.569	,572[b]	0.555	0.588	,291[b]	0.276	0.306
N of Valid Cases	321								

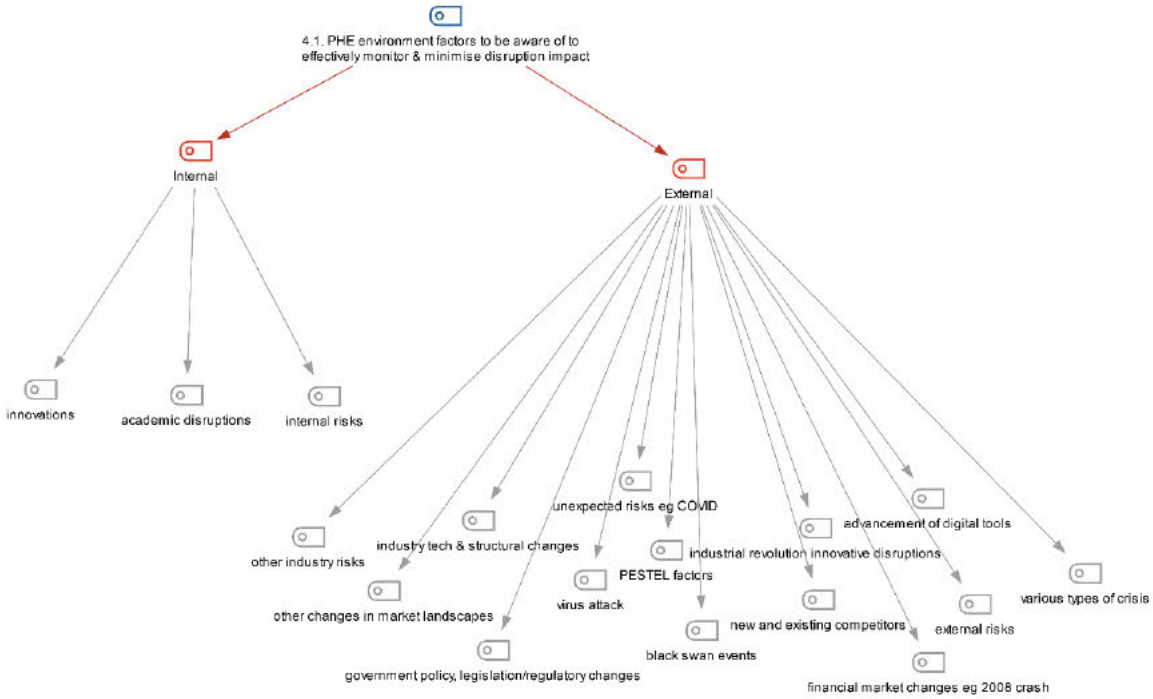
a. 10 cells (40,0%) have expected count less than 5. The minimum expected count is 1,48.

b. Based on 10000 sampled tables with starting seed 205597102.

c. The standardized statistic is ,570.

APPENDIX 6: KEY THEMES FOR QUALITATIVE STUDY

Appendix 6.1: Code relationships



Appendix 6.3: Code Frequencies

1.1. How would you define disruption?

	eBlack	eBlue	eBrown	eGreen	eOrange	eRed	eWhite	Total
1.1. How would you define disruption?	21.1%	10.5%	5.3%	15.8%	5.3%	26.3%	15.8%	100%
events changing regular operations	0%	0%	0%	100%	0%	0%	0%	100%
forcing a move away from normal	66.7%	0%	0%	0%	33.3%	0%	0%	100%
break or stop the correct flow	0%	0%	100%	0%	0%	0%	0%	100%
event impacting flow of business & edu env (+) (+) (+) (+) (+)	27.8%	5.6%	0%	33.3%	8.3%	16.7%	8.3%	100%
forcing response & review of existing business models	0%	0%	0%	0%	33.3%	66.7%	0%	100%
event forcing new way of doing business in edu industry	50.0%	0%	0%	25.0%	0%	25.0%	0%	100%
causing significant change in competitive element & equilibrium	0%	0%	0%	33.3%	0%	66.7%	0%	100%

external or internal forces that affect business processes	33.3%	0%	0%	66.7%	0%	0%	0%	100%
events changing the whole economic landscape	33.3%	0%	0%	66.7%	0%	0%	0%	100%
events overriding original business plan	75.0%	0%	0%	25.0%	0%	0%	0%	100%
unexpected event that affects normal operation eg COVID	0%	0%	0%	33.3%	0%	66.7%	0%	100%
planned competitive disruptor eg innovative technology	75.0%	0%	0%	25.0%	0%	0%	0%	100%
SUM	27.66	4.26	4.26	29.79	6.38	21.28	6.38	100
N = Documents/Speakers	21.05	10.53	5.26	15.79	5.26	26.32	15.79	100

Question 1.1

APPENDIX 7: EDITOR'S LETTER

Dynamic Language & Translation Specialists

Antoinette Bisschoff
71 Esselen Street,
Potchefstroom
Tel: 018 293 3046
Cell: 082 878 5183
Language@dlts.co.za
CC No: 1995/017794/23

Wednesday, 08 March 2023

To whom it may concern

Re: Confirmation of language edit

The thesis "**a conceptual framework for private higher educational institutions to respond to disruptions in South Africa**" by **Tshepo Maota** was edited for language and technical precision. The referencing and sources were checked, and it complies with the Harvard guidelines specified by the University of KwaZulu-Natal reference guide.

Final, last-minute corrections remain the responsibility of the author.

[redacted]

Antoinette Bisschoff

BA Languages (UPE – now NMU); MBA (PU for CHE – now NWU); Translation and Linguistic Studies (NWU)

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

Precision ... to the last letter

APPENDIX 8: ETHICAL CLEARANCE LETTER

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

01 August 2022

Tshepo Religion Maota (204519182)
School of Management, IT & Governance
Pietermaritzburg Campus

Dear TR Maota,

Protocol reference number: HSSREC/00004522/2022
Project title: A conceptual framework for private higher educational institutions to respond to disruptions in South Africa
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 17 July 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 04 August 2023.
To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

[redacted]

Professor Dipane Hlalele (Chair)