THE EFFECTS OF CELLULAR PHONE INNOVATION ON BRAND IMAGE AND PURCHASE INTENTION AMONGST UKZN STUDENTS.

By

Dina Osman

Student Number: 211503677

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College of Law and Management Studies

School of Management, IT and Governance

Supervisor: Sanjay Soni

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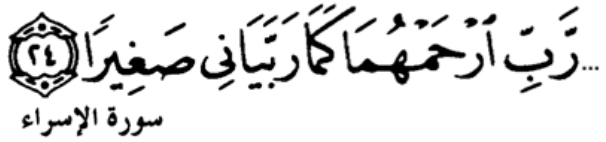
Dedication



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Abstract

Given the rapidly and continually changing economy, innovation has become a necessity for companies that wish to endure and grow. This study approached innovation from a consumer perspective and aimed to discover whether innovation is associated with brand image and purchase intention in the cellular phone industry amongst Generation Y consumers. Brand image is important as it influences purchasing decision; when customers see one brand as more innovative as compared to others, they are more likely to purchase. The importance of purchase intention stems from its ability to determine actual purchase of a product and thereby to determine the success of innovation; therefore these two variables, brand image and purchase intention, were selected. The study also aimed to answer the question of which innovation factors - performance or appearance - are most valued by consumers, with focus on the cellular phone industry from the perspective of South African students.

A quantitative approach was employed in the study to survey students and a four part questionnaire was physically distributed to 372 students at the Westville Campus of the University of KwaZulu-Natal (UKZN). A five point Likert scale was used with responses to questions ranging from 1 (strongly disagree) to 5 (strongly agree). An interval scale was used to measure the responses. The data was captured and a software program, *Statistical* Package for the Social Sciences (SPSS), was used to analyse the data and create graphs to present the findings. Descriptive statistics, factor analysis, t-tests and regression were conducted so as to obtain comprehensive results.

The highly competitive nature of the cellular phone industry and high penetration in South African markets has created a demand for brands to become more innovative and to differentiate their products in order to survive and maintain a competitive advantage. The findings of the study were consistent with the literature sources and indicated that features related to performance were slightly more important than those related to appearance. Based on the findings it was also concluded that by improving innovation in cellular phone technology, brand image is consequently improved. Enhancing innovation and strengthening brand image in turn increases purchase intention. This creates a further incentive to implement and practice innovative initiatives which have a positive trickledown effect.

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CHAPTER ONE: NATURE AND SCOPE OF THE STUDY

1.1 Introduction

In a rapidly and continually changing economy, it is vital for companies to become innovative in order to survive and grow (Tucker, 2008). This study approaches innovation from a consumer perspective and aims to discover whether innovation is associated with brand image and purchase intention. Brand image strongly influences the purchasing decision; when customers see a brand as more innovative compared to others, they are more likely to make a purchase (Andrews & Kim, 2007). Brand image is also important because it differentiates products, allows products to automatically be included in consumers' consideration and may lead to brand trust and risk reduction (Keller, 2013). Purchase intention is essential to predicting and determining the actual purchase of a product, particularly a new product, and gauging its potential success (Kuo, Wu & Deng, 2009). For the aforementioned reasons, the variables of brand image and purchase intention were selected for consideration in this study. The study also aims to answer the question of which innovation factors are most valued by consumers, with special focus on the cellular phone industry, from the perspective of South African students, by surveying students at the University of KwaZulu-Natal (UKZN).

The highly competitive nature of the cellular phone industry and high penetration in South African markets has created a demand for brands to become more innovative in order to continue operating, to differentiate their products and maintain a competitive advantage (Husso, 2011; Swann, 2009). Hence, this industry was chosen as a point of focus.

From the above discussion it becomes clear that studying the three concepts of innovation, brand image and purchase intention in an integrated manner would provide valuable information and insight to marketing managers; such insight would enable them to make better strategic decisions, particularly in highly competitive and technological industries.

1.2 Background of the Study

Most large companies make substantial investments in research and development (R&D) in order to increase their innovations and consequently their sales. However,

companies that invest a significantly large amount of money in R&D and innovation are not necessarily the most innovative (Groth, 2011). By understanding which specific factors of innovation to focus on, the effectiveness of R&D investments is increased and results in the production of more successful innovations that translate to real sales. The ultimate achievement with innovation is to have superior products in terms of quality as well as price and to differentiate products from competitors.

By studying the effect that innovation has on brand image and consumer purchase intention, investments into innovation can be better justified. This study attempts to demonstrate that by investing in innovation, there are positive effects in other aspects, such as improving brand image and increasing purchase intention and possibly actual purchases. Another issue supporting the need for the study is the very high level of competition, continually emerging technology and growth in the cellular phone industry which are the driving forces for innovation (O'Sullivan & Dooley, 2008). The strong presence of the driving forces of innovation means that consumer research is essential in improving innovation initiatives.

The results of this study would provide valuable insight to innovative companies and entrepreneurs regarding which specific factors of innovation should be most heavily invested in, as well as how this innovation may impact on their brand image and their consumers' purchase intentions. Without such information, unnecessary risk and incremental changes to products would be made that may not yield a positive return. In this research, innovation is defined as any new product or service or improvements of any degree made to existing products or services that add value and fulfill organisational objectives (O'Sullivan & Dooley, 2008), while brand image refers to perceptions of the brand held by consumers based on their knowledge of that brand (Keller, 2013). Lastly, purchase intention is the realistic predisposition that a consumer holds to make a purchase sometime in the future (Keller, 2013).

1.3 Problem Statement

Research regarding innovation in a marketing and business sense is often approached from within the organisation, such as the creation of a culture conducive to innovation and strategy formulation. However, the consumer is the final judge of all innovations; it is the consumer who, by deciding to purchase or abstain from purchasing an

innovative product, determines its success. It is therefore imperative that some research on innovation be focused on consumers. By uncovering which factors of innovation are most important and how innovation impacts brand image as well as purchase intention, organisations can then focus their investments on the factors most valued by consumers and which therefore are most likely to achieve marketing objectives.

Furthermore, there are gaps in existing knowledge on the topic of how innovation impacts brand image and purchase intention, which give rise to the need for such a study. For example a study by Shiau (2014) focused on innovation, brand image and behavioural intention in the Japanese animé dolls industry in Taiwan, however similar studies have not been done in the cellular phone industry, nor has research been conducted which focuses on students in particular. In addition, previous research tends to focus on just one aspect in isolation from the others, such as only brand image or innovation or purchase intention in the cellular phone industry. An example is a study by Faryabi, Fesaghandis and Saed (2015), which focused only on purchase intention of cellular phones in Iran. Moreover, none of these previous studies were conducted in South Africa, and none have concentrated on generation Y individuals. There is therefore a need for research related to this area of study in South Africa.

Drawing from the problem statement the research questions were formulated and are presented next.

1.4 Research Questions

1. What are the most important factors relating to the innovation of cellular phones for UKZN students?

2. How does innovation affect brand image for cellular phones?

3. Does innovation have a positive effect on brand image?

4. How does innovation affect purchase intention amongst UKZN students for cellular phones?

5. Does innovation have a positive effect on purchase intention?

6. How does brand image affect UKZN students' purchase intentions for cellular phones?

1.5 Research Objectives

The objectives of the research serve as a guide to the entire research and data collection process. The objectives of this study are as follows:

1. To identify the most important factors relating to the innovation of cellular phones for UKZN students.

2. To determine how innovation impacts on the brand image of cellular phones amongst UKZN students.

3. To determine whether cellular phone innovation helps to improve brand image.

4. To understand how innovation affects UKZN students' purchase intentions for cellular phones.

5. To determine whether innovation in cellular phones provides a better chance for a positive intention to purchase to arise.

6. To determine whether brand image creates a more favourable intention to purchase a cellular phone.

1.6 Hypothesis

There is no hypothesis for the first research question and objective as this is the exploratory aspect of the research.

H_0: The innovation of cellular phones has no effect on brand image.
H_1: The innovation of cellular phones has an effect on brand image.

H_0: The innovation of cellular phones does not have a positive effect on brand image.
H_2: The innovation of cellular phones has a positive effect on brand image.

H_0: The innovation of cellular phones has no effect on consumers' purchase intention.
H_3: The innovation of cellular phones has an effect on consumers' purchase intention.

H_0: The innovation of cellular phones does not have a positive effect on consumers' purchase intention.
H_4: The innovation of cellular phones has a positive effect on consumers' purchase intention.

H_0: Brand image does not have a positive effect on consumers' purchase intention.
H_5: Brand image has a positive effect on consumers' purchase intention.

1.7 Research Design

Secondary data analysis formed the theoretical foundation of the study. Literature that was relevant to the research with regards to innovation, brand image and purchase intention as well as the cellular industry was extensively reviewed; such literature was collected from journals, books, the Internet and other relevant sources.

A quantitative research approach was employed in this study as it allows for hypothesis testing and factor analysis (Sekaran & Bougie, 2013), both of which are inherent in this study. Quantitative research is also less biased, can be generalised more widely and has greater reliability and validity than qualitative research (Sekaran & Bougie, 2013). Findings can more easily be expressed numerically, which allows for quicker statistical analysis using computer-based applications as compared to the more time-consuming analysis involved in qualitative research (Sekaran & Bougie, 2013). The study has elements of both exploratory and descriptive studies. The exploratory aspect of this

study refers to the objective of identifying the specific factors that relate to innovation of cellular phones. The descriptive element refers to the objectives of understanding how specific factors relating to innovation affect brand image and purchase intention.

The study site for the research was the Westville campus of the University of KwaZulu-Natal (UKZN) and students from this campus made up the sample. The data was collected using a self-administered questionnaire that was distributed physically by the researcher amongst the students. The questions consisted of a mix of structured, closed-ended and numerical questions. A five point Likert scale was used, which ranges from 1 (strongly disagree) to 5 (strongly agree) as responses to the questions asked. An interval scale was used to measure the responses.

Once the data was coded, descriptive statistics were produced. A factor analysis was conducted to identify which are the leading factors of innovation in the cellular phone industry and a linear regression was performed to determine the links between innovation, brand image and consumer purchase intention. The research methodology, sampling method and analysis techniques are discussed in greater depth in Chapter Four.

1.8 Summary Outline per Chapter

The research consists of seven chapters in total. These chapters comprise the introduction, literature review, research methodology, research findings and analysis, discussion of the findings, and lastly the conclusions and recommendations. Below is a summary of the contents of each chapter.

Chapter One: *Introduction*

The first chapter includes the introduction and background to the study, the motivation for the study, the research questions and objectives as well as the research design. The outline of each chapter in the research is also included in the first chapter.

Chapter Two: *Literature Review - Innovation*

The second and third chapters will focus on a review of literature relevant to the area of focus of the study and the conceptual framework. Chapter Two will offer an in-

depth overview of innovation and will begin with a discussion of the history, classifications and types of innovation. Thereafter, the driving forces of innovation, challenges and diffusion of innovation into society will be considered. Next, the importance of innovation and the models that can be used to measure it will be outlined. This chapter will also briefly examine the history of cellular phones, the industry in South Africa and why innovation is particularly important in the cellular phone industry.

Chapter Three: *Literature Review - Brand Image and Purchase Intention*

Chapter Three forms the second chapter of the literature review and contains a discussion of the concepts of brand image and consumer purchase intention. The first part of Chapter Three discusses brand image by defining it in relation to cellular phones, examining its importance and considering how brand image can be measured. Thereafter, brand image is linked to innovation. The second part of chapter three, introduces the consumer purchase intention, by defining it and reviewing the factors that influence purchase intention, and discussing how purchase intention is measured. The chapter then commences to link purchase intention with innovation and with brand image. Finally the relationships between innovation, brand image and purchase intention are explored.

Chapter Four: *Research Methodology*

Chapter Four focuses on the research methodology that was used in the study, which was based on a quantitative research approach. The chapter recaps the objectives and hypotheses of the study and then discusses the research design, sampling method and the processes of data collection that were used. The validity and reliability of the study will also be deliberated on. Furthermore, the methods used to analyse the data gathered will be explained. Lastly, the limitations and ethical considerations encountered in data collection will also be included in the fourth chapter.

Chapter Five: *Research Results and Analysis*

Based on the data collected from the sample using a questionnaire, the research findings and analysis of the data are presented in Chapter Five. This chapter summarises the findings of the research by using both graphs and tables as well as performing inferential statistical analyses.

Chapter Six: *Discussion of the Main Results*

The sixth chapter discusses the findings of the study in relation to the literature review. The participants' responses are interpreted in order to deduce the implications of their answers, with specific reference to preferred features of cellular phones, and the participants' views regarding innovation and brand image. Finally, the participants' responses regarding purchase intention are considered.

Chapter Seven: *Conclusions, Limitations and Recommendations*

The seventh and final chapter summarises and concludes the research. It also briefly discusses opportunities for future, more conclusive research. Furthermore, Chapter Seven explores the limitations of the study as a whole. The chapter lastly provides the overall conclusions and recommendations that emerged from the study.

1.9 Conclusion

Chapter one has provided a brief overview of what is to be expected in the rest of the dissertation. Each aspect mentioned in this chapter will be elaborated on in the chapters to follow. The following two chapters make up the literature review; chapter two will focus on innovation and chapter three on brand image and purchase intention. The next chapter begins the literature review; it offers an in-depth discussion on innovation from a general point and also relates innovation to the cellular phone industry in particular.

CHAPTER TWO: INNOVATION

2.1 Introduction

Chapter Two presents a discussion of the conceptual framework used in this study. Innovation is central to this research and therefore the chapter begins with the history of innovation, the definitions of the concept, as well as the different classifications and types of innovation. Furthermore, the driving forces that have made innovation necessary will be discussed as well as the innovation process. The chapter proceeds by discussing the diffusion of innovation theory. The different measurements of innovation are then examined followed by the main challenges of innovation, before the chapter is concluded.

2.2 The History, Definition and Benefits of Innovation

To establish a comprehensive understanding of innovation, the history and origins of the concept must first be explained. Historically, innovation was approached from a sociological perspective. The first theories come from the French sociologist Gabriel Tarde in the early 1890s who was interested in the explanation of how innovation led to social change (Godin, 2008). Tarde's innovation theories consisted of three main aspects namely invention, opposition and imitation (Godin, 2008). Invention would give rise to opposition and thereafter imitation and acceptance; this was seen as the driving source of society.

Subsequently, beginning in 1928, economist Joseph Schumpeter linked innovation to business and economics (Godin, 2008). According to Schumpeter (1912: 66), five types of innovations were identified. These are:

1. Introduction of a new product or a significant change in an existing product
2. Introduction of new processes or production methods
3. Exploiting of new markets
4. Acquiring new sources of supply (raw materials and inputs) and
5. Implementing new ways of organising business and industry.

However, Schumpeter only concluded that entrepreneurs were responsible for innovation but did not state how they became innovative (Godin, 2008). Over time, economists and business school academics began to further develop theoretical models of innovation, particularly technological innovation, as a process from invention to diffusion, which then progressed to commercialised innovation (Godin, 2008). Commercialised innovation strongly linked innovation to the buying and selling of products in a marketing and business sense. Maclaurin (1953: 105) was the first to formally define commercialised innovation; he defined it as "the introduction of new production processes or new products into the market". In 1962, Rogers further confirmed that historically, innovation was directly linked to marketing by stating that "the adoption of a new idea almost always entails the sale of a new product" (Rogers, 1962: 261). The work of early scholars formed the foundation and was used to develop the innovation theories and models that are being used today by individuals and organisations. One of the most popular processes or models of innovation, the diffusion of innovation, will be discussed later in the chapter. The following discussion focuses on the difficulty of defining innovation.

Despite innovation being an extensively researched topic in numerous disciplines, there is a lack of consensus with regard to a single, formal definition (Wan, Ong & Lee, 2005). According to the Online Etymology Dictionary (2015) the word 'innovation' is derived from the Latin word 'innovatus', which means "introduce as new", or "to renew, restore; to change". This definition, though broad and unrelated to marketing, can be coupled with Schumpeter's innovation types, one of which refers to introducing a new product, new process, new supply source, new organisational methods and entering new markets. In early economics and management innovation referred to advancement and developments in machinery and improvements to the rate of production and manufacturing, particularly due to the increase in mechanisation (Godin, 2008).

In the marketing discipline, innovation refers to a company's efficient utilisation of resources and inventive production methods to meet the needs of the market (Shiau, 2014). O'Sullivan and Dooley (2008: 5) state that innovation refers to:

> the application of practical tools and techniques that make changes, large and small, to products, processes, and services that results in the introduction of something new for the organization that adds value to customers and contributes to the knowledge store of the organization.

Therefore, innovation refers to any degree of newness, whether completely new changes or small modifications or improvements are made. From the definitions above, it also becomes evident that innovative techniques can be implemented to the product, service or processes (O'Sullivan & Dooley, 2008). This means that either the physical product can be innovated, or the services or the process used to manufacture, distribute or price the product or service can be innovated. Innovation can be implemented by an entrepreneur or within an organisation, either public or private, for profit or for reasons other than generating profit. Innovation allows the innovator to enter new markets and reach new consumers, but must also add value for the consumer, fulfil their needs and enhance the degree and quality of products in order to achieve marketing objectives. Therefore, drawing from the general definition of innovation and applying it to cellular phones, innovation is any level of newness to either the hardware, software or the services that may be provided by the cellular phone manufacturer.

Innovation has numerous benefits for the firm and the consumer. Innovation and product improvements are vital to the success of an organisation (Yalcinkaya, Calantone & Griffith, 2007) and innovation is particularly necessary for the success of organisations in technological industries (Kim & Huarng, 2011). Some of the benefits of innovation include attracting new consumers while retaining existing ones, as well as gaining a competitive advantage and creating stronger relations with intermediaries (Hanaysha, Hilman, & Abdul-Ghani, 2014). Furthermore, by introducing new products, the long-term financial performance and brand value is improved (Hanaysha *et al.,* 2014). As for consumers, innovation fulfils their needs in new ways and adds value to their lives (Hanaysha *et al.,* 2014). Consumers are able to enjoy and benefit more from products than they previously did and most innovations also make consumers' lives easier.

The degree of innovation can be used to classify the innovation. Innovation ranges from radical to incremental; the next section will further discuss the classification of innovation.

2.2.1 Classifications of Innovation

There are different degree classifications of innovation which range from incremental to radical (Chandy & Prabhu, 2011). Table 2.1 below summarises the definitions, differences and requirements of radical and incremental innovation.

Table 2.1: Difference between Radical and Incremental Innovation

Radical Innovation	Incremental Innovation
New-to-the-world	New-to-the-company
Delivers a step-change in performance improvement	Delivers gradual performance improvements
Requires new competencies, skills or expertise	Utilises existing competencies and processes
Destroys existing organisational competencies	Enhance existing organisational; competencies
High risk	Low risk
Requires a change in business model	Operates within the existing business model
Radical innovation that delivers sustainable development necessitates social and systemic change	Perpetuates existing social practices
Challenges the rules of the status quo and thus leads to the identification of systemic resistance to change	Does not challenge the systemic status quo and therefore may be adopted with little resistance

(Source: Gaupmann, 2012:1)

Radical innovation is the development or addition of something completely new, or drastic changes to existing products. It often means that new facilities, processes, equipment or competencies would be needed; rendering existing business models useless (Song & Thieme, 2009). Radical innovation is often described as breakthrough innovation, disruptive innovation or competence destroying. Despite the different terms used to describe radical innovation, all descriptions possess a similar notion that this form of innovation entails a discontinuity with earlier processes, business models and competencies (Norman & Verganti, 2014). Consumers usually need to be taught about the radical innovation. Due to the lack of information and experience with radical product innovation, it is a high risk venture and usually requires much more initial investment. Radical innovation is therefore relatively rare

because of the associated risk and the fact that it could actually cause existing competencies to decrease in value.

Incremental innovation, on the other hand, describes innovative changes made in a small scope to existing products or services. Although these small changes may be new to the company, they are usually not new to the world and this decreases the risks associated with incremental innovation (Gaupmann, 2012; Song & Thieme, 2009). Incremental innovation helps improve the product's performance, enhance its appeal and decrease its costs. It also builds upon existing knowledge and resources and employs the facilities and equipment already available. The lifeblood of the company is incremental innovation as the gradual improvements to processes, products and services is an on-going and continuous objective (Davila, Epstein & Shelton, 2012). Incremental innovation is what allows companies to release newer models of products with added features or benefits, and is therefore very often implemented in the cellular phone industry.

While radical innovation may be very risky, the crux of the matter is that both radical and incremental innovations are essential to businesses. New domains, paradigms and potential for key changes are brought about through radical innovations while incremental innovation captures the value of the potential changes captured (Norman & Verganti, 2014). Radical and incremental innovations go hand in hand and businesses should therefore aim to achieve both types. Hanaysha *et al*. (2014) take a slightly different view of innovation and propose that innovation can be classified as a scope consisting of four levels namely: products new to the world; line extensions; products new to the organisation but not the market; and product modifications.

Despite the different understandings of innovation, there is no question that innovation helps brands to gain competitive advantage, to remain relevant in an ever-changing economy and to differentiate their brand (Swann, 2009). This suggests that brands that do not innovate will become outdated and cease to operate; therefore innovation is not a choice but rather a necessity for survival. This is particularly true for the cellular phone industry where, as stated in the introduction, the market is very volatile and has a high rate of innovation, making the need to innovate even higher than in other industries. Undoubtedly, innovation can improve the quality of products,

enhance brand image, reinforce customer loyalty, and attract possible customers (Ottenbacher & Gnoth, 2005). Innovation leads to the development of products and services that are of improved quality, have better features and durability, and possess an attractive price service (Nicoara, Maier & Maier, 2013). In addition to classifying innovation based on its extent, innovation can also be divided into different types, depending on what exactly is innovated. The next section will briefly discuss these different types of innovation, namely to the product, to the service and to the process.

2.2.2 Types of Innovation

Innovation can be implemented on the product, service or process. Product innovation refers to any degree of innovation that is implemented on a physical, tangible good (O'Sullivan & Dooley, 2008). Product innovations usually include changes and improvements to the product's visual appearance and design, increase in the product's features and functions as well as enhancement of the overall quality. In the cellular phone industry, the product comprises the hardware and software (Gupta & Gautam, 2015; Rasmusson, Dahlgren, Gustafsson & Nilsson, 2004). Hardware refers to the physical attributes while software refers to the operating system (Gupta & Gautam, 2015; Rasmusson *et al.,* 2004).

Service innovation is concerned with making alterations that enhance products that are not seen or touched, that is, intangible products such as education, hospitals, banking and entertainment (O'Sullivan & Dooley, 2008). Services can therefore be defined as activities that create value or benefit for the consumer and which have a high degree of consumer interaction. Services can be innovated by enhancing how the service is provided and by whom, improving the service environment and creating tangible cues to the brand or the service (O'Sullivan & Dooley, 2008). Services can also accompany product purchases, for example an increasing amount of manufacturers, such as vehicle or cellular phone manufacturers, now sell their products with a warranty or guarantee that provides services to the product.

Process innovation is the third component that can be innovated by the organisation. A process is a chain of activities that include an input and output, which is performed in order to achieve specific objectives; a process has a clear start, an end and clearly identified inputs and outputs (Davenport, 2013). In simple terms, the process is how

the organisation produces the product and all the activities that are conducted until the product reaches the final consumer. Process innovation occurs at the early stages of the industry life-cycle where, through trial and testing, the most suitable process is selected. Innovations are implemented to make the organisation's process more efficient, effective and reliable, and to ensure that the output meets consumer needs. Once the organisation establishes the dominant design of their major products, process innovation becomes increasingly important (O'Sullivan & Dooley, 2008). Some common approaches to process innovation include total quality management, supply chain management and lean manufacturing (O'Sullivan & Dooley, 2008).

The driving forces of innovation are disucessed in the next section.

2.2.3 Driving Forces of Innovation

Over time the economic and business landscape has forced organisations to become more innovative in order to continue operating. Some of the driving forces of innovation in recent times include increased competition, emerging technology, evolving changes in the external environment and new idea generation (O'Sullivan & Dooley, 2008). These factors encourage organisations to innovate where they would otherwise become obsolete. The increased competitiveness amongst companies means that the standard is set very high and actions taken by the competitors need to be countered or market share will fall. In addition, globalisation has also increased competition, meaning that foreign companies can now compete in and access local markets (Morris, 2011). The importance of remaining competitive makes it essential for businesses to remain innovative, even if this is achieved through continuous small improvements.

Commoditisation, which is another driver of innovation put forward by Morris (2011), can fall within the category of increased competition. Commoditisation refers to the driving down of prices by cutting costs in areas such as manufacturing and distribution, which can be accomplished through innovative initiatives (Morris, 2011). For example, if one company has decreased the prices of its products without decreasing the quality, other companies need to do the same to remain competitive, and this can be achieved through innovative initiatives.

Emerging technologies provide many opportunities for firms to become innovative and are therefore a strong driver of innovation. New technology can be the foundation for developing innovative products, services and processes (O'Sullivan & Dooley, 2008). For example, the advances in Internet technology have led to electronic commerce (e-commerce), the movement of magazines and newspapers to online platforms, cheaper telecommunications and the development of web applications. It is therefore important for businesses to stay vigilant of emerging technology by continually scanning the environment. Idea generation also creates a motive to innovate. Previously innovation ideas came solely from engineers and designers or through highly technical labs; however in recent times there has been an increase in alternative sources of ideas, such as from consumers, employees and suppliers (O'Sullivan & Dooley, 2008). By engaging with more stakeholders, businesses obtain more information about the needs of the market and this translates into innovation opportunities.

The external environment, which is not controllable by businesses, may also drive innovation (O'Sullivan & Dooley, 2008). The external environment consists of the political, legal, economic, environmental, sociocultural and technological environment (Daft, 2008: 72). A new law or regulation, for example, may force companies to adopt certain changes that must be implemented innovatively, or else face prosecution. The driving forces of innovation occur concurrently and are not independent of each other, and therefore must be faced in a coherent manner. These driving forces may also aid innovation by creating opportunities and creating conditions that must be adapted to, however they do not indicate the degree of innovation.

Innovation can further be split into organisational innovation and consumer innovativeness. Organisational innovation refers to how innovative an organisation is; this is determined by initiatives such as a strong innovative strategy, an organisational culture that is conducive to innovation, a structure and system that supports innovation, as well as reward systems and leadership support of innovative enterprises (Tucker, 2008). Consumer innovativeness can be defined as a consumer's tendency to adopt new or innovative products (Tellis, Yin & Bell, 2009). Consumer

innovativeness can therefore also be defined as the inclination to purchase an innovative product and will be discussed further in the next section.

2.3 Consumer Innovativeness

Consumer innovativeness is the extent or degree to which a consumer is receptive to new ideas and chooses to adopt them regardless of other people's experience (Dobre, Dragomir & Preda, 2015). Consumer innovativeness is often studied in order for marketers to segment the market into innovators and non-innovators; however innovativeness is a set of character traits inherent, more or less, in all consumers (Dobre *et al.,* 2015). The reason for this is that at some point in a consumer's life they will accept a new or innovative product or idea, either by choice or out of necessity. According to Dobre *et al.* (2015), consumers with high innovativeness have certain traits such as higher risk tolerance, are more open to new ideas, have greater income earnings, have higher education levels, are less influenced by society and interpersonal relationships and are usually opinion leaders. Other factors that affect consumer innovativeness include demographic factors, social and cultural environment, and situational factors (Dobre *et al*., 2015).

Consumer innovativeness is important because innovation characteristics influence a consumer's intention and ultimately their behaviour. Consumers who are younger in age, who are information seekers (trend followers) with higher education and incomes are more likely to adopt innovation (Arts, Frambach & Bijmolt, 2011). These demographic descriptions are relevant to students, since they are young, and will likely graduate with a degree and have potentially high future earnings.

By profiling and segmenting consumers based on their likelihood of adopting innovative products, marketers can target the markets most suitable for product success and improve their forecasting. Furthermore, the consumer is an important element in product innovation. This is because the innovative product must add value and adequately fulfil their needs in order for it to be considered as innovative by the consumer and ultimately purchased (O'Sullivan & Dooley, 2008). An error that technology firms often make is to emphasise the technological abilities of their products instead of how that technology can satisfy customer needs (O'Sullivan & Dooley, 2008). In order for businesses to take an innovative approach and ensure

high consumer innovativeness, a process must be followed; the next section explains one such process.

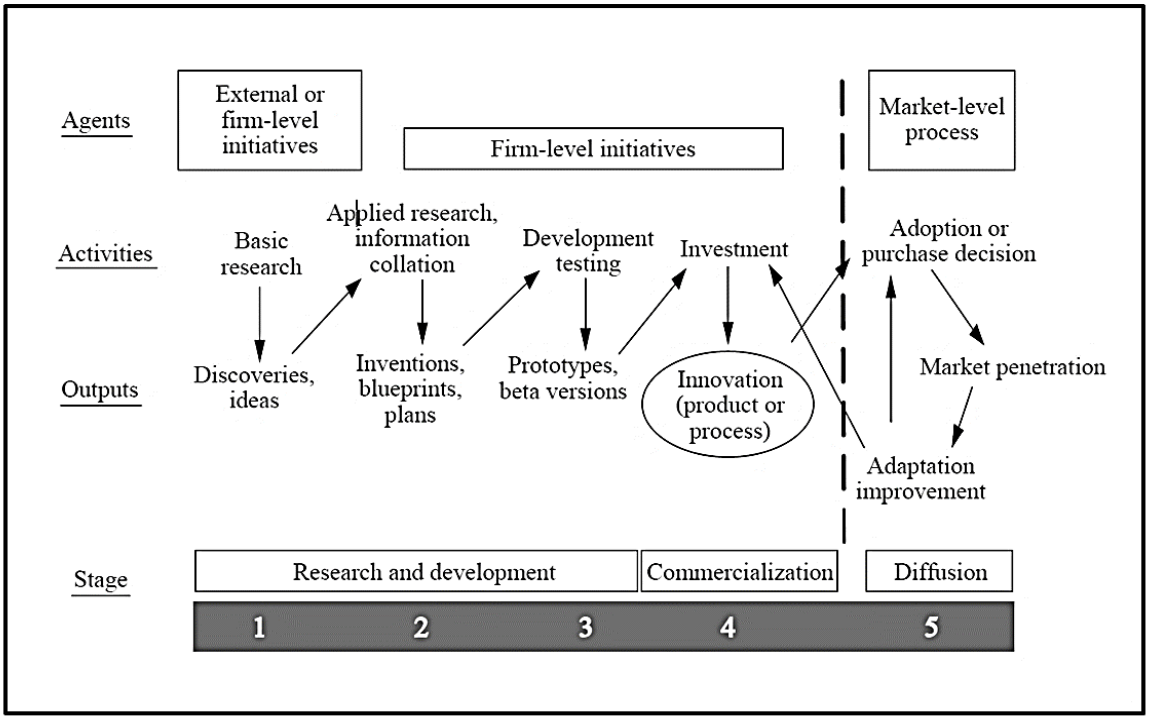
2.4 Process of Innovation

In 1986, Rosegger presented a five staged process of innovation. The model, called the 'linear model of innovation', has become one of the most prevalent and prominent theories of innovation (Godin, 2008). The linear model of innovation states that technological innovation includes five phases which begins with basic research, then applied research, development, production and finally diffusion by consumers (Godin, 2008). Drawing from the linear model of innovation, Greenhalgh and Rogers (2010) further developed the innovation process and made it more pertinent and relevant to modern practises. The innovation process identifies the different agents of innovation as external (customers, suppliers) and firm level (employees). The innovation process, as adapted by Greenhalgh and Rogers (2010), will be discussed below.

Stages one to three consist of the R&D phase. Stage one begins with the basic research from which ideas are generated. Stage two then focuses and applies further research to the ideas that were generated in the previous stage, as well as formulates the plans for the invention to be developed in the next stage. Stage three develops the prototypes and tests them and if they succeed they then proceed to the fourth stage, commercialisation. Stage four is the investment and launch phase for the newly innovated product or service. The fifth and final stage is releasing the product to the market. This is the diffusion stage, where a purchase decision is made by consumers regarding the new or improved product.

Each stage must be executed such that the innovation made to existing products or the development of new products add to the brand image and positively influence the purchase intention of consumers. Therefore, the innovation process must involve potential users of the product as their feedback could determine if there is an actual need for the product and whether it would yield any positive returns. The stages of the innovation process as explained above are illustrated in Figure 2.1 below.

Figure 2.1: Stages of the Innovation Process



(Source: Greenhalgh & Rogers, 2010: 7)

Communication must occur at each stage of the innovation process in order to develop the best products using the most recent information. Feedback is also imperative in continuing to improve products that actually fulfil customer needs and adds value to their lives. Without consumer feedback products with small, incremental changes and improvements will flood the market, while adding little value to consumers.

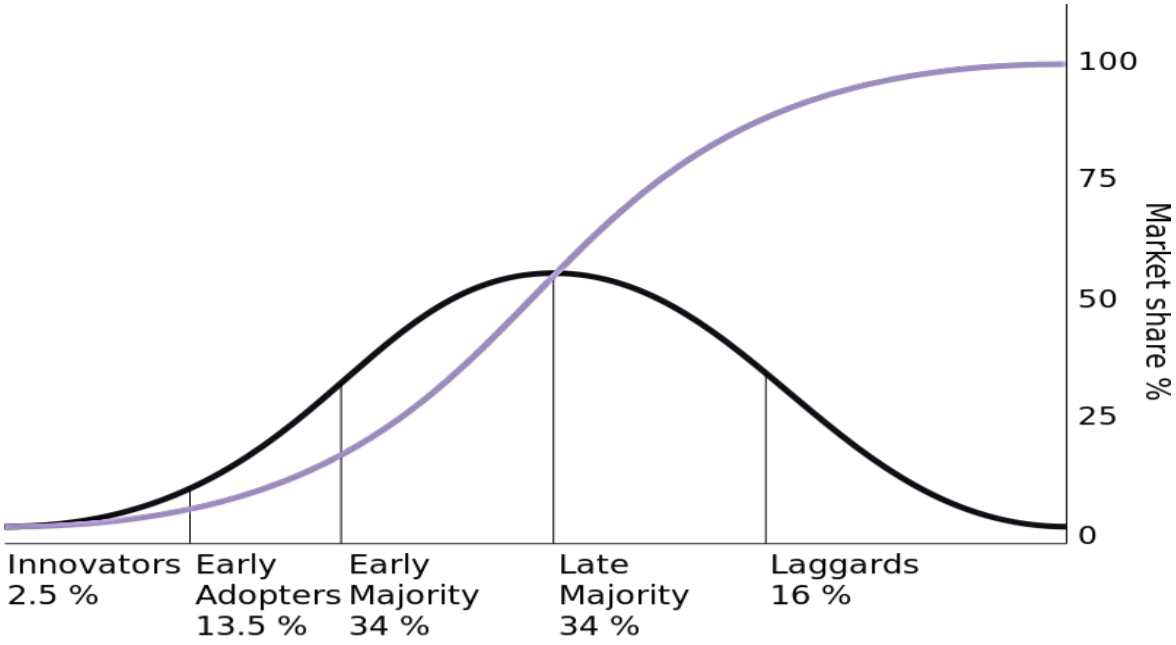
Once organisations have selected and adapted an innovation process to their industry, the introduction of innovative products is improved. When a successful product is launched, it can be beneficial to research its rate of diffusion or the speed at which it spreads in society. The next section discusses diffusion of innovation theory.

2.5 Diffusion of Innovation

There are many theories which focus on adoption of innovation. This study will review the theory of diffusion of innovation, which was first presented by Rogers (1962). The latest version of the theory appears in the most recent fifth edition of the

book, *Diffusion of Innovations*, released in 2003. The theory refers to the period of consumer adoption of technology. Diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003). From the definition of diffusion it becomes clear that diffusion occurs on a macroeconomic level since it involves the whole of society, it depends on communication and is mostly measured over time. Rogers (2003) focused extensively on how earlier adopters of innovation were different from later adopters, as well as how attributes of innovation as perceived by consumers affect the rate of adoption. This further emphasises the importance of the element of time. The time element refers to the duration of how long members of society will take to adopt an innovation (Rogers, 2003). There are five phases of innovation acceptance; these are innovators, early adopters, early majority, late majority and laggards (Rogers, 2003). The graph (Figure 2.2) below illustrates this as well as the percentage of society in each phase.

Figure 2.2: Diffusion of Innovation



(Source: Rogers, 2003: 282)

In the initial phase, there are a low number of adopters of the innovation. These initial adopters are called innovators. However, as time progresses an increased number of people begin to adopt the innovation. Where the two graphs intersect (Figure 2.2 above), the innovation is understood to have reached critical mass, at which point the

innovation becomes self-sustaining and further growth is created (Rogers, 1995). Applying this theory to the cellular phone industry, it has taken cellular phones 25 to 30 years to reach critical mass, with 3.5 billon cellular phone owners in 2008, when the population was 6.7 billion, which means that more than half of the world's population owned a cellular phone at that point in time (Kalba, 2008). Cellular phone ownership has grown in the years since then which means that this innovation can therefore be said to have diffused in society.

Another accompaniment of the diffusion of innovation theory is the innovation-decision process, which is the process that an individual uses to gather information about the innovation, form an opinion and finally decide whether to accept or reject the innovation (Rogers, 2003). The innovation-decision process starts with the consumer becoming aware of the innovation and finding more information about it; the process then moves to the persuasion phase, where the consumer forms an attitude towards the innovation, either positive or negative. The third phase of the process is the decision to accept or reject, thereafter implementation and confirmation, which refers to using the innovation and reinforcing the decisions made, respectively (Rogers, 2003).

Rogers (2003) also puts forward some attributes of innovation that members of society can assess when determining whether to adopt or reject innovation. The innovation attributes include relative advantage, compatibility, complexity, trialability or testability and observability (Rogers, 2003). These five attributes of innovation can be used as variables to measure which specific attribute is the most important to consumers and will therefore be further discussed in the next section of this chapter.

Although the diffusion of innovation theory is popular and extensively used in many disciplines, it has nevertheless been critiqued for a number of reasons. The first criticism of the theory is that it concentrates on diffusion within society and not adoption on an individual level. Furthermore, the theory assumes that all innovation is good and should be adopted; Rogers (2003) called this the pro-innovation bias. Another criticism of the theory is the fact that the model ignores the individuals' resources and ability to adopt the innovation (Stephenson, 2003). Rogers (2003) outlines further shortcomings of his theory such as the issue of equality, individual blame bias and recall problem. However, the shortcomings do not nullify the valuable

theoretical information regarding the diffusion of innovation that the theory provides which has been used for years by academics and organisations. Measurements of innovation are still vital, both from the organisation's perspective as well as the consumers. The next section discusses the measurements of innovation.

2.6 Measurements of Innovation

Measurement is an extremely important issue in innovation, both organisational measurements as well as consumer research. There are numerous models for measuring innovation within the organisation. These models will briefly be discussed and thereafter the literature on consumer measurements will be reviewed in greater depth.

One of the most common measurements of organisational innovations is culture; dimensions of the innovation culture can indicate whether an organisation is creating a conducive environment (Dobni, 2008). Some of the dimensions of innovation that Dobni (2008) measured were implementation context, market orientation, infrastructure and intention for innovation. Alternatively, Malinoski and Perry (2011) suggest measuring the number and quality of new ideas generated, and then measuring the quality of ideas that were actually implemented. The return of investment on innovative products can also be used to determine whether a product has been worth the investment or not (Malinoski & Perry, 2011). Another measurement type is to divide innovation into individual level, group level and organisational level (Chausset & McNamara, 2014). In the individual level, measurements of personality, motivation and creativity are taken, in the group level structure, climate and leadership are measured and the organisational level measures culture, structure and resources (Chausset & McNamara, 2014).

The Diamond Model is an additional measure of innovation that can be applied within an organisation. It measures five dimensions of innovation namely, strategy, process, organisation (structure and systems), linkages (ability to create healthy relationships with other intermediaries) and learning (Tidd, Bessant & Pavitt, 1997). Furthermore, the innovation value chain presented by Hansen and Birkinshaw (2007) recommends that the innovation process should be viewed as a value chain and measured accordingly. The Innovation Value Chain has three phases: idea generation,

conversion and diffusion. Each phase has key questions and key performance indicators that organisations can use to measure their innovation (Hansen & Birkinshaw, 2007). Furthermore, innovation can be measured by using organisational scorecards and industry benchmarks.

The aspects discussed above are just a few of many organisational innovation measurements. Although organisational measurements of innovation are imperative to the success of the organisation, the abovementioned models do not clearly identify the specific factors that consumers consider the most important to innovativeness. This research focuses on specific factors of innovation in the cellular phone industry, particularly innovation to products and services. The measurements of organisational innovation proposed by numerous authors are summarised below in Table 2.2.

Table 2.2: Measurement of Organisational Innovation

Measurement of Organisational Innovation	Author/s
-Individual Level Personality, motivation and creativity -Group Level Structure, climate and system -Organisational Level Culture, structure and resources	Chausset & McNamara (2014:25)
-Number of new ideas generated -Quality of the ideas generated -Quality of the ideas implemented -Return on Investment	Malinoski & Perry (2011:2)
-Implementation context for innovation -Market orientation for innovation -Infrastructure for innovation -Intention for innovation	Dobni (2008:541)
Measure the phases of the innovation value chain -Idea generation -Conversion -Diffusion	Hansen & Birkinshaw (2007:4)
-Strategy -Process -Organisational structure and system -Linkages (relationship creation) -Learning	Tidd, Bessant, Pavitt (1997:30)

(Source: Compiled by the author)

Understanding the factors that influence consumer's acceptance of new products provides increasingly vital and essential insight for marketing stakeholders involved in innovations (Arts *et al.,* 2011). Consumer innovativeness, as mentioned above, is a consumer's tendency to accept new products. One of the reasons that make measuring consumer innovativeness important, is that the consumer is the final judge of the new or improved product; therefore success of innovation hinges on whether it is approved by consumers or not. The relatively high failure rate means there is much room for improvement in developing innovative products.

Although the failure rate for innovation varies amongst industries, as shown in Table 2.3 below, it ranges from 35% to 45%, with an average of 41% (Castellion & Markham, 2013). The technology industry, which includes cellular phones, has a failure rate of just above the average at 42% and therefore can benefit from consumer insight on innovation. The most common method for gathering such information is through market research and understanding consumers' attitudes towards the innovation, and particularly by measuring purchase intention (Arts *et al.,* 2011). However, the first focus of consumer-based innovation measurements is to assess which factors or attributes of innovation are the most important or valued by consumers.

Table 2.3: Innovation Failure Rates amongst Different Industries

Industry	Percent Failure
Chemicals	44%
Other materials	39%
Industrial services	43%
Consumer goods	45%
Consumer services	45%
Capital goods	35%
Healthcare	36%
Software and services	39%
Technology	42%
Average	41%
Highest	45%
Lowest	35%

(Source: Castellion & Markham, 2013: 979)

Furthermore, the increased globalisation of markets has resulted in the need for marketers to understand the similarities and contrasts amongst consumers from different markets (Tellis *et al.,* 2009). This is important because many firms now operate in geographically dispersed markets, which are most likely to have different attitudes and preferences for innovation; this situation is highly applicable to the cellular phone industry. The increased frequency at which firms introduce new products is another reason that also makes consumer research incredibly important (Tellis *et al.,* 2009). Therefore firms must have a good understanding of the consumers' propensity to accept new and innovative products. This information will aid firms in more accurate resource allocation, based on which product features to enhance, the market with the highest consumer innovativeness and the way that innovative products are marketed.

Innovation has been a key source for increasing the welfare of consumers by enhancing the benefits of products while also decreasing the prices (Tellis *et al.,* 2009). The success of increasing consumer welfare depends as much on organisational innovation as it does on consumer innovativeness. Therefore by measuring consumer innovativeness, firms can determine which attributes are most vital for development, especially in third-world countries**.** For example, this notion can be related to the South African context, in the sense that South Africa is a developing country and most consumers thus have a high sensitivity to price. Innovation can then include a reduction in price while maintaining or even improving product quality. In this way the appropriate and suitable innovation is developed for the particular market. Given the importance of measurement, three key studies that have investigated the measurement of innovation will be reviewed. The measurements if innovation explored by the authors of these studies are summarised in Table 2.4 below.

Table 2.4: Measurement of Customer Innovativeness

Measurement of Consumer Innovativeness	Author/s
-Product Functionality (number of attributes) -Usability (ease of use/complexity) -Brand Reputation -Design Novelty -Price	Kim, Hunt & Lancioni (2015, 23)
Performance -Usefulness -Ease-of-use -Innovativeness of Technology Appearance -Visual Appeal Prototypicality -Communication Self-expression	Lee, Ha & Widdows (2011, 1198)
-Relative Advantage -Compatibility -Complexity -Trialability -Observability	Rogers (2003, 169)

(Source: Compiled by author)

Rogers (2003), in his diffusion of innovation theory, put forward five attributes of innovation that are used by consumers when deciding to adopt an innovation. Marketers can therefore measure these five attributes in order to determine the most valued of these attributes. These attributes are relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003: 169). Relative advantage refers to the extent to which an innovation is seen as superior to its predecessor; while compatibility is the extent to which an innovation is attuned to the current needs, ideas and values of society (Rogers, 2003). If consumers do not consider a new product to be relatively better than its predecessor, then they are less likely to intend on purchasing the product as it does not provide a higher degree of value to them.

As regards compatibility, consumers prefer an innovation that fits in with their needs, beliefs and values and are unlikely to adopt one that clashes with these. Complexity can be defined as ease-of use, meaning how difficult or easy it is to use and understand the innovation. Trialability or testability is the consumers' ability to use and test the product on a trial basis in order to reduce risk (Rogers, 2003). An

innovation that does not require extensive effort to use is more likely to be adopted by consumers, while testability reduces risk and therefore increases the likelihood of adoption. The last attribute is observability, which refers to the extent that the results of the innovation are visible to the consumers (Rogers, 2003). The attributes put forward by Rogers (2003) are most suitable for measuring product innovation, which includes cellular phones. These attributes were therefore used as a foundation for achieving the objectives of this study, namely to determine how innovation affects brand image and how it affects purchase intention.

In another study, Lee, Ha and Widdows (2011) investigated how high-technology attributes influence consumer response. The factors that they identified would therefore apply more to the innovativeness of the characteristics of the cellular phone. Measurements put forward by Lee *et al.* (2011) are divided into three groups, namely, performance, visual appeal and communication, which will be discussed further (Lee *et al*., 2011). Performance includes usefulness, ease-of-use and innovativeness of technology, where usefulness refers to the extent that the product fulfils its purpose. Ease-of-use refers to the ability of the consumer to use the product without having to make a cautious effort; while innovativeness of technology refers to the uniqueness and creativity of the product. Performance can measure the functions of the cellular phone device, particularly the software component of the product.

The second group of measurement is the appearance attribute which includes visual appeal and prototypicality. Visual appearance refers to how the a phone physically looks and feels and includes aspects such as design, colour, style, size, materials used and proportion; this can measure the innovativeness of the hardware component of the cellular phone. Prototypicality refers to the extent that an innovative product fits into a certain category. The third group, communication, includes self-expression, which is the degree to which the product holds meaningful messages to the consumer and allows them to display their own ideals and personalities to others as well as themselves. Lee *et al.* (2011) used the abovementioned measurement constructs, which are suitable in this study as they can be adapted to features of a cellular phone and the customers' preferences for them. An adaptation of the measurements identified by Lee *et al.* (2011) was used in the first part of the questionnaire to gauge

students' preference for certain features on a cellular phone (further discussed under the heading *Cellular Phone Innovation*).

Kim, Hunt and Lancioni (2015) conducted a study entitled 'Consumer innovativeness: a domain-specific perspective of information acquisition and choice'. They also developed attributes of product innovation pertinent to technological products, similar to Lee *et al.* (2011). Kim *et al.* (2015: 20) mention five innovation attributes; these are product functionality, usability, brand reputation, design novelty and price. Again, some of the factors identified by the authors of the three studies discussed above overlap. Product functionality (Kim *et al.*, 2015) can be seen to be similar to the 'performance' identified by Lee *et al*. (2011), and refers to the product's attributes, benefits and features, while usability can be understood as complexity (Rogers, 2003) or ease-of-use (Lee *et al.*, 2011).

The next factor identified by Kim *et al*. (2015) is brand reputation, which is what the consumer already thinks or believes about the brand. If the brand's reputation is positive then there is less perceived risk and an increased chance of adoption. The fourth attribute, design novelty, is similar to visual appeal proposed by Lee *et al*. (2011) and refers to the degree of newness in the design compared to similar existing or older products. The last factor put forward by Kim *et al.* (2015) is price. The price of the innovative product is also a consideration for the consumer when deciding to make a purchase or not. According to the literature reviewed in the study by Kim *et al.* (2015), these attributes have been accepted as predictors of consumer innovativeness and can therefore be a good measure for identifying which factors are most valued by consumers.

The above measurement constructs identified in the three studies are similar and this is shown by the fact that some factors overlap with those proposed by other authors; however each one is important and provides a strong foundation to build on. Lee *et al.* (2011) and Kim *et al.* (2015) used innovation factors pertaining and most relevant to technological products such as cellular phones. The researcher therefore determined that it was best to use their attributes in a combined manner as these were most relevant to this study.

2.7 Main Challenges of Innovation

Innovation is necessary for growth and gaining a competitive advantage, however it is not without its challenges. This section will discuss some of these challenges. Organisations find that the most significant obstacle to innovation is the lack of financial resources (Iammarino, Sanna-Randaccio & Savona, 2009; Loewe & Dominiquini, 2006). Given the research and testing that goes into developing successful innovations significant financial resources need to be invested into innovative projects, which greatly increases costs even before production. The lack of skilled personnel is another obstacle to innovation as organisations often do not seek creativity or innovativeness in employees. In addition to this, the incentives offered by management do not adequately reward or encourage innovation (Iammarino *et al.,* 2009; Loewe & Dominiquini, 2006).

Management needs to ensure that they employ individuals who are creative and able to generate innovative ideas. However, incentives also need to be provided, such as bonuses for rewarding good innovations. Some organisations encourage their employees to set aside some time in the day dedicated solely to coming up with innovative ideas, such as the company 3M did in coming up with its innovative products. Organisations should not focus mainly on analytical thinking but should instead insist on a balance (Iammarino *et al*., 2009). The organisation could even provide creative training for employees and include innovation as a part of their performance review, which would ensure a consolidated organisational culture that supports and encourages innovation at all levels. Innovation is nevertheless a long-term focus and does not necessarily reward or result in immediate pay-offs to the organisation (Loewe & Dominiquini, 2006). However, by having a leadership that only focuses on short-term results, innovation developed will be inefficient and result in fewer benefits. Long-term results must therefore be a primary focus of any organisation.

The next major challenge to innovation is timing, particularly in the technology industry (Berkun, 2010). Organisations need to move quickly to fulfil an innovation gap due to the fact that organisations who innovate late often receive the least benefits, as consumers usually adopt the brand that innovated first (Berkun, 2010). However, this is risky as very little is known about the innovation in the early stages.

Fast followers, who enter the innovative market immediately after the leader, avoid R&D costs as well as risk of non-adoption (Berkun, 2010). Therefore, it is often most beneficial to be a fast follower. Such issues make timing an important function in the success of an innovation. Organisations need to keep abreast of the market and macro-environment in order to ensure that they innovate at the right time, when there is a balance between demand and supply.

Businesses need to be aware of the obstacles and challenges of innovation that are most relevant to them, in order to be able to effectively and efficiently overcome these and be able to implement strong innovations and reap the high rewards thereof. The next section briefly examines the cellular phone industry, from both an international perspective and a local South African perspective.

2.8 The Cellular Phone Industry in South Africa

A brief history of cellular phones will first be put forth in this section. Thereafter, the cellular phone industry and why innovation is particularly important in this specific industry will be discussed. The first time a cellular phone was used in history was on 3 April 1973, on a device developed by Motorola called the Motorola DynaTAC 8000X (Goodwin, 2015). Some of the specifications of the Motorola DynaTAC 8000X are that it weighed 1.1 kg, measured in at 23 cm long, 13 cm deep and 4.45 cm wide, stored 30 phone numbers, took 10 hours to charge and offered 6 hours standby and 30 minutes of call time (Goodwin, 2015). It cost £2639 ($3995), over R45000 (Goodwin, 2015).

In 1979, the first commercially automated cellular network was launched, which introduced the first generation (1G) of cellular phones, and by 1981 cellular phones and networks had spread to Denmark, Norway, Sweden and Finland (Hardman & Steinberger-Wilckens, 2014). Over the years the production of cellular phones continued to improve. Although initially cellular phones were not developed for normal consumers but rather for rich men of business, the chief of Motorola's portable communication products successfully lobbied to develop products of wireless communication that were small in size and usable anywhere and promoted the innovation in cellular phone design (Hardman & Steinberger-Wilckens, 2014). On 6

March 1983, the Motorola DynaTAC phone launched in America's first 1G network, costing $100 million to develop and taking over 10 years to reach the market (Hardman & Steinberger-Wilckens, 2014). Although the specifications of the cellular phone may seem primitive now, at the time it was a technological breakthrough and therefore consumer demand was strong.

Second generation (2G) cellular phones emerged in the 1990s, which used digital instead of analogue transmission and moved from band phone to networking signals (Hardman & Steinberger-Wilckens, 2014). The rise in mobile phone usage as a result of 2G was explosive and this era also saw the advent of prepaid cellular phones. The second generation introduced short messaging services (SMS), also known as text messaging, as well as access to media content and prepaid services, and in the late 1990s mobile payments were first trialled (Hardman & Steinberger-Wilckens, 2014). The leading cellular phones of the 1990s were smaller in size compared to their 'brick' sized predecessors and included games, a calculator, clock, calendar, currency converter, text messaging, profile settings and were available in several colours (Goodwin, 2015). The 1990s also represented a mounting trend toward portability and cellular phone designs were fast becoming the norm (Goodwin, 2015). It is clear that the 1990s was a time for great technological improvements and innovations, particularly in the cellular phone industry.

With time and the advancement of internet technology, consumers' demand for data services such as access to the internet from cellular phones increased (Hardman & Steinberger-Wilckens, 2014). This led to the development of the third generation (3G) cellular phone. The most used cellular phone currently is 3G; by the mid-2000s 3G internet coverage was strong enough to have the majority of cellular phone users utilise the service (Hardman & Steinberger-Wilckens, 2014). Although prior to this 2G cellular phones could also access the internet, the poor infrastructure meant that the use of it was not widespread. Phones in the early 2000s were now equipped with a camera, phone-to-phone sharing capabilities, geographic positioning systems (GPS), an array of downloadable applications such as games, high quality screen views and colours, superior materials and improved designs (Hu, Lu & Tzeng, 2014). The latest in cellular phone technology is the fourth generation (4G), which was launched in 2009 and promised rapid internet speed improvements and superior internet coverage,

streaming of high definition videos, better quality voice calls, crystal clear video calls and the ability to play live multiplayer games compared to 3G cellular phones (Hardman & Steinberger-Wilckens, 2014).

With each new generation of cellular phones, there comes great improvements and innovation. The cellular phone industry is continuously and progressively improving and growing and it has only taken cellular phones 25 to 30 years to diffuse and almost completely spread through societies across the world. In 2008 there were 3.5 billon cellular phone owners of a total world population of 6.7 billion; this means that more than half of the world's population owned a cellular phone at that point in time (Kalba, 2008). This figure must certainly have grown in recent years. In support of this assertion, according to a press release by the International Data Corporation (IDC) (2014), 1.25 billion cellular phones were sold in 2014; a 23.8% increase from 2013.

The cellular phone industry in South Africa has shown enormous growth, particularly driven by the introduction of prepaid services by cellular phone network providers such as MTN and Vodacom in 1993 (Petzer, Mostert, Kruger & Kuhn, 2014). In 2014 in South Africa, 91% of the population owned a cellular phone, with 33% of those individuals owning a smartphone (Pew Research Centre, 2014). The telecommunications industry generated R118 billion from cellular phone communication in 2010 (Petzer *et al.*, 2014). If cellular phone companies want to establish and maintain a competitive advantage in the industry, where it is very easy for consumers to switch between brands, they need to create strong relationships with their customers and continue to innovate to fulfil consumers' needs (Petzer *et al.*, 2014).

Since 2011, emerging markets have accounted for over 50% of the annual smartphone shipment (IDC, 2014). Smartphones are electronic devices that combine the universal mobile phone and the personal computer (Hu *et al.,* 2014). They integrate beneficial functionalities like audio-visuals, mobile video, web browsing, e-mail, word processing, and a global positioning system (GPS) (Hu *et al.,* 2014). In 2013, smartphone sales surpassed 1 billion units for the first time, a 40% increase from the 734 units sold in 2012 (CCS, 2014). Smartphone shipments accounted for 56% of all

cellular phones shipments; Apple accounted for 35% of this in the mobile phone business while Samsung led with 39% (CCS, 2014). In 2014, growth in emerging markets for smartphones was expected to reach 32.4% while mature markets were expected to decrease to 4.9% growth (IDC, 2014).

If organisations wish to maintain their market share they need to innovate at a level that is equal to or exceeds their competitors. For example, Nokia failed to innovate, especially with regard to its operating system, and has seen a steep drop in market share and net loss of $1.68 billion, while brands such as Apple, Huawei, HTC, Sony and Samsung continue to innovate and add new features to their devices (Adikari, 2013). Since the majority of features found on a cellular phone are similar, small changes to the hardware or software can have a differentiating effect.

2.9 Cellular Phone Innovation

A laissez-faire standardisation and mandated cellular phone industry standards that vary across technological generations and countries have led to a string of radical innovations in the industry (Koski & Kretschmer, 2007). The rapid rate of growth and cellular phone penetration has made the cellular phone industry very competitive (Husso, 2011). Competition is a strong driving force for innovation and the highly competitive nature of the cellular phone industry makes innovation imperative to success, and demands that brands become more innovative in order to survive, differentiate their products and maintain a competitive advantage (Husso, 2011; O'Sullivan, & Dooley, 2008; Swann, 2009).

Cellular phone companies need to be even more innovative than other companies because competition is strong. In order to ensure that companies keep abreast of competition, innovation, both radical and incremental, must be adopted so that the performance of their products continues to improve and they continue to increase their sales (Koski & Kretschmer, 2007). Furthermore, innovation will provide a competitive advantage through product differentiation via the addition of new features and functions or product design, and because different firms often serve different segments of markets or niches of consumers, it also lessens price competition (Koski & Kretschmer, 2007).

As stated above, the growth of the cellular phone industry is continuing at a decreasing rate in mature markets (IDC, 2014). Therefore, another reason for the importance of innovation in the cellular phone industry is that it is a mature industry, especially in first world countries, and companies thus need to implement new strategies in order to attract new consumers (Koski & Kretschmer, 2007). This shift in markets means that cellular phone companies need to be innovative in order to fulfil the needs of customers in emerging markets and to take into consideration their circumstances that differ from mature markets.

Cellular phone companies need to be creative and add more features and benefits, thereby increasing the value of cellular phones, while also maintaining the price so that they are able to attract new consumers and grow. These emerging markets are usually to be found in developing countries and will therefore bring new challenges and opportunities that need to be adapted to through innovation. It is essential for cellular phone manufacturers to maintain a presence in mature markets but also to establish a strong presence in emerging markets that are growing quickly (IDC, 2014). In order for companies to do this, they need to innovate to decrease the price of their handsets so they can cater to consumers in developing markets, which includes South Africa.

The change in consumers' use of cellular phones serves as another reason why cellular phone innovation is important. Over time, cellular phone users expected more from their phones and began to use the device for social interactions, work related functions and entertainment purposes. The increased and more varied uses of cellular phones meant more sources of ideas for innovation, which further forced cellular phone companies to innovate. Examples of these innovative ideas are including a stylus with a phone so that work-related tasks are made simpler, or improving the keypad because of increased text message communication. This means that cellular phones needed to innovate in order to fulfil the changing demands of their consumers. Cellular phone companies that failed to do this saw a substantial drop in sales and profit.

In addition to the above, the growing importance of replacement demand, particularly in mature markets means that cellular phone companies need to continuously add new features and benefits to their devices so that replacement demand from existing users

is stimulated (Koski & Kretschmer, 2007). In mature markets demand will mainly arise from replacing existing handsets and mass-market consumers are also more heterogeneous than early adopters of mobile phones, which means there is more need to differentiate through innovation (Koski & Kretschmer, 2007). When technological improvements are not very valuable to existing mobile phone users, the only way to generate new handset demand is through additional product features for existing users in order to overcome switching costs.

Presently, innovation is made increasingly important because of design monotony where the physical hardware design has reached a point of maturation (Rooney, 2013). Most new cellular phones are touch screen smartphones that are mono-blocks of the same screen size (Rooney, 2013). In addition, in trying to differentiate and innovate their hardware, cellular phone companies are increasingly focused on innovating the software, which has a bigger influence on user experience. Given that so many cellular phones are similar in design, consumers tend to place more importance and value on the software of the device or what the device can offer with regards to added benefits and features. These may include features such as an improved camera, improved resolution, faster internet, stronger network connection and so on rather than the size and weight of the phone.

Previously, innovation was mostly focused around the design, size, dimensions and weight of the cellular phone device (Koski & Kretschmer, 2007). However, now in addition to software innovations, the design must have more than just aesthetic appeal and is expected to offer something to the consumer. An example is Samsung's new curved screen, which provides a more improved user experience when using the device instead of just being physically pleasing (Koski & Kretschmer, 2007). To conclude, aspects such as competition in the cellular phone industry, change in demand by consumers, the maturing of markets as well as new emerging markets accompanied by the high rate of replacement purchases of cellular phones and a monotone of design all combine to create an environment that makes innovation absolutely essential. These aforementioned aspects also create opportunities for cellular phone brands to be innovative and gain positive returns on their innovation and R&D investments.

Cellular phones have become multi-functional devices used as a mobile phone, camera, video camera, text messenger, music player, alarm clock, internet browser, game console, calculator and even as a flashlight (Head & Ziolkowski, 2012). The addition and improvements of features enhances, differentiates and makes a product more attractive to consumers through added utility and therefore increased demand (Haverila, 2013; Head & Ziolkowski, 2012). Research has been conducted which asked consumers what their general preferred features on a cellular phone are, such as a study by Head & Ziolkowski (2012) and three separate studies conducted by Haverila in 2011, 2012 and 2013. Consumers were asked about their feature preference based on age, with almost 100 features used (Haverila, 2012). Additionally, Adikari (2013) studied the determinants of mobile phone demand among university students. These researchers included all features and attributes to be found on a cellular phone, some of which are out-dated and not necessarily innovations implemented on the device.

However, there is little research that has been done which explores the most important or most valued factors or features in terms of innovation found in a cellular phone device. The studies conducted by Head & Ziolkowski (2012) and Haverila (2011, 2012, 2013) differ from this study, as this study seeks to uncover preferences for features for innovation found in either the hardware or software of a cellular phone. Furthermore, as previously discussed, Lee *et al*. (2011) studied how high-technology attributes influence consumer response; their factors would therefore also apply to the cellular phone industry. Measurements used by Lee *et al.* (2011) are divided into three groups, namely innovation to the performance, visual appeal and communication. Performance includes usefulness, ease-of-use and innovativeness of technology; where usefulness refers to the extent that the product fulfils its purpose. Performance can measure the functions of the cellular phone device, particularly the software component of the product. The above discussion has provided a brief insight into the history of cellular phones and the innovative progression of the industry, providing a motivation as to why innovation is vital to the success of cellular phone companies.

2.10 Conclusion

This chapter provided a synopsis of the main concepts relating to innovation that are pertinent to this study. The chapter began with a brief history of innovation along with

the different definitions, classifications and types of innovation. Consumer innovativeness and the theory of diffusion were also discussed, as well as the driving forces and process of innovation. The measurements of innovation were then reviewed from a number of different authors and lastly the main challenges of innovation that organisations face was examined. The next chapter reviews the literature pertaining to the main concepts of brand image and consumer purchase intention, as well as the relationship they have with innovation, in order to provide a coherent overview of the connections between the three variables that are central to the research.

CHAPTER 3: BRAND IMAGE AND PURCHASE INTENTION

3.1 Introduction

Chapter Three continues the review of literature by introducing and defining brand image and discussing the variables of brand image and how to measure it. The chapter then proceeds by elaborating on the relationship between innovation and brand image. The next aspect to be explained is consumer purchase intention. The definition of consumer purchase intention will be discussed, and an explanation of how it is measured and the factors influencing it will be put forth. Thereafter the link between innovation and purchase intention will be expanded on. The final relationship elaborated on is the one between innovation, brand image and purchase intention.

3.2 Brand Image

Brand image is an extremely vital concept in marketing. Marketers invest a large amount of time and money in creating the perfect brand; this is because having a positive brand has numerous benefits for the organisation as well as for consumers. This section defines brand image and how it is developed, and also discusses its importance. The measurements of brand image and factors affecting it will also be reviewed. Brand image is a central concept in consumer behaviour, because brand purchase decisions taken by consumers are based on their valuation of brand image.

Due to the very broad selection of product choices that manufacturers offer in the market and the omnipresent marketing efforts, consumers often consider a favourite brand to facilitate their buying decisions. The word brand is derived from the Old Norse word ‘brandr’ which means ‘to burn’ and it referred to farmers burning or branding their livestock in order to identify them in the fields (Keller, 2013). Given the derivation of the word, it can be understood that a brand is a differentiating element that distinguishes between similar products. A brand is a “name, term, sign, symbol, or design, or a combination of them, intended to identify the goods and services of one seller or group of sellers and to differentiate them from those of competition” (Keller, 2013). However, industry definitions add on to the simple definition of brand, by including the aspects of awareness, reputation and prominence.

Brand elements such as the name, logo, symbol, mantra, package design and any other characteristics are the components that are used to identify and make up a brand. Kapferer (2008) defines a brand as a salient, exclusive and trusted name that influences buyers. A brand is made up of three aspects: the brand elements; the brand concept, which is the value provided by the brand both tangible and intangible; and lastly the consumer's past experiences of the brand's product or services (Kapferer, 2008). These three aspects are how the consumer forms an opinion on the brand, whether positive or negative. More important than just the brand is the brand image, which is more relevant to firms and consumers as it refers to all the information that a consumer has about the brand that they use to form an opinion on it (Kapferer, 2008).

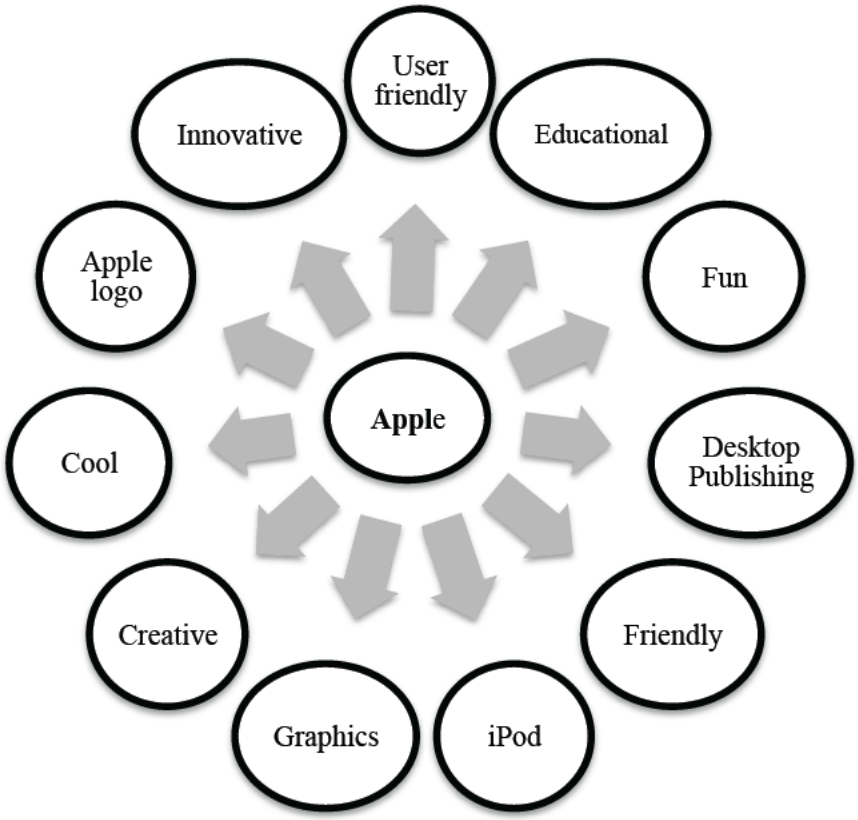
Once a brand identity is created using brand elements, the organisation must create brand awareness. Brand awareness makes consumers more familiar with the brand and what it offers, and includes brand recognition and brand recall (Keller, 2013). Brand awareness can be created through promotional activities such as advertising and promotions and by repeatedly exposing the brand to consumers, as well as by linking specific product categories to suitably strong associations. Once an adequate level of brand awareness is generated, marketers can put more effort into creating a brand image (Keller, 2013).

Brand image can be defined as the consumers' associations with the brand that allows them to form a perception of the brand (Keller, 2013). These associations are developed in the consumer's memory; they connect information in other nodes to the brand node which is then translated as the meaning of the brand for the consumer. Associations can be created in different forms, which might reflect product features or characteristics completely independent of the product. According to Keller (2013) the brand image makes up part of the consumers' knowledge of the brand, along with brand awareness. Additionally, a brand image can be defined as the "consumer's combined, total emotional experience with a firm, their product or service" (Hammond, 2008). This means that the consumer's complete past experiences will impact and affect the brand image, which further implies that the brand image can be altered and can be fragile. In order for an organisation to create a strong brand image, it needs to ensure that consumers' experiences with the brand are consistently positive. Alternatively, brand image can also be defined as the immediate thoughts

that come to a consumer's mind when a certain brand is mentioned (Ross, James & Vargas, 2006).

From the definitions above, it becomes apparent that brand image is based on consumer opinion and not necessarily on facts. The image is created through a combination of the individual's personal experience of the brand as well as the information gained from other sources. However, these opinions are very real and form a strong basis for purchase decision making and heavily influence other consumer behaviour such as word-of-mouth (Keller, 2013). Consumers will draw on their own general knowledge and make assumptions where they have gaps in information about a particular brand; they will not always engage in factual information search. Advertising can aid in the creation or re-shaping of an image, however personal experience and users of other brands signify the reality behind the image and are therefore more powerful than advertising and other organisational marketing communications.

Figure 3.1: Apple Brand Associations

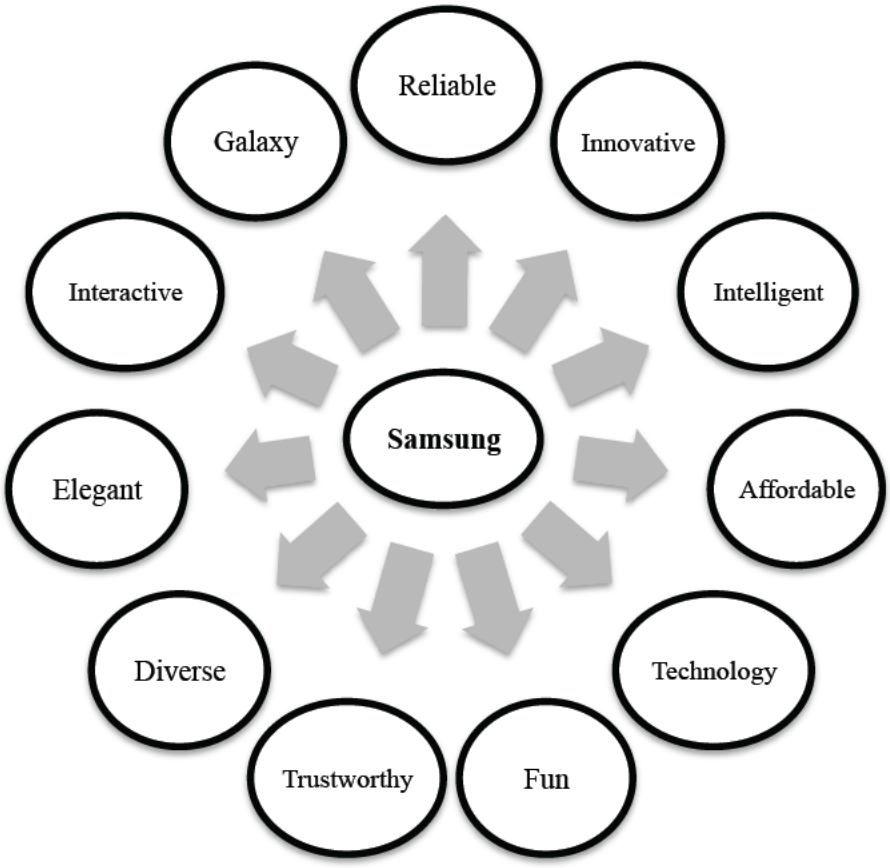


(Source: Keller, 2013: 73)

The brand image will include all the associations that a consumer believes about a certain brand. An example relevant to the cellular phone industry is the associations held by consumers about Apple; these associations are shown in Figure 3.1 above. The possible associations held by some consumers about Apple form the brand image for the company. Associations such as 'innovative' and 'creative' indicate that innovation can positively impact the brand image.

Alternatively, the Samsung brand is considered as cutting edge in technology and one of the main differentiating brand factors is the price affordability and innovative design (Chauhan, 2013: 44). The brand associations of Samsung are illustrated in Figure 3.2 below.

Figure 3.2: Samsung Brand Associations



(Source: Chauhan, 2013: 45)

In order for a strong brand image to be created, marketers and marketing efforts need to link strong, unique and favourable associations to the brand in consumers' memory (Keller, 2013). According to Keller (2013), brand associations are made up of either brand attributes or benefits, where brand attributes are the descriptive features that depict a product and brand benefits refer to the meaning and personal value that consumers ascribe to the product attributes. Consumers use all sources to gather information; they are influenced by society, news, the internet and interpersonal relationships. Marketers therefore need to understand the influence of these sources and manage this influence, so that the brand's image is not negatively affected.

The overall image of the organisation is just as important as the brand image. In order to achieve the brand's full potential, the organisation's overall image needs to be consistent with the brand's image. To achieve this, the organisation must emphasise internal brand integration and activation (Dunn & Davis, 2003). The image needs to be integrated into the organisation's core activities, culture, and customer experience and in this way the overall image is operationalised (Dunn & Davis, 2003). This means that the brand image supplements and supports the organisation's overall image by guiding and assisting with decision making and being the driver of action throughout the firm. Furthermore a positive overall image leads to increased loyalty, which is operationalised through behavioural intention such as purchase intention of consumers to continue and repeatedly purchase from one brand (Hsu & Cai, 2009).

The next section discusses the importance of brands and brand image, to both the firm and the consumers, and also examines how brand image creates brand equity, which is a valuable asset for businesses.

3.2.1 Importance of Brand Image

The essential functions that brands perform make them very important to both the consumer and the organisation. A brand allows consumers to easily differentiate the product from other producers (Keller, 2013). A positive brand image allows the product to almost automatically be considered in the consideration set of the consumer. Consumers use the brand image to organise, process and recall information

stored in their mind when making a purchasing decision (Hanaysha *et al.,* 2014). A strong brand image allows the product to stand out from the clutter and is remembered by the consumer; this aids the consumer in making purchase decisions. A positive brand image has also been found to lead to brand trust (Wang & Tsai, 2014). The knowledge a consumer has about a brand reduces the perceived risk of purchasing that brand (Hammond, 2008).

When a consumer knows which brand they prefer, it reduces the time and money spent on searching for alternatives. Furthermore, a positive brand image carries with it a guarantee or certain standard of quality, and previous experience with the brand further confirms the quality of their products (Keller, 2013). By using or purchasing specific brands, the image of that brand is reflected on to the consumer and in this way the brand allows the consumer to engage in self-expression. To continue from the example above, the associations of Apple can be reflected on its users, who then also express themselves as 'creative', 'innovative', 'fun' and 'cool'. The benefits of brand image for consumers can be summarised as risk reduction, information efficiency and self-expression (Aaker, 2007).

As mentioned above, a strong brand with a positive brand image creates trust and emotional attachment with the consumer (Hammond, 2008). The relationship created between the brand and consumer results in many benefits for the organisation. The key benefit of a brand image is that it allows the organisation to capitalise on their promise of quality and to bestow their products with associations that are favourable and unique (Hammond, 2008). Marketers can also use the brand image as a tool to position, extend and differentiate the brand, as well as to launch favourable attitudes and emotions towards the brand **(**Hanaysha *et al.,* 2014).

A strong brand image also allows the firm to achieve competitive advantage, as consumers largely favour and prefer brands with a strong image. A highly competitive market makes it less profitable for other companies to enter the industry if other firms have brands with strong brand images, thereby increasing the barriers to entry (Keller, 2013). This means that organisations with strong brands are more likely to have a higher market share. A powerful brand image also decreases the cost of promotional activities and sales relative to those with weaker brand images because consumers of

strong brands spread positive word-of-mouth recommendations and often make purchases and repurchases (Chiaravalle & Schenck, 2014; Hammond, 2008). In this way the brand image can augment the effectiveness of marketing communication.

To the manufacturer or the organisation, a positive brand image means increased consumer loyalty, trust, purchases and therefore profit. Organisations are also able to charge a premium price for products with strong brands, as consumers are willing to pay a higher price for a brand that they have had positive past experience with, and therefore perceive as providing more value and less risk compared to other brands (Chiaravalle & Schenck, 2014). A strong brand also allows the organisation or firm to attract the best employees who become devoted to the brand and further its success (Hammond, 2008). The above are examples of how a strong brand image can be a source of financial returns to the organisation. Less money is spent on marketing efforts, while a higher price is charged for the brand's products. Another major benefit of brand image is brand equity. The ultimate objective for most businesses is to achieve positive brand equity, which is created by the brand image and is therefore a crucial element for brand success (Keller, 2013).

The value that the brand creates is called brand equity (Mallik, 2009). Brand equity can also be defined as the creation of profitable value that stems from consumer perception of the brand name of a specific product instead of the actual product (Kapferer, 2008). The table below (Table 3.1), from a report released by Millward Brown (2014), shows the top 10 most valuable brands of 2014, where Google is the world's most valuable brand, with a value of over $158 billion dollars, and Apple is second and is worth over $147 billion dollars. According to Mallik (2009) brand equity can be either positive or negative; positive brand equity results when an organisation exceeds the expectations of their consumers. It is therefore vital for organisations to start with a strong, positive brand image if they wish to achieve high brand equity.

Table 3.1: Top 10 Most Valuable Global Brands 2014

	Brand	Category	Brand value 2014 $M
1	Google	Technology	158,843
2		Technology	147,880
3	IBM	Technology	107,541
4	Microsoft	Technology	90,185
5		Fast Food	85,706
6	Coca-Cola	Soft Drinks	80,683
7	VISA	Credit Card	79,197
8	at&t	Telecoms	77,883
9	Marlboro	Tobacco	67,341
10	amazon.com	Retail	64,255

(Source: Millward Brown, 2014)

It becomes clear from the list of most valuable global brands that technological companies invest significantly in their brand. This is evidenced by the fact that the first four most valuable brands are Google, Apple, IBM and Microsoft, which are all related to cellular phones in some way. The eighth most valuable brand is AT&T, a cellular phone service provider, which further emphasises the notion that the most successful companies invest in their brands, and technology companies in particular understand the importance of branding. Android phones such as Samsung and Sony use Google platforms for Internet and web usage, while Apple produces their own cellular phone, the iPhone range, and Microsoft develops the operating systems for some Nokia cellular phones (Millward Brown, 2014). This shows that these leading technological brands are in some way related to cellular phone devices and illustrates how widespread and competitive the cellular phone industry is around the world.

This section reviewed the importance and benefits that are ultimately created by a strong brand image. However, the measurement of the brand image is a necessary step for an organisation's success. The next section discusses the measurements of brand image.

3.2.2 Measurements of Brand Image

Measurement is an important element in branding. Measurements make the organisation aware of the shortcomings in their branding efforts and may indicate what changes need to be made in order to improve. The increased financial accountability placed on marketers means that they need to justify the financial resources spent on branding, in terms of the rate of return of marketing investment (ROMI) (Keller, 2013). Most organisations measure components of brands such as brand equity to assess how consumers feel about their specific brands. Although this research is interested in studying the impact of innovation on brand image in general, specific brand measurements will nevertheless be discussed. Given that brand equity stems from consumers' perceptions about the brand or the brand image, it becomes clear that measurements are most often conducted through market research. Consumers are asked questions that help marketers gauge the brand's strength. Brand associations can be used as a measurement of brand image. Assessing the brand image is ultimately assessing associations held regarding a specific brand; these associations can be made up according to the product categories of the brands being measured.

According to Keller (2013) there are three main methods of conducting brand measurements, namely brand audits, brand tracking systems and brand measurement systems; the first two will briefly be discussed here. A brand audit can be conducted, which is a consumer-focused examination of the brand's condition that aims to reveal sources of brand equity, one of which is brand image and recommending ways of improving the brand (Keller, 2013). A brand audit requires understanding the sources of brand equity from the perspective of both the firm and the consumer. Although the brand audit examines the sources of brand equity by questioning consumers about their perceptions and associations with the brand, the brand image is also uncovered. A brand audit is a two-step process that includes brand inventory and brand exploratory (Keller, 2013).

The brand inventory is conducted to establish the firm's perspective of their brands. It provides a comprehensive and complete profile that describes how all the products sold by the firm are branded and marketed (Keller, 2013). The brand elements are all

catalogued along with the advertising and promotion, pricing plan and distribution plan plus all other pertinent marketing activity linked to the brand. However, assessing the brand from within the firm does not provide information of how it is actually seen by consumers, therefore a brand exploratory must be done. The brand exploratory is the second step of the brand audit and is concerned with investigating what consumers feel and think about the brand and its image (Keller, 2013). The brand exploratory is essentially a type of market research and can be done using quantitative or qualitative methods. Some of these methods are summarised in the table below.

Table 3.2: Qualitative and Quantitative Brand Measurement Research Techniques

I. **Qualitative Research Techniques**
Free association
Adjective ratings and checklists
Projective techniques
Photo sorts
Bubble drawings
Story telling
Personification exercises
Role playing
Experiential methods
II. **Quantitative Research Techniques**
A. Brand Awareness
Direct and indirect measures of brand recognition
Aided and unaided measures of brand recall
B. Brand Image
Open-ended and scale measures of specific brand attributes and benefits
Strength
Favorability
Uniqueness
Overall judgments and feelings
Overall relationship measures
Intensity
Activity

(Source: Keller, 2013: 353)

Qualitative techniques would usually consist of interviews and focus groups where consumers would give more detailed opinions on the brand. Hanaysha *et al.* (2014) drew the constructs from Keller's (2013) definition of brand image, where an image should consist of strong, unique and favourable associations. By developing sub-constructs from strong, unique and favourable associations, any brand can be measured, with a high level of generalisability. A quantitative approach would most likely include questionnaires that are statistically analysed.

Aaker (1997) conducted a study titled 'Dimensions of brand personality', which puts forward five brand personalities that can be used as measurement constructs. Although brand personality is not identical to brand image, the personality of a brand may be used to measure the associations held about it. The personalities are sincerity, excitement, competence, sophistication and ruggedness. The brand personality traits although outdated, are still being used in recent published research (Baloglu, Henthorne & Sahin, 2014; Ferrandi, Valette-Florence & Fine-Falcy, 2015).

The first personality, sincerity, captures the honesty and pragmatism of brands; it also includes originality of the brand and friendliness. Some of the traits used to measure sincerity are honesty, wholesomeness and cheerfulness (Aaker, 1997). Excitement refers to whether the brand is daring and enthusiastic, and this personality is measured using the following traits: daringness, spiritedness, imaginativeness and up-to-date elements. Competence relates to how well the brand does what it is functioned to do; competence traits are reliability, intelligence and successfulness (Aaker, 1997). Sophistication refers to the social class that the brand belongs in and uses measurement traits such as upper-class and charm, and the last brand personality construct is ruggedness, which is how tough and outdoorsy the brand is.

Another set of brand image measurement constructs were used in the research studies of Onyancha (2013), Nagaraju and Kumar (2014) and Reddy (2014). These authors used specific constructs in their studies to measure brand image. These constructs are products' appeal, ease of use, functionality, fame and overall value. Brand image includes each one of these constructs and that is why they were chosen. They are general enough to be applied to all brands, and therefore are a good fit for any research into any brand. Respondents were asked to measure brands based on the above constructs in order to measure the brand image. The products' appeal refers to how likable or engaging the products of the brand are. Ease-of-use refers to the amount of effort consumers must exert when using the products of a particular brand, and functionality includes the benefits or features that a brand provides to consumers (Onyancha, 2013). Fame is how well-known the brand is, while overall value is the amount of significance and value a brand provides. Other sub-constructs can be included to suit the type of brand and product category.

Shiau (2014) used the three constructs put forward by Park, Jaworski and MacInnis (1986), namely functional, symbolic, and experiential dimensions, to measure brand image. Under the functional dimension, questions about the value, quality and reputation of the brand where asked. The symbolic dimension asked questions related to self-expression and personal style while the experiential dimension focused on questions such as emotions felt from using the brand and the brand's role in pursuing life pleasures. These constructs, although developed almost 30 years ago, are still applicable to measuring brand image today due to the fact that they are broad enough to be applied to current brands and are relevant to the function, symbolism of the brand or experiences of consumers and are therefore being used by numerous authors such as Shiau (2014).

In this study, an innovative cellular phone brand that has a good image should score highly in terms of its functional, symbolic and experiential construct as well as holding strong, favourable associations. A high score on the questionnaire would then demonstrate that innovation impacts positively on the brand image of cellular phones amongst UKZN students.

Table 3.3: Measurement Constructs of Brand Image

Measurement Constructs of Brand Image	**Author/s**
-Unique Associations -Strong Associations -Favourable Associations	Keller (2013)
-Sincerity -Excitement -Competence -Sophistication -Ruggedness	Aaker (1997)
-Product Appeal -Ease-of-use -Functionality -Fame -Overall Value	Onyancha (2013), Reddy (2014) and Nagaraju & Kumar (2014)
-Functional -Symbolic -Experiential	Park, Jaworski & Macinnes (1986)

(Source: Compiled by author)

The table 3.3 summarises all the measurement constructs for brand image put forth by authors in the studies that were previously discussed. The next section explains the relationship between innovation and brand image. This relationship is important as it forms part of the conceptual framework.

3.3 Brand Image and Innovation

According to the results obtained by Shiau (2014) product innovation, particularly technological innovation and new products, all had a significant positive impact on brand image. Shiau (2014) further adds that for the consumer to distinguish the superiority of product functions there must be good product innovation. In this way the organisation ensures that they have a positive brand image in consumers' minds and it can then be understood that product innovation enhances the product's brand image (Shiau, 2014). Therefore, a strong brand image leads to higher acceptance of product innovations by consumers and in this way there exists a complementary relationship between innovation and brand image.

Furthermore, when a firm introduces innovative products with features that are unique to similar existing products they positively influence the purchasing decision of the consumer (Andrews & Kim, 2007). The method most frequently used for product differentiation and protecting brand image is the implementation of innovative initiatives such as the addition of new features to products (Andrews & Kim, 2007). Therefore when a product is improved, consumers' perceptions about the product improve as well and this translates to a stronger, positive brand image.

In addition, consumers consider brand image as a risk reduction factor, which is positively linked with product quality and reliability (Kim *et al.,* 2015). This means that for a product with a positive and strong brand image, innovations are more easily accepted because a strong brand image decreases the perceived risk of purchasing an innovative product. This is due to the fact that consumers have had positive past experiences and associations with the brand. Furthermore, according to the World Intellectual Property Report (WIPR) (2013), branding and the brand image provides an incentive for organisations to innovate due to the fact that innovation aids in the recovery of their return on investment that must be made in innovative initiatives. A positive brand image results in consumers' trust in the organisation and their products

being earned; this trust is a further incentive for organisations to innovate, as they know that consumers will trust in their innovations (WIPR, 2013).

In the technology industry, innovation alone cannot lead to financial success any longer. Marketing initiatives such as branding are therefore playing a progressively large role in consumers' acceptance and purchasing of high-tech products (Keller, 2013). Innovation can create competitive advantage for a brand, thus enhancing the brand's image. Strong innovation initiatives and brand image are used in conjunction with one another to ensure survival and growth; in this way organisations are able to create new value for their assets (Hanaysha *et al.,* 2014).

Previous research conducted by Yang, Wang, Song, Chen and Hung (2011) studied the professional competencies, brand image and brand recognition of Taiwan's mobile phone industry. Chu (2009) researched the effects of brand recognition on cellular phones purchase in Beijing. Furthermore, Ahmed and Moosavi (2013) studied the factors influencing cellular phone brand loyalty of Swedish Generation Y and found that brand image is one of the main factors that affects brand loyalty. The main concepts of brand image that are relevant to this research have been examined above and the next section introduces and defines consumer purchase intention, factors affecting it and its measurements.

3.4 Consumer Purchase Intention

This section of the literature review will examine the consumer purchase intention variable of the research. Purchase intention will firstly be defined; thereafter the factors affecting consumer purchase intention and how to measure it will be discussed. Lastly the relationship between innovation and purchase intention will be reviewed, as well as the relationship between brand image and purchase intention.

Business organisations invest a significant amount of resources in monitoring, forecasting, understanding and persuading consumers' behaviour (Kardes, Cronley & Cline, 2014). Consumer behaviour is the study of the processes or activities that are associated with the consumer's purchase, use and disposal of products or services that satisfy their needs. It includes the individual's behavioural, rational and emotional responses that precede, determine or follow these activities (Kardes *et al.,* 2014). The

success of the organisation depends on convincing consumers to use their products instead of competitors' offerings. In order for organisations to achieve this, consumers are inundated with marketing efforts from advertising to social media and promotions. Purchase intention is just one concept that falls within consumer behaviour.

Purchase intentions can be defined as the consumer's subjective or personal judgement that is revealed after general evaluation to buy a product or service (Balakrishnan, Dahnil & Yi, 2014). Purchase intention refers to whether a consumer intends or plans on purchasing a product or service or not (Kuo, Wu & Deng, 2009). Purchase intention triggers a consumer to decide on which product or service or brand they believe can best fulfil their needs (Qun, Lee, Lim, Loke & Wong, 2012). In other words, the consumer's purchase intention is their aim, plan or inclination to purchase a particular product or service sometime in the near future, based on their knowledge of the product or service as well as the alternatives. Purchase intentions are an individual's mindful plan to make an effort to purchase a brand. The pertinent points from the definition are: that the consumer is willing to consider making a purchase; that a future purchase intention exists; and also a possible decision to make a repurchase (Balakrishnan *et al.,* 2014).

Purchase intention is determined by asking consumers whether they intend on making a purchase in the near future. Although purchase intention does not always guarantee an actual purchase, its measurement gives marketers a strong indication of consumers' level of acceptance and may highlight possible ways of improving persuasive strategies to convince consumers to make an actual purchase. Furthermore, according to a study by Mahmoudzadeh, Bakhshandeh and Ilkhechi (2013) an increase in consumers' purchase intention increased the possibility of them making an actual purchase. Measuring intentions can also change consumers' consequent purchasing behaviour; this is called the mere-measurement effect. If the consumer has a positive attitude towards the brand, then by asking them about their intention it increases the probability of them actually purchasing it. A positive purchase intention by consumers may often result in a positive brand commitment; this may further drive consumers to make an actual purchase (Mahmoudzadeh *et al.,* 2013). Consumers do not only consider one brand when making a purchase intention, instead they consider a range of brands in their consideration set (Balakrishnan *et al.,* 2014). This means

that brands need to have a competitive advantage and be better at marketing the brand than their competitors in order for the consumer to choose them when taking an actual purchase action.

There are numerous other factors that affect consumer purchase intention; some of these will be discussed in the section to follow.

3.4.1 Factors Influencing Purchase Intention

According to previous research, there are many factors that affect consumer purchase intention. This section begins with a consideration of the theory of reasoned action, and some of the factors affecting consumer purchase intention will also be discussed.

Intentions are the main determinant of actual behaviour; in this case the behaviour is to purchase a product. The theory of reasoned action attempts to predict and understand behaviour using factors such as behavioural intention, attitude and subjective norm. According to the theory, people think and evaluate the implications of their actions before determining whether or not to engage in the action (Ajzen & Fishbein, 1980). The theory of reasoned action assumes that people are rational and know the value of information. Consumers therefore make coherent decisions using available information from multiple sources before making a purchase.

A subjective norm is an individual's personal belief or opinion of whether another individual should or should not perform a particular behaviour, in this case purchase a product. This is the social influence or pressure, and can be related to word-of-mouth in marketing. Attitude can be defined as the total beliefs about a specific behaviour weighted by evaluations of these beliefs. Not all possible referents will be significant or relevant for a consumer's decision-making; only behavioural referents will influence their decision-making (Ajzen & Fishbein, 1980). Many researchers (Chowtanapanich & Chaipoopirutana, 2014; Nezakati, Hosseinpou & Hassan, 2014; Nor, Shanab & Pearson, 2008; Promotosh & Sajedul, 2011) have employed the theory in their studies of reasoned action, relating it to purchase intention and purchase behaviour.

Demographics is another factor that affects purchase intention (Chowtanapanich & Chaipoopirutana, 2014; Promotosh & Sajedul, 2011). Demographics include

characteristics about the consumer such as age, race, gender and education, as these influence a consumer's intentions. A study by Li, Kim and Park (2007) found that trust has a big influence over purchase intention and that consumers are more likely to consider making a purchase from a brand that they trust. This is particularly relevant for technological products where trust plays a key role. Trust comprises perceived ease-of-use, perceived risk and perceived reputation (Li *et al.,* 2007). Perceived value of the product is another factor that affects purchase intention (Wood & Scheer, 1996). Perceived value is made up of expected benefits of obtaining the product and expected costs to be incurred (Wood & Scheer, 1996). Moreover, research conducted by Mahmoudzadeh *et al.* (2013) found that there is a positive and direct relationship with purchase intention and brand identity, where brand identity is made up of perceived value, customers' satisfaction and trust. This indicates that consumers are more likely to consider purchasing a brand that they identify with.

Brand image and attitude towards the brand also influence consumer purchase intention as found in research by Shah, Aziz, Jaffari, Waris, Ejaz, Fatima and Sherazi (2012) as well as Wang and Tsai (2014). These authors found that the increased perceived quality associated with a positive brand image positively influences purchase intention. Another factor that may affect purchase intention is information, which is made up of experience, knowledge and media exposure (Promotosh & Sajedul, 2011).

All assessments of consumer intentions to purchase a cellular phone need to take into account the various conditions and complex factors that affect the changing cellular phone market as well as the individual consumers' particular thoughts and feelings when making a purchase decision (Chen, Kyaw & Ross, 2008). Just as important as the factors that influence purchase intention, are the measurements of purchase intention, which will be discussed below.

3.4.2 Measurement of Purchase Intention

It is essential to measure purchase intention, as it allows marketers to influence consumers' planned purchasing behaviour (Lindquist & Sirgy, 2008). The crucial aspect of influencing planned purchasing is to have knowledge of purchase intention

and the strength of the consumer's commitment to it. This section discusses some of the concepts related to the measurement of purchase intention.

Purchase intention can simply be measured using a yes or no question, related to whether the consumer intends on making a purchase or not. However, consumer purchase intention is more commonly measured using a Likert scale, where marketers evaluate how likely consumers are to purchase their brand or products, using varying degrees of likelihood (Lindquist & Sirgy, 2008).

There is a common component to purchase intention measurements, which is the time factor of intention (Hosein, 2012). The time factor depends on the product being measured and its life cycle. Using time to measure purchase intention may consist of asking consumers questions such as whether they intend on making a purchase in 1-3 months, 4-6 months or 1 to 2 years, 2 to 3 years and so on, as was done by Hosein (2012) in his study. However, exact time does not need to be specified. For example Lim, Chew, Lee, Loke and Wong (2012) in their study did not specify the time when questioning consumers about purchase intention. Consumers may be asked if they intend on making a purchase sometime in the future without specifying a timeframe, although this is a given since intent may occur in the present but purchases are made in the future.

Other measurements of purchase intention can include whether the consumer will make a recommendation to others. This measurement was used by Lim *et al.* (2012), Mahmoudzadeh *et al.* (2013) and Faryabi *et al*. (2015) in their studies. They asked consumers if they would recommend purchasing the particular brand to other consumers. Faryabi *et al.* (2015) also asked consumers if they would still intend purchasing if the price of the brand increased. Purchase intention can be measured both before a certain marketing initiative and after, in order to determine whether the purchases were actually made. This shows marketers the effectiveness of their marketing efforts (Lindquist & Sirgy, 2008).

In addition to measuring purchase intention, purchase probability can also be measured (Lindquist & Sirgy, 2008). Purchase probability asks consumers to indicate how strongly they believe they will implement their intentions into actions (Lindquist

& Sirgy, 2008). Once again, a Likert scale can be used or a percentage based scale, where 100% indicates absolute certainty that the consumer will follow up on their intention. However, direct purchase intention will not be measured in this type of study; rather which variable innovation or brand image is more likely to result in a purchase intention being made will be determined. The next section discusses the relationship or link between purchase intention and innovation.

3.5 Innovation and Purchase Intention

Innovation and consumer purchase intention are closely related. This section will explain why there is a relationship between these two variables.

As discussed previously, part of the definition of innovation states that an innovative product must add more value to consumers than its predecessor (O'Sullivan & Dooley, 2008). Value must be added by the innovation in order to persuade customers to purchase the product or service or to perceive an improvement. Successful innovation must adequately fulfil the needs of potential customers (O'Sullivan & Dooley, 2008). The probability of consumers purchasing a product depends on how well the innovation satisfies their needs. A mistake that manufacturers of technology often make is to place emphasis on the technological capability of their products instead of on how that technology can satisfy customer needs (O'Sullivan & Dooley, 2008). If innovation results in actual improvements, consumers perceive that the quality of the product has increased, further adding value to the product (Wang & Tsai, 2014).

Perceived quality and value is the key link between innovation and purchase intention; this is because research shows that perceived value and quality are major factors that influence consumer purchase intention (Mahmoudzadeh *et al.*, 2013; Wang & Tsai, 2014; Wood & Scheer, 1996). The value of the product is created by increasing its benefits and features to better satisfy consumers' wants and needs (Mahmoudzadeh *et al.*, 2013). Several researchers (Chen & Chang, 2012; Wang & Tsai, 2014; Yee & San, 2011) have noted that perceived value is pertinent to the consumption experiences and emotional responses of consumers. This can further impact the purchase behaviour of the consumer, thereby affecting their purchase

intention. A higher perception of quality improves consumers' perceived value, which strengthens consumers' purchase intention (Wang & Tsai, 2014).

Given that innovation increases the perceived value of products, which then positively affects consumers' purchase intention, it can be understood that innovation and purchase intention have a positive relationship. As innovation increases, so does perceived value and quality, and thus so does purchase intention. This indicates that a positive relationship exists between innovation and purchase intention, assuming that the innovation has caused the product to increase in value. Drawing from the link between innovation and purchase intention, it is assumed that the results of this study will show that innovation has a positive influence on purchase intention. The next section briefly examines the relationship between purchase intention and brand image.

3.5.1 Brand Image and Purchase Intention

This section will examine how brand image and consumer purchase intention are related. Although this research does not study this relationship, it is important to understand it in order to have a better understanding of how all three variables, namely innovation, brand image and purchase intention fit together and are related to each other.

According to past research (Shah *et al*., 2012; Wang & Tsai, 2014), a relationship exists between brand image and purchase intention. Brand image is a key factor that influences consumer purchase intention. Research conducted by Wang and Tsai (2014) showed that brand image increases purchase intentions because brand image consists of perceived quality, and quality is a key factor leading to purchase intention. A strong, favourable, and unique brand image is positively related to willingness to pay premium prices thereby promoting higher brand equity (Wang & Tsai, 2014). A positive brand image also leads to brand trust (Esch, Langner, Schmitt & Geus 2006; Liao, Chung & Widowati, 2009). This means that if a brand has a positive image, consumers are most likely to trust the brand. This trust could be based on the fact that consumers have had continuous positive previous experiences with the brand (Liao *et al.,* 2009).

Meanwhile, research has also shown that trust has a major impact on purchase intention and that consumers are more likely to consider making a purchase from a brand that they trust over one that they do not (Li *et al*., 2007; Schlosser, White & Lloyd, 2006). Therefore, customer trust would positively influence consumer purchase intentions (Lu, Zhao & Wang 2010 Schlosser *et al.,* 2006). This indicates that there is a positive relationship between brand image and purchase intention through the intervening variable of trust (Mahmoudzadeh *et al.,* 2013). A positive brand image leads to consumer trust, which in turn leads to a higher intent to purchase and in this way there exists a relationship between brand image and purchase intention. Therefore data can be collected to determine whether brand image creates a more favourable intention to purchase a cellular phone.

The next section of the chapter discusses the relationship between innovation, brand image and consumer purchase intention.

3.6 Innovation, Brand Image and Purchase Intention

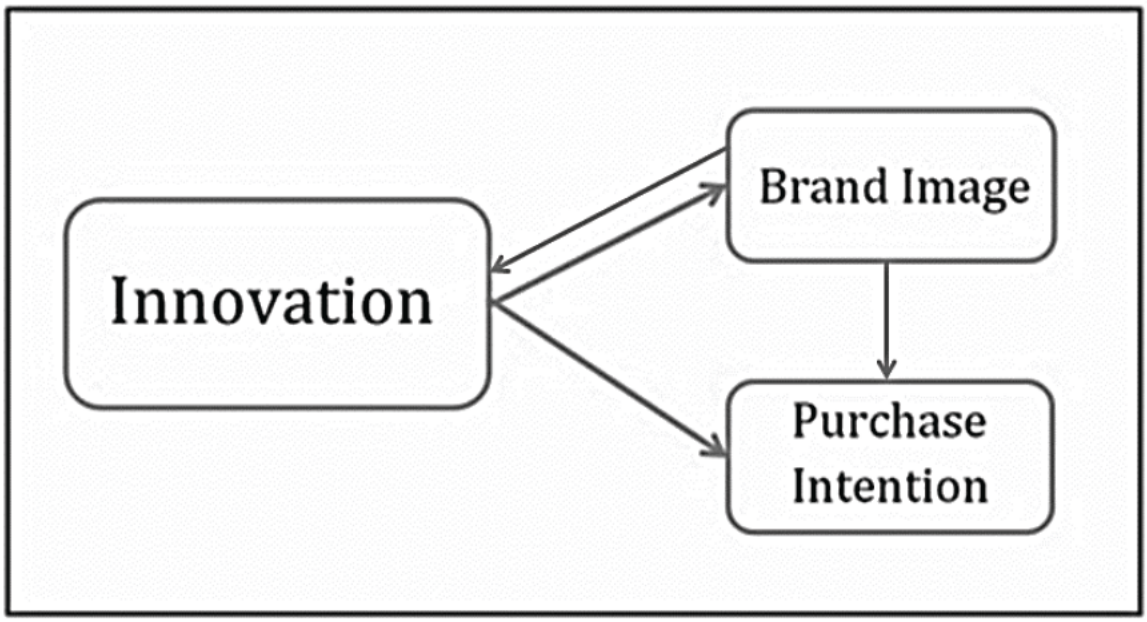
The relationships between innovation and brand image, innovation and purchase intention and purchase intention and brand image have already been discussed in this chapter. This section seeks to consolidate these relationships. Below the conceptual framework used in the study, which drew from numerous authors, is discussed.

Innovation results in the perception that the improved product is superior to competitors' products, in this way enhancing the brand's image (Shiau, 2014). Innovation allows products to be differentiated and hold a distinct place in consumers' minds; in this way the positive associations held about the brand are strengthened (Andrews & Kim, 2007). Furthermore, innovation can create competitive advantage for the brand, thus further enhancing the brand's image. At the same time, brand image reduces the risk associated with using a new or innovative product because consumers' past experiences with the brand have been consistent and rewarding (Kim *et al.,* 2015). It is therefore clear that brand image affects consumers' purchasing intention. Lee, James and Kim (2014) further attest that the brand image of a product not only guides and forms the basis of marketing strategies for the company but also strongly influences consumer's purchase intention.

Innovation also adds an increased level of quality and value to the product; it satisfies consumers' needs in an improved and better way than its predecessor (O'Sullivan & Dooley, 2008), while the brand image increases the trust that the consumer has in the product (Esch *et al*., 2006; Liao *et al*., 2009). Increased value created through innovation and trust created through a strong brand image are two of the leading factors that influence consumer purchase intention (Li *et al.,* 2007; Mahmoudzadeh *et al.*, 2013; Schlosser *et al.,* 2006; Wang & Tsai, 2014; Wood & Scheer, 1996).

An innovative product improves the brand image, while the brand image leads to higher acceptance of the innovation and a higher degree of purchase intention. Innovation adds value and positively influences purchase intention, while brand image adds trust and risk reduction, also positively influencing purchase intention.

Figure 3.3: Conceptual Framework



(Source: Compiled by author)

It can therefore be concluded that innovation does in fact impact brand image, but that brand image also impacts innovation, specifically the acceptance of innovation, while innovation and brand image simultaneously influence the consumers' purchase intentions. The main research papers discussed in the literature review have been tabulated in Table 3.4 below, with specific reference to the products studied and the

constructs measured in each study. This creates a summarised overview of the authors who have conducted research relevant to this particular study. The authors below have researched concepts of purchase intention, brand image and innovation in many combinations on an array of products.

Table 3.4: Summary of Most Relevant Studies

Author/s	Year	Products Studied	Constructs Measured
1. Holak & Lehmann	1990	Multiple electronic and durable products	Purchase Intention and Innovation
2. Bayus & Mason	2003	Electronic Products	Innovation and Purchase/adoption Intention
3. Arts, Frambach & Bijmolt	2011	General (no specific product)	Innovation and Purchase/adoption Intention
4. Shah, Aziz, Jaffari, Waris, Ejaz, Fatima & Sherazi	2012	General (no specific product)	Brand Image and Purchase Intention
5. Mahmoudzadeh, Bakhshandeh & Ilkhechi	2013	Cellular phones	Brand Identity and Purchase Intention
6. Tseng & Chiang	2013	Cellular phones	Innovation and Purchase intention
7. Wang & Tsai	2014	Mutual Funds	Brand Image and Purchase Intention
8. Shiau	2014	Japanese Anime Dolls	Innovation, Brand Image and Behavioural Intention
9. Hanaysha, Hilman & Abdul-Ghani	2014	Vehicles	Innovation and Brand Image

(Source: Compiled by author)

Holak and Lehman (1990) and Arts *et al.* (2011), used Rogers (1962, 2003) attributes of innovation to determine intention to purchase or adopt an innovation. Holak and

Lehman (1990) found that relative advantage and compatibility have a significant positive relationship with purchase intentions, while complexity, divisibility and communicability were not statistically significant. Additionally, they added the factor of perceived risk and it was found that perceived risk has a negative relationship to intention. Arts *et al.* (2011) tested Roger's (2003) attributes of innovation based on adoption intention and actual behaviour. They found that compatibility has a stronger positive effect on intention than it does on behaviour and that relative advantage has a stronger positive effect on behaviour than on intention. Perceived complexity was discovered to more strongly hinder behaviour than intention, but to have a positive effect on intentions. Trialability and observability display negative effects at the later stage of the innovation adoption process because personal experience with the innovation reduces their effect.

Bayus and Mason (2003) studied the effect of consumer innovativeness on adoption intention and found that the former had a positive and significant effect on the latter. In particular, younger consumers with a high income and higher innovative tendencies are more likely to adopt more new products. Shah *et al.* (2012) found that brand image and brand attitude had a very strong correlation with purchase intention. Tseng and Chiang (2013) studied the factors most important to cellular phone upgrades and found that perceived value created by innovation was the most critical factor influencing consumers' intention to upgrade their cellular phones to newer, more innovative models. Wang and Tsai's (2014) research showed significant relationships among brand image, perceived quality, perceived value, and purchase intention.

Shiau (2014) found that product innovation had a positive effect on brand image and that innovation led to brand images that were perceived as 'worth their value' and of 'high quality'. In other words sound product innovation greatly enhances brand image. Shiau (2014) further found brand image to have a positive effect on behavioural intentions. These results are consistent with the findings of a study by Shah *et al.* (2012). Hanaysha *et al.* (2014) had similar results to Shiau (2014); they found that product innovation has a significant relationship with brand image. These results show that innovations to products allow companies to build stronger brand images and thereby increase perceived quality, trust, loyalty and eventually profits.

3.7 Brand Image and Purchase Intention in the Cellular Phone Industry

Most consumers prefer internationally known brands of cellular phones such as Apple and Samsung compared to lesser known brands (Yufang, Bin & Qiaoyi, 2014). Apple and Samsung currently dominate the cellular phone market, with other brands such as Sony, HTC, Huawei, Blackberry, Nexus and LG trailing (Yufang *et al.,* 2014). However, Nokia is still a popular choice for low income consumers in third world countries (Mahapatra, 2013). The brand value of Apple and Samsung are close. While Apple has more brand awareness than Samsung, the latter is considered, used and recommended more than Apple (Yufang *et al.,* 2014).

Given that cellular phones, particularly smartphones, have reached a dominant design and have become very similar in terms of features and appearance, choice is often based on the brand (Liu, 2002). Furthermore, research shows that the brand of the cellular phone is one of the main determinants for cellular phone selection (Simay, 2009). This means that a strong and positive brand image of a cellular phone is essential in the purchase decision and intention of customers, and therefore needs to be a focal point for cellular phone companies. Additionally, a cellular phone company with strong brand image means that the user will continue to use their products and to upgrade and repurchase from the same brand (Liu, 2002). Upgrading cellular phones to newer models is common practice, either done immediately upon the release of a newer model or at a later period once the price of the device has decreased (Liu, 2002). As mentioned above, a strong and well-known brand image indicates high quality products and thus creates brand trust, which leads to a higher possibility of purchase intentions.

Deciding to purchase a cellular phone, and which particular device to purchase, can be a complex process. The complexity arises due to the many choices that exist; consumers first have to decide on which brand and then which model of cellular phone to purchase. A cellular phone can also be expensive, which means more thought goes in to deciding which brand and model to purchase (Chen *et al.,* 2008). The characteristics of a cellular phone shape the decision-making process and therefore the consumers' purchase intentions.

In addition, cellular phones are technological products that are continuously innovated, which means that some consumers may associate a risk with purchasing a device. A cellular phone is also a product with high consumer involvement as it is used extensively throughout the day, which adds to the cognitive process of decision-making (Chen *et al.,* 2008). All these factors imply that consumers are most likely to plan ahead for the purchase, and adequately compare prices, brands and models; this therefore makes the consumer purchase intention very important and relevant to cellular phones. Cellular phone companies need to understand the factors that influence purchase intention for their products and must be able to use those factors to persuade consumers to purchase their brands.

3.8 Conclusion

Chapter Three served as the second and final literature review chapter. In this chapter brand image was defined in detail and a consideration of its importance, measurements and relationship with innovation was offered. Purchase intention was also reviewed, the factors affecting it and the measurements were discussed along with the relationship between purchase intention and innovation and purchase intention and brand image. The chapter then linked all three variables of innovation, brand image and purchase intention and briefly discussed some aspects about the cellular phone industry in particular. Chapter Four will examine the research methodology that was used in conducting this research.

CHAPTER: 4: RESEARCH METHODOLOGY

4.1 Introduction

Chapter four discusses the research methodology utilised in the study. The research methodology aims to address, in great detail, how the research is to be conducted. It discusses the research design, sampling strategy as well as the data collection method to be used to conduct this research. In addition, the validity, reliability and the ethics underpinning the research will be considered as well as the limitations pertaining to the research methodology.

The research objectives and hypothesis must first be re-stated as these will guide the research and to serve as a reminder of what the research seeks to uncover.

4.2 Problem Statement

Innovation is necessary for business growth and survival; research shows that innovation may also have a positive influence over brand image and purchase intentions. However, innovation is more often approached from the business's context with less importance given to consumer research. Consumer research is neglected which may result in innovations providing little to no extra value for customers. In other words a company may be implementing innovation that is not necessarily what consumers want. Therefore, this study seeks to determine with reference to cellular phones, the effects that innovation has on brand image and consumer purchase intention amongst students, so that investments into innovation can be improved. The high level of competition, continually emerging technology and growth in the cellular phone industry, further encourages the importance of innovation. The strong presence of the driving forces of innovation means that consumer research is essential in enhancing innovation initiatives, especially in the cellular phone industry.

4.3 Research Questions

1. What are the most important factors relating to the innovation of cellular phones for UKZN students?

2. How does innovation affect brand image for cellular phones?

3. Does innovation have a positive effect on brand image?

4. How does innovation affect purchase intention amongst UKZN students for cellular phones?

5. Does innovation have a positive effect on purchase intention?

6. How does brand image affect UKZN students' purchase intentions for cellular phones?

4.4 Research Objectives

The objectives of the research serve as a guide to the entire research and data collection process; they are as follows.

1. To identify the most important factors relating to the innovation of cellular phones for UKZN students.

2. To determine how innovation impacts on the brand image of cellular phones amongst UKZN students.

3. To determine whether cellular phone innovation helps to improve brand image.

4. To understand how innovation affects UKZN students' purchase intentions for cellular phones.

5. To determine whether innovation in cellular phones provides a better chance for a positive intention to purchase to arise.

6. To determine whether brand image creates a more favourable intention to

purchase a cellular phone.

4.5 Hypothesis

There is no hypothesis for the first research question and objective as this is the exploratory aspect of the research.

H_0: The innovation of cellular phones has no effect on brand image.
H_1: The innovation of cellular phones has an effect on brand image.

H_0: The innovation of cellular phones does not have a positive effect on brand image.
H_2: The innovation of cellular phones has a positive effect on brand image.

H_0: The innovation of cellular phones has no effect on consumers' purchase intention.
H_3: The innovation of cellular phones has an effect on consumers' purchase intention.

H_0: The innovation of cellular phones does not have a positive effect on consumers' purchase intention.
H_4: The innovation of cellular phones has a positive effect on consumers' purchase intention.

H_0: Brand image does not have a positive effect on consumers' purchase intention.
H_5: Brand image has a positive effect on consumers' purchase intention.

4.6. Research Methodology

The research methodology includes aspects such as the research design, sampling methods, data collection methods, measurements to be used as well as the data analysis and limitations of the research, which will be discussed below.

4.6.1 Research Design

The research design is a blueprint or framework of the research that is based on the research objectives; the blueprint will serve as a guide for the collection, measurement and data analysis (Sekaran & Bougie, 2013). A research design is therefore a plan that constitutes and specifies the methodologies, strategies and procedures to be used for the collection and analysis of the data.

There are three main types of research design; these are exploratory, descriptive and causal (Sreejesh, Mohapatra & Anusree, 2013). Exploratory research is a research design that is undertaken to clarify the nature of the problem, discover ideas, gain a stronger understanding and to provide direction for future research, it has very little secondary data and very little is known about the phenomena (Sreejesh *et al.,* 2013). The researcher seeks to explore the problem; it is usually done in the preliminary phases. When the researcher knows precisely what has to be studied and seeks to describe a phenomena, determine its frequency of occurrence or the relationship between two or more variables it is a descriptive research design (Sreejesh *et al.,* 2013). In descriptive research the researcher is trying to uncover something specific and he knows what questions to ask. The last main research design is causal research which is used to determine the cause and effect relationship (Sreejesh *et al.,* 2013). Causal research tries to determine which occurrences lead to a particular effect.

The study will have elements of both exploratory and descriptive studies. Exploratory research design is conducted when previous studies on the issue are limited (Sekaran & Bougie, 2013). The exploratory aspect of this study refers to the objective of identifying the specific factors that relate to the innovation of cellular phones. A descriptive study is used to describe or determine the characteristics of the issue or phenomena being studied (Sekaran & Bougie, 2013). The descriptive element refers to the objectives of understanding how specific factors relating to innovation relates to brand image and purchase intention.

A research design can also be either qualitative or quantitative. Due to the nature of this study, a quantitative research methodology will be the most suitable. Quantitative research is fundamentally about explaining a particular phenomenon through the collection of numerical data (Zikmund, Babin, Carr, & Griffin, 2012). Therefore

quantitative research is based on mathematical models, theories and/or hypotheses pertaining to phenomena. Quantitative methods also use statistics to analyse data while qualitative research does not.

The qualitative approach allows the researcher to have an in-depth understanding of the research phenomena; however that is not a requirement for this study. A quantitative approach will be taken as it allows for hypothesis testing and factor analysis, both inherent in this research study. Quantitative research is also less biased than qualitative, as there is very limited subjective interpretation of the data and it is highly scientific and structured (Zikmund *et al.* 2012).

Quantitative research findings can be also generalised and have greater reliability and validity than qualitative research (Sekaran & Bougie, 2013), although the data collection methods for both quantitative and qualitative are similar such as questionnaires and surveys, the type of questions asked and how they are phrased and analysed will differ. Another reason that quantitative research will be used is that the findings can more easily be expressed numerically, allowing for quicker statistical analysis using computer-based applications compared to more time-consuming analyses for qualitative research.

4.6.1.1 Study Site

The study site for the research is the University of KwaZulu-Natal (UKZN) since it is the students of this university who made up the sample. On the first of January 2004, a merger between the University of Durban-Westville and the University of Natal resulted in the formation of UKZN (UKZN[1], 2015). The university combines the rich heritage and diversity of both the former Universities and is therefore a good sample that is representative of all the different cultures and races of South Africa. The study site provides direct access to Generation Y, the required sample in terms of age group and education level. Furthermore, it is in close proximity to the researcher thus decreasing the cost of the research. Out of the five UKZN campuses only the Westville campus will be used as a study site.

4.6.1.2 Target Population

The population is the entire group of people or events that is to be studied by the researcher (Sekaran & Bougie, 2013). In this study the target population has been the entire undergraduate and honours (first year to fourth year) students of UKZN from which a sample was selected. The target population is mainly based on age, with Generation Y also known as Millennials being targeted, which includes older teenagers and young adults (Hawkins, Mothersbaugh & Mookerjee, 2007). This generation is expected to be the most educated to date, with incomes that will follow (Hawkins *et al.,* 2007). The individuals in Generation Y are very technologically and internet savvy with over 90% having a strong online presence, higher than any other generation (Hawkins *et al.,* 2007).

Technology is a crucial and even necessary aspect of Generation Y individuals This is because they were born during the digital age and grew up surrounded by technological gadgets such as laptops, tablets and cellular phones; they also witnessed the rise of the Internet, the Web, social media and some of the most transformative innovations in history (Gibson, 2013: Na'Desh, 2015). According to the Deloitte Millennial Survey (2014), Generation Y considers innovation as one of the most important purposes of a company and do not only want to work for organisations that put innovation in the forefront but also to purchase from innovative brands. Furthermore, millennials are 2.5 times more likely to be early adopters of new technology than any other generation (Logan, 2015). These characteristics make Generation Y the most suitable and pertinent generation to this study.

By deriving the target population from students, there is clear access to individuals from Generation Y; however it controls the population not just in terms of age but other characteristics such as education and expected future earnings. University students all have a minimum education level of completing their schooling education. Furthermore it is assumed that they will complete and graduate from university which improves their earnings expectations in the future.

The next section explains the sampling method.

4.6.2 Sampling Method

Sampling refers to the selection of an adequate, relevant number of members from a defined population; it includes probability and non-probability sampling through a random selection procedure (Sekaran & Bougie, 2013). When selecting the group of individuals or a subset of the population, it is known as sampling. There are two main types of sampling, probability and non- probability sampling.

Probability sampling is the selection of a sample from the population in a random manner, such that each element of the population has a known and equal probability of being selected (Onwuegbuzie & Collins, 2007). In probability sampling, the subjects have a known or equal chance of being selected (Merriam, 2009). For this reason, in probability sampling, the sample usually represents the population fairly and lends itself to generalisability. There are numerous methods of probability sampling, which includes area sampling, double sampling, cluster sampling, simple random sampling, and systematic sampling (Sekaran & Bougie, 2013).

In non-probability sampling, the subjects do not have a known or equal chance of being selected; it is at the discretion of the specific research requirements (Merriam, 2009). In non-probability sampling the researcher will purposefully select the individuals for the sample from within the population (Onwuegbuzie & Collins, 2007). Some non-probability sampling techniques are purposive sampling (which include judgement and quota sampling); convenience sampling, snowball sampling and purposive sampling are other forms of nonprobability sampling. Purposive sampling is used when the sample can provide the information required by the researcher or conform to criteria set by the researcher (Merriam, 2009).

The sampling method used was non-probability, judgement sampling. Non-probability sampling is better utilised because it is more time and cost efficient, it is also more convenient and makes it easier to access the sample (Sekaran & Bougie, 2013). Since this research is partially exploratory, non-probability sampling suits it well and is the best way to get information efficiently and quickly (Sekaran & Bougie, 2013). Judgement sampling is when the sample is chosen on the basis of the individual's ability to provide the type of special information needed by the researcher (Sekaran & Bougie, 2013). In other words, the sample is selected by the

researcher based on some appropriate characteristics required of the sample member. Specific target groups are selected to provide certain desired information. The concepts of cellular phone innovation is more likely to be pertinent to the individuals within the population of Generation Y and UKZN, given their higher use and knowledge of technological devices such as cellular phones as well as their preferences for and openness to innovation.

Therefore, students were selected not only for their convenience, but also for their level of education, that is they have all completed their school education and are pursuing a higher education degree as well as average age. Students were also selected for their anticipated purchasing power once they enter the workforce and higher interest in technological gadgets than people in other age groups, as discussed in detail in the section above (target population) (McKinsey & Company, 2011). Although judgement sampling was used it is still less costly and time consuming because the researcher has easy access and is in close proximity to the sample (Sekaran & Bougie, 2013).

The main disadvantage of judgement sampling is that results are less representative and generalizable to the population, particularly with judgement sampling; generalisability may be questionable (Sekaran & Bougie, 2013). Although probability sampling allows for greater generalization of the findings, non-probability sampling maximizes understanding of the underlying phenomenon (Onwuegbuzie & Collins, 2007). Additionally, judgement sampling may be subject to the researcher's bias which may distort the results (Onwuegbuzie & Collins, 2007). However, in this case, the sample will be better representative of the population because of the close similarities in characteristics, furthermore, the researcher will be aware and ensure that they minimize the bias so as not to distort the results.

4.6.2.1 Sample Size

The sample was drawn from the Westville campus of UKZN. According to official figures there are 12120 students registered at the Westville campus (UKZN[3], 2015). Using an accepted confidence interval of 5% and confidence level of 95%, the appropriate sample size would be 372, which confirms the adequacy of the sample

(Sekaran & Bougie, 2013: Krejcie & Morgan, 1970). There are numerous published studies that have used the Krejcie & Morgan (1970) method of calculating sample size, some of these include Asomaning & Abdulai (2015), Veiga, & Eloff (2010) and Li & Ranieri (2010). Once the sampling method is completed, the data collection method must be considered; data collection is discussed in the next section below.

4.6.3 Data Collection Method

A core element of research is data collection. Data collection can be defined as a process of systematically finding, collecting, measuring, analysing and interpreting information of variables of interest, in a systematic manner that allows the researcher to test hypotheses, evaluate outcomes and answer stated research questions (Sekaran & Bougie, 2013). In other words, the data collection method is the tool or instrument that will be used to gather the required information from the sample size.

There are two main types of data collection; secondary and primary data. Secondary data is data that already exists; it has been collected and recorded by other researchers preceding the current research (Zikmund *et al.,* 2012). Sources of secondary data include databases, government publications, academic journals, books and economic indicators (Sekaran & Bougie, 2013). Secondary data has many advantages such as convenience and easy availability, quicker and cheaper than acquiring primary data, especially due to electronic access to data that is stored digitally (Zikmund *et al.,* 2012). In this research, secondary data has been collected to conduct a literature review, which adds substance to the research and puts forward existing information in a comprehensive, yet summarised manner.

Primary data refers to data that is collected first hand for a current research by the researcher (Sekaran & Bougie, 2013). There are numerous tools for collecting data, which includes content analysis, observations, focus groups, surveys and questionnaires (Tewksbury, 2009). For this research, structured questionnaires with closed-ended questions have been chosen. A questionnaire is a preformulated, written set of questions to which respondents record their answers, usually within rather closely defined alternatives (Sekaran & Bougie, 2013). The questionnaires were self-administered; the researcher physically distributed it to respondents who then completed it on their own, on completion the researcher collected the questionnaires

for analysis.

One of the disadvantages is that the questionnaire is structured and uses closed-ended questions which mean that respondents cannot elaborate, but rather are restricted to make a choice from the responses predetermined by the researcher (Deren, 2013). Respondent freedom may also be a disadvantage because the time taken to do the questionnaire depends solely on the respondents. Printing of the questionnaires may also result in high financial costs, since over 372 questionnaires were printed (Zikmund *et al.* 2012). However, questionnaires are generally less expensive and time consuming compared to other data collection methods such as interviews and experiments; they are also more practical, scientific and more easily analysed compared to other forms of data collection (Sekaran & Bougie, 2013).

Using a self-administered questionnaire means that respondents had more freedom to control the pace and time for completing the questionnaire, which is more convenient and easier for them (Deren, 2013). Since, the researcher distributed and collected the questionnaires, there is a higher response rate than other methods of administration, anonymity of respondents can also be maintained better (Sekaran & Bougie, 2013). The questionnaire has been distributed to students across the different faculties during their tutorials and where possible during their lectures. Furthermore, gathering of the data is reasonably easy for the researcher, the data is simply coded and if the validity and reliability of the data is high it benefits the scientific community (Sekaran & Bougie, 2013). The questionnaire will be structured, using closed-ended questions, which ask the respondent to make choices amongst a given, predetermined set of alternatives; closed ended questions enable quick decisions by respondents and easy coding for later analysis (Sekaran & Bougie, 2013).

Questionnaires are more frequently used in quantitative research studies and according to Rowley (2014) it is used when the researcher needs to profile the sample in numerical terms or to calculate the frequency of occurrence of the issue or phenomena being studied. Questionnaires are more appropriate when the researcher knows exactly what information is needed and when the sample size used in the study is large (Sekaran & Bougie, 2013). Since the sample size for this study is 372, questionnaires are an appropriate data collection method. Furthermore, since the research is to be conducted in one campus, it is not inconvenient or costly to distribute

the questionnaires physically. Therefore self-administered, structured questionnaires are the most appropriate and suitable for this research.

4.6.3.1 Construction of the Questionnaire

The questionnaire consisted of four main sections, with questions based on the research questions, objectives and hypothesis. The four sections of the questionnaire are as follows:

Section: A

Section A included the sample's biographical information such as age, gender, campus, year of study and whether the respondent owns a cellular phone. The questions in this section will be dichotomous and multiple-choice.

Section: B

Section B included statements relating to innovation; particularly factors of innovation preferred by the respondent especially those regarding (but not necessarily limited to) cellular phones.

Section: C

The questions in section C related to the brand image variable and how respondents think innovation affects brand.

Section: D

The last section is section D; this section consisted of statements related to how innovation impacts consumer purchase intention as well as how brand image affects consumer purchase intention.

Section B, C and D all have statements to which respondents indicated their extent or degree of agreement or disagreement using a five point Likert scale. For this research, scale items implemented from previous research were used as far as possible; this is to ensure content validity. However, the scale items have been adjusted to better suit this study and some adjustments made.

The factors of innovation will be used and adapted to best answer the questions of this research. Through the work of Lee *et al*. (2011), the factors of cellular phone innovation were drawn and will be analysed in the data collection process. Therefore, the following constructs are the most relevant and significant to this study: performance to measure the preferred features of innovation in the software of a cellular phone, appearance measure hardware preferences, and price Kim *et al.* (2015) as a regulator. Communication was not seen as relevant to features of a cellular phone as it cannot be used physically or observed in a cellular phone device and was therefore omitted. Although these factors can be seen as oversimplified and groups all innovation together as one, they are the closest construct to use. By using factors of innovation already used in previous research, the validity is improved.

The questions related to innovation were drawn from Rogers (2003) measurements, namely relative advantage, compatibility, complexity, trialability and observability. Rogers is one of the most recognized names in innovation research and has been used by numerous researchers such as Holak & Lehman (1990) and Arts *et al.,* (2011), using his measurements is likely to produce more reliable results. For brand image a combination of constructs reviewed in the literature are used, namely Park, Jaworski & Macinnis (1986) functional, symbolic and experiential construct, which were also recently used by Shiau (2014).

The table 4.1 shows the constructs, variables and sources from which the items will be selected.

Table 4.1 Measurements for the Questionnaire

Construct	Variables	Author/s
Innovative Cellular Phone features	Performance -Usefulness -Ease-of-use -Innovativeness of Technology Appearance -Visual Appeal	Lee, Ha & Widdows (2011)
	Price	Kim, Hunt & Lancioni (2015)
Innovation	Relative advantage Compatibility Complexity Trialability Observability	Rogers (2003)
Brand Image	Functional Symbolic Experiential	Park, Jaworski & Macinnis (1986) and Shiau (2014)
	Favourable associations	Keller (2013)

(Source: Compiled by author)

A sample of the questionnaire can be found in appendix 6. The next section discusses the measurements to be used in the research.

4.6.4 Measurements

A five point Likert scale will be used which will include strongly disagree, disagree, neutral, agree, and strongly agree; it ranges from 1 being strongly disagree to 5 being strongly agree in response to the questions asked. An interval scale will be used to measure the responses. An interval scale is a multi-point scale that gauges the differences, equality and order of the degree of the differences in the responses (Sekaran & Bougie, 2013). The higher the points pertinent to each section the stronger the impact of innovation on brand image and purchase intention.

4.6.5 Data Analysis

Once the data has been collected it must be analysed; this requires reducing the data collected to a digestible size, devising summaries, looking for any patterns and applying statistical techniques (Sekaran & Bougie, 2013). Data analysis must be related to testing the hypothesis, finding solutions to the research problem and achieving the research objectives. The data analysis method will be discussed below.

The first step to data analysis is to prepare the data, this means that the data must be coded and then entered into a computer-based application for easy analysis (Sekaran & Bougie, 2013). For the purpose of this research, the software, *Statistical* Package for the Social Sciences (SPSS) will be used to input the data, easy editing of the data as well as analyzing the data. Once the data is coded and inputted, descriptive statistics will be generated especially for section A of the questionnaire, the biographical data. Descriptive statistics provide descriptive information about a set of data and can be in numerical form or displayed graphically; they consist of measures of central tendency (mode, mean and median) and measures of dispersion (standard deviation and variance) (Jupp, 2006). The graphical aspect of descriptive statistics includes graphs such as bar graphs, pie charts, histograms, scatterplots and tables (Jupp, 2006). Descriptive statistics will also be used to get a feel of the data; calculating and comparing the mean also summarises the data into a simpler form.

For the first research objective, which is in section B, factor analysis will be used to analyse the most important factors of innovation to students. In factor analysis, the researcher may not have exact knowledge of the nature or number of factors (Williams, Brown & Onsman, 2010). Therefore, EFA is exploratory in nature as the name suggests, lending itself to the exploratory research design. Exploratory factor analysis allows the researcher to reduce a large number of factors into a smaller set of factors and to explore the main dimensions to develop a theory from a fairly large set of latent constructs usually represented by a set of items (Williams *et al.,* 2012).

In order to test for significant trends in the data inferential statistics will be applied. Inferential statistics are statistics that assist in establishing relationships between variables and draw conclusions therefrom (Sekaran & Bougie, 2013). These inferential statistics will include Pearson's correlation, regression, t-tests, ANOVA and chi squared tests. Where the conditions are not met for the application of these tests, non-parametric equivalent tests or exact tests where applicable, will be used. Throughout the data analysis, a P value of 0.05 will be used to indicate significance. . Inferential statistics will be used to analyse the impact of innovation on brand image and consumer purchase intention. Regression analysis is used in a situation where one independent variable is hypothesised to affect one dependent variable (Sekeran & Bougie, 2013). As well as to analyse whether innovation impacts brand image and

whether innovation impacts purchase intentions. The use of the computer-based SPSS software will continually be used in order to analyse the data from this study. Furthermore, the validity of results will depend on the correct and appropriate use of statistical tests such that assumptions are adhered to and are not violated.

4.7 Reliability

Reliability refers to the research's consistency, replicability, predictability and stability; this means that for a research to be reliable it must produce the same or similar results if it is repeated under the similar conditions (Bashir, Afzal & Azeem, 2008). Reliability is more relevant to quantitative research as these can more easily be repeated over time, whereas with qualitative research, conditions are always altering. There are three aspects related to reliability - the extent of the result's consistency, stability over time and similarity of the results within a given time period (Bashir *et al.,* 2008).

In other words, research must be reliable in order to be of a high quality, that can test or measure phenomena more than once and will result in the same outcome. Internal consistency can be measured by using Cronbach's alpha, which is a reliability coefficient or measure that indicates how well the different items are correlated and complement each other in measuring the same concept (Sekaran & Bougie, 2013; Jupp, 2006). Cronbach's alpha will be used to assess reliability and can be calculated using SPSS software. The lowest value of Cronbach's alpha deemed to be reliable is 0.7; anything below this is deemed questionable (George & Mallery, 2003: Nunnally, Bernstein & Berge, 1967). The closer the Cronbach's alpha is to 1, the higher the internal consistency reliability (Sekaran & Bougie, 2013).

4.8 Validity

Validity is the truthfulness, accuracy, authenticity, genuineness, or soundness; it refers to how well a piece of research actually measures what it sets out to, or how well it reflects the reality it claims to represent (Sekaran & Bougie, 2013: Bashir *et al.*, 2008). In other words, validity determines if the measuring instrument, which is a questionnaire, truly measures that which it was intended to measure or how accurate and truthful the results of the research are.

There are four main aspects for establishing validity these are; content validity, face validity, criterion validity and construct validity (Zikmund *et al.,* 2012).

Content validity refers to the degree that the elements within a measurement have considered a wide range of theory and relevant literature and that the construct is adequately represented (Zikmund *et al.,* 2012). The secondary data conducted by reviewing a wide range of literature relating to innovation, brand image and purchase intention will ensure a higher degree of content validity. Face validity refers to the extent to which the purpose of the test is clear, obvious and apparent to the respondents (Zikmund *et al.,* 2012). This is the least scientific method of validity as it is not quantified using statistical methods. The questions asked should logically reflect the measurements that were planned. This will be established by clearly stating the purpose of the research in the questionnaire and ensuring that the way that questions will be asked will reflect what is intended on being measured so that the purpose of the research is clear to respondents; this may then also serve as motive for them to answer without bias and truthfully. For the above reasons and since face validity is a subjective evaluation, it can be claimed in this study as the literature review was conducted in depth and guides the study however face validity is a minimum index of content validity and would not suffice on its own additional forms of validity are sought (Zikmund *et al.,* 2012; Sekaran & Bougie, 2013).

The ability of a measure to correlate with other standard measures of similar constructs or established criteria is called criterion validity (Zikmund *et al.,* 2012). All measurement constructs, used in the questionnaire, have been drawn from authors who used them in previous research and in this way criterion validity is ensured.

Construct validity refers to how well the variables were selected and defined with regards to the construct that is being measured or how well the results fit the theories that were used in the study (Bashir *et al.*, 2008; Sekaran & Bougie, 2013). Construct validity is measured in two ways, through discriminant and convergent validity (Sekaran & Bougie, 2013). Discriminant validity is when two variables are predicted, based on theory or past research, to be uncorrelated and the findings further confirms that they are indeed uncorrelated (Sekaran & Bougie, 2013). According to Zikmund *et al.* (2012) discriminant validity may be questioned if two scales are correlated above 0.75. While, convergent validity refers to the degree of correlation between two

different instruments that measure the same concept, the higher the correlation the stronger the convergent validity (Sekaran & Bougie, 2013). Discriminant and convergent validity can be established through correlation analysis, multi-trait or factor analysis (Sekaran & Bougie, 2013). At this stage, content validity which includes face validity can be claimed, and criterion validity, this is due to the extensive literature reviewed and analysed and the selection of measure that correlate with other standard measures of similar constructs. However construct validity can only be claimed once statistical tests are conducted, such as the analysis mentioned above. The next section discusses the limitations of the study.

4.9 Limitations of the Study

The limitations of the study stem from the fact that this study was only conducted on students from first to fourth year from one university and the sample drawn from only one of the five campuses. The research was done on a small scale whereas a larger study would have been more comprehensive and provided extra insight; however this was not possible since the research is self-funded and was conducted on limited financial and time resources. It was also conducted using quantitative methods; although this is more suitable for numerical based studies it will not allow for in-depth understanding and the gathering of detailed information, in this sense it was more generalisable. However the non-probability sampling method limits representation and this will reduce generalisability; a sampling bias may also occur.

Other limitations that may be inherent are sampling and non-sampling errors. Sampling errors are errors or inaccuracies that may occur because inferences about the whole population are founded on information acquired from only a sample of that population (Zikmund *et al.,* 2012). Furthermore, according to Zikmund *et al.* (2012) even if the sampling units are selected properly, adhering to sampling theory, it may not necessary be perfectly representative of the full population but generally they are reliable estimates. Although students generally have many similar characteristics such as age, education level and high future potential earning, as well as a stronger inclination towards technology than other age groups, they may be different in other ways such as, current financial standing and familiarity with different cellular phone devices.

Non-sampling errors include errors such as non-response errors, response errors, processing errors and coverage errors. Non-response errors arise when a respondent is unable or unwilling to answer correctly for whatever reason (Zikmund *et al.,* 2012). This may cause some bias in the findings, however a non-response error is unlikely to occur in this study, as the number of questionnaires that will be distributed will exceed the sample size in order to cover up for any nonresponses that may arise during the course of data collection. Response error refers to errors that occur when respondents do respond but they misunderstand the question or have to rely on memory (Zikmund *et al.,* 2012). In this study, participants do not need to recall any information; it is based on their opinions.

A processing error refers to any error that may occur at the time of processing or analysing the data such as incorrect data input or coding errors, this will be reduced by doing structure checks, range edits, sequencing checks, checks for duplication and omissions, and logic edits where appropriate (Abbasi, 2002). Coverage error is when the sampling frame does not match the target population (Sekaran & Bougie, 2013). The sampling frame was made up of all the students studying at UKZN, however the target population is made up only of undergraduate and honours students, while the sample is only those studying at the Westville campus. This was avoided by ensuring that respondents meet the criteria of the study.

By being aware and understanding the limitations of the study, the researcher is better able to take the necessary precautions and more equipped to minimize the limitations in order to produce a highly reliable and valid research. The next section discusses the ethical considerations of the study.

4.10 Ethical Considerations

It is important to consider the ethical concerns of research in order to be aware and avoid making any unethical decisions. The researcher needs to remain impartial and not create any biases (Sekaran & Bougie, 2013). There will be full disclosure to all participants regarding what the research is about and why their input is required. Before the respondents are approached, consent will be sought and participation is completely voluntary, should a respondent wish to withdraw at any time, they are entitled to do so without consequences.

Additionally, as per the policy of the University of KwaZulu-Natal, ethical clearance forms (appendix 3) and Gate Keepers permission (appendix 4) will be completed and submitted and the research code of conduct form will be signed. On approval of the ethical clearance, the fieldwork will commence. This will hold the researcher accountable and assures high quality research. There will also be no fabrication of data or any sort of plagiarism, as well as a respect and conservation to the environment or setting where the research will be conducted.

The data collected will be securely stored in such a way that only those mentioned above will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

Furthermore, if research respondents wish to remain anonymous, that decision will be respected and implemented. The privacy and confidentiality of respondents will be respected and maintained. All respondents will be respected throughout the collection of the data and treated autonomously (Chambliss & Schutt, 2012: 44). The study is beneficial to respondents as it provides valuable information to businesses to support undertaking innovative initiatives. There will also be no deception or dishonesty in this study at all (Chambliss & Schutt, 2012: 44). By following the above guidelines, the quality and integrity of this study is ensured. Paying attention to the ethical considerations will also ensure that the research is conducted ethically and thereby increasing the validity of the research.

4.11 Conclusion

This chapter has considered all the elements relevant to the research methodologies that will be used for this study. The research design, sampling methods and data collection method were all discussed in detail. Furthermore, the measurements and data analyses were also deliberated, as well as validity and reliability. The chapter ended off by taking into consideration the limitations and ethical issue. The next chapter will analyse and display the results of the research.

CHAPTER 5: RESEARCH RESULTS AND ANALYSIS

5.1 Introduction

Chapter five presents the results of the data analysis and results of the four part questionnaire that was distributed to 376 students at the UKZN Westville campus. The questionnaire was distributed in phases over a period of two weeks. Once 372 usable questionnaires were completed, data collection ended. Out of the questionnaires that were distributed the researcher made sure to meet the calculated sample size of 372, and therefore there is a 100% usability rate with the 372 questionnaires. The unusable remaining four questionnaires were incomplete or did not have student's consent signatures. The high response rate is due to the fact that the questionnaires were physically distributed to students while they were in the Computer LANS, tutorials and immediately after lectures so that a large number of students could be reached within a short period of time.

The four parts of the questionnaire are as follows, section A biographical data, section B cellular phone features that are divided into performance and appearance, and price. Section C relates to innovation and brand image while section D is purchase intention. The findings will be presented similarly in four parts, so as to be in line with the questionnaire. The objectives and hypothesis will also be used accordingly, within the related section.

Due to the large volume of analysis, only essential information will be included within this chapter, other findings and the analysis done per question will only be included in the appendices (Appendix 7). In this chapter the results from the questionnaires are presented in the form of tables and figures such as bar graphs and pie charts. Matrices have been drawn up to summarise results for ease of reading.

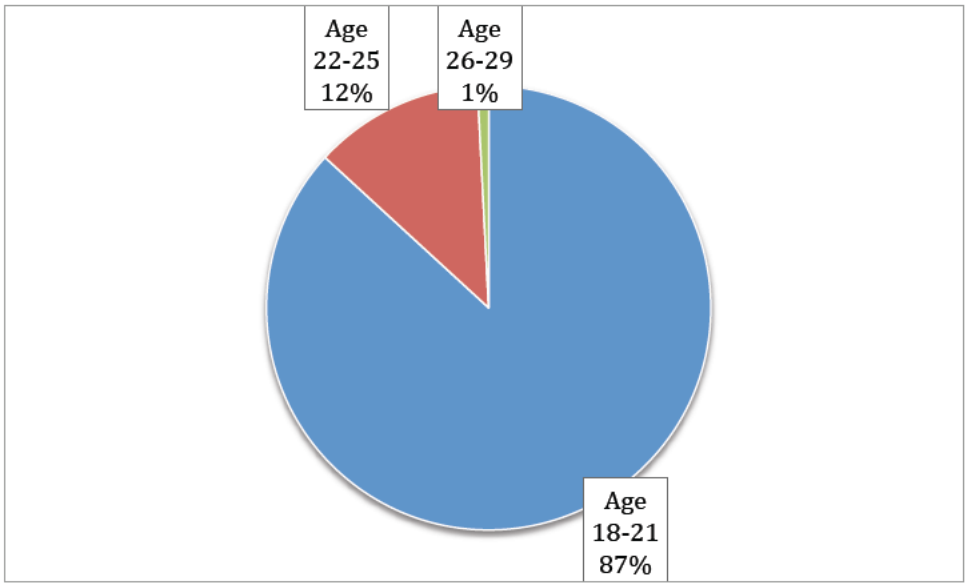
- Descriptive statistics including means and standard deviations, where applicable. Frequencies are represented in tables or graphs.
- Factor analysis was done for the features of innovative cellular phones.
- One-sample t- test used to test, in this study, whether the average value is significantly different from a value of 3 (the central score). This is applied to Likert scale questions.

- Analysis of variance: Tests whether means from several independent samples are equal.
- Regression analysis was also conducted using the features of innovative cellular phone and purchase intention of innovative cellular phones.

5.2 Demographic Results

This section presents the demographic results of the respondents namely the age group, year of study, gender and race of the respondents. These will be displayed graphically using pie charts and then summarized using a bar chart.

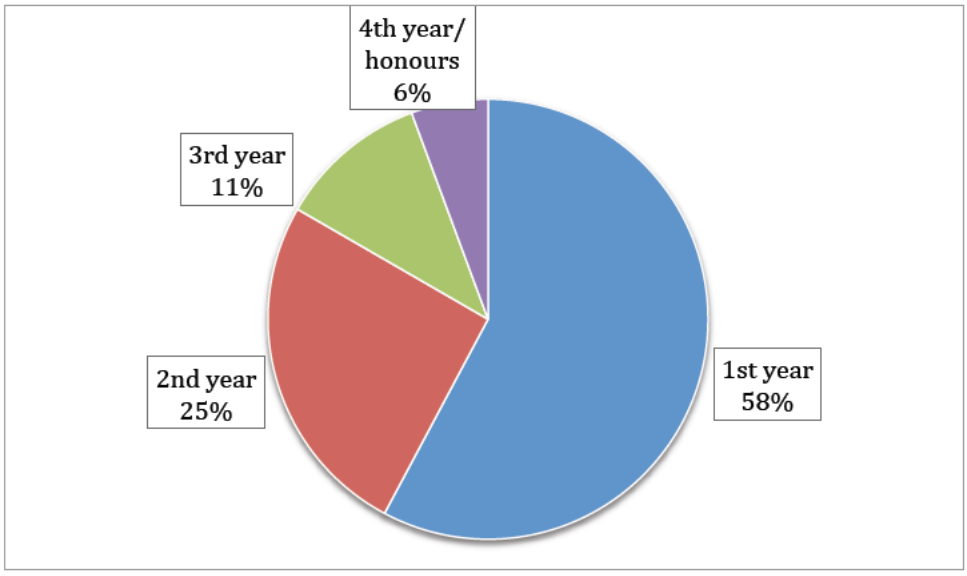
Figure 5.1 Frequency of Respondents' Age



The first question in this section was related to the age of respondents. The majority of respondents, 87% were aged between 18 and 21 years old. The 22-25 year old age group made up 12% of respondents while only 1% of the respondents indicated they were between 26-29 years old.

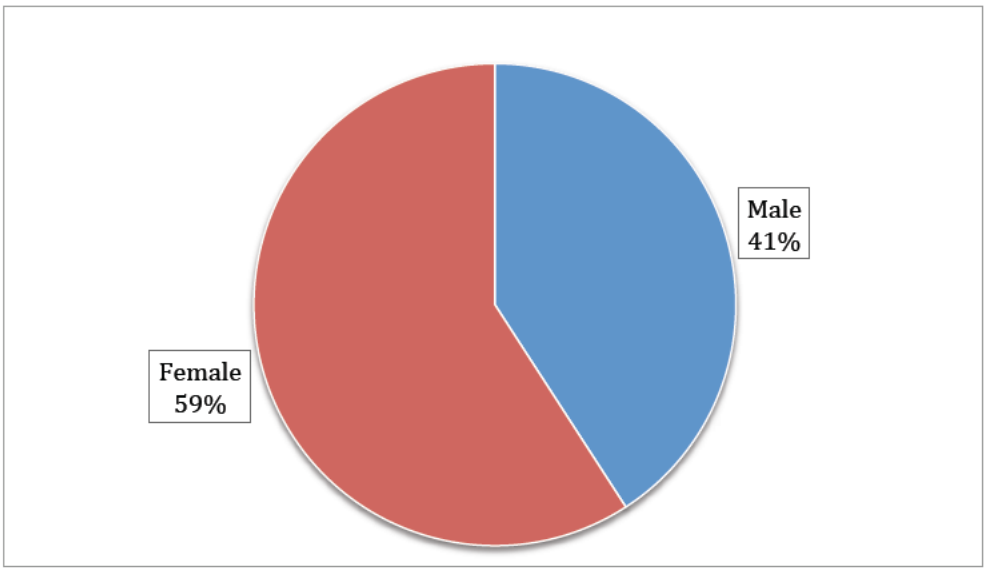
Figure 5.2 below displays the frequency of respondents' level or year of study.

Figure 5.2 Frequency of Respondents' Level/Year of Study



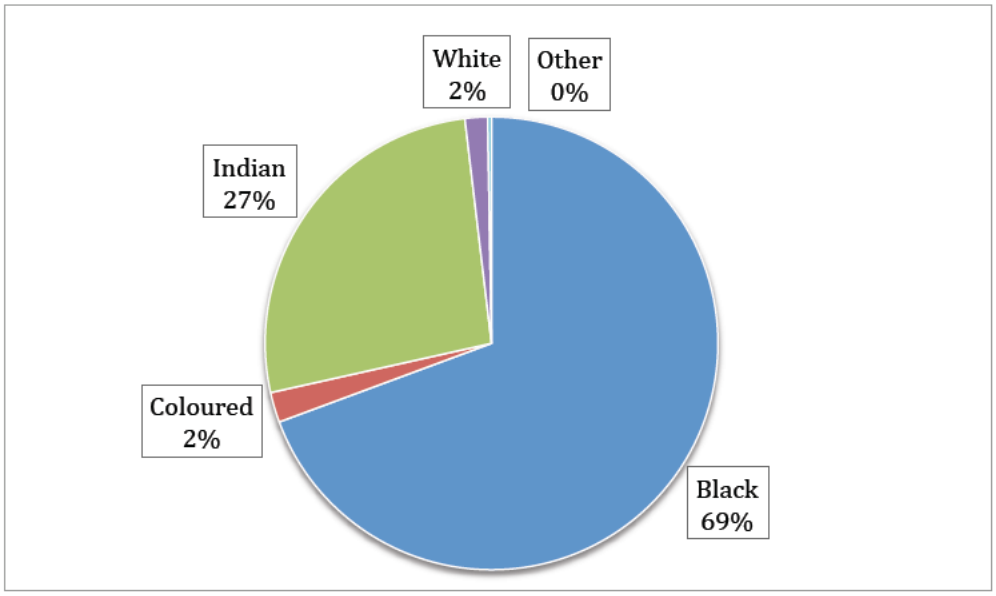
Question two of section A asked respondents to specify their year of study. First year students made up 58% of the study, while second year students made up 25%. Third and fourth/honour year students made up 11% and 6 % of the sample, respectively.

Figure 5.3 Frequency of Respondents' Gender



Gender was the third question in Section A, 41% of respondents indicated they were male and 59% were female.

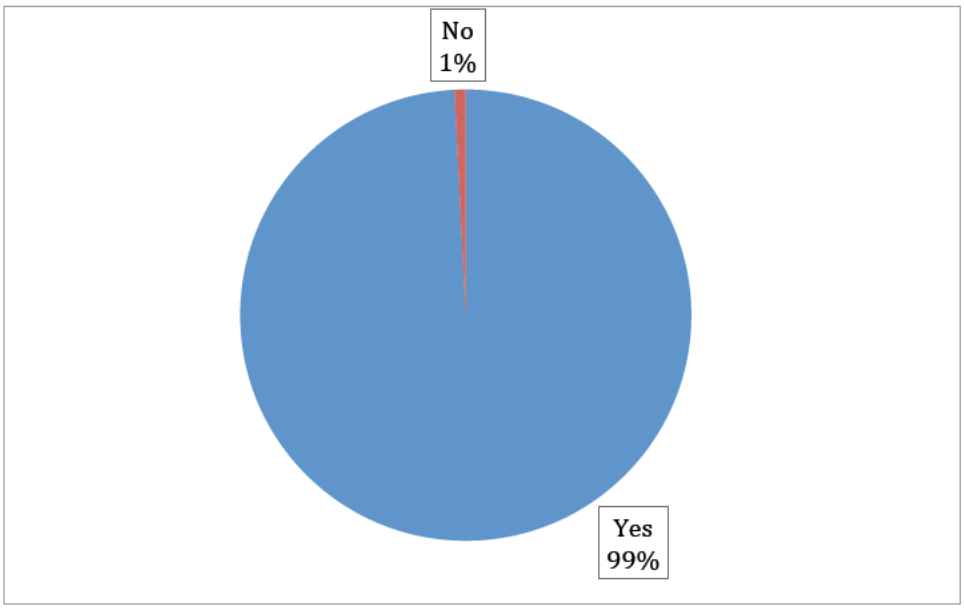
Figure 5.4 Frequency of Respondents' Ethnicity



In section A, the fourth question was related to race. The majority of the respondents 69% indicated that their ethnicity was Black. Coloureds made 2% of the respondents, while Indians counted for 27% and Whites for 2%. Only one respondent indicated their ethnicity was Other, this was Asian.

The next figure graphically displays the results of the fifth question, whether or not the respondent owns a cellular phone. This question was asked out of interest and to increase validity, where a cellular phone owner would usually have more knowledge on cellular phones than a non-owner, however all results from owners and non-owners were included in the study.

Figure 5.5 Frequency of Cellular Phone Ownership



Approximately, 99% of the population owned cellular phones and only 1% did not (in real numbers this made up only 3 respondents).

The next section presents the findings of the features of cellular phones.

5.3 Features of Innovative Cellular Phone Results

For the features of innovative cellular phones, which were divided into performance, appearance and cost, factor analysis as well as one sided t-test analysis was conducted; the results from both of these analyses will be presented in order to provide a more holistic picture of the results.

5.3.1 Factor Analysis Results

Kaiser Meyer Olkin (KMO) test and a Bartlett's test for sphericity was conducted in order to determine if factor analysis is applicable. The results concluded that factor analysis is possible as the KMO test produced a sampling adequacy score of .894 which is very good (Sekaran & Bougie, 2013: 307). The Bartlett's test confirmed that conditions were met for factor analysis to be conducted.

Table 5.1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.894
Bartlett's Test of Sphericity	Approx. Chi-Square	3531.548
	df	210
	Sig.	.000

Table 5.2 Factor Analysis.

Variables	Factor			
	1	2	3	4
1. many functionalities	.594			
2. a faster processor than previous models	.701			
3. an application store (to download new applications) such as Play Store or App Store	.755			
4. a high megapixel camera	.790			
5. ease of use	.691			
6. increased customisation	.649			
7. an anti-virus software	.772			
8. strong connection to networks	.827			
9. a GPS system (such as maps)	.720			
10. a high resolution screen	.776			
11. a long lasting battery	.658			
12. be visually appealing				.636
13. have a stylish design				.678
14. be larger in size than previous models		.579		
15. be available in different colours				
16. be thin in width			.724	
17. be light in weight			.758	
18. include a stylus pen		.598		
19.be waterproof		.438		
20. be made of new raw materials		.677		

Where factor 1 is features related to performance (blue), factor 2 is special features (green), factor 3 (orange) is size related features and factor 4 is visual features (purple). Since question 15 loads strongly onto factor 2 and 3 it was not included. Table 5.3 below shows how much of variance each factor explains.

Table 5.3 Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.082	33.725	33.725	6.651	31.673	31.673	6.066	28.886	28.886
2	3.022	14.389	48.113	2.515	11.978	43.650	1.796	8.551	37.436
3	1.287	6.128	54.241	.803	3.824	47.474	1.626	7.741	45.177
4	1.247	5.940	60.181	.767	3.653	51.127	1.249	5.950	51.127
5	.934	4.449	64.631						
6	.873	4.155	68.786						
7	.775	3.691	72.477						
8	.646	3.076	75.553						
9	.639	3.042	78.595						
10	.561	2.670	81.266						
11	.499	2.374	83.640						
12	.483	2.301	85.941						
13	.476	2.266	88.206						
14	.409	1.949	90.156						
15	.389	1.853	92.009						
16	.339	1.612	93.621						
17	.316	1.504	95.125						
18	.290	1.381	96.507						
19	.279	1.327	97.834						
20	.253	1.207	100.000						

Factor analysis based on gender can be found in the appendix (appendix 7). Both males and females found strong connections to network in the top three features. Males preferred a high megapixel camera and a digital store to download applications. While females had preference of a stylish design and cellular phone light in weight.

5.3.2 T-Test Results

The t-test used a neutral score of 3 in order to gauge significance. Where when the p value; p=.000, it is reported as p <.0005. Each question, from 1 to 20, is interpreted individually.

Table 5.4 T-test Results for Performance Features

An innovative cellular phone should:	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
12. be visually appealing	26.848	370	.000	4.21
13. have a stylish design	25.528	371	.000	4.18
14. be larger in size than previous models	5.613	371	.000	3.33
15. be waterproof	24.074	369	.000	4.15
16. be thin in width	23.634	370	.000	4.15
17. be light in weight	28.572	370	.000	4.31
18. include a stylus pen	6.565	371	.000	3.39
19. be waterproof	30.126	368	.000	4.44
20. be made of new raw materials	13.099	369	.000	3.71

A neutral value of 3 was used to answer the first research questions:

1. To identify the most important factors relating to the innovation of cellular phones for UKZN students.

There are three parts to answering this question, related to performance, appearance and price. According to the t-tests, it was found that all aspects making up performance are important in an innovative cellular phone, are significantly different and higher than a neutral value of 3.

Similarly, there is significant agreement that each feature of appearance be included in an innovative cellular phone using t-tests. Furthermore, all the mean scores for each feature were greater than the neutral value of 3 that was used. Below, in table 5.6 is the ordered list of these features. The features of performance are then listed in order of perceived importance from most to least. All features of performance were important with very slight difference. The price consumers are willing to pay for an

innovative cellular phone is just as important as its features. Table 5.5 below shows the results for the statements related to pricing.

Table 5.5 T-test Results for Price

	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
21. An innovative cellular phone should be cheap	4.788	371	.000	3.31
22. The price of a cellular phone is more important than innovations made to it.	-4.596	370	.000	2.70

For question 21, there is significant agreement that a cellular phone should be cheap ($t(371) = 4.788$, $p<.0005$). However, the mean is 3.31 which means it is only slightly over the neutral value of 3. But, for question 22, there is disagreement with the statement that the price of a cellular phone is more important to the innovations made to it ($t(370) = -4.596$, $p<.0005$), with a mean of 2.70 suggesting that, innovations made to a cellular phone are more important than the asking price.

The next questions 1 to 22 are ordered in ascending order of importance, in order to provide a clear and overall ranking. Most features were found to be important; some have very slight differences where others such as including a stylus pen and a larger sized device were only slightly preferable as their means were 3.39 and 3.33 respectively.

Table 5.6 Overall Ranking for Features of Innovative Cellular Phone

1. strong connection to networks	4.59
2. a faster processor than previous models	4.52
3. a long lasting battery	4.49
4. a high resolution screen	4.45
5. be waterproof	4.44
6. an application store (to download new applications) e.g. *Play Store*	4.44
7. an anti-virus software	4.39
8. a high megapixel camera	4.39
9. a GPS system (such as maps)	4.36
10.ease of use	4.36
11. be light in weight	4.31
12. many functionalities	4.29

Table 5.6 Overall Ranking for Features of Innovative Cellular Phone (continued)

13. increased customisation	4.26
14. be visually appealing	4.21
15. have a stylish design	4.18
16. be thin in width	4.15
17. be available in different colours	4.15
18. be made of new raw materials	3.71
19. include a stylus pen	3.39
20. be larger in size than previous models	3.33
21. An innovative cellular phone should be cheap	3.31
22. The price of a cellular phone is more important than innovations	2.70

The next section presents the results for innovation and brand image.

5.4 Innovation and Brand Image Results

Similar to the above, this section will use tables for each question, which will include the mean, t value, degree of freedom and the significance. The result per question will then be interpreted beneath the table. Detailed tables that include the frequencies, percentage, valid percentage and cumulative percentage as well as the standard deviation and standard error mean will be included in the appendix. The product chosen for this research is the cellular phone, which will be interchangeably referred to as 'the product'.

5.4.1 T-test Results for Questions 23 to 34

This section presents the t-test results for questions 23 to 34, with the mean scores in descending order. The measurement for innovation was adapted from Rogers (2003) who put forward five factors to measure innovation They are relative advantage, compatibility, complexity, trialability and observability (mentioned in chapter 2 and 4). Questions 23 to 34 consisted of statements to measure the following "I will have a higher opinion of the brand image if the cellular phone is innovative".

Table 5.7 Results for Questions 23 to 34

I will have a higher opinion of the brand image if the cellular phone:	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
23. allows one to accomplish tasks more efficiently	45.859	370	.000	4.53
24. allows one to accomplish tasks more easily	41.603	370	.000	4.52
25. compatible with my daily needs	40.882	369	.000	4.51
26. consolidates multiple functions into one device	39.614	368	.000	4.45
27. has more functions than the products before it	37.457	371	.000	4.38
28. is better than the products before it	31.277	371	.000	4.27
I will have a higher opinion of the brand image if the cellular phone:	Test Value = 3			
29. has clearly noticeable improvements	35.425	369	.000	4.39
30. is one that is easy to use	33.042	370	.000	4.37
31. has many positive testimonials or reviews	32.234	371	.000	4.34
32. does not clash with my lifestyle (values/beliefs)	26.097	370	.000	4.19
33. can be used on a trial basis before being purchased	17.455	370	.000	3.92
34. does not require me to learn new skills to use it	14.349	370	.000	3.80

Significant agreement was found for each statement, which means that respondents would have a higher opinion of the brand image if the product is innovative. Furthermore, the mean was above the neutral 3 for each statement.

5.4.2 T-test Results for Questions 35 to 47

Next, the results for questions 35 to 47 are presented with the mean values in descending order; these questions measure the brand image that an innovative product should have. Brand image is measured using Functional, Symbolic and Experiential

statements adapted from Park, Jaworski & Macinnis (1986) and one question adapted from Keller (2013) related to brand associations.

Table 5.8 Results for questions 35 to 47

An innovative cellular phone has a brand image that:	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
35. portrays excellent quality	37.621	367	.000	4.43
36. is trustworthy	33.191	371	.000	4.38
37. has different products and models to choose from	31.713	367	.000	4.30
38. is unique from other brands	32.050	368	.000	4.29
39. has a good reputation	31.454	371	.000	4.28
40. creates a feeling of excitement amongst customers	32.801	371	.000	4.28
41. delivers good value for the price	30.776	371	.000	4.27
42. is socially accepted	24.917	370	.000	4.15
43. has favourable associations linked to it	26.842	371	.000	4.15
44. is innovative in its design (logo, name)	24.730	371	.000	4.10
45. portrays a feeling of sincerity to the customer	25.080	371	.000	4.09
46. reflects customers' personal styles	23.099	368	.000	4.08
47. is well known	16.603	371	.000	3.83

Once again, significant agreement was found for each statement, which indicates that respondents think an innovative product should have a brand image that is strong and positive. Moreover, the mean was above the neutral 3 for each statement.

The results from questions 23 to 34 are then averaged to give a composite score which measures: "I will have a higher opinion of the brand image if the product is innovative".

5.9 Composite Result for questions 23 to 34

	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
Brand image and Innovative cellular phone	50.615	371	.000	4.3048

This result tells us that there is significant agreement that there will be a higher opinion of the brand image if the product is innovative ($t(371) = 50.615$, $p<.0005$). From the above results it becomes clear that innovation has a positive effect on brand image. The next section will discuss the hypothesis testing results.

H_0: The innovation of cellular phones has no effect on brand image.

H_1: The innovation of cellular phones has an effect on brand image.

Therefore, with the first hypothesis, the null hypothesis that cellular phones has no effect on brand image is rejected and the alternate hypothesis, which is that the innovation of cellular phones has an effect on brand image is accepted.

H_0: The innovation of cellular phones does not have a positive effect on brand image.

H_2: The innovation of cellular phones has a positive effect on brand image.

For the second hypothesis, the null hypothesis is rejected again that innovation of cellular phones does not have a positive effect on brand image and the alternate hypothesis that he innovation of cellular phones has a positive effect on brand image is accepted. This is because respondents indicated that they will have a higher opinion of the brand image if the product is innovative, which is a positive effect. This part of the results answers research objective 2 and 3 which were:

2. Determine how innovation impacts on the brand image of cellular phones amongst UKZN students.

3. To determine whether cellular phone innovation helps to improve brand image.

The next section presents the results related to purchase intentions.

5.5 Consumer Purchase Intention Results

In order to gauge consumer purchase intention, the statements related to innovation and brand image were used again. Question 48 to 59 measures purchase intention with regards to innovation (the same measurements as above are used).

5.5.1 T-test Results for Questions 48 to 59

Table 5.10 Results for questions 48 to 59

I will be more likely to purchase the cellular phone if it:	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
48. allows one to accomplish tasks more efficiently	46.720	370	.000	4.54
49. allows one to accomplish tasks more easily	42.707	370	.000	4.52
50. is better than the products before it	39.119	370	.000	4.50
51. consolidates multiple functions into one device	41.827	371	.000	4.49
52. is compatible with my daily needs	42.369	370	.000	4.49
53. has more functions than the products before it	41.166	371	.000	4.47
54. has clearly noticeable improvements	37.867	371	.000	4.40
55. is one that is easy to use	32.267	370	.000	4.36
56. has many positive testimonials or reviews	33.712	371	.000	4.35
57. does not clash with my lifestyle (values/beliefs)	28.498	370	.000	4.26
58. can be used on a trial basis before being purchased	22.929	368	.000	4.12
59. does not require me to learn new skills to use it	17.595	369	.000	3.95

Similar to the above findings, there was significant agreement that respondents are more likely to purchase a cellular phone if it is innovative.

5.5.2 T-test Results for Questions 60 to 72

Table 5.11 Results for questions 60 to 72

I will be more likely to purchase a cellular phone if the brand:	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
60. delivers good value for the price	38.562	371	.000	4.47
61. portrays excellent quality	39.799	370	.000	4.47
62. is trustworthy	36.455	371	.000	4.42
63. has a good reputation	36.039	368	.000	4.40
64. is unique from other brands	35.553	369	.000	4.37
65. has different products and models to choose from	33.328	371	.000	4.31
66 .has favourable associations linked to it	34.097	371	.000	4.31
67. creates a feeling of excitement amongst customers	30.906	370	.000	4.30
68. portrays a feeling of sincerity to the customer	28.703	371	.000	4.21
69. is innovative in its design (logo, name)	28.527	371	.000	4.21
70. reflects customers' personal styles	26.073	368	.000	4.19
71. is socially accepted	24.957	371	.000	4.19
72. is well known	21.547	368	.000	4.09

Respondents were also more likely to purchase a cellular phone with a positive and strong brand image.

Table 5.12 Composite Result for Questions 48 to 59 and 60 to 72

	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
Purchase intention for innovative cellular phone	49.838	371	.000	4.3708
Purchase intention for cellular phone with good brand image	45.478	371	.000	4.3019

There is significant agreement that the likelihood of purchasing is higher if the cellular is innovative ($t(371) = 49.838$, $p<.0005$) and if it has a good brand image ($t(371) = 45.478$, $p<.0005$).

From the above results objectives 4, 5 and 6 are met. The objectives are as follows:

4. To understand how innovation affects UKZN students' purchase intentions for cellular phones.

5. To determine whether innovation in cellular phones provides a better chance for a positive intention to purchase to arise.

6. To determine whether brand image creates a more favourable intention to purchase a cellular phone.

The results indicate that there is a higher likelihood that an individual purchases an innovative cellular phone and a cellular phone that has a positive, strong brand image. However, using the means, innovation (4.3708) was found to be slightly more important than brand image (4.3019) when making a purchase decision. The results are then applied to hypothesis testing.

H_0: The innovation of cellular phones has no effect on consumers' purchase intention.
H_3: The innovation of cellular phones has an effect on consumers' purchase intention.

Therefore in hypothesis 3, the null hypothesis that the innovation of cellular phones has no effect on consumers' purchase intention is rejected and the alternate hypothesis is accepted.

H_0: The innovation of cellular phones does not have a positive effect on consumers' purchase intention.
H_4: The innovation of cellular phones has a positive effect on consumers' purchase intention.

The null hypothesis is again rejected that the innovation of cellular phones does not have a positive effect on consumers' purchase intention for the fourth hypothesis.

H_0: Brand image does not have a positive effect on consumers' purchase intention.
H_5: Brand image has a positive effect on consumers' purchase intention.

The null hypothesis for the fifth and last hypothesis that brand image does not have a

positive effect on consumers' purchase intention is also rejected and the alternate accepted as brand image was found to have a positive effect on purchase intentions.

Although the hypotheses have all been proven, the last 3 questions, 73, 74 and 75 will add validity to the findings. Analysis testing the average against a neutral 3 is done for these as well.

5.5.3 T-test Results for Questions 73 to 75

Table 5.13 Composite Result for questions 73 to 75

	Test Value = 3			
	t	df	Sig. (2-tailed)	Mean
73 likely to choose cellular phone if it's innovative	36.279	371	.000	4.44
74 likely to purchase cellular phone if it has good brand image	28.877	370	.000	4.24
75 likely to purchase cellular phone within the next year	12.696	371	.000	3.77

There is significant agreement that purchase is likely if: a phone is innovative ($t(371) = 36.279$, $p<.0005$); if it has a good brand image ($t(370) = 28.877$, $p<.0005$); and within the next year ($t(371) = 12.696$, $p<.0005$).

5.6 Bivariate Analysis

Bivariate analysis was done in order to identify whether there are differences in responses between gender, age, race and year of study with regard to the combined scores for: Innovation and brand image, (Hypothesis 1 and 2); purchase intention and innovation (Hypothesis 3 and 4); and lastly purchase intention and brand image (Hypothesis 5).

H_0: The innovation of cellular phones has no effect on brand image.

H_1: The innovation of cellular phones has an effect on brand image.

H_0: The innovation of cellular phones does not have a positive effect on brand image.

H_2: The innovation of cellular phones has a positive effect on brand image.

H_0: The innovation of cellular phones has no effect on consumers' purchase intention.

H_3: The innovation of cellular phones has an effect on consumers' purchase intention.

H_0: The innovation of cellular phones does not have a positive effect on consumers' purchase intention.

H_4: The innovation of cellular phones has a positive effect on consumers' purchase intention.

H_0: Brand image does not have a positive effect on consumers' purchase intention.

H_5: Brand image has a positive effect on consumers' purchase intention.

Table 5.14 Bivariate Analysis for Gender

		N	Mean	Std. Deviation
Brand image and innovative cellular phone	Male	152	4.2826	.49420
	Female	220	4.3202	.49984
	Total	372	4.3048	.49722
Purchase intention and innovative cellular phone	Male	152	4.3262	.55093
	Female	220	4.4016	.51493
	Total	372	4.3708	.53050
Purchase intention and brand image	Male	152	4.2477	.57432
	Female	220	4.3393	.53437
	Total	372	4.3019	.55213

Next, ANOVA for gender is presented on table 5.15 below.

Table 5.15 ANOVA for Gender

		Sum of Squares	df	Mean Square	F	Sig.
Brand image and innovative cellular phone	Between Groups	.127	1	.127	.513	.474
	Within Groups	91.593	370	.248		
	Total	91.720	371			
Purchase intention and innovative cellular phone	Between Groups	.511	1	.511	1.820	.178
	Within Groups	103.900	370	.281		
	Total	104.411	371			
Purchase intention and brand image	Between Groups	.755	1	.755	2.487	.116
	Within Groups	112.342	370	.304		
	Total	113.097	371			

There is no significant difference for the 3 questions for gender because $p>0.05$.

Table 5.16 Bivariate Analysis for Age

		N	Mean	Std. Deviation
Brand image and innovative cellular phone	18-21	323	4.3272	.49928
	22-25	46	4.1572	.46937
	26-29	3	4.1591	.39430
	Total	372	4.3048	.49722
Purchase intention and innovative cellular phone	18-21	323	4.3894	.52812
	22-25	46	4.2663	.54507
	26-29	3	3.9722	.26788
	Total	372	4.3708	.53050
Purchase intention and brand image	18-21	323	4.3208	.54317
	22-25	46	4.1845	.60708
	26-29	3	4.0641	.54404
	Total	372	4.3019	.55213

Table 5.17 ANOVA for Age

		Sum of Squares	df	Mean Square	F	Sig.
Brand image and innovative cellular phone	Between Groups	1.228	2	.614	2.505	.083
	Within Groups	90.492	369	.245		
	Total	91.720	371			
Purchase intention and innovative cellular phone	Between Groups	1.090	2	.545	1.947	.144
	Within Groups	103.321	369	.280		
	Total	104.411	371			
Purchase intention and brand image	Between Groups	.919	2	.460	1.512	.222
	Within Groups	112.178	369	.304		
	Total	113.097	371			

Once again, there are no significant differences to report for age because $p>0.05$.

Next, table 5.18 presents the bivariate analysis for the different ethnicities.

Table 5.18 Bivariate Analysis for Ethnicity

		N	Mean	Std. Deviation
Brand image and innovative cellular phone	Black	258	4.2703	.51526
	Coloured	8	4.2500	.29881
	Indian/Asian	100	4.4100	.45438
	White	6	4.1111	.38968
	Total	372	4.3048	.49722
Purchase intention and innovative cellular phone	Black	258	4.3395	.54541
	Coloured	8	4.2396	.35756
	Indian/Asian	100	4.4842	.48326
	White	6	4.0000	.53748
	Total	372	4.3708	.53050
Purchase intention and brand image	Black	258	4.2904	.55133
	Coloured	8	4.2378	.51513
	Indian/Asian	100	4.3615	.55587
	White	6	3.8846	.46090
	Total	372	4.3019	.55213

* For this analysis, the 'other' Asian is grouped with the Indian group.

In the next section, ANOVA is applied for ethnicity.

Table 5.19 ANOVA for Ethnicity

		Sum of Squares	df	Mean Square	F	Sig.
Brand image and innovative cellular phone	Between Groups	1.663	3	.554	2.266	.081
	Within Groups	90.057	368	.245		
	Total	91.720	371			
Purchase intention and innovative cellular phone	Between Groups	2.500	3	.833	3.009	.030
	Within Groups	101.911	368	.277		
	Total	104.411	371			
Purchase intention and brand image	Between Groups	1.467	3	.489	1.612	.186
	Within Groups	111.629	368	.303		
	Total	113.097	371			

There is a significant difference between the ethnicities in the response to the effect of an innovative product on purchase intention (F (3,371) = 3.009, p=.030). Specifically, Indians are more likely than Blacks and Whites to purchase a cellular phone if it is innovative.

Table 5.20 Bivariate Analysis for Year of Study

		N	Mean	Std. Deviation
Brand image and innovative cellular phone	1st year	215	4.3413	.48356
	2nd year	95	4.2884	.54694
	3rd year	41	4.2366	.44498
	4th year/honours	21	4.1389	.47750
	Total	372	4.3048	.49722
Purchase intention and innovative cellular phone	1st year	215	4.4329	.49934
	2nd year	95	4.2862	.59321
	3rd year	41	4.3374	.49369
	4th year/honours	21	4.1825	.54430
	Total	372	4.3708	.53050
Purchase intention and brand image	1st year	215	4.3558	.54240
	2nd year	95	4.2652	.55117
	3rd year	41	4.2139	.54352
	4th year/honours	21	4.0882	.62193
	Total	372	4.3019	.55213

Table 5.21 displays the results when ANOVA is applied to year of study.

Table 5.21 ANOVA for Year of Study

		Sum of Squares	df	Mean Square	F	Sig.
Brand image and innovative cellular phone	Between Groups	1.082	3	.361	1.464	.224
	Within Groups	90.639	368	.246		
	Total	91.720	371			
Purchase intention and innovative cellular phone	Between Groups	2.300	3	.767	2.763	.042
	Within Groups	102.111	368	.277		
	Total	104.411	371			
Purchase intention and brand image	Between Groups	2.028	3	.676	2.240	.083
	Within Groups	111.068	368	.302		
	Total	113.097	371			

There is a significant difference between levels of study (year) in the response to the effect of an innovative product on purchase intention (F (3,371) = 2.763, p=.042), specifically, 1st years are more likely than 2nd and 4th years to purchase a cellular phone if it is innovative.

5.7 Regression Analysis

A regression analysis has also been conducted in order to predict which factors relating to performance and appearance of a cellular phone will predict overall purchase intention based on innovation. Questions 1 to 11 have been grouped to measure performance and questions 12 to 20 to measure appearance. The item's total statistics can be found in the appendix (appendix 7).

The dependent variable was overall purchase intention based on innovation (question 73) and the independent variables were Performance; Appearance; Cost (questions 1 to 21). All the necessary checks for conditions were done and met; thereafter the regression was done successfully.

Six respondents (87; 101; 142; 149; 253 and 297) were found to be outliers and excluded from the analysis.

Table 5.22 Model Summary for Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.534[a]	.286	.280	.42360	1.757

Table 5.23 ANOVA for Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.977	3	8.659	48.256	.000[a]
	Residual	64.956	362	.179		
	Total	90.933	365			

Table 5.24 Coefficients for Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.751	.222		7.888	.000		
	Performance	.296	.038	.351	7.771	.000	.965	1.036
	Appearance	.308	.041	.343	7.561	.000	.959	1.043
	Cost	.025	.018	.061	1.368	.172	.979	1.021

From the above tables, it can be concluded that the three predictors (performance, appearance and cost) account for 28.6% of the variance (R^2 = .286, F (3,365) = 48.256, p<.0005). It was found that performance significantly predicted 'purchase innovation' (β = .351, p<.0005) as did appearance (β = .343, p<.0005) with only a slight difference. However, Cost was not a significant predictor.

5.8 Cronbach's Alpha Results

To test whether the combination of the questions all consistently measuring the same thing (an innovative phone); we calculate the Cronbach alpha value. If this value is greater than 7, we can assume that the measure is a reliable one; anything below this

is questionable (George & Mallery, 2003:22, Nunnally, Bernstein & Berge, 1967:246). The closer the Cronbach's alpha is to 1, the higher the internal consistency reliability (Sekaran & Bougie, 2013: 292).

Table 5.25 Cronbach's Alpha Results

Construct	Questions	Cronbach's Alpha	N of Items
Performance	1-11	.922	11
Appearance	12-20	.788	9
Innovation	23-34	.855	12
Purchase Intention	48-59	.897	12
Brand Image	60-72	.906	13

The Cronbach's Alpha value for performance is .922 which is greater than 7, making the performance scale a reliable measurement. For appearance, the Cronbach's Alpha value is .788 which is greater than 7, again, making the scale a reliable measurement. Six respondents (87; 101; 142; 149; 253 and 297) were found to be outliers and excluded from the analysis.

Since the Cronbach's alpha value for innovation is .855 it is greater than 7; this shows that the combined value is reliable and that the questions consistently measure the same thing.

The reliability of the combined questions 48 to 59 will be tested once again, using Cronbach's Alpha, these questions measures the following; 'I will be more likely to purchase the product if it is innovative'. Since the Cronbach's Alpha value is .897 it is greater than 7, therefore questions 48 to 59 provide a reliable measure for 'I will be more likely to purchase the product if it is innovative'. The Cronbach's Alpha value for questions 60 to 72, is .906 which is also greater than 7, therefore the questions provide a reliable measure for 'I will be more likely to purchase the product if it has a good brand image'.

5.9 Missing Values

Missing values were minimal (far <5%) and so complete case analysis was used and is statistically acceptable. Moreover, if multiple imputation (MI) was to be conducted, all the analysis methods employed here would not be possible since MI does not support all analyses. For the regression analysis, 6 respondents (87; 101; 142; 149;

253 and 297) were found to be outliers and excluded from the analysis in order to comply with regression assumptions.

5.10 Conclusion

Numerous types of analyses such as factor analysis, t-tests and regression analysis were conducted and the results presented in the form of graphs and tables in order to provide a holistic picture of the results. The next chapter will discuss these results in relation to the literature review. The participant's responses will be interpreted in order to deduce the implications of their answers; recommendations will also be made.

CHAPTER 6: DISCUSSION OF MAIN RESULTS

6.1 Introduction

The intention of the discussion chapter is to integrate the research findings with the literature and previous studies. The main findings of the study will be highlighted, as well as the implications of the findings for marketing managers. The chapter follows a similar structure to the questionnaire and previous chapter; discussions commence with the features of cellular phones, then innovation's effect on brand image followed by aspects related to purchase intention. In addition, the chapter will include a brief background of the study, presented below.

6.2 Background of the Study

Innovation that does not add value to the consumer may not necessarily produce the desired results. It is therefore essential to understand which features of a product are most relevant to consumers, which then translate into real benefits when innovated. For this reason, understanding which features of cellular phones, those related to performance or appearance, to invest efforts in is essential. The ultimate feat of innovation is not to emphasise the technological abilities of products but rather how those products add value and satisfy customer needs (O'Sullivan & Dooley, 2008). When the outcome of innovation is real improvements to the product or service, the perception of quality increases.

Furthermore, innovation is not an isolated initiative and can impact other aspects of marketing related to the product such as the brand, which is crucial to a company's success. By studying the effect that innovation has on brand image and consumer purchase intention, investments into innovation can be better justified. Improvements can also be made to measurements and evaluations of innovation as well as to align innovation efforts to the desired brand image that marketers intend to convey. This study aims to present the positive trickle-down effect of innovation onto the brand image and how these two constructs then impact the consumers' purchase intention for the product. The cellular phone industry was ideal for this study as it is characterised by high innovation and competition and is an industry where brand image is imperative.

6.3 Main Findings

The objectives of the study along with the relevant results are summarised in Table 6.1 below.

Table 6.1 Research Objectives and Results

Objective	Result
1. To identify the most important factors relating to the innovation of cellular phones for UKZN students.	Performance related features; the three most important features were strong connection to networks, a faster processor than previous models and a long lasting battery.
2. To determine how innovation impacts on the brand image of cellular phones amongst UKZN students.	Innovation has a positive impact on brand image (especially performance related innovations).
3. To determine whether cellular phone innovation helps to improve brand image.	Innovation helps improve the brand image through improved perceptions of quality and increased value.
4. To understand how innovation affects UKZN students' purchase intentions for cellular phones.	Innovation has a positive effect on purchase intentions.
5. To determine whether innovation in cellular phones provides a better chance for a positive intention to purchase to arise.	Innovation increases the likelihood of purchase intention.
6. To determine whether brand image creates a more favourable intention to purchase a cellular phone.	Brand image increases the likelihood of purchase intention.

The hypotheses proposed based on the objectives and results are tabulated in Table 6.2 below. The first objective is exploratory and was not hypothesised.

Table 6.2 Hypotheses and Results

Hypotheses	Result
H_0: The innovation of cellular phones has no effect on brand image. H_1: The innovation of cellular phones has an effect on brand image.	The null hypothesis is rejected and the alternate hypothesis is accepted.
H_0: The innovation of cellular phones does not have a positive effect on brand image. H_2: The innovation of cellular phones has a positive effect on brand image.	The null hypothesis is rejected and the alternate hypothesis is accepted.
H_0: The innovation of cellular phones has no effect on consumers' purchase intention. H_3: The innovation of cellular phones has an effect on consumers' purchase intention.	The null hypothesis is rejected and the alternate hypothesis is accepted.
H_0: The innovation of cellular phones does not have a positive effect on consumers' purchase intention. H_4: The innovation of cellular phones has a positive effect on consumers' purchase intention.	The null hypothesis is rejected and the alternate hypothesis is accepted.
H_0: Brand image does not have a positive effect on consumers' purchase intention. H_5: Brand image has a positive effect on consumers' purchase intention.	The null hypothesis is rejected and the alternate hypothesis is accepted.

The next sections expand on the main findings.

6.4 Feature Preferences

The previous chapter listed all the features identified in the study in order of preference to consumers. Two types of analysis were conducted, namely factor analysis and t-tests. The results were clear in indicating that both performance and appearance features are very important with regards to feature preference of a cellular phone. However, performance outranked appearance by an incremental amount. The three most important features were: strong connection to networks; a faster processor than previous models; and a long lasting battery, features that are all related to performance. This indicates that consumers primarily focus on performance of a cellular phone and then its appearance. On the other hand, the least important features

identified by students were that the cellular phone should be made of new raw materials, include a stylus pen and be larger in size than previous models. Therefore, producers of cellular phones need to ensure that their product performs at an optimal level, and only thereafter should they focus on design.

These findings are in line with previous studies discussed in the literature review, which found that innovations need to add value to the customer in order to be successful (O'Sullivan & Dooley, 2008). Previous studies also found that due to design monotony of the latest cellular phones, software and performance-related innovation was becoming an increasingly important aspect of innovation (Rooney, 2013). Consumers place more importance on performance-related features because it adds more value to their daily lives and augments their user experience. Cellular phone brands should continue to be innovative in terms of the hardware and appearance of their phones, but should focus and place more emphasis on improving the features of the device, as this is more important to consumers and will lead to greater success. Since an innovation plateau has been reached regarding the design (a large touch screen), consumers tend to place more importance and value on the software of the device or what the device can offer with regards to added benefits and features.

Previously, innovation mostly focused around the design, size, dimensions and weight of the cellular phone device (Koski & Kretschmer, 2007). However, now, in addition to software innovations, the design relates to more than aesthetic appeal and is expected to offer something to the consumer. An example is Samsung's new curved screen, which provides an improved user experience when using the device instead of just being visually appealing (Koski & Kretschmer, 2007). By ensuring that the design enhances performance and use of the cellular phone, this increases the benefits and therefore the value of the cellular phone, thus increasing perceptions of innovation. The high rate of replacement purchases of cellular phones means that innovation must be implemented on a consistent basis in newer models in order for consumers to continue repurchasing from a particular brand. Where previously ease-of-use was a barrier to adoption of innovation, this study revealed that amongst Generation Y, it was not. This age group is more willing to learn how to use features

of new products. Therefore, ease-of-use was not negatively related to intention to purchase a cellular phone.

Respondents did not necessarily agree that the price of an innovation should be low and that the innovations of the cellular phone are more important than the price. This indicates that consumers are willing to pay a higher price for an innovative product if the device is differentiated from others and if the innovation is relevant to them. Both performance and appearance significantly predicted purchase innovation. The next section discusses the results pertaining to innovation and brand image.

6.5 Innovation and Brand Image

Innovation significantly and positively impacts the brand image; these findings are consistent with that of Nemati (2009), Hanayasha *et al.,* (2012) and Shiau (2014). If a product is innovative, a higher and stronger opinion of the product's brand image will exist than that of non-innovative products. Innovation translates to improved product functions and therefore increased consumer satisfaction, which allows the consumer to perceive the product as superior to others thus having a positive effect on brand image. Products are also then perceived as of a high quality that are 'worth their value'; this further translates to a stronger, positive brand image. Investing in innovative initiatives not only results in an improved end product but also has a positive trickle-down effect and improves the product's overall brand image, thereby increasing the return on investment (ROI). This is particularly relevant in the cellular phone industry, where new models are continuously being introduced and brand image is one of the main determinants for cellular phone selection (Simay, 2009).

However, product innovation needs to be of a good, high quality and must be relevant to the user in order for it to be perceived as valuable and superior. Marketers need to ensure that the innovations they make allow the consumer to accomplish tasks more efficiently and more easily and also need to ensure that the innovations are compatible with consumers' daily needs as these were the measurements with the highest average scores. These measurements further highlight the importance of relevance, as consumers perform different tasks and have different daily needs from cellular phone devices. Although all measurements were significantly important, the ones with the lowest scores included: requirement to learn new skills to use the product; using the

product on a trial basis; and that the product does not clash with consumers' lifestyle. Therefore, marketers can launch innovative products even if it requires the user to learn new skills and without the product being available for a trial period, however enough information about the product needs to be provided to the consumer.

Branding plays an increasingly significant role in consumers' acceptance and purchasing of high-tech products; innovation alone can no longer lead to financial success (Keller, 2013). A balanced combination of good innovation and a positive brand image is optimal. It can now be said that one of the advantages of innovation is having an improved brand image, which aids in the acceptance of innovation because a strong brand image decreases the perceived risk of purchasing an innovative product. Therefore, a strong brand image leads to higher acceptance of product innovations by consumers and in this way there exists a complementary relationship between innovation and brand image. Innovation can create competitive advantage for a brand, can enhance the brand image and allows marketers to protect their brands.

Therefore, when companies innovate they not only receive the benefits of innovation but also the benefits of a better brand image, both of which are essential for the longevity of the company as a whole. Marketers also need to have brand image in mind when innovating, in order to ensure that the innovation is in line with the image they are trying to convey and to maximise the benefits. For example, Apple, through their innovations, has improved their brand image and become known as an innovative brand; the Apple brand is synonymous for innovation. Innovation, particularly in the cellular phone industry, needs to be continuous, relevant to consumers' needs and communicated clearly to users and potential users.

6.6 Consumer Purchase Intention

Through the data gathered in this study it was established that innovation and brand image play a substantial role in consumer purchase intentions. Results significantly show that likelihood of purchasing is higher if the cellular phone is innovative, which is in line with similar research. Shiau (2014) obtained results that showed that consumer behaviour, which includes purchase intention, is positively impacted by innovation. Additionally, Tseng and Chiang (2013) also found that consumers' intention to upgrade their cellular phones was increased through perceived value

created by innovation. The results of this study further showed that purchase intention is more likely to occur if the product has a good brand image, which is consistent with the results of previous studies by researchers such as Shah *et al.* (2012) and Wang and Tsai (2014), who also found that brand image positively influences consumer purchase intention.

Although both innovation and brand image is key when consumers make a purchasing decision, results in this study showed that innovation is very slightly more relevant, especially in the cellular phone industry. The reason for this could be that since cellular phones are used for many different purposes, are used daily and are greatly depended on by consumers, consumers attach higher importance when purchasing a cellular phone to the product that has better features, added value and relevance over the phone's brand image. Innovation of a cellular phone can be understood and perceived immediately thereby increasing the perceived value, however trust created by brand image may only be attained over time.

Increased value created through innovation and trust created through a strong brand image are two of the leading factors that influence consumer purchase intention (Li *et al.,* 2007; Mahmoudzadeh *et al.*, 2013; Schlosser *et al.*, 2006; Wang & Tsai, 2014; Wood & Scheer, 1996). Therefore, a combination of innovation and brand image is optimal to entice a positive purchase intention. Companies need to ensure that their products are either on par with or superior to competitors while simultaneously creating trust and enhancing their brand image, in order to capitalise on consumers' purchase intentions, which may later translate to actual purchases.

Over 99% of the sample was cellular phone owners, with over 85% (responded at a neutral 3 or higher with an average score of 3.77) intending on purchasing a cellular phone within the next year. These results indicate that cellular phone owners are continuously upgrading their cellular phone devices, which increases the opportunity for companies to improve and optimise their products. A cellular phone company with strong brand image means that the user will continue to use their products and upgrade and repurchase from the same brand. In order for cellular phone companies to capture this demand, they need to ensure that they not only have a good, strong brand image, but that they also continuously innovate based on what is relevant to their consumers.

Furthermore results showed that in terms of ethnicity and year of study, Indians and first year students respectively were more likely to purchase an innovative cellular phone than other groups. Such information can be used when segmenting markets and directing advertising, information and promotions of products to the groups who require it the most in order to maximise on marketing efforts. As mentioned before, both performance and appearance significantly predicted purchase intention, with performance slightly outweighing appearance. However, cost was not a significant predictor, this could indicate that consumers are willing to pay a higher price for a product that is innovative, that they perceive as adding value to their lives and as a high quality, superior product. This proves that through innovation, companies can charge a premium price for their products as an advantage is created over sellers of similar products.

An innovative product improves the brand image while the brand image leads to higher acceptance of the innovation, and higher degree of purchase intention. Innovation adds value and positively influences the purchase intention, while brand image adds trust and risk reduction, and also positively influences the purchase intention.

6.7 Conclusion

Chapter Six has discussed the main results of the research and briefly how it applies to real world operations. All of the findings were consistent with the theories and findings of previous studies reviewed in the literature review chapters. The main overall finding that emerged was that innovation does indeed have a positive effect on both brand image and purchase intention of cellular phones amongst students. The next chapter concludes the study by highlighting the main limitations encountered, and also puts forth recommendations for future research and the direction that this future research may take.

CHAPTER 7: CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

7.1 Introduction

The study titled 'The Effects of Cellular Phone Innovation on Brand Image and Purchase Intention amongst UKZN students' was conducted to determine feature preference for cellular phones, the effect that innovation has on brand image and how the two variables affect consumer purchase intention. A self-administered, physically distributed questionnaire was completed by 372 students at the Westville campus of UKZN and a range of statistical tests were used to analyse the data, which was presented and discussed in previous chapters. This chapter of the research will make conclusions based on the main results obtained, and will discuss the conceptual framework and offer recommendations for real world organisations and their operations based on the findings of the study. Additionally, the limitations of the research will be mentioned and recommendations will be made for future research.

7.2 Conclusions on the Main Results

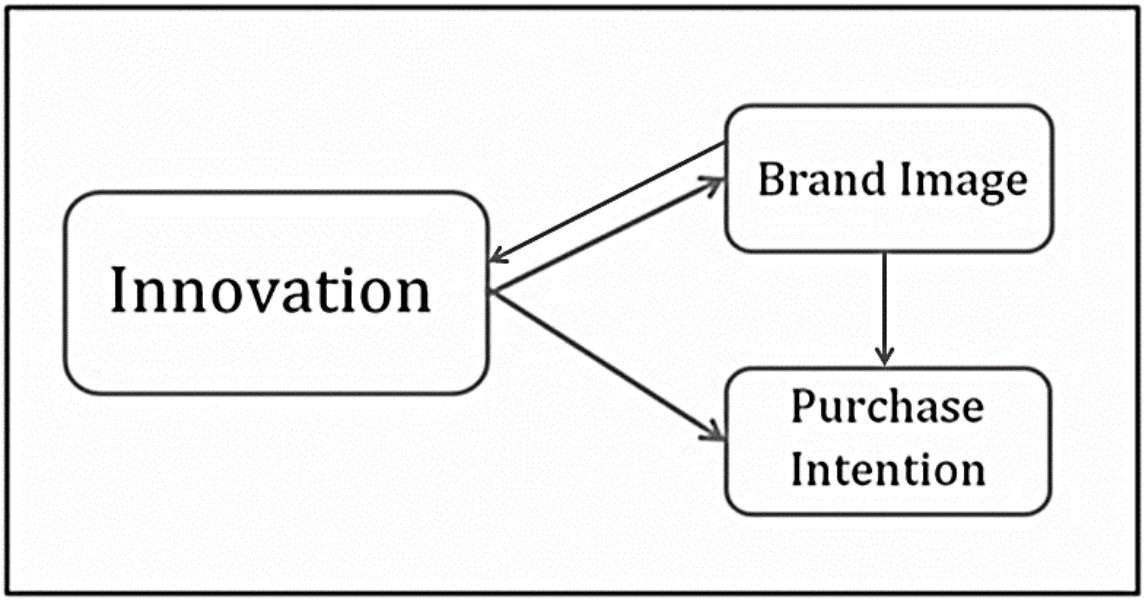
The results were consistent with the studies discussed in the literature review and findings of previous authors. Features related to performance were found to be slightly more important than those related to appearance and it was found that consumers are willing to pay more for what they consider an innovative product. As expected, innovation positively affects brand image as well as increases the likelihood of purchase intentions. A positive brand image further increases the chance of intent to purchase. In simple terms innovation and brand image have a complementary relationship and can enhance one another, leading to higher purchase intention. The findings of this study can be used to supplement and improve marketing strategies.

7.3 Conceptual Framework

Based on the discussion in Chapter Three and on the results of the research, the conceptual model is further validated. Innovation allows consumers to perceive the product as superior to predecessors and to differentiate it from existing products. This

creates a competitive advantage and thereby enhances the brand image and strengthens the positive associations held with the brand. The research results have confirmed that innovation improves the brand image. Simultaneously, previous research has also shown that the brand image guides purchase intention and reduces the risk associated with using a new or innovative product if previous experience with using the brand has been good and consistent. This research further confirmed that a stronger brand image leads to higher purchase intentions.

Figure 7.1: Conceptual Framework



(Source: Compiled by author)

It can therefore be confirmed from the related findings in this study that innovation does in fact impact brand image, and that brand image also impacts innovation, with specific reference to the acceptance of innovation. Simultaneously innovation and brand image influence the consumers' purchase intentions.

7.4 Recommendations Based on Results

This section mentions some recommendations that can be applied to real world business operations, particularly in the technology industry.

- The primary innovation focus of an organisation should be on performance and then on appearance.

- Organisations should ensure that improvements made to the performance of products are relevant to the people who use them and must allow them to actually accomplish tasks more efficiently, more easily and must enable them to satisfy their needs.

- Innovations made to the appearance of a product should also enhance the use of the product and improve user experience rather than be purely for aesthetic or visual appeal, so that real value is created.

- Organisations should highlight to consumers *how* performance-related features adds value to their daily lives and augments their user experience so that good perceptions are created and existing ones are improved.

- Sufficient information should be provided to consumers on new and enhanced features and how they are used. Trial periods are not necessary but the tools to learn new skills to use the product must be provided.

- Organisations should ensure that innovation is consistent and on par or superior to competitors in order to continue capturing repurchase demand.

- Organisations should ensure that innovation differentiates the product from competitors' products so that it can be sold at a premium price.

- Marketers need to also have brand image in mind when innovating, in order to ensure that the innovation is in line with the image that they try to convey and to maximise the benefits, alignment between innovation and the brand image.

- Organisations should ensure that the brand image creates trust with consumers so that they are more willing to purchase and try innovative products.

- Organisations should segment markets and target groups that are less willing to purchase innovative products with advertising and marketing efforts in order to maximise on marketing efforts.

7.5 Limitations of the Study

The following were considered limitations of the study:

- Due to time constraints, financial restraints and limited manpower, only students were included in the study, with ages ranging from 18 to 25 years. The research was also conducted on only one campus of one university.

- The research was conducted on a small scale. Although 372 questionnaires were used, an even larger study would have been more comprehensive and provided extra insight; however this was not possible since there were limited financial resources and time.

- Only quantitative methods were utilised. Although this is more suitable for numerical based studies and the results are generalizable, quantitative methods do not allow for in-depth understanding and the gathering of detailed information.

- The research focused on one industry only, the cellular phone industry instead of numerous industries.

- Due to the above reasons the results cannot be generalised to other age groups and industries.

The next section proposes recommendations for future research.

7.6 Recommendations for Future Research

Drawing from the limitations and changes that occurred related to innovation, the recommendations for future research are as follows:

- Future research of a similar nature may increase the scope of the study, for example a larger sample size. The inclusion of different age groups may also be relevant; these age groups can then be compared. This would provide additional insight into the topic.

- A qualitative approach can be taken in future research in order to discover additional insight and allow respondents to answer open-ended questions instead of answering from a given set of responses.

- Research in countries related to South Africa, for example the BRICS countries (Brazil, Russia, India, China), can be conducted which will allow for cross border comparisons. Researchers may also want to select other products or industries.

- Future research may include other variables that may affect innovation, brand image and purchase intention such as psychological and situational factors thus gaining an understanding into the extent of influence the different variables have on the study.

- Furthermore, the impact of innovation can be investigated in terms of other variables such as digital marketing and sustainability (green marketing efforts) with regards to technological products and the effect innovation has had on electronic waste.

- Research focusing on the innovation plateau and monotony of design that is arising in some industries such as the cellular phone industry can be conducted, in respect of how having very similar products affects consumers and companies.

- Research into how innovation drives costs lower and brand image allows for charging a higher price can be undertaken, for example in terms of how Chinese cellular phone manufacturers produce similar products to American and Korean products yet are able to charge lower prices.

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APPENDICES

Appendix 1: Ethical Clearance Form

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

23 July 2015

Ms Dina Osman (211503677)
School of Management, IT & Governance
Westville Campus

Dear Ms Osman,

Protocol reference number: HSS/0865/015M
Project title: The effects of cellular phone innovation on brand image and purchase intention amongst UKZN students

Full Approval – Expedited Application

In response to your application received on 25 June 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have 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

[redacted]

Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Mr Sanjay Soni
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:** singhsh@ukzn.ac.za / ssymeonm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za

Appendix 2: Gatekeeper's Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

18 June 2015

Ms Dina Osman
School of Management, IT & Governance
College of Law & Management Studies
Westville Campus
UKZN
Email: 211503677@stu.ukzn.ac.za

Dear Ms Osman

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN) towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"The effects of cellular phone innovation on brand image and purchase intention amongst UKZN students".

It is noted that you will be constituting your sample by randomly approaching and handing out questionnaires to students on the Westville campus.

Please ensure that the following appears on your questionnaire/attached to your notice:

- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book.

Data collected must be treated with due confidentiality and anonymity.

Yours sincerely

[redacted]

MR B POO
REGISTRAR (ACTING)

Appendix 3: Informed Consent Document

I, Dina Osman, am a student registered for a Masters of Commerce in Marketing at the University of KwaZulu-Natal (UKZN) Westville campus. My student number is 211503677 and I can be reached on 211503677@ukzn.ac.za or on 0796796758. A requirement for the degree is a dissertation and I have chosen the following topic;

"The effects of cellular phone innovation on brand image and purchase intention amongst UKZN students."

My supervisor is Mr Sanjay Soni and he is based in the School of Management, IT and Governance at the Pietermaritzburg campus of the University of KwaZulu-Natal. He can be contacted on Soni@ukzn.ac.za or 033-260 5735 during office hours. The HSSREC Research Office is based at the Govan Mbeki building at the Westville Campus and can be contacted on 031 260 8350, faxed on 031 260 3093 and emailed at hssreclms@ukzn.ac.za.

The purpose of this research is to determine the effects that innovation has on brand image and purchase intention and it is hoped that the research will provide useful information that can be used to justify investing in innovation and to demonstrate the possible positive effect that innovation can have on brand image. Information gathered in this study will include data retrieved through a questionnaire that I would require you to complete. Please note that your name will not be required and will not be included in the report. The information will be seen only by my supervisor and examiner. Your anonymity and confidentiality is of utmost importance and will be maintained throughout the study through the use of password restricted access on the computer.

Your participation through completion of the questionnaire is completely voluntary. You have the right to withdraw at any time during the study. I would be very grateful for your participation as it would enable me to complete my dissertation and will also provide better insight into the effect that innovation has on brand image and purchase intention.

Please complete the section below:

I…… (Full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Signature of participant……

Date……

Appendix 4: Research Questionnaire

To whom it may concern

I, Dina Osman, am a Masters student at the University of KwaZulu-Natal. I am conducting research to determine the effects of cellular phone innovation on brand image and purchase intention amongst UKZN Students, as part of my degree's requirements. It is hoped the research will provide useful information that can be used to explain why innovation is important to brand image and purchase intention. I would like to kindly ask for your cooperation in completing the attached questionnaire. I hope you will be kind enough to accept my request, which will take approximately 15 minutes of your time.

The questionnaire consists of 4 short parts. Part A has questions which ask for some basic biographical information. Part B consists of statements which require you to rate the important factors of cellular phone innovation. Part C asks questions about how innovation affects brand image and part D is concerned with purchase intentions.

If you agree to take part in the study, your information will be kept confidential. Please note that your name will not be included in the report and the questionnaire does not require any personal information. The information will be seen only by me and my supervisor and examiner. Your anonymity and confidentiality is of utmost importance and will be maintained throughout the study.

If you have any queries regarding the research, my supervisor can always be contacted at this email address Soni@ukzn.ac.za.

Thank you for your time.

Yours Sincerely,

Dina Osman

Title: The effects of cellular phone innovation on brand image and purchase intention amongst UKZN Students.

Questionnaire

Section A: Biographical Data

For Section A, please complete the questions below by placing a cross (X) next to the most appropriate box that applies to you.

1. Age group:

- ☐ **18-21 years**
- ☐ **22-25 years**
- ☐ **26-29 years**
- ☐ **>29 years**

2. Current year of study:

- ☐ **1st year**
- ☐ **2nd year**
- ☐ **3rd year**
- ☐ **4th year/Honours**

3. Gender:

- ☐ **Male**
- ☐ **Female**

4. Ethnicity

- ☐ **Black**
- ☐ **Coloured**
- ☐ **Indian**
- ☐ **White**
- ☐ **Other (please specify)** _____

5. Do you own a cellular phone?

- ☐ **Yes**
- ☐ **No**

Section B: Innovation Features

Innovation refers to any degree of newness either completely new or small changes or improvements made to a product, in this case a cellular phone.

Indicate your agreement with the following statements regarding the performance of an innovative cellular phone.

An innovative cellular phone should have:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. many functionalities					
2. a faster processor than previous models					
3. an application store (to download new applications) such as *Play Store* or *App Store*					
4. a high megapixel camera					
5. ease of use					
6. increased customisation					
7. an anti-virus software					
8. strong connection to networks					
9. a GPS system (such as maps)					
10. a high resolution screen					
11. a long lasting battery					

Indicate your agreement with the following statements regarding the appearance of an innovative cellular phone.

An innovative cellular phone should:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
12. be visually appealing					
13. have a stylish design					
14. be larger in size than previous models					
15. be available in different colours					
16. be thin in width					

17.	be light in weight					
18.	include a stylus pen					
19.	be waterproof					
20.	be made of new raw materials					

Indicate your agreement with the following statements regarding the price of an innovative cellular phone.

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
21. An innovative cellular phone should be cheap					
22. The price of a cellular phone is more important than innovations made to it.					

Section C: Innovation and Brand Image

Brand image refers to customers' complete perceptions about a brand created by linked associations and/or past experience.

Indicate your agreement with the following statements regarding innovation and brand image.

I will have a higher opinion of the brand image if the cellular phone:	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
23. is better than the cellular phones before it					
24. has more functions than the products before it					
25. allows one to accomplish tasks more efficiently					
26. allows one to accomplish tasks more easily					
27. consolidates multiple functions into one device					
28. is compatible with my daily needs					
29. does not clash with my lifestyle (values/beliefs)					
30. is one that is easy to use					
31. does not require me to learn new skills to use it					

32. can be used on a trial basis before being purchased					
33. has clearly noticeable improvements					
34. has many positive testimonials or reviews					

Indicate your agreement with the following statements regarding innovation and brand image.

An innovative cellular phone has a brand image that:	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
35. is well known					
36. delivers good value for the price					
37. portrays excellent quality					
38. has a good reputation					
39. is unique from other brands					
40. creates a feeling of excitement amongst customers					
41. portrays a feeling of sincerity to the customer					
42. is trustworthy					
43. reflects customers' personal styles					
44. has different products and models to choose from					
45. is innovative in its design (logo, name)					
46. is socially accepted					
47. has favourable associations linked to it					

Section D: Purchase Intention

Purchase intention refers to whether or not an individual intends or plans on purchasing a product sometime in the future.

Indicate your agreement with the following statements regarding purchase intention:

Appendix 5: Proof of Editing

The Writing Place
Teaching & Learning Unit
College of Law & Management Studies
University of KwaZulu-Natal
Westville Campus – J Block

09 November 2015

To Whom It May Concern,

This letter serves to confirm that I have indeed edited Ms Dina Faisal Osman's Master of Commerce thesis (Student number: 211503677) titled "The Effects of Cellular Phone Innovation on Brand Image and Purchase Intention Amongst UKZN Students". Ms Osman's supervisor is Mr Sanjay Soni. The specific areas that I paid attention to in the thesis were:

- **Content:**

  Sentence structure, correction of grammar, coherence, clarification of academic expression and spelling;

  Logical flow of ideas within and between paragraphs and sections;

  Chapter introductions and conclusions;

- **Referencing:**

  Cross-checking in-text with Reference List entries;

  Formatting of in-text and Reference List entries;

  Looking up of missing or incorrect references and making corrections accordingly.

Please do contact me if you require clarification regarding any of the above matters pertaining to Ms Osman's thesis.

Yours sincerely,

Ms Serrenta Naidoo
Writing Place Coordinator
Office J 012
Teaching and Learning Unit
College of Law and Management Studies
Tel: 031 260 2121 / 084 489 2622
Email: naidoos2@ukzn.ac.za / serrenta@yahoo.com

Appendix 6: Detailed Statistical Results (per question), Regression Analysis Performance Scale and Regression Analysis Appearance Scale

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-21	323	86.8	86.8	86.8
	22-25	46	12.4	12.4	99.2
	26-29	3	.8	.8	100.0
	Total	372	100.0	100.0	

Year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1st year	215	57.8	57.8	57.8
	2nd year	95	25.5	25.5	83.3
	3rd year	41	11.0	11.0	94.4
	4th year/honours	21	5.6	5.6	100.0
	Total	372	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	152	40.9	40.9	40.9
	Female	220	59.1	59.1	100.0
	Total	372	100.0	100.0	

Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black	258	69.4	69.4	69.4
	Coloured	8	2.2	2.2	71.5
	Indian	99	26.6	26.6	98.1
	White	6	1.6	1.6	99.7
	Other	1	.3	.3	100.0
	Total	372	100.0	100.0	

The one 'other' is Asian.

Cellular phone Ownership

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	369	99.2	99.2	99.2
	No	3	.8	.8	100.0
	Total	372	100.0	100.0	

Cellular Phone Features

1. many functionalities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	9	2.4	2.4	2.4
	Disagree	7	1.9	1.9	4.3
	Neutral	44	11.8	11.8	16.1
	Agree	120	32.3	32.3	48.4
	Strongly agree	192	51.6	51.6	100.0
	Total	372	100.0	100.0	

2. a faster processor than previous models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.6	1.6	1.6
	Disagree	6	1.6	1.6	3.2
	Neutral	16	4.3	4.3	7.5
	Agree	103	27.7	27.7	35.2
	Strongly agree	241	64.8	64.8	100.0
	Total	372	100.0	100.0	

3. an application store (to download new applications) such as Play Store or App Store

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	9	2.4	2.4	2.4
	Disagree	6	1.6	1.6	4.0
	Neutral	23	6.2	6.2	10.2
	Agree	108	29.0	29.0	39.2
	Strongly agree	226	60.8	60.8	100.0
	Total	372	100.0	100.0	

4. a high megapixel camera

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	2.7	2.7	2.7
	Disagree	10	2.7	2.7	5.4
	Neutral	27	7.3	7.3	12.6
	Agree	103	27.7	27.7	40.3
	Strongly agree	222	59.7	59.7	100.0
	Total	372	100.0	100.0	

5. ease of use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	9	2.4	2.4	4.3
	Neutral	35	9.4	9.4	13.7
	Agree	113	30.4	30.4	44.1
	Strongly agree	208	55.9	55.9	100.0
	Total	372	100.0	100.0	

6. increased customisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.6	1.6	1.6
	Disagree	6	1.6	1.6	3.2
	Neutral	49	13.2	13.2	16.4
	Agree	134	36.0	36.1	52.6
	Strongly agree	176	47.3	47.4	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

7. an anti-virus software

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	17	4.6	4.6	6.5
	Neutral	28	7.5	7.5	14.0
	Agree	91	24.5	24.5	38.5
	Strongly agree	228	61.3	61.5	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

8. strong connection to networks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	8	2.2	2.2	4.1
	Neutral	21	5.6	5.7	9.7
	Agree	59	15.9	15.9	25.7
	Strongly agree	275	73.9	74.3	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

9. a GPS system (such as maps)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	9	2.4	2.4	2.4
	Disagree	5	1.3	1.3	3.8
	Neutral	38	10.2	10.2	14.0
	Agree	109	29.3	29.4	43.4
	Strongly agree	210	56.5	56.6	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

10. a high resolution screen

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	2.2	2.2	2.2
	Disagree	4	1.1	1.1	3.2
	Neutral	27	7.3	7.3	10.5
	Agree	104	28.0	28.1	38.6
	Strongly agree	227	61.0	61.4	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

11. a long lasting battery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	16	4.3	4.3	4.3
	Disagree	12	3.2	3.2	7.5
	Neutral	23	6.2	6.2	13.7
	Agree	42	11.3	11.3	25.1
	Strongly agree	278	74.7	74.9	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

12. be visually appealing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.6	1.6	1.6
	Disagree	6	1.6	1.6	3.2
	Neutral	55	14.8	14.8	18.1
	Agree	140	37.6	37.7	55.8
	Strongly agree	164	44.1	44.2	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

13. have a stylish design

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1.1	1.1	1.1
	Disagree	9	2.4	2.4	3.5
	Neutral	69	18.5	18.5	22.0
	Agree	124	33.3	33.3	55.4
	Strongly agree	166	44.6	44.6	100.0
	Total	372	100.0	100.0	

14. be larger in size than previous models

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	19	5.1	5.1	5.1
	Disagree	73	19.6	19.6	24.7
	Neutral	117	31.5	31.5	56.2
	Agree	91	24.5	24.5	80.6
	Strongly agree	72	19.4	19.4	100.0
	Total	372	100.0	100.0	

15. be available in different colours

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	8	2.2	2.2	4.1
	Neutral	66	17.7	17.8	21.9
	Agree	131	35.2	35.4	57.3
	Strongly agree	158	42.5	42.7	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

16. be thin in width

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.6	1.6	1.6
	Disagree	11	3.0	3.0	4.6
	Neutral	70	18.8	18.9	23.5
	Agree	118	31.7	31.8	55.3
	Strongly agree	166	44.6	44.7	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

17. be light in weight

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	7	1.9	1.9	3.8
	Neutral	42	11.3	11.3	15.1
	Agree	122	32.8	32.9	48.0
	Strongly agree	193	51.9	52.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

18. include a stylus pen

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	18	4.8	4.8	4.8
	Disagree	64	17.2	17.2	22.0
	Neutral	126	33.9	33.9	55.9
	Agree	83	22.3	22.3	78.2
	Strongly agree	81	21.8	21.8	100.0
	Total	372	100.0	100.0	

19.be waterproof

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	2.2	2.2	2.2
	Disagree	9	2.4	2.4	4.6
	Neutral	35	9.4	9.5	14.1
	Agree	77	20.7	20.9	35.0
	Strongly agree	240	64.5	65.0	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

20. be made of new raw materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	10	2.7	2.7	2.7
	Disagree	24	6.5	6.5	9.2
	Neutral	138	37.1	37.3	46.5
	Agree	89	23.9	24.1	70.5
	Strongly agree	109	29.3	29.5	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

21. An innovative cellular phone should be cheap

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	38	10.2	10.2	10.2
	Disagree	53	14.2	14.2	24.5
	Neutral	118	31.7	31.7	56.2
	Agree	82	22.0	22.0	78.2
	Strongly agree	81	21.8	21.8	100.0
	Total	372	100.0	100.0	

22. The price of a cellular phone is more important than innovations made to it.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	74	19.9	19.9	19.9
	Disagree	98	26.3	26.4	46.4
	Neutral	100	26.9	27.0	73.3
	Agree	62	16.7	16.7	90.0
	Strongly agree	37	9.9	10.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

Section C: Innovation and Brand Image

23 is better than the products before it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1.1	1.1	1.1
	Disagree	6	1.6	1.6	2.7
	Neutral	35	9.4	9.4	12.1
	Agree	168	45.2	45.2	57.3
	Strongly agree	159	42.7	42.7	100.0
	Total	372	100.0	100.0	

24 has more functions than the products before it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	8	2.2	2.2	2.4
	Neutral	20	5.4	5.4	7.8
	Agree	162	43.5	43.5	51.3
	Strongly agree	181	48.7	48.7	100.0
	Total	372	100.0	100.0	

25 allows one to accomplish tasks more efficiently

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	2	.5	.5	.8
	Neutral	18	4.8	4.9	5.7
	Agree	129	34.7	34.8	40.4
	Strongly agree	221	59.4	59.6	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

26 allows one to accomplish tasks more easily

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	6	1.6	1.6	1.9
	Neutral	21	5.6	5.7	7.5
	Agree	115	30.9	31.0	38.5
	Strongly agree	228	61.3	61.5	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

27 consolidates multiple functions into one device

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	2	.5	.5	.8
	Neutral	33	8.9	8.9	9.8
	Agree	128	34.4	34.7	44.4
	Strongly agree	205	55.1	55.6	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

28 is compatible with my daily needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	2.2	2.2	2.2
	Neutral	23	6.2	6.2	8.4
	Agree	111	29.8	30.0	38.4
	Strongly agree	228	61.3	61.6	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

29 does not clash with my lifestyle (values/beliefs)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	11	3.0	3.0	3.0
	Neutral	81	21.8	21.8	24.8
	Agree	106	28.5	28.6	53.4
	Strongly agree	173	46.5	46.6	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

30 is one that is easy to use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	.8	.8	.8
	Disagree	5	1.3	1.3	2.2
	Neutral	42	11.3	11.3	13.5
	Agree	122	32.8	32.9	46.4
	Strongly agree	199	53.5	53.6	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

31 does not require me to learn new skills to use it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	40	10.8	10.8	12.7
	Neutral	96	25.8	25.9	38.5
	Agree	105	28.2	28.3	66.8
	Strongly agree	123	33.1	33.2	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

32 can be used on a trial basis before being purchased

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	1.3	1.3	1.3
	Disagree	25	6.7	6.7	8.1
	Neutral	101	27.2	27.2	35.3
	Agree	105	28.2	28.3	63.6
	Strongly agree	135	36.3	36.4	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

33 has clearly noticeable improvements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	7	1.9	1.9	2.4
	Neutral	28	7.5	7.6	10.0
	Agree	141	37.9	38.1	48.1
	Strongly agree	192	51.6	51.9	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

34 has many positive testimonials or reviews

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	4	1.1	1.1	1.3
	Neutral	60	16.1	16.1	17.5
	Agree	108	29.0	29.0	46.5
	Strongly agree	199	53.5	53.5	100.0
	Total	372	100.0	100.0	

35 is well known

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	29	7.8	7.8	9.7
	Neutral	81	21.8	21.8	31.5
	Agree	157	42.2	42.2	73.7
	Strongly agree	98	26.3	26.3	100.0
	Total	372	100.0	100.0	

36 delivers good value for the price

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	12	3.2	3.2	3.5
	Neutral	39	10.5	10.5	14.0
	Agree	153	41.1	41.1	55.1
	Strongly agree	167	44.9	44.9	100.0
	Total	372	100.0	100.0	

37 portrays excellent quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	4	1.1	1.1	1.6
	Neutral	29	7.8	7.9	9.5
	Agree	130	34.9	35.3	44.8
	Strongly agree	203	54.6	55.2	100.0
	Total	368	98.9	100.0	
Missing	System	4	1.1		
Total		372	100.0		

38 has a good reputation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	1.6	1.6	1.6
	Neutral	59	15.9	15.9	17.5
	Agree	131	35.2	35.2	52.7
	Strongly agree	176	47.3	47.3	100.0
	Total	372	100.0	100.0	

39 is unique from other brands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	6	1.6	1.6	1.9
	Neutral	48	12.9	13.0	14.9
	Agree	144	38.7	39.0	53.9
	Strongly agree	170	45.7	46.1	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

40 creates a feeling of excitement amongst customers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	3	.8	.8	1.1
	Neutral	53	14.2	14.2	15.3
	Agree	147	39.5	39.5	54.8
	Strongly agree	168	45.2	45.2	100.0
	Total	372	100.0	100.0	

41 portrays a feeling of sincerity to the customer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	8	2.2	2.2	2.7
	Neutral	79	21.2	21.2	23.9
	Agree	149	40.1	40.1	64.0
	Strongly agree	134	36.0	36.0	100.0
	Total	372	100.0	100.0	

42 is trustworthy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	.8	.8	.8
	Disagree	7	1.9	1.9	2.7
	Neutral	36	9.7	9.7	12.4
	Agree	127	34.1	34.1	46.5
	Strongly agree	199	53.5	53.5	100.0
	Total	372	100.0	100.0	

43 reflects customers' personal styles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1.1	1.1	1.1
	Disagree	14	3.8	3.8	4.9
	Neutral	69	18.5	18.7	23.6
	Agree	143	38.4	38.8	62.3
	Strongly agree	139	37.4	37.7	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

44 has different products and models to choose from

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	8	2.2	2.2	2.7
	Neutral	39	10.5	10.6	13.3
	Agree	147	39.5	39.9	53.3
	Strongly agree	172	46.2	46.7	100.0
	Total	368	98.9	100.0	
Missing	System	4	1.1		
Total		372	100.0		

45 is innovative in its design (logo, name)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	11	3.0	3.0	3.5
	Neutral	75	20.2	20.2	23.7
	Agree	143	38.4	38.4	62.1
	Strongly agree	141	37.9	37.9	100.0
	Total	372	100.0	100.0	

46 is socially accepted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	1.3	1.3	1.3
	Disagree	9	2.4	2.4	3.8
	Neutral	65	17.5	17.5	21.3
	Agree	140	37.6	37.7	59.0
	Strongly agree	152	40.9	41.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

47 has favourable associations linked to it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	.8	.8	.8
	Disagree	8	2.2	2.2	3.0
	Neutral	61	16.4	16.4	19.4
	Agree	158	42.5	42.5	61.8
	Strongly agree	142	38.2	38.2	100.0
	Total	372	100.0	100.0	

Section D: Purchase Intention

48 is better than the products before it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	6	1.6	1.6	2.2
	Neutral	24	6.5	6.5	8.6
	Agree	113	30.4	30.5	39.1
	Strongly agree	226	60.8	60.9	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

49 has more functions than the products before it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	1.3	1.3	1.3
	Neutral	27	7.3	7.3	8.6
	Agree	127	34.1	34.1	42.7
	Strongly agree	213	57.3	57.3	100.0
	Total	372	100.0	100.0	

50 allows one to accomplish tasks more efficiently

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.3	.3	.3
	Neutral	26	7.0	7.0	7.3
	Agree	114	30.6	30.7	38.0
	Strongly agree	230	61.8	62.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

51 allows one to accomplish tasks more easily

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	1.3	1.3	1.3
	Neutral	26	7.0	7.0	8.4
	Agree	110	29.6	29.6	38.0
	Strongly agree	230	61.8	62.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

52 consolidates multiple functions into one device

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	2	.5	.5	.8
	Neutral	29	7.8	7.8	8.6
	Agree	122	32.8	32.8	41.4
	Strongly agree	218	58.6	58.6	100.0
	Total	372	100.0	100.0	

53 is compatible with my daily needs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	4	1.1	1.1	1.3
	Neutral	20	5.4	5.4	6.7
	Agree	135	36.3	36.4	43.1
	Strongly agree	211	56.7	56.9	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

54 does not clash with my lifestyle (values/beliefs)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	8	2.2	2.2	2.7
	Neutral	63	16.9	17.0	19.7
	Agree	115	30.9	31.0	50.7
	Strongly agree	183	49.2	49.3	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

55 is one that is easy to use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	10	2.7	2.7	3.2
	Neutral	37	9.9	10.0	13.2
	Agree	126	33.9	34.0	47.2
	Strongly agree	196	52.7	52.8	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

56 does not require me to learn new skills to use it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	1.6	1.6	1.6
	Disagree	30	8.1	8.1	9.7
	Neutral	83	22.3	22.4	32.2
	Agree	108	29.0	29.2	61.4
	Strongly agree	143	38.4	38.6	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

57 can be used on a trial basis before being purchased

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1.1	1.1	1.1
	Disagree	13	3.5	3.5	4.6
	Neutral	79	21.2	21.4	26.0
	Agree	113	30.4	30.6	56.6
	Strongly agree	160	43.0	43.4	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

58 has clearly noticeable improvements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	1.6	1.6	1.6
	Neutral	32	8.6	8.6	10.2
	Agree	140	37.6	37.6	47.8
	Strongly agree	194	52.2	52.2	100.0
	Total	372	100.0	100.0	

59 has many positive testimonials or reviews

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	8	2.2	2.2	2.2
	Neutral	44	11.8	11.8	14.0
	Agree	131	35.2	35.2	49.2
	Strongly agree	189	50.8	50.8	100.0
	Total	372	100.0	100.0	

60 is well known

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	1.9	1.9	1.9
	Disagree	19	5.1	5.1	7.0
	Neutral	60	16.1	16.3	23.3
	Agree	130	34.9	35.2	58.5
	Strongly agree	153	41.1	41.5	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

61 delivers good value for the price

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	8	2.2	2.2	2.7
	Neutral	18	4.8	4.8	7.5
	Agree	129	34.7	34.7	42.2
	Strongly agree	215	57.8	57.8	100.0
	Total	372	100.0	100.0	

62 portrays excellent quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	2	.5	.5	.8
	Neutral	35	9.4	9.4	10.2
	Agree	118	31.7	31.8	42.0
	Strongly agree	215	57.8	58.0	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

63 has a good reputation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	7	1.9	1.9	2.2
	Neutral	31	8.3	8.4	10.6
	Agree	135	36.3	36.6	47.2
	Strongly agree	195	52.4	52.8	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

64 is unique from other brands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	1.3	1.4	1.4
	Neutral	43	11.6	11.6	13.0
	Agree	133	35.8	35.9	48.9
	Strongly agree	189	50.8	51.1	100.0
	Total	370	99.5	100.0	
Missing	System	2	.5		
Total		372	100.0		

65 creates a feeling of excitement amongst customers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	5	1.3	1.3	1.6
	Neutral	62	16.7	16.7	18.3
	Agree	115	30.9	31.0	49.3
	Strongly agree	188	50.5	50.7	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

66 portrays a feeling of sincerity to the customer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	6	1.6	1.6	1.9
	Neutral	68	18.3	18.3	20.2
	Agree	135	36.3	36.3	56.5
	Strongly agree	162	43.5	43.5	100.0
	Total	372	100.0	100.0	

67 is trustworthy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	5	1.3	1.3	1.6
	Neutral	38	10.2	10.2	11.8
	Agree	122	32.8	32.8	44.6
	Strongly agree	206	55.4	55.4	100.0
	Total	372	100.0	100.0	

68 reflects customers' personal styles

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	.5	.5	.5
	Disagree	10	2.7	2.7	3.3
	Neutral	71	19.1	19.2	22.5
	Agree	119	32.0	32.2	54.7
	Strongly agree	167	44.9	45.3	100.0
	Total	369	99.2	100.0	
Missing	System	3	.8		
Total		372	100.0		

69 has different products and models to choose from

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	1.9	1.9	1.9
	Neutral	46	12.4	12.4	14.2
	Agree	143	38.4	38.4	52.7
	Strongly agree	176	47.3	47.3	100.0
	Total	372	100.0	100.0	

70 is innovative in its design (logo, name)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.3	.3	.3
	Disagree	8	2.2	2.2	2.4
	Neutral	63	16.9	16.9	19.4
	Agree	141	37.9	37.9	57.3
	Strongly agree	159	42.7	42.7	100.0
	Total	372	100.0	100.0	

71 is socially accepted

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	1.3	1.3	1.3
	Disagree	15	4.0	4.0	5.4
	Neutral	53	14.2	14.2	19.6
	Agree	131	35.2	35.2	54.8
	Strongly agree	168	45.2	45.2	100.0
	Total	372	100.0	100.0	

72 has favourable associations linked to it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	6	1.6	1.6	1.6
	Neutral	44	11.8	11.8	13.4
	Agree	151	40.6	40.6	54.0
	Strongly agree	171	46.0	46.0	100.0
	Total	372	100.0	100.0	

73 likely to choose cellular phone if it's innovative

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	.8	.8	.8
	Disagree	6	1.6	1.6	2.4
	Neutral	27	7.3	7.3	9.7
	Agree	124	33.3	33.3	43.0
	Strongly agree	212	57.0	57.0	100.0
	Total	372	100.0	100.0	

74 likely to purchase cellular phone if it has good brand image

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	1.1	1.1	1.1
	Disagree	5	1.3	1.3	2.4
	Neutral	54	14.5	14.6	17.0
	Agree	142	38.2	38.3	55.3
	Strongly agree	166	44.6	44.7	100.0
	Total	371	99.7	100.0	
Missing	System	1	.3		
Total		372	100.0		

75 likely to purchase cellular phone within the next year

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	18	4.8	4.8	4.8
	Disagree	35	9.4	9.4	14.2
	Neutral	93	25.0	25.0	39.2
	Agree	95	25.5	25.5	64.8
	Strongly agree	131	35.2	35.2	100.0
	Total	372	100.0	100.0	

Regression Analysis Performance Scale

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. many functionalities	44.27	46.932	.590	.920
2. a faster processor than previous models	44.03	46.985	.697	.915
3. an application store (to download new applications) such as Play Store or App Store	44.11	45.787	.734	.913
4. a high megapixel camera	44.17	44.949	.750	.912
5. ease of use	44.19	46.234	.681	.916
6. increased customisation	44.29	46.939	.633	.918
7. an anti-virus software	44.17	45.053	.727	.913
8. strong connection to networks	43.97	45.603	.777	.911
9. a GPS system (such as maps)	44.19	45.996	.691	.915
10. a high resolution screen	44.10	45.817	.753	.912
11. a long lasting battery	44.07	45.704	.595	.921

Regression Analysis Appearance Scale

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
12. be visually appealing	31.67	24.504	.391	.778
13. have a stylish design	31.70	23.387	.518	.762
14. be larger in size than previous models	32.55	22.419	.450	.773
15. be available in different colours	31.72	22.382	.632	.747
16. be thin in width	31.73	23.601	.460	.769
17. be light in weight	31.56	23.550	.499	.764
18. include a stylus pen	32.50	22.439	.457	.771
19.be waterproof	31.43	23.743	.462	.769
20. be made of new raw materials	32.18	23.125	.441	.772

Gender

KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.863
Bartlett's Test of Sphericity	Approx. Chi-Square	1447.864
	df	210
	Sig.	.000

Male

	Factor			
	1	2	3	4
1. many functionalities	.600			
2. a faster processor than previous models	.712			
3. an application store (to download new applications) such as Play Store or App Store	.812			
4. a high megapixel camera	.768			
5. ease of use	.697			
6. increased customisation	.655			
7. an anti-virus software	.725			
8. strong connection to networks	.830			
9. a GPS system (such as maps)	.718			
10. a high resolution screen	.735			
11. a long lasting battery	.662			
12. be visually appealing			.711	
13. have a stylish design			.602	
14. be larger in size than previous models		.536		
15. be available in different colours		.629		
16. be thin in width				.739
17. be light in weight				.569
18. include a stylus pen		.591		
19.be waterproof		.511		
20. be made of new raw materials		.720		

Female

Rotated Factor Matrix[a,b]

	Factor			
	1	2	3	4
1. many functionalities	.607			
2. a faster processor than previous models	.701			
3. an application store (to download new applications) such as Play Store or App Store	.719			
4. a high megapixel camera	.812			
5. ease of use	.703			
6. increased customisation	.666			
7. an anti-virus software	.794			
8. strong connection to networks	.814			
9. a GPS system (such as maps)	.720			
10. a high resolution screen	.809			
11. a long lasting battery	.640			
12. be visually appealing				.587
13. have a stylish design				.830
14. be larger in size than previous models			.627	
15. be available in different colours		.549	.405	
16. be thin in width		.686		
17. be light in weight		.926		
18. include a stylus pen			.615	
19.be waterproof				
20. be made of new raw materials			.656	
21. An innovative cellular phone should be cheap				

Factor 1 is features related to performance.

Factor 2 is special features.

Factor 3 is size related features

Factor 4 is visual features. (Since question 15 loads strongly onto factor 2 and 3 it was not included.)