THE INFLUENCE OF WORK INTEGRATED LEARNING ON STUDENTS STUDYING AT A UNIVERSITY OF TECHNOLOGY IN KWAZULU-NATAL

By

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DECLARATION

I, Zamandaba Cynthia Hlubi, declare that:

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ii. This dissertation has not been submitted for any degree or examination at any other university.

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- Mr Bethel Mutanga, my colleague, for his support, assistance and encouragement on many occasions as I went through this journey.
- Mangosuthu University of Technology for the consistent support I have received during my studies.

DEDICATION

This dissertation is dedicated to my husband Muziwandile, who stood by me in the entire journey of this research study, encouraging me and making me believe that I can do this, even during the days when I felt like I was not moving forward.

I also dedicate this to my children Andile and Siyabonga, for their understanding whenever I had to put my studies first.

ABSTRACT

This research study investigates the experiences of students during Work Integrated Learning (WIL) at a University of Technology in KwaZulu-Natal. Work Integrated Learning is a methodology of curriculum design that integrates academic learning with industry-based experiential learning that is structured, monitored and assessed to meet the outcomes of a learning programme. Students spend three to twelve months in the workplace (depending on the academic requirements of their qualification) under the mentorship of a workplace supervisor.

The purpose of Work Integrated Learning is to develop the ability to apply knowledge and skills to the demands of real life and the world of work. WIL also provides students with an opportunity to learn by doing, understanding their role in the workplace and applying their skills and knowledge to complete work responsibilities. Of paramount importance in the investigation was the impact of WIL on student learning. In carrying out this investigation, this work made use of the framework of Kolb's theory of learning (2014). Kolb's theory of learning states that learning is the process whereby knowledge is created through the transformation of experience and knowledge resulting from the combination of grasping experience and transforming it (McLeod, 2010). Kolb's theory of learning defines the process of learning during experiential learning into four stages, namely: concrete experience, reflective observation, abstract conceptualisation and active experimentation. According to this model, for learning to take place during Work Integrated Learning, students should be exposed to all four aspects of the learning cycle.

This research study adopted a quantitative research methodology. The questions were formulated from each of the four constructs in Kolb's theoretical framework. Data was analysed in an SPSS package. From the findings, it can be concluded that the students were exposed to active experimentation, and hence managed to obtain sufficient work experience. Furthermore, the students managed to see a direct link between classwork and their work experience. However, a significant percentage of the students expressed less confidence on given tasks where they had to work independently. These findings are of paramount importance in the re-design of the curriculum and lecture delivery.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1. BACKGROUND OF THE STUDY

The Province of KwaZulu-Natal has two Universities of Technology; the Durban University of Technology (DUT) and Mangosuthu University of Technology (MUT). Both universities provide students with career-oriented skills through theoretical knowledge and practical learning. The fundamental focus of the Universities of Technology is on bridging of the gap between theoretical and practical learning through workplace training (Usher, 2011). The ultimate goal of these academic institutions is to produce work-ready graduates by introducing specific and compulsory periods of work experience (Govender & Taylor, 2013). The learners from these institutions are required to fulfil a number of specific tasks in the workplace under the mentorship and guidance of a qualified mentor or supervisor.

This study was conducted at a University of Technology in KwaZulu-Natal, situated in Durban. It has three faculties; namely Engineering, Natural Sciences and Management Sciences, with an enrolment of about 10 000 students (Kgaphola, 2013). This university aims at providing advanced, technology-based programmes and services that are both career and business-oriented in the fields mentioned above for the upliftment of talented but mainly disadvantaged people. Through its orientation, the university shows its commitment to the need to address the past social inequalities.

The main goal of this University of Technology is to contribute to creating an equitable and rich Southern Africa in which individuals have the opportunity to achieve their full potential. In spite of the university's noble vision, the researcher is not aware of any research studies about the influence of Work Integrated Learning among students at this university. Previous studies show that Universities of Technology in South Africa are facing various challenges (Usher, 2011; Elijido-Ten, 2014). Those problems faced include lack of suitable employers willing to train students, which poses challenges to universities' throughput and adds to universities' financial problems, and the scarcity of academically qualified supervisors minimises the number of employers who are able to professionally train the students. In addition, there is the challenge of securing suitable employers who are willing to offer work experience to students, and there is a general employer's attitude that training a learner is a waste of time and resources (Govender & Taylor, 2013). Thus, it is imperative to this study to

be conducted to ascertain the influence of Work Integrated Learning among students at this university.

1.1 RESEARCH PROBLEM

This study assesses the influence of Work Integrated Learning on student learning. The introduction of Work Integrated Learning has allowed learners to demonstrate an understanding of their theoretical knowledge while acquiring workplace knowledge. The study is triggered by universities' recognition of simulation and experiential education as authentic learning activities in which students should engage (Elijido-Ten, 2014).

Employers have expectations of highly skilled graduates and have partnered with Universities of Technology in order to develop a competent workforce. On the other hand, Universities of Technology in South Africa are faced with the challenge of placement of students for Work Integrated Learning and producing graduates who are ready for the world of work. According to the Southern African Journal for Work-Based Learning (2013) universities are in the business of offering education skills and knowledge that will enable students to engage meaningfully with the world of work. This makes it important to conduct this study to ascertain the influence of Work Integrated Learning on students at a University of Technology in KwaZulu-Natal.

1.2 RESEARCH QUESTIONS

1.2.1 What is the extent of students' exposure to tasks that enable concrete experience during Work Integrated Learning?

1.2.2 To what extend do students reflect on their experiences in a way that enables learning?

1.2.3 To what extent do students engage in activities that require abstract conceptualisation of their knowledge?

1.2.4 What are the students' perceptions of active experimentation after completing the WIL programme?

1.3 RESEARCH OBJECTIVES

1.3.1 To determine the extent of the concrete experience the student had during WIL.

1.3.2 To ascertain the extent of the reflective observation the student underwent during WIL.

1.3.3 To determine the extent of abstract conceptualisation experienced by the student during WIL.

1.3.4 To determine students' perceptions of the usefulness of WIL by investigating their perception of actively experimenting with knowledge gained through WIL.

1.4 RATIONALE OF THE STUDY

This study investigated the influence of Work Integrated Learning, since it is assumed that there is a low level of validity and reliability in Work Integrated Learning. The findings of the study were used to identify contemporary best practices in Work Integrated Learning strategies, as well as emphasise the need for a critical review of current Work Integrated Learning practices in the light of the findings of this study. However, there is a greater emphasis on the quality of teaching and learning by the Higher Education Quality Committee (HEQC) which monitors the quality of teaching and learning across all higher education providers in South Africa. Moreover, the South African Society for Cooperative Education (SASCE) formed as an initiative of the Committee of Technikons' Principals to develop and enhance the capacity of Work Integrated Learning across the sector. Universities of Technology still have numerous Work Integrated Learning challenges. Thus, in spite of the necessary support structures for cooperative education that exist nationally, the researcher undertook an examination of the reasons behind the concerns raised about the practice of Work Integrated Learning.

1.5 AIM OF THE STUDY

The aim of the study was to determine the impact of the WIL programme on student learning and the acquisition of skills.

1.6 PURPOSE OF THE STUDY

The study explored the influence of Work Integrated Learning on students at a University of Technology. In particular, the study determined the extent of concrete experience, reflective observation, abstract conceptualisation and active experimentation during Work Integrated Learning.

1.7 LIMITATIONS OF THE STUDY

Due to time constraints, this study only included one University of Technology based in KwaZulu-Natal, in particular two faculties; namely Engineering and Natural Sciences. The study did not include all students at a particular University of Technology. However, the sample was reliable which allowed the study to generate credible findings.

1.8 RESEARCH METHODOLOGY

The research study used the quantitative method. Data was collected through the use of a structured questionnaire. Kolb's theory of learning was utilised to inform the study, and thematic analysis was used to analyse data. The literature review provides a discussion on the basic factors in the assessment of Work Integrated Learning. The utilisation of the key research ethical principles met the requirements of the Research Office at the University of KwaZulu-Natal (UKZN).

1.9 CONCEPTUAL BASIS

1.9.1 **Work Integrated Learning**: is defined by the Southern African Journal for Work-Based Learning (2013:11) "as an umbrella term for any purposefully-designed learning programme that integrates theoretical knowledge with authentic practice in the workplace". The purpose of Work Integrated Learning is to develop the students' skills, knowledge and experience, as demanded by the world of work.

1.9.2 **Assess:** to estimate the value or qualify. Assessment focuses on what is important and expected from a student to complete a task. Assessment should focus on, and be aligned with, the intended outcomes of the programme (The Southern African Journal for Work-Based Learning, 2013) Work Integrated Learning students are assigned to a workplace supervisor or mentor, who then trains them and assesses their training and concludes whether or not they meet the expected professional competence (Elijido-Ten, 2014).

1.9.3 **Effect:** the extent to which WIL influenced the students' learning experience.

1.9.4 **Employ:** paying a person to work for you. Students are required to complete theoretical and practical training in order to gain knowledge and skills that will render them work-ready (Bosch, 2013).

1.9.5 **Concrete experience:** to learn by doing or to obtain practical, employment-related experience. "Requires a person to be involved in a new experience" (Kolb, 2014).

1.9.6 **Reflective observation:** reviewing the experience achieved by "watching others, developing observations about one's own experience and giving feedback to other participants" (Kolb, 2014:8).

1.9.7 **Abstract conceptualisation:** learning from the experience. It involves "creating theories to explain observations, present models and give facts" (Kolb, 2014:8).

1.9.8 **Active experimentation**: trying out what has been learned. "It is about using theories to solve problems, make decisions" (McLeod, 2010:2).

1.9.9 **Standards:** the "performance indicators outlined in the assessment process against which students are measured in order to arrive at a summative assessment/ assessment score. These performance indicators become the benchmark if they are consistently applied across the higher education sector and therefore become valid and reliable indicators for the institution" (McLeod, 2010:12).

1.9.10 **Universities of Technology:** "are clearly defined in terms of a government gazette released by the Minister of Education (Republic of South Africa) in 2003 declaring that the previous Technikons (which in terms of the Higher Education Act 101 of 1993 promulgated such Technikons as institutions of Higher Learning offering qualifications from the certificate level up to the doctorate level), will in future be referred to as Universities of Technology while some Technikons merging with Universities will in future be referred to as Comprehensive Universities." (The Southern African Journal for Work-Based Learning 2013:14).

1.10 OUTLINE OF THE DISSERTATION

The dissertation has five chapters, as presented below

Chapter One: Introduction and Background to the Study

This chapter presents an introduction and brief background to the study. The research problem being investigated is also articulated, together with the significance of the study, objectives and research questions.

Chapter Two: Literature Review

This chapter presents literature on Work Integrated Learning, and in particular, the assessment of Work Integrated Learning. Literature is discussed to contextualise the study.

Chapter Three: Research Methodology

The research design, methodology, study site, population, target population, sampling methods, and the sample size are explained in this chapter. Also, the chapter presents data collection instruments and techniques, as well as a description of the data analysis techniques used in the study. An overview of the ethical measures that guide the study concludes the chapter.

Chapter Four: Presentation of Results and Analysis

This chapter presents and discusses findings in detail theorised around the phenomenon of Work Integrated Learning. Themes to be discussed and analysed include concrete experience, reflective observation, abstract conceptualisation and active experimentation.

Chapter Five: Conclusions and Recommendations

The chapter presents conclusions, recommendations, limitations of the study, recommendations for future work and thesis contributions based on the key findings.

1.11 CHAPTER SUMMARY

This chapter provides an overview into the dissertation and importance of the research study on how Work Integrated Learning influences students studying at a University of Technology.

CHAPTER TWO

LITERATURE REVIEW

2. INTRODUCTION

The concept of Work Integrated Learning (WIL) is gaining popularity amongst Universities of Technology (UoTs) in South Africa, due to its numerous benefits to UoTs' stakeholders.

The Southern African Journal for Work-Based Learning (2013:16) defines Work Integrated Learning (WIL) as "an umbrella term to describe curricular, pedagogic and assessment practices, across a range of academic disciplines that integrated formal learning and workplace concerns". In 2004 the phrase "Work Integrated Learning" started being used to replace terms such as action learning, apprenticeships, experiential learning, in-service training, vacation work and problem-based learning (Govender & Taylor, 2013).

WIL aligns academic programmes offered in Universities of Technology and workplace practices for the mutual benefit of students and employers. Furthermore, Work Integrated Learning is seen as a means to develop the graduate expertise, knowledge and qualities that Universities of Technology want their graduates to possess after successfully completing their university qualifications (Leong & Kavanagh, 2013).

Work Integrated Learning was introduced as a way of improving the student's ability to apply knowledge and skills, as well as develop competence in order to meet the demand of real life challenges (Bosch, 2013).WIL also provides students with the opportunity to learn by doing, understanding their role in the workplace and applying their skills and knowledge to handle work responsibilities. In addition, Elijido-Ten (2014:216) states that "Work Integrated Learning programs enable a holistic adaptive learning to transpire by providing students the opportunity to go through the entire learning cycle of experiencing, learning thinking and acting".

This chapter is structured as follows: In section 2.2, the benefits of WIL are explained. Section 2.3 discusses the roles of different stakeholders within the WIL programme. The challenges of WIL are covered in section 2.4. Section 2.5 presents a literature survey based

on the theoretical framework adopted in this dissertation. The chapter concludes by giving a summary in section 2.6.

2.1 BENEFITS OF WORK INTEGRATED LEARNING

The benefits of Work Integrated Learning (WIL) to all stakeholders are difficult to estimate, due to the social and economic impact that the WIL programme entails. Elijido-Ten (2014) suggests that Work Integrated Learning is a three-way partnership of mutual benefit between students, companies and universities. Inherently, Work Integrated Learning also benefits the government. The subsections below outline the benefits of WIL to the different stakeholders.

2.1.1 To Students

One of the major objectives of WIL is to produce a confident, self-reliant person who possesses the skills and technological know-how to contribute to the economy and be instrumental in the eradication of poverty and unemployment. WIL allows students the opportunity to test their theoretical knowledge in real-life work scenarios, thereby improving the quality of graduates. Furthermore, it is commonly accepted that WIL opportunities have value and create benefit for students, including employment readiness and job-related skills (Usher, 2011). In addition, according to Jackson (2013), WIL builds students' confidence, increases students' appreciation of the importance of employability skills and knowledge, and also serves as an introduction to the world of work. During Work Integrated Learning, students benefit from the opportunity to demonstrate their abilities to potential employers.

2.1.2 To Companies

Work Integrated Learning allows industry the opportunity to gain productive students with fresh ideas and skills. WIL further provides an employer the prospect to gain experience in mentorship. Delahaye (2011) states that students involved in WIL are not only required to demonstrate an understanding of new knowledge but must also apply that knowledge in ways that benefits the organisation. Furthermore, there is a general employer perception that good students are often employed even before they graduate **(**Elijido-Ten, 2014). WIL provides an employer with the opportunity to assess students as potential employees. By employing students through Work Integrated Learning programmes, employers have the advantage of

choosing competent employees who understand the workplace requirements and responsibilities. Employers also have the opportunity to recruit graduates who already know and understand the management and procedures of that particular company, thus reducing the recruitment costs.

2.1.3 To Universities of Technology

One of the WIL benefits to the Universities of Technology is the attainment of industry input into academic programmes and curriculum, as well as gaining the opportunity to remain "up-to-date with latest technology" (Govender & Taylor, 2013:15). Blom (2013) further states that universities benefit by being part of real-world practices which are then integrated into the curricula, in order to bridge the gap between learning and work. Universities of Technology invite employers to be part of their Advisory Committees, which have influence on the universities' curriculum and provide insight on industry requirements. Through Work Integrated Learning, Universities of Technology gain opportunities to be research partners with industries.

2.1.4 To the Country

The Southern African Journal for Work-Based Learning, (2013) notes that Work Integrated Learning is not a quick fix to South Africa's problem of being an insufficiently-skilled society, but it can play a major role in ensuring work readiness of graduates when entering the workplace. In addition, Blom (2013) suggests that Work Integrated Learning and employability is not the solution for unemployment, but that they enhance the learner's chances for a better fit and a smooth changeover from learning to work. Fisher & Scott (2011) also agreed that WIL is not a "quick fix" to national industry-relevant skill shortages, and will not produce "high skills" immediately, but that it can play a significant role in ensuring graduate readiness to enter and contribute to the world of work and South African society.

2.2 ROLES AND RESPONSIBILITIES OF THE WIL STAKEHOLDERS

In order for Work Integrated Learning to be successful, each stakeholder has roles and responsibilities. In this section, we outline the roles and responsibilities that respective stakeholders are expected to fulfil within the WIL framework.

2.2.1 Students

In order to ensure the successful completion of Work Integrated Learning, students have to complete a number of tasks. According to Blom (2014) some of the important roles and responsibilities for students are to use workplace placement as a learning opportunity, ensure completion of work tasks on time, adhere to workplace rules, comply with the requirements for the WIL programme and compile the WIL reports and logbooks. Furthermore, the Vaal University of Technology WIL policy (2016) identifies the following roles and responsibilities; registration of Work Integrated Learning practical training within one month of starting training; notification to universities of changes of address or companies during WIL training; compliance with university's WIL guidelines and compliance with the company's employment rules and regulations.

2.2.2 Companies

Industries also have responsibilities to the students and Universities of Technology. Some of those responsibilities, according to Blom (2014) are to make the workplace available to students; ensure the safety of the students; provide a workplace that is conducive to learning; provide feedback about students' work performance to the university, as well as maintaining partnerships with the university, thus ensuring sustainable and mutual benefit implementation of WIL. Additionally, the Vaal University of Technology categorises the following as roles and responsibilities of companies; conduct induction and orientation to students on the first day of WIL training; provide a safe working environment; inform the university of placement opportunities; provide WIL signed evaluation forms on completion of WIL and notify the relevant department when students have completed and met the training requirements.

2.2.3 Universities of Technology

Universities of Technology have a duty to strengthen partnerships with companies in order to increase workplace training opportunities. The White Paper (DHET, 2013) states that universities require close collaboration with companies and training providers in order to encourage growth in terms of workplace training. Universities of Technology seek to ensure the smooth running of Work Integrated Learning, and to enable the achievement of this goal, Universities of Technology have created the Co-operative Education Departments, which are tasked with liaising with companies, an academic department as well as students. The Co-

operative Education policy at Mangosuthu University of Technology states that the academic department has responsibilities to approve suitable WIL workplaces; advise companies on practical training requirements; monitor training and provide guidelines for WIL programmes. The Co-operative Education Department must organise, coordinate, administer, control and monitor all activities pertaining to implementation of the WIL programmes. They also play a role in seeking relevant student placement in conjunction with the academic department. Furthermore, the Cooperative Education Department has a responsibility to ensure that the quality of the Work Integrated Learning programmes is maintained.

2.3 CHALLENGES OF WORK INTEGRATED LEARNING

Despite the fact that Work Integrated Learning provides many benefits to various stakeholders, WIL also presents challenges to students, employers and universities. The following are some of those challenges:

2.3.1 To Students

While Work Integrated Learning provides much-needed experience to students, there are some challenges. One of the major challenges, according to Ori (2014), is funding of WIL; the lack of funding for WIL by the Department of Education resulted in the benefit of these programmes accruing to a relatively small number of students. Furthermore, Ori (2014) points out that student face challenges due to diverse backgrounds and lack of skills and relevant knowledge. Moreover, student numbers and demand for Work Integrated Learning placement increases every year, but the number of companies available to train students does not necessarily increase, which poses a problem, as some students are not placed immediately after they are eligible for placement. International students, for example, struggle to find placement due to visa restrictions and employment laws.

2.3.2 To Universities

Universities in general have authority and power over the content of the curriculum, types of learning and outcomes. Universities set their academic standards, but the introduction of Work Integrated Learning necessitates partnerships between Universities of Technology and

industries, as well as redesigning of curricula to include industry input. Delahaye (2011) suggests that Universities of Technology may find it challenging to maintain such partnerships, as they require time and effort. Delahaye (2011) further states that the alignment of academic content to workplace activities poses challenges, as there are no previous procedures that chart the territories of knowledge in academia and industry.

2.3.3 To Companies

One of the major challenges to companies who are willing to train students is limited time and resources. Elijido-Ten (2014) suggests that companies experience more challenges if the student lacks the ability to be trained and he further argues that training of students means companies are taking a risk, as students may choose not to remain with the company after completing their Work Integrated Learning.

2.4 THEORETICAL OR CONCEPTUAL FRAMEWORK

In this dissertation, Kolb's theory of learning and McLeod's (2010) model of experiential learning were used to determine the effectiveness of the WIL programme in transferring skills to the students. The model states that learning is the process whereby knowledge is created through the transformation of experience. Kolb's learning theory also suggests that people do not necessarily learn from experience, or reflection, if they do not think critically about the experience as well as take responsibility for their learning. The theory further states that knowledge results from the combination of grasping experience and transforming it (McLeod, 2010).

Early in the nineties, few educational theorists had an understanding of the mechanics of learning. John Dewey was the first educational theorist who believed that people learn by doing and that all genuine education is achieved through experience. Saul McLeod developed his model of learning from David Kolb's learning experience model which worked on a four-stage cycle of learning and four separate learning styles. McLeod's (2010) model states that experience is part of learning; it is not, on its own, a sufficient condition for learning.

Furthermore, Deslauriers *et al.,* (2016:307) suggest that "there is a gap in knowledge regarding how students experience a programme since a great deal of research on experiential learning programmes neglect to make ties between programme outcomes and educational

theory". The author further recommends that "it is equally important to understand how students have learned so that the Work Integrated Learning programmes can be modified and strengthened accordingly". Kolb's learning theory focuses on a four-stage learning cycle which consists of (i) concrete experience that is acquired by doing, or having experiences, (ii) reflective observation, or reviewing the experience, (iii) abstract conceptualisation, which consists of learning from the experience and (iv) active experimentation that is trying out what has been learned (McLeod, 2010). For actual learning to take place, Kolb believed that all four stages of learning must be achieved. This research study investigates the extent to which students are exposed to all four aspects during the WIL programme.

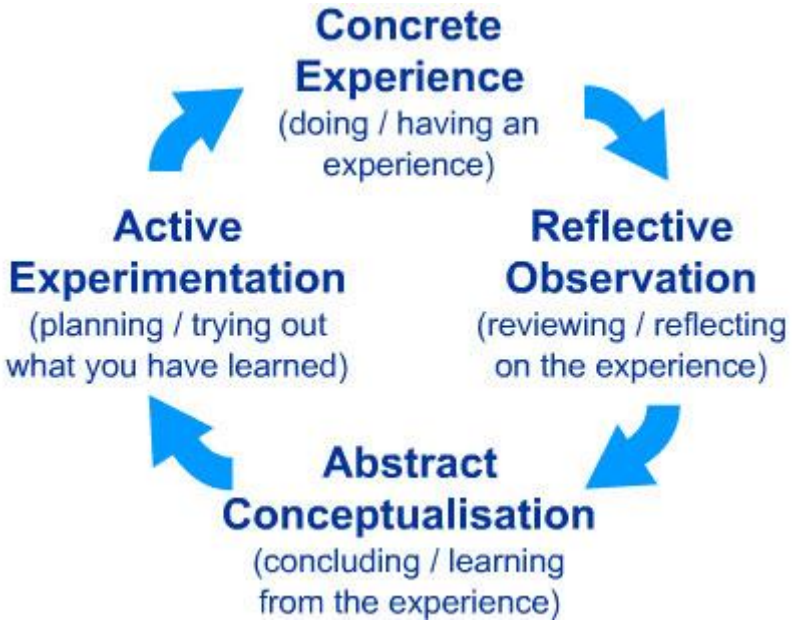

Figure 1: Kolb's Model on experiential learning

Source: Saul McLeod (2010:8)

2.4.1 Concrete Experience: is to learn by doing or by practical experience. It requires a person to be involved in a new experience (Kolb, 2014). Kolb further suggests that for an experience to be concrete enough to be qualified for consideration, it has to involve both organisation and participation in a new experience.

The following are some of the activities that support concrete experience; team-building exercises, being involved in problem-solving, work presentations, interacting with clients and being involved in work projects. For WIL students to significantly benefit from the programme, it is imperative that they partake in such activities. This work investigates the

level at which students are exposed to such activities during their WIL programme. The study will focus on the following teaching activities that support concrete experience.

a. Team-building

Team-building activities are a pleasurable way to engage students in meaningful learning that has benefits on social, emotional, and academic development. Edwards (2012) describes team-building as the ability to gather the right people to join a project team and get them working together to achieve a common goal. He further states that a team has to go through stages of forming, storming, norming and performing, as outlined by Dr Bruce Tuckman's theory (Tuckman & Jensen, 2010) in order to grow and deliver.

Figure 2: Tuckman Development Model
Source: Tuckman and Jensen (2010:43)

Team-building in the workplace plays a huge role in building trust and employee motivation, thereby increasing productivity. Group projects allow for sharing of ideas, knowledge amongst peers, as well as improving communication between the employees. These activities should be integrated in any team-building effort, as they allow the group to recover from disunity, frustration and conflict. They also help sensitise the team

members to behaviours that may contribute toward or obstruct group problem-solving. Behaviours such as communication, problem-solving skills, trust, taking advantage of the strengths and weaknesses of each team member, and understanding the customer's point of view contribute to strengthening the team.

In order to prepare students for the workplace, universities use group assignments and projects as activities to encourage students to work as a team. Govender & Taylor (2013) further identify the ability to work well with others across age, culture, experience and seniority as one of the skills required by students entering the workplace.

However, there are disadvantages to implementing a teamwork concept in the workplace; unequal participation, limiting creativity, longer process and inherent conflict are some of the challenges that are likely to occur.

b. Involvement in problem-solving

To effectively solve a problem, one needs to identify a problem, investigate it, analyse it then attempt to solve the problem. Students have to be involved in all these stages to effectively be part of problem-solving. Problem-solving refers to the ability to use knowledge, facts, and data to effectively solve problems. This does not mean providing an immediate answer, but rather being able to think fast, assess problems and find solutions. The ability to develop a well thought out solution within a reasonable timeframe is a skill that employers value greatly. It is thus important for students to be exposed to such activities during WIL. In a study that was conducted in 2013 in order to establish a list of skills required by employers from analytical chemistry graduates, problem-solving was identified as one of the critical skills (Nofemela, 2015). Furthermore, Govender & Taylor (2013) identify problem-solving as one of the skills required by students entering the workplace.

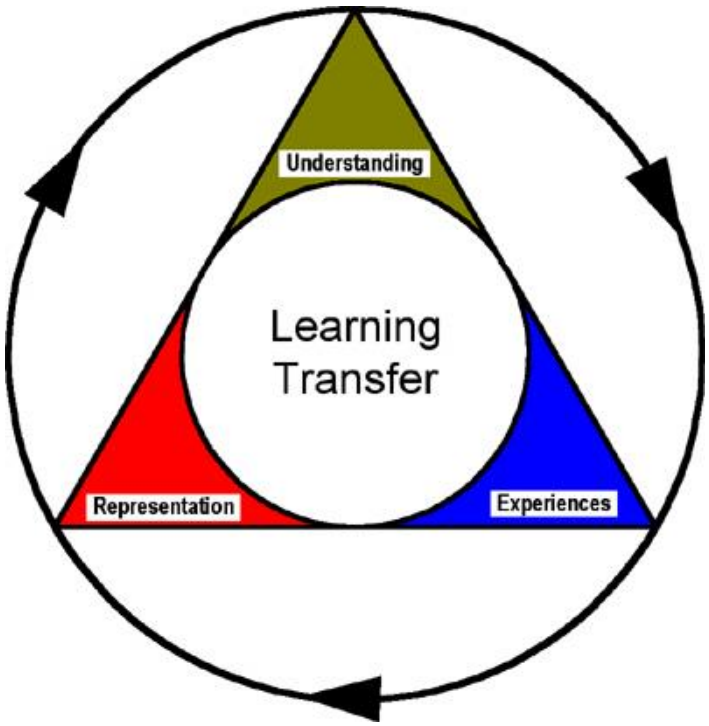

Figure 3: The Problem-Solving Triad

Source: Sutton (2003:5)

According to the problem-solving triad proposed by Sutton (2003), experiences are vital for knowledge transfer. When a student is exposed to real life problems in the industry, it enhances their learning process. Although employers do not necessarily require students to come up with a solution to the problem, they expect students to do initial problem-solving through observation, questioning and considering all facts at hand before reporting the problem to a senior staff member. Employers want employees who can work through problems on their own or as an effective member of a team. Ideal employees should think critically and inventively, share thoughts and suppositions, possess practical insight, and make good decisions.

c. Work presentations

Work presentation can be either formal or informal; it provides students with opportunity to reflect on their experiences and it is also the common way for students to express their Work Integrated Learning experiences (Martin *et al*., 2011). Furthermore, presentation can be done individually or in a group. Students can deliver presentations to various stakeholders such as workplace mentors, fellow students and also Work Integrated Learning co-ordinators. Students are usually required to present on their workplace experiences or projects they are involved in, in the form of a PowerPoint presentation.

2.4.2 Reflective observation: reviewing the experience achieved by "watching others, developing observations about one's own experience and giving feedback to other participants" (Kolb, 2014:8). Ryan & Ryan (2013) acknowledge that reflection is complex, takes time to do well and is difficult to teach, but also promotes lifelong learning and professional practice in higher education.

According to Ambrose *et al*., (2010) experience becomes educative only when one starts thinking and reflecting on it. The following are some of the activities that support reflective observation; report writing, completion of logbook or reports, guidance of mentors, being afforded time to ask questions and get answers, as well as opportunity to do feedback sessions. These activities are of vital importance to students going through the WIL programme.

a. Report writing

Report writing is a form of assessment. Students are required to write a report on their work experience as a form of reflecting on their work experience. In some programmes written reports form part of a portfolio of evidence. These reports can be assessed by the workplace supervisor, in some cases they are also required to rate the student's workplace performance using these reports, but the final marking and assessment responsibility lies with the academic supervisor (McNamara, 2013).

Similarly, workplace supervisors are required to submit a formal report on student workplace performance. In some instance these reports are used only as guidance and do not contribute to the final grading of the students (Martin *et al*., 2011).

b. Completion of Logbook or Journal

Larkin & Beatson (2014) describe a journal as a written document where students record their work experiences, events, self-development process and significant learning experiences. Another word used for a journal is a logbook. Students on a Work Integrated Learning programme are required to fill logbooks as a proof of work or activities they have done on a daily basis. These logbooks are signed by their mentors or supervisors during the WIL period, and at the end of WIL, students submit their logbooks to their

lecturers to assess and mark. Based on the information provided in the logbook, student then pass or fail their Work Integrated Learning.

Wang & Zhan (2010) states that use of journals to record their activities it encourages students to reflect on their learning journey. Furthermore, Clark & Adam (2012) argue that journals encourage critical thinking and self-expression.

However, in a study conducted by Larkin & Beatson (2014) on marketing students, they found that submitting logbooks or journals at the end of the internship programme does not allow lecturers to give necessary and required support to students. This study resulted in the introduction of an online journal, which was reported to be more interactive and effective.

c. Supervisor or mentor guidance

Workplace supervisors and Work Integrated Learning coordinators or on-campus academic supervisors' guidance are some of the most important parts of Work Integrated Learning. Ongoing communication and interaction between these supervisors is the key to student learning and a successful WIL programme (Martin *et al*., 2010).

Universities of Technology require the host employers to provide competent mentors with necessary experience and qualifications to train and supervise students. Not all employers are able to provide such supervisors, which results in a shortage of host employers. As part of ensuring successful Work Integrated Learning programmes, Massey University holds two-day training sessions on inducting workplace supervisors into having students at their workplace (Martin *et al*., 2011).

However, workplace supervision may not always be reliable in terms of quality assurance, as workplace supervisors may lack the necessary skills and consistency required for assessment. According to McNamara (2013) when workplace supervisors are asked to grade a student, they mostly recommended an A. Most supervisors felt that it was necessary to reward students for their contribution to the workplace, especially when the company was not paying the student. Despite the assessment quality issues, workplace supervisor's assessments make up a valuable component of Work Integrated Learning. To

address reliability and quality assurance, Universities of Technology provide guidance as to what is expected from the workplace supervisor involved with student assessments.

d. Feedback sessions

Feedback sessions aim at allowing students to reflect on their experience, as well as learning from one another's experience. An industry-based supervisor can also use the feedback session throughout the Work Integrated Learning programme, as well as feedback to the lecturers on the conduct of the students, and these can be considered in finalising the marking of the student's logbook (Larkin & Beatson, 2014). Furthermore, a feedback session can be used by the lecturer or Work Integrated Learning coordinator to assist WIL students to effectively reflect on their WIL experience. Feedback should be meaningful to student's own situation.

The Central University of Technology successfully uses the feedback method on their Hotel School Work Integrated Learning second-year students. Furthermore, the Central University of Technology uses their second-year students' feedback sessions as part of preparing their first-year students for their upcoming WIL placement (Jacobs, 2015).

2.4.3 Abstract conceptualisation**:** Explaining what has been observed, presenting models, creating theories as well as giving facts (Kolb, 2014). Ambrose *et al*., (2010) suggest that abstract conceptualisation is the process of gaining knowledge, which depends on one's experience in gaining that knowledge. Presenting models, giving theories and facts are some of the activities that support abstract conceptualisation. Thinking critically and understanding the meaning of experience also form part of abstract conceptualisation.

As stated by Moletsane & Moloi (2015), a reflective teaching and learning process improves learning outcomes and enhances student experience. Assessment by the supervisor, mentor and Work Integrated Learning co-ordinators encourages students to appraise their work and articulate learning outcomes (Henderson & Trede, 2017). Furthermore, learning experiences need to integrate knowledge with the previous experience of the students through various teachings and practical experience encountered in the workplace settings (Yorke, 2011).

a) Reflection and Learning from Experience

Reflection on experience has a number of advantages: it encourages insight, enhances the meaning of learning and links current experience with previous learning. To reflect, one needs to process and evaluate the information. Dean *et al*., (2012) suggest that reflection supports student learning during Work Integrated Learning. In the workplace, it is important that mentors and supervisors guide the student's process of reflection. This process allows students to ask questions and draw comparisons. Students should be able to talk and write about their work experience. During this period, students make sense of what has been learned with the help of an experienced supervisor or mentor and reflect on what they already know and compare their knowledge with their experience. Students need to be able to assess their learning experience and plan for their continuing learning.

While Ryan & Ryan (2013) agree that reflection encourages lifelong learning, they also acknowledge that reflection can be difficult to teach and takes time to do well, as it is complex to assess and has implementation issues.

2.4.4 Active experimentation: trying out what has been learned, as well as using theories to solve problems or make decisions (McLeod, 2010). In order for learning to take place, one needs to see how learning is useful to one's life (Kolb, 2014). Work Integrated Learning students relate to active experimentation by applying their experience to their daily life in order to see the results, as well as to make assumptions for future situations. The following are the teaching activities that support active experimentation; learners consider how they are going to put what they have learnt into practice, take what they have learnt and predict what will happen next or what actions should be taken, and then place into context the relevance of what they have learnt and its usefulness to their lives.

a) Work Integrated Learning as an Empowerment Tool for Future Jobs

Experience gained through WIL can be vital in assisting students to get jobs. It is evident that in today's competitive world, employers want employees who can be productive with minimum training and supervision. Moreover, WIL provides students with a platform to acquire and apply WIL experience in future life and work encounters. As stated by Blom (2013), Work Integrated Learning decreases mismatch of workplace requirements and educational outcomes while enriching the student's

learning experience. Furthermore, Blom suggests that WIL experience enhances student opportunities to be employed.

b) Work Integrated Learning as a Skill Development Platform

Skill developed through practical experience is valuable in today's industry. As defined by the Queensland University of Technology (2011), WIL is a process of learning through engagement with industry in order for students to acquire knowledge and skills through creative problem-solving in real world contexts. Skills acquired during WIL will enhance active participation of students in tasks that may be assigned to them. Moreover, students participating in WIL are not only required to acquire knowledge but are expected to demonstrate understanding and apply that knowledge. Knowledge transfer is more effective when it involves practical experience. In essence, practical experience gives students confidence and thus enhances active experimentation.

c) Relevancy of Work Integrated Learning in life

WIL is more likely to improve students' perception of their field of study and its place in the world of work and ideas. Positive perception results in the likelihood that the students will find relevance in what they experienced. A study conducted at the Central University of Technology by Wheeler (2015) suggests that previous learning and skills acquired during WIL combined to enhance positive adaptation to the working environment. The study further suggests that students' perceptive adaption to the work environment leads to confidence in their ability, more work participation, and improvement in their chances of finding gainful employment.

2.5 CHAPTER SUMMARY

This chapter critically examines the concept of Work Integrated Learning. An analysis of the learning processes that takes place during exposure to the industry was carried out using the theoretical framework proposed by Kolb's learning theory. There is evidence in literature that all the four stages proposed in the theoretical framework are vital in the learning process of students during their time in industry. Of great importance is concrete experience, where students are exposed to real life work projects. Unlike in classroom situations, concrete

experience provides a unique learning journey to the students. The analysis done in this chapter is used as a basis for interpreting the results obtained from the data gathering exercise.

CHAPTER THREE

RESEARCH METHODOLOGY

3. INTRODUCTION

This study investigated the impact of Work Integrated Learning (WIL) among students studying at a University of Technology in KwaZulu-Natal. Of paramount importance in the investigation is the impact of WIL on student learning. This research aims at investigating the learning processes undergone by students in the WIL programme.

As mentioned in the previous chapter, the need to carry out this research is due to various benefits of establishing the status quo vis-à-vis the experiences of the students during the WIL programme. In carrying out this investigation, this work made use of the framework proposed by Kolb (2014). Kolb's theory states that learning is the process whereby knowledge is created through the transformation of experience and knowledge resulting from the combination of grasping experience and transforming it (McLeod, 2010). In essence, the theory describes four stages of the learning cycle, namely: concrete experience, reflective observation, abstract conceptualisation and active experimentation. For actual learning and knowledge transfer to take place, Kolb argues that all four stages of learning must be achieved. The chapter therefore presents the research methodology used in the investigation of the extent to which students on WIL acquired knowledge using Kolb's model.

A research methodology by itself is the systematic, theoretical analysis of the methods a researcher will apply to a field of study. Hence it is crucial that it is presented and explained in detail in this chapter. The rest of the chapter is structured as follows: In section 3.1, an outline of the research design adopted in this work is given. Section 3.2 describes the details of the research processes followed in our investigation. Aspects such as research population are articulated in this sub-section. In addition, the sub-section also explains the data collection instruments, analysis techniques, and issues of data control. The chapter concludes by giving a summary, as well as an outline of the ethical measures that guided the study in Section 3.5 and 3.7 respectively.

3.1 RESEARCH DESIGN

In this work, the researcher used a descriptive research design. Proponents of descriptive research design study argue that this approach is undertaken in order to determine and describe the characteristics of the variables of interest in a situation (Sekaran & Bougie, 2010:106). Additionally, the descriptive research method also describes relevant aspects of the phenomenon of interest from an individual, organisational, industry-oriented or other perspective. This conforms to the goal of this work, the main objective of which is to investigate the influence of Work Integrated Learning on students studying at a University of Technology. An examination of the process of research design is appropriate in order to understand the characteristics of the study, to probe and further research the situation in a descriptive manner.

3.2 RESEARCH METHODOLOGY

Due to the nature of the area under investigation, the research method utilised in this dissertation is a quantitative approach. Data in this work was gathered using mostly structured questions, hence the choice of a quantitative method. The data to be collected also uses different scales of measurement.

A quantitative research method was further selected to quantify the problem of the influence of Work Integrated Learning among students by way of generating numerical data or data that will be transformed into useable statistics. The method is good at quantifying attitudes, opinions, behaviours, and other defined variables. Furthermore, Maxwell (2014) argues that findings from the quantitative data can be generalised from the small sample to the entire population.

3.2.1 Research Setting

This research study was conducted at a University of Technology in Durban, KwaZulu-Natal. This university was established in 1979 and has three faculties; namely Engineering, Natural

Science and Management Science, with an enrolment of about 10 000 students (Kgaphola, 2013).

3.2.2 Target Population

The target population of this research encompasses students enrolled at a University of Technology in KwaZulu-Natal, specifically those students registered for Work Integrated Learning. About 400 students annually register for Work Integrated Learning. The period of Work Integrated Learning can be a minimum of three months and a maximum of twelve months. Some students are eligible for Work Integrated Learning in their second year of study, whilst others are only eligible for WIL in the third and final year of study.

According to Plooy-Cilliers, Davis and Bezuidenhout (2014) the target population is all units or people that are part of the population parameters. Sekaran & Bougie (2010:267) state that the **"**target population must be defined in terms of elements, geographical boundaries and time". The target population are students studying Engineering and Natural Sciences at a University of Technology. These students are required to complete theoretical and practical learning before obtaining their qualification and graduating.

3.2.3 Accessible Population

For this study, the accessible population consists of students from five departments within the faculties of Engineering and Natural Sciences at a University of Technology. Only those students who could be reached were included in the study. Plooy-Cilliers, Davis and Bezuidenhout (2014) define an accessible population as the people that we can really use in the study.

3.2.4 Sampling Strategies

Probability sampling was used by the researcher for this research study. Probability sampling is also called random or quantitative sampling. For random sampling, units or people are chosen by chance, and every person has an equal opportunity to participate, from which the results are generalised. Sekaran & Bougie (2010:279) state that "probability sampling designs are used when the representativeness of the samples are of importance in the interests of wider generalizability". Sekaran & Bougie (2010:274) define cluster sampling "as samples gathered in groups or chunks of elements that ideally are natural aggregates of elements in the population".

The researcher used census sampling in this study for selection of the students. Census sampling is used when the researcher attempts to include every individual in the population. This has the advantage of producing accurate results that can easily be generalised in other populations. All available students from faculty of Engineering and Natural Sciences took part in the study.

3.2.5 Sample and Sample Size

Sekaran & Bougie (2010) suggest that a sample is selected from the population and made up of the members of that population. The sample size consists of the number of people or units selected to participate in the study. This University of Technology has three faculties. The researcher selected students from five departments within two of the three faculties. The sample population is represented by Table 3.1.

Table 1: Faculties and Departments

Faculty of Engineering	**No. of Students**	**Sample size**
Mechanical Engineering	50	25
Chemical Engineering	40	20
Electrical Engineering	50	25
Faculty of Natural Science		
Information Technology	50	25
Analytical Chemistry	30	15
Total number of participants	230	115

3.2.6 Data Collection Instruments

This study used questionnaires to collect data. Sekaran & Bougie (2010) state that the use of questionnaires has the advantage of obtaining data more efficiently in terms of the researcher's time, energy and costs. Structured questionnaires, together with letters of consent

outlining the nature of the study and guaranteeing the privacy of the information provided, and the anonymity of the respondents, were provided and personally administered to the targeted students. Hardcopies were distributed, and soft copies were emailed to students. The aim of the researcher was to be able to administer questionnaires to a large number of students and be able to collect the completed questionnaires within a short period of time.

3.3 RELIABILITY AND VALIDITY OF STUDY

Tavakol & Dennick (2011) state that reliability and validity are of paramount importance in the process of research, because when utilised they increase the credibility of the evaluation and assessment of a research project. In this manner, a study that does not consider the significance and gravity of validity and reliability might not have the sound thoroughness required of the research process.

Reliability alludes to the consistency of a measure (Creswell, 2014). Therefore, a questionnaire is considered solid if similar outcomes are obtained when the survey is re-administered or tested repeatedly (see also Twycross & Shield, 2005).

Validity alludes to the degree to which a questionnaire or test measures what it purports to measure (Thatcher, 2010; Creswell, 2014). Validity of the questionnaire also infers that the questionnaire ought to be free from both irregular and deliberate mistakes. Zikmund *et al*., (2013:179) explain that:

> *"Validity can be defined as the extent to which differences in observed scale scores reflect the true difference between objects on the characteristics being measured, rather than systematic or random errors. Thus, validity addresses the questions of whether what was attempted to be measured, was actually measured. Validity can be viewed from a number of different perspectives, being; content validity, criterion validity and construct validity."*

In this study, the dependent variable is Work Integrated Learning, as its value was dependent on the researcher's manipulation of the independent variables: solid experience followed by reflective observation, abstract conceptualisation and active experimentation.

Researchers argue that validity and reliability have diverse interpretations, depending on the nature of the research work to be conducted (Thatcher, 2010). This implies that the nature of the problem being investigated determines the methods of reliability and validity measures used. The different types of validity include:

3.3.1 Face Validity

As indicated above, a pilot study was conducted to test the designed research instruments. For the purposes of data analysis reported in this document, the pilot study respondents were excluded. Thus the respondents from the pilot study have similar characteristics to the respondents of the actual study. The pilot study was used to enhance questionnaires and establish the amount of time that respondents needed to respond to the questions asked. The core motivation for conducting the pilot study was to understand the statistical variability. The pilot study was also used to evaluate the questionnaire to ensure that the research objectives were adequately met. Creswell (2014) also argues that a pilot study tries to identify as well as fix problems that might arise when the actual study is being conducted. According to Bless *et al*., (2013:394) "pilot study is conducted in order to determine whether the methodology, sampling, instruments and analysis are adequate and appropriate". The researcher used five students for the purpose of the pilot study.

3.3.2 Content Validity

The study was reliable because the selection of the respondents and the processes of analysing the data adhered to statistical principles.

The questionnaire was purpose-designed in accordance with structured theoretical knowledge and research questions. Specifically, the questions were adapted from the Work Integrated Learning models. Therefore, the personal influence of the researcher was eliminated, thus decreasing bias in the investigation. Furthermore, the questions were evaluated and validated by qualified and experienced statistician. Thus, the study took advantage of statisticians' knowledge by making use their expertise gained through years of experience.

Additionally, the researcher used random sampling, which indicates that bias was significantly reduced, since each respondent in the population used in the study was given an equal chance of participating (Kuo *et al*., 2009).

3.4 DATA ANALYSIS

Antonius (2013) refers to data analysis as creating an electronic data file and performing the appropriate analyses and interpreting the results. Data analysis uses two techniques: descriptive and inferential statistics. Bless *et al*., (2013:390) describe descriptive statistics as "procedures for summarising information about a set of data or measurements". Inferential statistics is defined as "mathematical techniques, or statistical tests, which allow the researcher to make statements about populations based on data derived from samples" (Bless *et al*., 2013: 392).

There is a number of software packages used to analyse data. The researcher used Statistical Package for the Social Science (SPSS) for this study. Sekaran & Bougie (2010:365) describe Statistical Package for the Social Science as a "data management and analysis programme designed to do statistical data analysis, including descriptive statistics such as plots, frequencies, charts and lists, as well as sophisticated inferential and multivariate statistical procedure like analysis of variance (ANOVA), factor analysis, cluster analysis and categorical data analysis".

3.5 ETHICAL CONSIDERATION

Ethical approval for this research has been obtained from the University of KwaZulu-Natal Ethics Research Committee and a gatekeeper's letter from the Research Department at a University of Technology in KwaZulu-Natal**.** The researcher will maintain privacy, confidentiality and anonymity of the respondents**.** The respondents will make an informed decision to participate or not to participate in the study based on the information to be provided about the study. The researcher will also maintain the human dignity of all the respondents.

3.6 LIMITATIONS OF THE STUDY

Due to time constraints, this study only included students studying Engineering and Natural Sciences at a University of Technology. However, the sample is reliable, so as to allow the study to generate credible findings.

3.7 CHAPTER SUMMARY

The research methodology used in this dissertation is explained in detail in this chapter. In particular, the chapter presents an in-depth explanation of the research design, study site, population, sampling methods, and the sample size. Furthermore, the design of the data collection instruments was also explained. Data analysis techniques employed in Chapter Four are also explained. The chapter then concludes by presenting the ethical considerations followed in the study.

CHAPTER FOUR

ANALYSIS OF DATA AND PRESENTATION OF RESULTS

4. INTRODUCTION

This chapter presents findings from the quantitative survey conducted. The primary data presented and analysed was collected using questionnaires personally administered to students, as well as distributed through emails.

The data presented in this study is based on 142 questionnaires that were successfully completed and returned in time for collection. Students were selected from the five departments, namely: Chemical Engineering, Electrical Engineering, Mechanical Engineering, Information Technology and Analytical Chemistry; these departments are within the faculties of Engineering and Natural Sciences.

The results are grouped according to the theoretical framework adopted in this work, Kolb's theory of learning, which divides the process of experiential learning into four stages, namely: concrete experience, reflective observation, abstract conceptualisation and active experimentation. According to this model, for learning to take place during Work Integrated Learning, students should be exposed to all four aspects of the learning cycle.

The rest of the chapter is structured as follows: Section 4.1 describes how data was processed for analysis. In Section 4.3, a detailed presentation of the demographic information of the respondents is given. Section 4.4 outlines the results of student exposure to concrete experience. Sections 4.4, 4.6, and 4.7 present results on, abstract conceptualisation, reflective observation and active experimentation respectively. A chapter summary and conclusion is given in Section 4.8.

4.1 ANALYSIS OF DATA

The data collected from the questionnaire was tabulated in an Excel spreadsheet table and then converted to a data sheet that could be used on Statistical Package for the Social Sciences, SPSS software, version 18.0. The following statistical techniques were carried out:

- Descriptive statistics, including means and standard deviations to calculate frequencies.

- ANOVA test for several independent samples that compared two or more groups of cases in one variable.
- Binomial test, where a significant proportion of respondents select one of two possible responses.
- One sample t-test to test whether a mean score is significantly different from a scalar value.
- Independent samples t-test to compare two independent groups of cases.

4.2 DEMOGRAPHIC INFORMATION

Figure 4.1 below gives the gender and age details of the students who participated in this study.

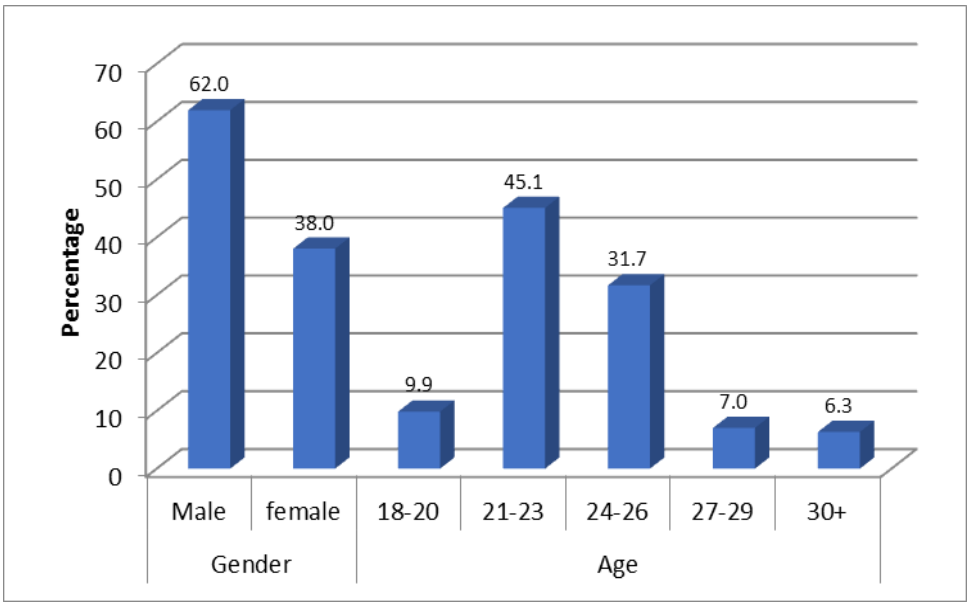

Figure 4-1: Results by Gender and Age

4.2.1 Gender

A total of 62% of the respondents were male students and 38% were female students. The population of the University of Technology has more male students in technical fields than female students. In addition, studies show that there is a perception that male students prefer technical subjects to females (Wang *et al*., 2013). In a study by Hunt (2016), it was reported that female students tend not to choose engineering-related work because of the limited

promotion opportunities. The total number of Information Technology students participated on this research was 76, with 51 of those being male and only 25 being female.

4.2.2 Age

The students who participated in the survey were of different age groups. A total of 45.1% were between the ages of 21 and 23 years, 31.7 between the ages of 24 and 26 years, 9.9% between the age of 18 and 20 years, 7.0% between the ages of 27 and 29 years and 6.3% were 30 years and above. The University of Technology supports part-time courses by offering parallel diploma programmes in the evening. This can be considered as a contributing factor to 6.3% of students being over the age of 30. During the WIL period, the students are expected to seek companies whose whole line of business is aligned to their qualifications.

4.2.3 Level of Study

Figure 4.2 indicates the different levels of study for students who participated in the research survey. A total of 71.1% partook in six months of Work Integrated Learning, 24.6% had completed their first 6 months (practical 1) of a total of 12 months of WIL, 1.4 % completed their second 6 months (practical 2) and 2.8 % had completed their 6 months of Work Integrated Learning.

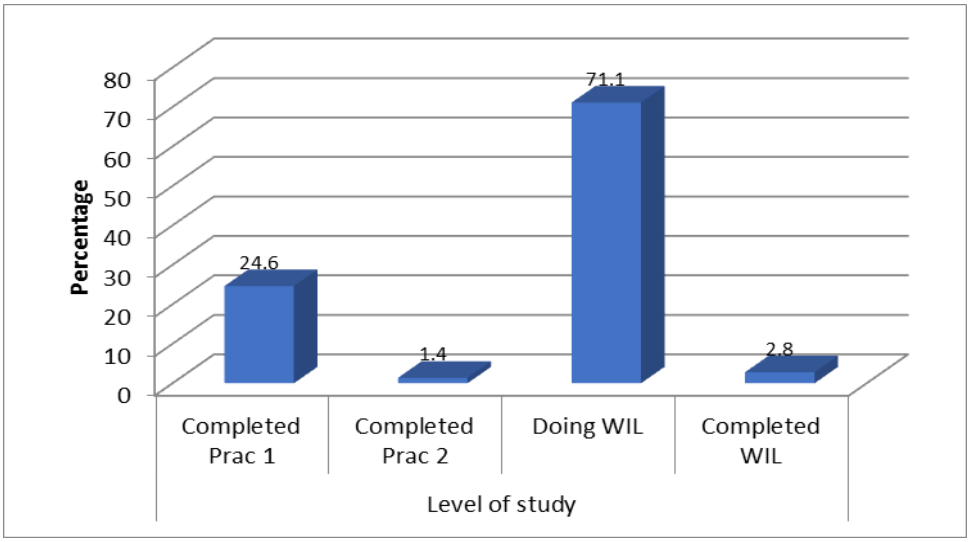

Figure 4-2: Results by Level of Study

4.2.4 Area of Specialisation

Figure 4.3 presents the area of specialisation. Students were given an equal opportunity to participate in this research study, and of the total number of students, who responded, 7% are studying towards Chemical Engineering, 18% are studying towards Electrical Engineering, 18% are studying towards Mechanical Engineering, 54% are studying towards Information Technology and 3 % are studying towards Analytical Chemistry.

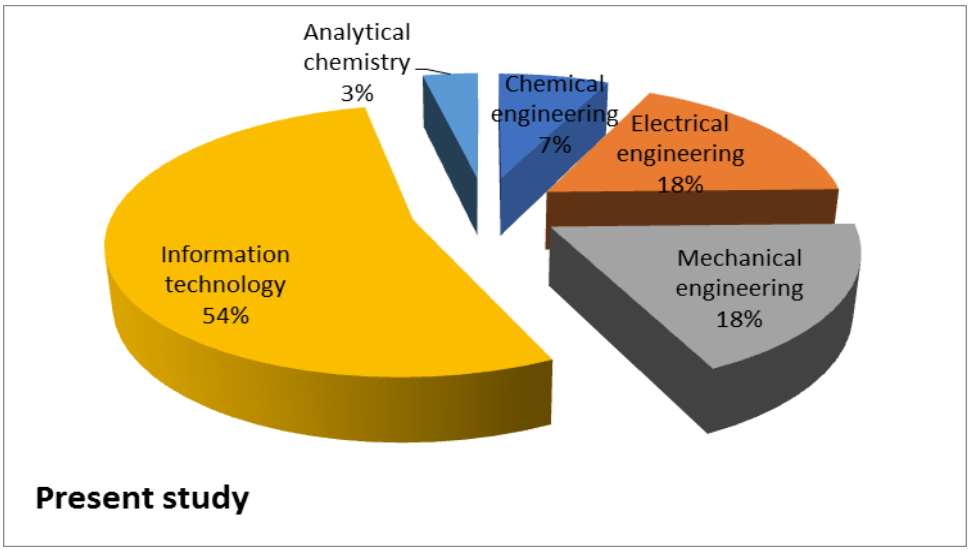

Figure 4-3: Results by Area of Specialisation

4.2.5 Media Preference

Figure 4.4 detailed various media preferred by students when applying for Work Integrated Learning. It is evident that the most effective media is the use of the Co-operative Education Office. This is supported by the results, which show a mean of 4.15, and a standard deviation of .993. These results are due to the fact that the main function for the Co-operative Education office is to source placement for WIL students. The internet was the second most used medium, and the results were a mean of 3.89, and a standard deviation of 1.238. This was followed by WIL placement through lecturers, with a mean of 3.79, and a standard deviation of 1.396. The word of mouth, results were a mean of 3.30, and standard deviation of 1.238. Local newspaper, Facebook and employment agencies were the least effective media used. Local newspaper results show a mean of 2.17, and standard deviation of 1.086, Facebook shows a mean of 2.70 and standard deviation of 1.361 and employment agencies a mean of 2.63, with a standard deviation of 1.124.

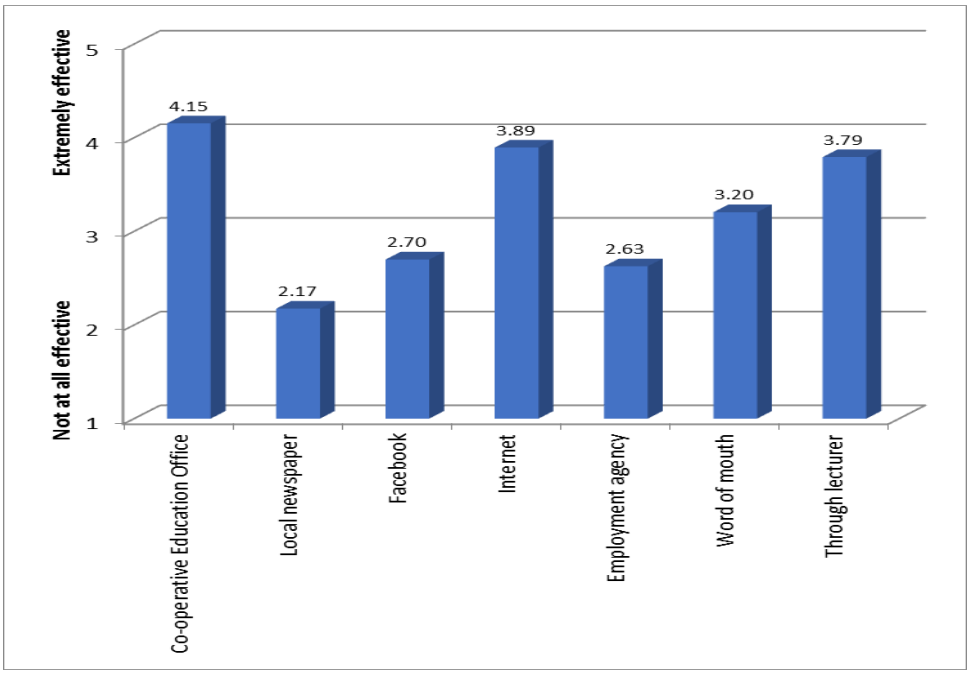

Figure 4-4: Results by Media Preference

4.3 CONCRETE EXPERIENCE

Figure 4.5 illustrates the students' various experiences and exposure during Work Integrated Learning. Students evidenced a significant participation in all concrete experience activities, with the exception of interaction with clients, which was slightly lower than the others.

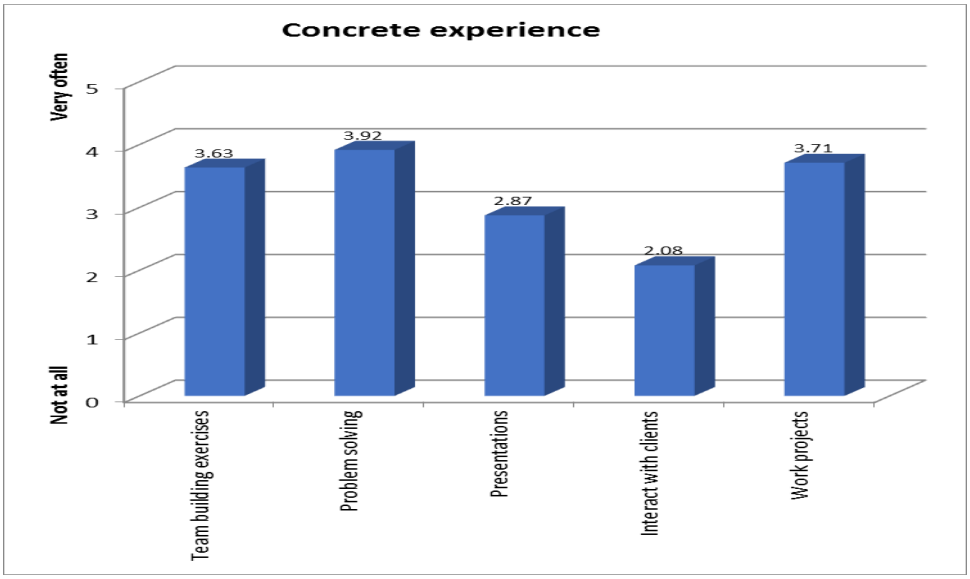

Figure 4-5: Results by Concrete Experience

4.3.1 Team-Building Exercises

There was significant participation of the students in team-building exercises. The results show a mean of 3.63, standard deviation of 1.350 and t-test value of 141, which is equal to 10.008. This may be attributed to the fact that all the students interviewed do practical subjects hence they are bound to work as a team. This can further be supported by a high score of 3.71 on the students' involvement in work projects. Teamwork is vital in knowledge transfer, and is it one of the skills required by students entering the workplace (Govender & Taylor, 2013).

4.3.2 Problem-Solving

Most students also reported being involved in problem-solving activities. Problem-solving recorded a mean value of 2.97. Again, this may be attributed to the fact that most students belonged to technical fields. For example, Information Technology (IT) personnel are usually involved in attending to IT-related problems hence most students were exposed to problem-solving. The same may not be the case if one considers arts or commercial students. In a case study conducted by Nofemela (2015), which included Analytical Chemistry and Chemical Engineering students, problem-solving was listed as a critical skill, as the new graduates are often working alone. In most cases, students who are able to use problem-solving skills are often able to work independently.

4.3.3 Taking Part in Presentations

There was significant involvement of students in presentations. A mean value of 2.87 was recorded in the results. This may be attributed to the fact that many departments, such as Chemical Engineering and Analytical Chemistry, require students to do presentations on projects that they were involved in during Work Integrated Learning. Delivering presentations enhances understanding of the concepts learnt in class or during practical experience. When comparing students from different programmes, there was a significant difference in participation with regard to doing presentations across courses: $F(4, 137) = 4.145$, $p=.003$. Specifically, students studying Electrical Engineering ($M=3.76$) did presentations significantly more often than students studying IT ($M= 2.71$) or Analytical Chemistry ($M=1.60$).

4.3.4 Interaction with Clients

Most of the WIL students who participated in this study did not experience regular exposure to clients. A mean value of 2.08 shows a significantly low participation. This may be attributed partly to the fact that most of the students studied technical subjects, where they interacted with machines more than people. As a result, they only received exposure to technical aspects. This can be confirmed by a high mean score of 3.7 recorded for student involvement in work projects.

4.3.5 Work Projects

Due to the practical nature of the programmes for students who participated in this study, most students who underwent WIL reported that they were involved in real-life projects and hence solved real-life problems. For instance, IT students are expected to attend to real-life technical problems, such as disruption in an internet connection etc. This is confirmed by a mean value of 3.92, which indicates a significant level of involvement in work projects.

4.4 REFLECTIVE OBSERVATION

Figure 4.6 indicates significant student involvement in all reflective observation activities. If mean is >2.5, there is a significantly higher participation, while a mean of <2.5 indicates low participation.

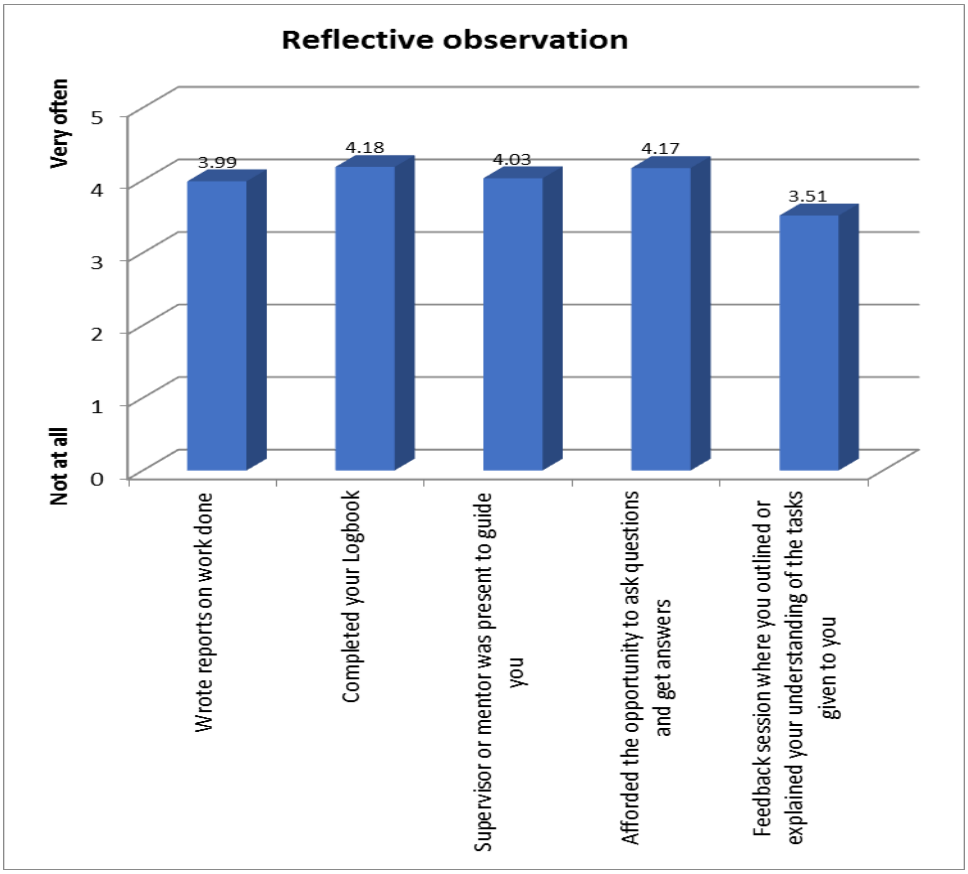

Figure 4-6: Results of Reflective Observation

4.4.1 Report Writing

Student involvement in report writing was significantly high. The results show a mean of 3.99, a standard deviation of 1.238 and t-test of 142, which equals to 14.307. This may be as a result of a Work Integrated Learning requirement to submit reports to WIL co-ordinators on projects undertaken during the student training. High participation on report writing may also be as a result of availability of a work supervisor or mentor to guide the students, which shows a mean of 4.18, translating to frequent participation.

4.4.2 Logbook

The results show a mean of 4.18, which indicates a high level of participation, a standard deviation of 1.036 and t-test of 142, which equals to 19.366. Students indicated that they often completed their logbook. This may be as a result of the logbook being used as a tool to confirm all activities and training students were involved in during their WIL training. Based

on the logbook submitted and marked by the WIL co-ordinator, a student could pass or fail the WIL training.

4.4.3 Availability of Mentor or Supervisor

Availability of a mentor or supervisor to students is very important throughout the Work Integrated Learning training. The outcome of mentor or supervisor availability indicated a high participation, a mean of 4.03, which is very high, a standard deviation of 1.148 and t-test of 142, which equals to 15.860. Ideally, this score should be higher than the reported figures, due to the fact that prior to student placement, supervisors had to commit to being available to assist students.

4.4.4 Asking Questions

Respondents frequently reported the availability of work supervisors or mentors. These results show a mean of 4.17, standard deviation of 1.024 and t-test of 142, which equals to 19.416. Students are expected to learn by doing during the Work Integrated Learning period. The availability of a supervisor or mentor to ask work-related questions ensures the success of the training. Most of the students who go for WIL did not have any industry exposure hence the availability of mentors to answer questions was a crucial part of training. The high mean score of 4.17 means that the students benefited from their interaction with the mentors or supervisors.

4.4.5 Feedback Sessions

Although the feedback sessions occurred often enough, their frequency was less than other activities, such as being afforded the opportunity to ask questions. Results show a mean of 3.51, a standard deviation of 1219 and a t-test of 142, which equals to 9.914. This may be due to the nature of their training. The respondent training was mostly hands-on and technical in nature; it required ongoing communication as opposed to feedback sessions. Feedback sessions are important in student learning, as they help to assess students' understanding of their responsibilities.

4.5 ABSTRACT CONCEPTUALISATION

The results of abstract conceptualisation in Figure 4.7 indicate students' significantly high participation in all activities. If the mean is >2.5, it means that there is significantly higher participation, while a mean of <2.5 indicates low participation.

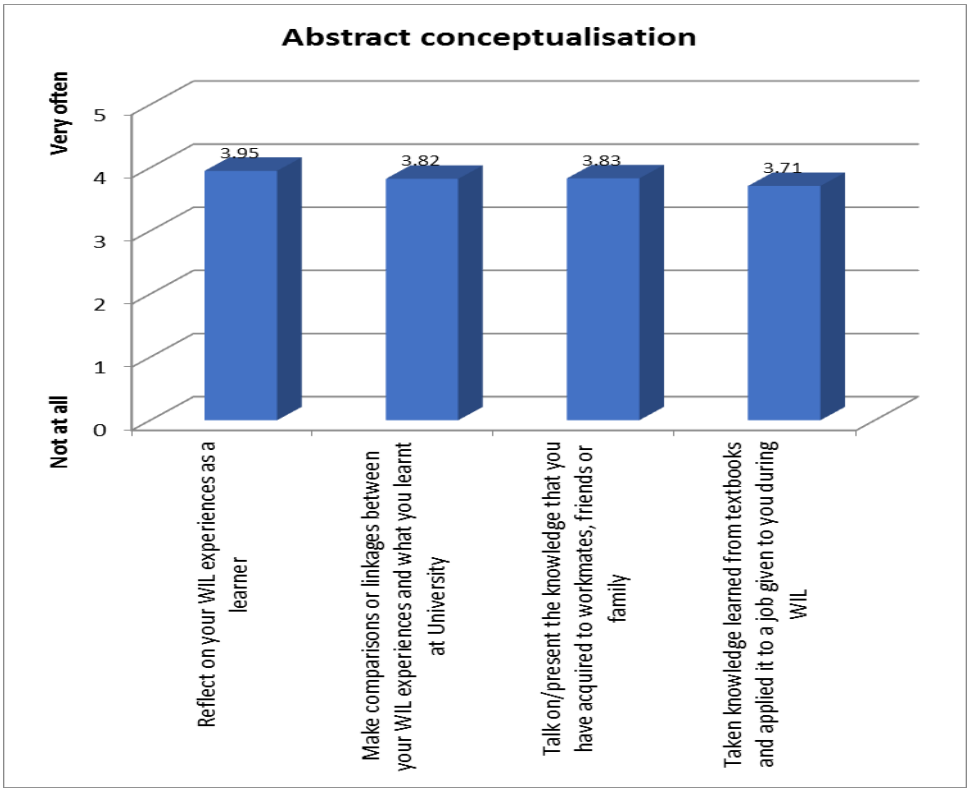

Figure 4-7: Results of Abstract Conceptualisation

4.5.1 Reflect on WIL Experiences as a Learner

Students were reported to often reflect on their WIL experience. Results show a mean of 3.95, a standard deviation of 1.027 and t-test of 141, which equals to 16.836. The high level of student reflection on the WIL experience may be as a result of students' need to understand their training and acquire skills in order to increase their chance of being employable in the future. Furthermore, students need to constantly assess their learning experience and plan for the future. Jacobs (2015) suggests assessment as an important tool to encourage student reflection on experience and knowledge gained in the workplace. He further suggests that reflection plays an important role when there is a need for improvement.

4.5.2 Make Comparisons with University Knowledge

There is evidence that students often made a linkage between WIL experiences and what they learnt at the university. The results indicate a mean of 3.82, a standard deviation of 1.054 and t-test of 141, which equals to 14.970. Work Integrated Learning allows students the opportunity to test their theoretical knowledge taught in the classroom on real-life work situations. For students to be able to successfully complete and pass their WIL training, they

need to learn new skills and acquire knowledge offered by the hosting companies or organisations. All diploma programmes periodically assess the relevance of the curriculum in relation to industry expectations. This exercise results in the curriculum being aligned to the needs of industry hence students were able to make comparisons between their experiences and knowledge gained at the university.

4.5.3 Share Knowledge Acquired

The results show a mean of 3.83, a standard deviation of 1.017 and t-test of 141, which equals to 15.590 indicating a high level of participation. Students often share their acquired knowledge with classmates, workmates, friends and family. Theoretical knowledge acquired during classroom lessons, plus WIL experience, often becomes knowledge that one uses on a daily basis, whether it is at work or at home.

4.5.4 Use Textbook Knowledge in Tasks

The level of high participation is further evident by the results which indicate a mean of 3.71, a standard deviation of 1.235 and t-test of 141, which equals to 11.685. All students participating in the research study were required to have hands-on experience of the knowledge they acquired during their studies. For example, Electrical Engineering students may learn about wiring from their textbook and then be required to do a project that involves wiring, which allows them to develop their theoretical knowledge into the practical skill of wiring.

4.6 ACTIVE EXPERIMENTATION

The results of active experimentation in Figure 4.8 indicate that students perceived WIL as useful; hence they envisaged themselves applying the knowledge acquired during WIL. All activities showed a mean which is greater than 2.5, and we can therefore conclude that there was a high level of involvement in active experimentation. Questions with regards to active experimentation focused on the perceptions of student concerning the future.

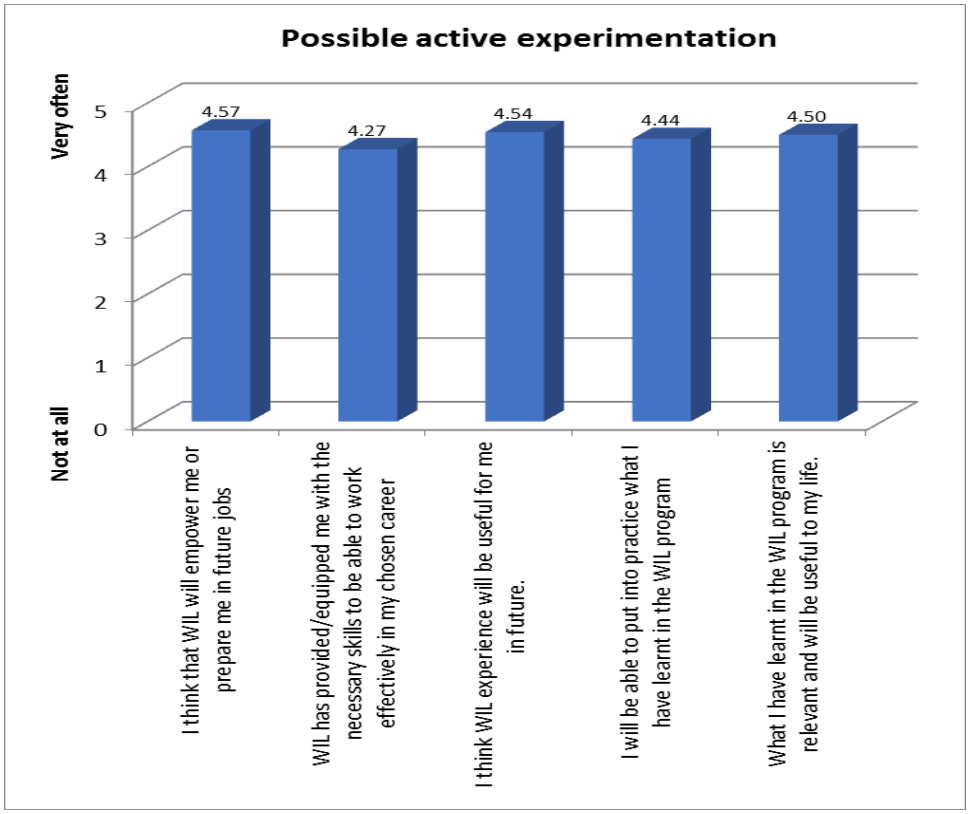

Figure 4-8: Results of Active Experimentation

4.6.1 WIL Empowers for Future Jobs

The results indicate that students believed WIL training would prepare them for the future. This is supported by the mean score of 4.57, the standard deviation of .794 and t-test of 141, which equals to 31.090. In most cases, companies who train students for their WIL period will offer students employment after they have completed their study hence the response of students participating in this research study. This idea is confirmed by Brydson (2013) who holds that, due to WIL in Jamaica, the University of Technology students are the preferred candidates for employment. Further support is provided by Bates & Bates (2013) who state that employers use WIL placement as the preferred platform to recruit graduates.

4.6.2 WIL Provided Necessary Skills

Students identified WIL training as necessary in order to gain skills to be able to work in their chosen careers. This is indicated by results which show a mean of 4.27, a standard deviation of .969 and t-test of 141, which equals to 21.833. Most companies or organisations recruiting from the University of Technology prefer to hire students who already have hands-on

experience which they acquired during the Work Integrated Learning training. An example is of Electrical Engineering students, who will undergo twelve months of WIL training and after completion, will be employed as Engineers in Training, which could take another two years. This shows how important it is to have necessary skills in order for students to progress in their chosen careers.

4.6.3 WIL Usefulness in the Future

Most participants believed that WIL experience would be useful in their future. This is confirmed by the results, which show a mean of 4.54, a standard deviation of .822 and t-test of 141, which equals to 29.610. WIL training is likely to improve students' perception of their field of study and future work challenges. This view is supported by Wheeler (2015) in the study conducted on students' perception of Work Integrated Learning at the Central University of Technology, which provided evidence that career clarification, professional identity, increased employment opportunities, increased competence and increased technical knowledge and skills are some of the identifiable career benefits of WIL.

4.6.4 Will be Able to Replicate What I Have done during WIL Training

Respondents believed that they would be able to practice skills acquired during WIL on tasks that may be assigned to them. This is evident by results which indicate a mean of 4.44, a standard deviation of .879, and t-test of 141, which equals to 26.256. Students participating in WIL are not only required to acquire knowledge but they are expected to demonstrate understand and application of that knowledge. Knowledge transfer is more effective when it involves practical experience.

4.6.5 Relevance of WIL Experience

There is evidence that students who participated in this research study believed that the WIL programme was relevant and would be useful to their lives. This is shown through the results which indicate a mean of 4.50, a standard deviation of .873 and t-test of 141, which equals to 27.295. Today's industries value skills developed through practical experience. Usher (2011) states that WIL opportunities have value and create benefits for students, including employment readiness and job-related skills. In addition, Jackson (2013) indicates that WIL builds students' confidence, increasing students' appreciation of the importance of

employability skills and knowledge, as well as serving as an introduction to the world of work.

4.7 DISCUSSION

Based on Kolb's theory of learning framework used in this dissertation, we can conclude that students were exposed to experiences that enabled learning during WIL if they were significantly exposed to all four constructs of the framework. From the results presented in this chapter, it can be asserted that the students were exposed to all four stages of the learning cycle, as defined in Kolb's framework. Figure 4.9 show that all stages of the learning cycle were achieved. An average mean value 3.4 for all four stages is an indication that the students were exposed to activities that enabled learning.

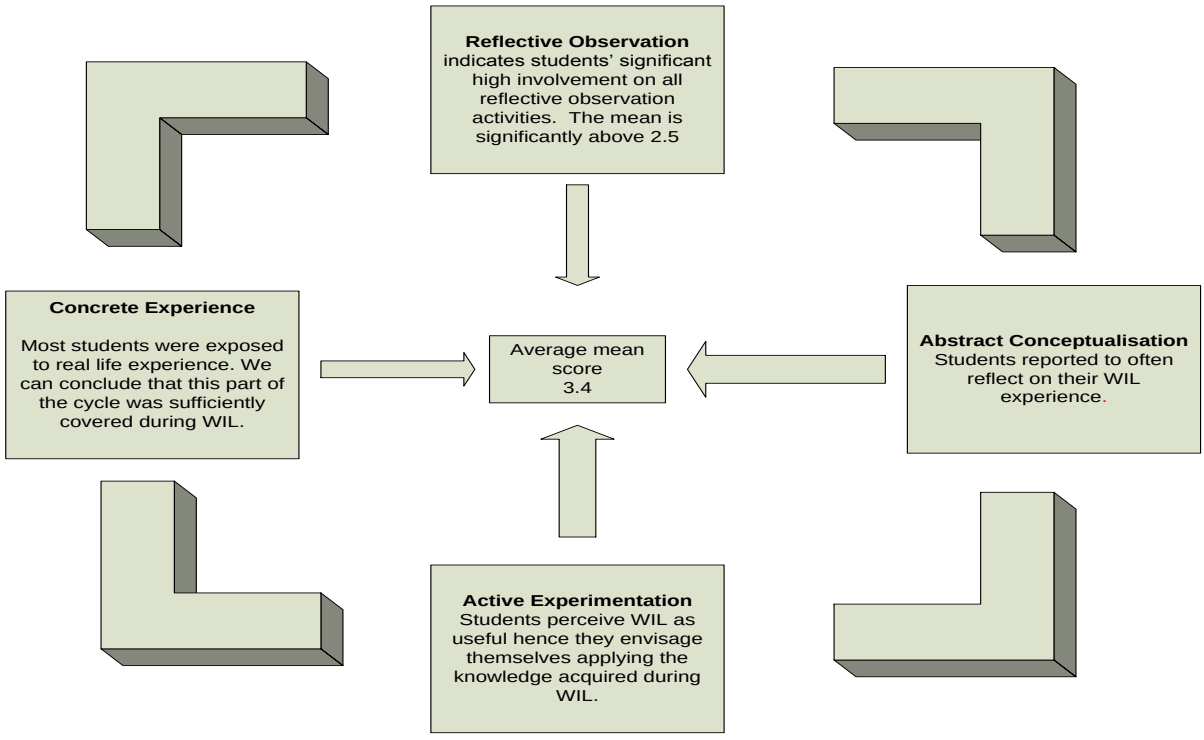

Figure 4-9: Results according to Kolb's theory of learning

4.8 CHAPTER SUMMARY

This chapter presented the findings of this research study, based on Kolb's learning theory. A survey of 142 students across five diploma programmes was conducted and the results were analysed using SPSS, version 18. Of the respondents, 54% were from IT, 18% were from Mechanical Engineering, 3% came from Analytical Chemistry, 18% came from Electrical Engineering, and 7% were from Chemical Engineering. The results reported point to the fact that the respondents were exposed to experiences that allowed for learning and skills development. There was no significant difference in any of the constructs measured across gender, age and level of studies. When comparing the level of participation on all four constructs; active experimentation was clearly most often practiced, which is confirmed by the results showing a mean of 4.4648, a standard deviation of .76318 and t-test of 142, which equals to 30.679. Students perceived WIL as a useful tool and could envisage themselves applying the skills and knowledge acquired through WIL in the future.

Reflective observation activities were the second most regularly practiced, the results showing a mean of 3.9038, a standard deviation of .96803 and t-test of 142, which equals to 17.280. Students often reflected on their training through activities like feedback sessions, completing logbooks and supervisor and mentor participation.

Abstract conceptualisation was the third most practiced, with results that show a mean of 3.8292, a standard deviation of .74220 and t-test of 142, which equals to 21.341. Students could link their WIL experience and make comparisons between their theoretical and WIL knowledge.

Concrete experience was least practiced by the students, with results that show a mean of 1.621, a standard deviation of .7023, and t-test of 142, which equals to 36.721. Students participated less in concrete experience activities, with problem-solving being often practiced, followed by team-building exercises, work projects, and presentation. Client interaction was the least practiced activity.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5. INTRODUCTION

The study was successfully conducted to investigate the influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal. The conclusions are limited to the findings of this study, but it is important to mention that a thorough effort was made to ensure this research study is unbiased and scientific. Conclusions were drawn from the following objectives:

a) The first objective of this research study was to determine the influence of concrete experience on students' learning at a University of Technology.

The study revealed that, during Work Integrated Learning, most of the students were exposed to, and participated in, activities such as team-building, problem-solving, presentation and work on projects that form concrete experience. However, there was not much exposure to interaction with clients. Deslauriers *et al*., (2016) state that in order to modify and strengthen Work Integrated Learning, it is important to understand how students learn.

b) The second objective of study was to ascertain the influence of reflective observation on students' learning at a University of Technology.

The study showed that the activity students practiced the most were the reflective observation activities, by writing reports on work they did, completing their logbooks and often interacting with their mentors and work supervisors. The study also revealed that students often had feedback sessions and were afforded opportunities to ask questions and receive answers. Reflective observation plays a big part in the student Work Integrated Learning experience, as it enhances the meaning of leaning. Ryan & Ryan (2013) acknowledge that reflection is complex, and takes time to do well, but it also promotes lifelong learning and professional practice in higher education.

c) The third objective of the study was to investigate the influence of abstract conceptualisation on students' learning at a University of Technology.

The study revealed that most of the students often thought about what they are learning and experiencing. They were able to use knowledge that they already had in order to

perform their Work Integrated Learning. The study further revealed that most students often reflected on their experience and made comparisons with what they learnt at the university. Abstract conceptualisation talks to gaining knowledge on what you have experienced. Learning experience needs to integrate knowledge with the previous experience of the students through various teachings and practical experience encountered in the workplace setting (Yorke, 2011).

d) The fourth objective of the study was to understand the influence of active experimentation on students' learning at a University of Technology.

The study revealed that most of the students had a positive attitude towards Work Integrated Learning. They agreed that WIL was an important part of their learning experience, as they believed that it would empower them in the future and it would also increase their chance of being employable. The study also shows that students were confident that they would be able to use the experience they gained through WIL throughout their life. Furthermore, WIL students were able to put into practice their theoretical experience. Work Integrated Learning students relate to active experimentation by applying their experience in their daily life in order to see the results, as well as use assumptions for future situations. The study conducted at the Central University of Technology by Wheeler (2015) suggests that WIL students' adaption to the work environment leads to confidence in their abilities and more work participation, which in turn improves their chance to be employed.

5.1 LIMITATIONS AND FUTURE WORK

In this subsection, a list of the limitations of this study is discussed. From each identified limitation, opportunities for future research are identified and discussed briefly.

5.1.1 The number of students who participated

Due to time constraints, this study was carried out at one University of Technology based in KwaZulu-Natal. The respondents were Work Integrated Learning students from two faculties; namely Engineering and Natural Sciences. Therefore, results may be different if future studies include other faculties.

Future work may focus on a comparative study across different disciplines. From the results obtained in this work, it is clear that student experiences are different across disciplines. It is therefore imperative to investigate these differences so as to make appropriate recommendations rather than generalise.

5.1.2 Accessibility of Students

Work Integrated Learning students are hosted by companies throughout South Africa. It is rather challenging to contact all students, and as a result the study did not include all Work Integrated Learning students, due to students being scattered throughout the country. However, the sample is sufficiently reliable to allow the study to generate credible findings.

In future work, it may be beneficial to try and include more WIL students and maybe recruit work supervisors to assist with WIL student accessibility.

5.1.3 Research Method Used

Ideally, it would have been better to adopt a mixed research approach. However, due to time constraints, quantitative data was gathered for analysis. Questionnaires limited what the respondents could say. Collecting qualitative data would have resulted in the students opening up more about their experiences.

Future aspects of this research may use a mixed research approach in order to gain a more comprehensive understanding of the subject matter.

5.1.4 Time Constraints

Due to time constraints, this research study was conducted at one University of Technology.

For future research, it may be interesting to include other Universities of Technology in order to compare the responses and gain more understanding of the influence of Work Integrated Learning on students from multiple institutions.

5.2 RECOMMENDATIONS

Based on the findings from this study concerning concrete experience, although students were exposed to most activities, there was a lack of exposure to interaction with clients.

It is recommended that the relationship between companies and universities is strengthened in order to have successful Work Integrated Learning. This can be accomplished by the use of advisory committee meetings.

Universities of Technology have realised the importance and the role that is played by their industrial partners. They have since formed what is now known as Advisory Committees or Advisory Boards, which are made up of industrial partners and university staff members. These are committees where curriculum issues are discussed and agreed to. They are also where WIL structure is discussed. They are also a mechanism for the facilitation of development of sustainable working relations and partnerships between university and industry are formed. All academic departments are required to conduct these meetings at least once a semester.

5.2.1 Consultation with Employers

Reflective observation highlighted the importance of work mentors and supervisors. The study conducted has also shown that the availability of supervisors to students ensures that reflective observation activities are accomplished. This study also highlighted the importance of work supervisors in the acquisition of knowledge and workplace skills by students. It is recommended that such relationships continue to grow, as they are of mutual benefit to universities, students and employers.

Partnerships between Universities of Technology and industry players ensure extensive involvement by all parties in development of curricula. It also ensures that curricula are relevant to industry needs, as well as employability of students. Consultation with employers also encourages innovative industrial research, as well as developing practical abilities required by employers to successfully train and employ students.

5.2.2 Increase in Student Visitation and Monitoring

This study stressed the importance of monitoring and assessment of students, as well as reflection using tools like presentation, feedback, logbooks, teambuilding exercises and being involved in a work project. It is therefore recommended that visitation and monitoring of WIL students is increased and supported by both the Universities of Technology and employers.

Student visitation and monitoring is crucial to the success of Work Integrated Learning. This is when a WIL coordinator visits the work supervisor in order to discuss the issues relating to WIL performance of the students hosted by the company. The main aim of monitoring is to witness and evaluate the training that students receive from the industry.

5.3 CONTRIBUTIONS TO KNOWLEDGE

5.3.1 Although much work has been done on Work Integrated Learning, there is no work the researcher is aware of that has investigated the exposure of students to Work Integrated Learning. The research is vital in order to check if the industry is giving sufficient practical work to the students. There have been a few reports where the industry would host students but were not able to give them the necessary exposure. It was therefore imperative to carry out an investigation on concrete experience during WIL.

5.3.2 There are numerous methods one could use in order to reflect on experience. The student reflection during WIL challenges students to be critical about their learning experience and encourages them to look back on, and think about, their experience in the form of activities like writing reports, completing logbooks, asking questions and seeking work supervisor guidance. To the best knowledge of the researcher, there are limited research studies available on student reflective observation during WIL. Research studies on reflective observation are vital in order to encourage understanding and application of the reflection tools.

5.3.3 The relevance of the curricula of Universities of Technology is determined by how well it is aligned to industry developments. In order for students to learn, they need to have an opportunity to test the theoretical knowledge taught in the classroom in real life work situations. Abstract conceptualisation encourages students to reflect on their WIL experience, share their acquired knowledge as well as test their classroom

knowledge and skills in the world of work. The results of this research can contribute towards the design of relevant curricula for the various Diploma programmes.

5.3.4 Universities of Technology in South Africa have been running the WIL programme for some time, but insufficient research has been conducted to determine if the students benefited from their experiences. This research addressed that gap by determining the student perceptions of active experimentation. Active experimentation encourages learners to take what they have learnt and predict what will happen next or what actions should be taken, as well as placing into context the relevance of what they have learnt and the usefulness of that education to their lives. It is thus important to do more research on active experimentation in order to develop students' confidence in their future.

5.4 CHAPTER SUMMARY

This research study has shown that students had exposure to all four stages of the learning cycle, which are concrete experience (learning by doing or having experiences), reflective observation (reviewing the experience), abstract conceptualisation (learning from the experience) and active experimentation (trialling what has been learned) (McLeod 2010). Based on the research findings, conclusions can be drawn that students are positively affected by Work Integrated Learning, and studying does take place as a result of practical learning experience received through industry exposure.

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APPENDICES

Gate Keeper Letter

Mangosuthu
University of Technology

25 April, 2017

Dear Mrs ZC Hlubi

It is my pleasure to inform you that permission to conduct project titled: "The influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal" has been granted.

Permission to conduct the project is granted on the condition that any changes to the project must be brought to the attention of the MUT Research Ethics Committee as soon as possible.

Good luck with your research.

Yours faithfully,

Prof. K Shale

Director: Research (Acting)

031 9077354/7450

Karabo.shale@mut.ac.za

Ethical Clearance Letter

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

20 June 2017

Mrs Zamandaba Cynthia Hlubi (213569805)
School of Management, IT & Governance
Westville Campus

Dear Mrs Hlubi,

Protocol reference number: HSS/0690/017M
Project title: The influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal

Approval Notification – Expedited Application

In response to your application received on 25 April 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application 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.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Dr Given Mutinta
Cc Academic Leader Research: Professor Brian McArthur
Cc School Administrator: Ms Angela Pearce

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za

Informed Consent Form

UNIVERSITY OF KWAZULU-NATAL

UKZN HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE (HSSREC)

APPLICATION FOR ETHICS APPROVAL
For research with human participants

Information Sheet and Consent to Participate in Research

15 September 2017

Dear respondent,

My name is **Zamandaba Cynthia Hlubi;** I am a Master student in the discipline of human resource management at the school of management, information technology and governance of the University of KwaZulu-Natal.

Researcher: Zamandaba Cynthia Hlubi (083 549 1798); zamah@mut.ac.za
Supervisor: Dr Trishana Ramluckan (031 260 8854); RamluckanT@ukzn.ac.za

You are being invited to consider participating in a study that involves research the influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal.

The aim and purpose of this research is to address the issue of leaners who are unable to graduate as a result of not meeting the requirements for workplace training.

The study is expected to include 135 students on from Chemical Engineering, Electrical Engineering, Mechanical Engineering, Information Technology and Analytical Chemistry. The research study will be conducted at Mangosuthu University of Technology.

The researcher will personally administer the questionnaires to the participating students. The duration of your participation if you choose to participate and remain in the study is expected to be 30 minutes. The study will provide no direct benefits to participants. We hope that the study will create awareness on the effect of Work Integrated Learning on student as well as offer insight on issues that adds to unemployment of graduates.

This study has been ethically reviewed and approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number: HSS/0690/017M).

In the event of any problems or concerns/questions you may contact the researcher at 083 549 1798 or zamah@mut.ac.za or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban 4000 KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557- Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

Your participation in the study is voluntary and by participating, you are granting the researcher permission to use your responses. You may refuse to participate or withdraw from the study at any time with no negative consequence. There will be no monetary gain from participating in the study. Your anonymity will be maintained by the researcher and the School of Management, I.T. & Governance and your responses will not be used for any purposes outside of this study.

All data, both electronic and hard copy, will be securely stored during the study and archived for 5 years. After this time, all data will be destroyed.

If you have any questions or concerns about participating in the study, please contact me or my research supervisor at the numbers listed above.

Sincerely

Zamandaba Cynthia Hlubi

UNIVERSITY OF
KWAZULU-NATAL

CONSENT TO PARTICIPATE

I _____ have been informed about the study entitled the influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal by Zamandaba Cynthia Hlubi.

I understand the purpose and procedures of the study the influence of Work Integrated Learning on students studying at a University of Technology in KwaZulu-Natal.

I have been given an opportunity to ask questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as a result of study-related procedures.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at 083 549 1798, zamah@mut.ac.za.

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION
Research Office, Westville Campus
Govan Mbeki Building
Private Bag X 54001
Durban
4000
KwaZulu-Natal, SOUTH AFRICA
Tel: 27 31 2604557 - Fax: 27 31 2604609
Email: HSSREC@ukzn.ac.za

_____ _____
Signature of Participant **Date**

_____ _____
Signature of Witness **Date**
(Where applicable)

_____ _____
Signature of Translator **Date**
(Where applicable)

Questionnaire

Section A: Demographics

1.1 What is your gender?

Male	Female

1.2 What is your age in years?

18 - 20	21 - 23	24 - 26	27 - 29	30 and above

1.3 What is your current level of study? (Select ONE option only)

Semester 4	Completed Practical 1	Completed Practical 2	In a process of completing WIL	Completed WIL

1.4 Which qualification are you studying towards?

Chemical Engineering	Electrical Engineering	Mechanical Engineering	Information Technology	Analytical Chemistry

Section B: Work Integrated Learning (WIL) related questions

2.1 For each of the following media used to obtain Work Integrated Learning, rate from 1 (not at all effective) to 5 (extremely effective) the <u>level of effectiveness</u> you experienced. <u>If you did not use a medium, tick the 'did not use' option</u>.

Medium	Did not use	Not at all effective 1	2	3	4	Extremely effective 5
2.1.1 Co-operative Education Office						
2.1.2 Local newspaper						
2.1.3 Facebook						
2.1.4 Internet						
2.1.5 Employment agency						
2.1.6 Word of mouth						
2.1.7 Through lecturer						

2.2 Concrete experience (Learn by doing/ having experience)
On a scale of 0 to 5, with 0 being 'not at all' and 5 being 'very often', rate your participation in the following tasks:

		Not at all 0	1	2	3	4	Very often 5
2.2.1	How often did you take part in team-building exercises?						
2.2.2	How often were you involved in problem-solving?						
2.2.3	How often did you do a presentation?						
2.2.4	How often did you interact with clients?						
2.2.5	How often were you involved in work projects?						

2.3 Reflective observation (Reviewing or reflecting on experience)
On a scale of 0 to 5, with 0 being 'not at all' and 5 being 'very often', rate your participation in the following tasks

		Not at all 0	**1**	**2**	**3**	**4**	**Very often 5**
2.3.1	How often did you write reports on work you had done?						
2.3.2	How often did you complete your logbook?						
2.3.3	How often was your supervisor or mentor present to guide you?						
2.3.4	How often were you afforded the opportunity to ask questions and get answers?						
2.3.5	How often did you have feedback sessions where you outlined or explained your understanding of the tasks given to you?						

2.4 Abstract conceptualisation (Learning from experience)
On a scale of 0 to 5, with 0 being 'not at all' and 5 being 'very often', rate your participation in the following tasks

		Not at all 0	**1**	**2**	**3**	**4**	**Very often 5**
2.4.1	How often do you reflect on your WIL experiences as a learner?						
2.4.2	How often did you make comparisons or linkages between your WIL experiences and what you learnt at University?						
2.4.3	How often do you talk-on/present-on the knowledge that you have acquired to workmates, friends or family?						
2.4.4	How often have you taken knowledge learned from textbooks and applied it to a job given to you during WIL?						

2.5 Understanding the extent of possible active experimentation

On a scale of 0 to 5, with 0 being 'strongly disagree' and 5 being 'strongly agree', provide your perceptions on how WIL will benefit you in your future career/jobs/tasks

		Strongly disagree 0	1	2	3	4	Strongly agree 5
2.5.1	I think that WIL will empower me or prepare me in future jobs						
2.5.2	WIL has provided/equipped me with the necessary skills to be able to work effectively in my chosen career						
2.5.3	I think WIL experience will be useful for me in future.						
2.5.4	I will be able to put into practice what I have learnt in the WIL programme						
2.5.5	What I have learnt in the WIL programme is relevant and will be useful to my life.						

Thank you for your time

Turnitin Report

ORIGINALITY REPORT

9%	5%	1%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of KwaZulu-Natal Student Paper	4%
2	uir.unisa.ac.za Internet Source	1%
3	aaaeonline.org Internet Source	<1%
4	Submitted to University of Zululand Student Paper	<1%
5	Sarojni Choy. "Partnerships between universities and workplaces: some challenges for work-integrated learning", Studies in Continuing Education, 07/2011 Publication	<1%
6	Submitted to Universal College of Learning Student Paper	<1%
7	open.uct.ac.za Internet Source	<1%
8	Submitted to North West University Student Paper	<1%