Modelling the antecedents of mobile gaming brand loyalty amongst Generation Y students

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DECLARATION

I, **DG Price,** declare that **MODELLING THE ANTECEDENTS OF MOBILE GAMING BRAND LOYALTY AMONGST GENERATION Y** students is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references and that this thesis has not previously been submitted for a degree at any other university.

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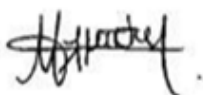
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To whom it may concern

This is to confirm that I, the undersigned, have language edited the completed research of Dylan Price for the Philosophiae Doctor thesis entitled: *Modelling the antecedents of mobile gaming brand loyalty amongst Generation Y students.* The responsibility of implementing the recommended language changes rests with the author of the thesis.

Yours truly,

Angeliki Albanis

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ABSTRACT

Keywords: Mobile gaming, satisfaction, challenge, game identification, flow, psychological commitment, brand loyalty, Generation Y, South Africa

The rapid dissemination of smartphones amongst consumers over the past decade has led to a plethora of mobile services being available. Of all mobile services available, mobile application games (hereafter referred to as mobile games) have experienced the most success. Mobile gaming has become a major success in the South African market, with mobile gaming surpassing console video gaming in terms of revenue generated in 2016. A mobile game, as a type of video game, is described as an interactive entertainment that can be played on a mobile device such as a smartphone or tablet. The object of a video game, particularly a mobile game, is to create a pleasurable experience for a player, which is attained by accomplishing certain objectives set out in the game. Mobile games have become ubiquitous amongst smartphone users due to their portability, as well as them being interactive, challenging and fun to play. Internationally, mobile games have become a lucrative business, with consumer expenditure exceeding $35 billion. Players who enjoy the game will either purchase the full-version, make repeated in-game purchases (in-app purchases) to speed up their gameplay progress or download other mobile games from the same company. This type of consumer behaviour is typically linked to brand loyalty, and the success of these mobile gaming brands can be attributed to their ability to attract and retain brand loyal consumers.

The primary objective of this study was to determine the antecedents of mobile gaming brand loyalty amongst Generation Y students within the South African context. The empirical objectives included determining Generation Y students' psychological commitment and behavioural loyalty toward their favourite mobile game, together with their level of satisfaction, perceptions of challenge, level of flow experienced and level of identification with their favourite mobile game. The second empirical objective determined if mobile gaming brand loyalty is a six-factor model comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty. The third empirical objective tested a proposed model on the influence of mobile gaming satisfaction, challenge, game identification and flow on

Generation Y students' psychological commitment and behavioural loyalty towards their favourite mobile game. The final empirical objective sought to determine if there are any gender differences in terms of Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards their favourite mobile game.

The sampling frame for this study comprised 26 public registered South African universities. From this initial sampling frame, non-probability judgement sampling was applied to select a campus from a traditional university, one from a university of technology and one from a comprehensive university. A non-probability convenience sample of 600 students was taken across these three campuses during 2017. The statistical techniques used to analyse the data collected from the 464 completed questionnaires returned included factor analysis, descriptive statistics, structural equation modelling and an independent samples t-test.

The findings in this study indicate that South African Generation Y students experience satisfaction when playing their favourite mobile game, respond positively to challenges posed and identify with their favourite game in terms of in-game characters, social communities and the virtual worlds they present. Furthermore, Generation Y students respond strongest to games that evoke a state of flow. Moreover, they are brand loyal towards their favourite mobile game in terms of both psychological commitment and behavioural loyalty. The study also determined that mobile gaming brand loyalty amongst Generation Y students in South Africa is a six-factor model.

The empirically-tested model indicates that satisfaction, challenge and game identification have a significant direct positive influence on Generation Y students' flow, which, in turn, is a significant positive predictor of psychological commitment. In turn, Generation Y students' psychological commitment towards their favourite mobile game was found to be a significant positive predictor of their behavioural loyalty towards that game. Game identification, in addition to having an indirect influence on psychological commitment via its direct influence on flow, also had a direct influence on psychological commitment. In terms of gender difference, female Generation Y students were found to experience a statistically significant higher level of satisfaction, challenge and sense of flow with their favourite mobile game than their male counterparts.

This study contributes towards to the literature concerning brand loyalty toward mobile gaming in both the South African and global context. This study determined which antecedents contribute to making Generation Y students brand loyal when playing mobile games. In addition, the study demonstrates the underlying relationships between mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty amongst Generation Y students.

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CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

The rapid dissemination of smartphones amongst consumers over the past decade has led to a plethora of mobile services being available. Of all mobile services available, mobile application games (hereafter referred to as mobile games) have experienced the most success (Liu & Li, 2011:890). Mobile gaming is also a major success in the South African market, with mobile gaming overtaking console video gaming in terms of revenue generated in 2016 (PricewaterhouseCoopers, 2016:36). A mobile game, as a type of video game, is described as an interactive entertainment that can be played on a mobile device such as a smartphone or tablet. The object of a video game, particularly a mobile game, is to create a pleasurable experience for a player, which is attained by accomplishing certain objectives set out in the game (Granic, Lobel & Engels, 2014:67; Jeong & Kim, 2009:186). Mobile games have become ubiquitous amongst smartphone users due to their portability, as well as them being interactive, challenging and fun to play (Hill, 2014).

Internationally, mobile games have become a lucrative business with consumer expenditure exceeding $35 billion (Statista, 2016a). The three giants of the mobile gaming industry, Rovio (Angry Birds), King (Candy Crush Saga) and Supercell (Clash of Clans) are at the forefront of this success with their flagship mobile games becoming burgeoning brands (Loveday, 2015; Takahashi, 2014; Newzoo, 2013; Sinha, 2012; Cheshire, 2011). These mobile games are able to attract a large following of video gamers by allowing them to download the mobile game for free. Thereafter, players who enjoy the game will either purchase the full-version, make repeated in-game purchases (in-app purchases) to speed up their gameplay progress or download other mobile games from the same company (Davidovici-Nora, 2014:83). This type of consumer behaviour is typically linked to brand loyalty, and the success of these mobile gaming brands can be attributed to their ability to attract and retain brand loyal consumers (video game players) (Teng, 2013:884).

Brand loyal consumers are defined as people who commit themselves to one particular brand and possess a strong resistance to change their loyalty from one brand to another (Clow & Baack, 2014:52). The importance of brand loyalty to an organisation's success has been widely acknowledged by multiple academics in research that is closely related to mobile games (mobile gamification, online games, video games and mobile phones) (Wu & Chien, 2015; Teng, Chen, Chen & Li, 2012; Lin, 2010; Gaur & Arora, 2014). Bauer, Stockburger- Sauer and Exler (2008:207) state that brand loyalty must be conceptualised as a two-dimensional construct comprising psychological commitment and behavioural loyalty. Psychological commitment represents the attitudinal component of brand loyalty. It manifests as an emotional commitment to a brand that is characterised by a consumer's willingness to support the success of a brand and a resistance towards switching brands (Lu & Wang, 2008:504). Behavioural loyalty represents a consumer's intention to continue engaging with a brand. This includes past and future purchase behaviour, as well as intentions to buy additional products related to the brand (Lii & Sy, 2009:772). Amine (1998:307) posits that higher psychological commitment to a brand typically leads to increased behavioural loyalty.

Limited research aimed at determining potential antecedents of consumer loyalty towards video games has revealed flow to be a significant predictor (Teng, 2013; Choi & Kim, 2004). Flow is described as a holistic experience that occurs when a player becomes cognitively absorbed while playing a video game (Ha, Yoon & Choi, 2007:279). A study done by Teng (2013:885) found that flow has a positive and statistically significant impact on consumer loyalty towards a video game. The study also found that challenge predicts flow. Challenges posed by a video game encourage players to use cognitive skills to overcome them, which increases the cognitive concentration required when playing that game (Teng, 2013:884). In video games research, the term cognitive concentration has become interchangeable with flow (Jung *et al.,* 2009:125).

There are two other popular antecedents of consumer video game loyalty that have been identified in the literature, namely satisfaction (Lu & Wang, 2008:500) and game identification (Van Looy, Courtois & De Vocht, 2012:129). Research conducted by Lu and Wang (2008) revealed that satisfaction has a positive significant impact towards consumer loyalty. Game identification is the conceptualisation of brand identification for

video games, and was utilised by Van Looy *et al.* (2012). It is defined as the extent to which a player can identify himself/herself with their favourite video game and with other people playing the same game. Brand identification is considered a salient predictor of brand loyalty (Lin, 2010:7). The literature pertaining to brand loyalty has shown that consumers who perceive a level of connectedness to a particular brand may become psychologically committed and behaviourally loyal to that brand (Parker, 2005:27). However, a study by Van Looy *et al.* (2012) did not explore the possibility of a player's game identification predicting their loyalty towards that video game. As such, further research is needed to prove if game identification can be used to predict mobile gaming brand loyalty, as is the case with satisfaction, challenge and flow.

Targeting potential brand loyal consumers is of the utmost importance to marketers (Clow & Baack, 2014:102). A study conducted by Price (2017:114) revealed that South African Generation Y students – also known as today's youth or the Millennials – display positive attitudes towards mobile games and have positive behavioural intentions towards playing them. The Generation Y cohort includes any individual born between 1986 and 2005 (Markert, 2004:21) and, in South Africa, represented an estimated 40 percent of the population in 2017 (Statistics South Africa, 2017:12). Moreover, Generation Y members who are students at higher education institutes (HEIs) are of particular importance, as they tend to develop into opinion leaders and trend setters amongst their peers (Bevan-Dye & Surujlal, 2011:49). As such, their perceptions of and engagement with mobile games, be it positive or negative, is likely to influence the wider Generation Y market. Therefore, understanding South African Generation Y university students' perceptions of and engagement with mobile games may be fruitful for marketers seeking to develop and grow mobile gaming brands aimed at members of the country's wider Generation Y market segment.

1.2   PROBLEM STATEMENT

Mobile games have become a lucrative market in South Africa, given that close to six million active players with an average revenue per user estimated at R67 generated consumer expenditure approaching R500 million in 2017 (Statista, 2017a). The revenue generated by popular mobile games stems from a freemium business strategy, whereby the majority of income earned is from in-game purchases and repeat purchases (Moreira,

Filho & Ramalho, 2014:3). Much of the success of well-known mobile games, such as Angry Birds, Candy Crush Saga and Clash of Clans, can be attributed to brand loyal consumers who engage in repeat in-game or branded merchandise purchases (Verto Analytics, 2015). Despite this, the literature aimed at understanding how they attract such a loyal following is scarce, particularly in the South African context.

There are only a few studies that exist concerning consumer loyalty towards online video games (Teng, 2013; Choi & Kim, 2004), with no study conducted on consumer loyalty towards mobile games. Moreover, the studies alluded to in the introduction predicted loyalty as a one-dimensional concept and not as two-dimensional concept, as indicated by Bauer *et al.* (2008:207). This suggests that there is a gap in the literature concerning brand loyalty towards video games and, in particular, brand loyalty towards mobile games amongst a specific target market.

Generation Y students' positive attitudes and behavioural intentions toward mobile games (Price, 2017:114), together with their potential to be opinion leaders and trendsetters amongst their peers (Bevan-Dye & Surujlal, 2011:49) renders them an important target population for investigating the factors that influence Generation Y individuals' two-dimensional brand loyalty towards mobile games. The wider Generation Y cohort represents a large size of the total South African population (40 percent) (Statistics South Africa, 2017:12), making the Generation Y cohort – particularly South African Generation Y university students - an important target market for marketers seeking to build mobile gaming brands.

As such, this study endeavoured to bridge the gap in the literature by developing and testing a model of potential predictors of mobile gaming brand loyalty amongst Generation Y students in South Africa. The findings of this study may assist local marketers and video game developers in understanding the antecedents of brand loyalty in mobile games and how to incorporate them into a sustainable business model.

The following section outlays the objectives for the study.

1.3 OBJECTIVES OF THE STUDY

This study aimed to enlighten video game organisations and marketers on brand loyalty as a theoretical dimension and how it can be successfully incorporated to build a sustainable business model for mobile games.

The proceeding subsections detail the primary, theoretical and empirical objectives formulated for the study.

1.3.1 Primary objective

The primary objective of this study was to determine the antecedents of mobile gaming brand loyalty amongst Generation Y students in South Africa.

1.3.2 Theoretical objectives

In line with the primary objective of this study, a relevant literature review was conducted according to the following theoretical objectives:

- Review the literature on mobile gaming.

- Discuss the marketing potential of mobile games.

- Introduce and discuss the notion of a mobile game as a brand.

- Review the literature on brand equity and brand loyalty.

- Review the literature on satisfaction, challenge and game identification as possible antecedents of mobile gaming brand loyalty.

- Review the literature on flow as a significant predictor of mobile gaming brand loyalty.

- Discuss psychological commitment and behavioural loyalty as dimensions of mobile gaming brand loyalty.

- Conduct a review on the literature pertaining to Generation Y as a target market.

- Propose a model on the influence of mobile gaming satisfaction, challenge, game identification and flow on Generation Y students' psychological commitment and behavioural loyalty towards their favourite mobile game.

1.3.3   Empirical objectives

After considering the theoretical objectives, the following empirical objectives were formulated in order to achieve the primary objective of the study:

- Determine Generation Y students' psychological commitment and behavioural loyalty toward their favourite mobile game, together with their level of satisfaction, perceptions of challenge, level of flow experienced and level of identification with their favourite mobile game.

- Determine whether Generation Y students' mobile gaming brand loyalty is a six-factor model comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty.

- Empirically test a proposed model on the influence of mobile gaming satisfaction, challenge, game identification and flow on Generation Y students' psychological commitment and behavioural loyalty towards their favourite mobile game.

- Determine if there are any gender differences in terms of Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards their favourite mobile game.

1.4   HYPOTHESES

In line with the empirical objectives, the following five hypotheses were promulgated:

H_o1:   Antecedents of mobile gaming brand loyalty is not a six-factor structure comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty.

H_a1:   Antecedents of mobile gaming brand loyalty is a six-factor structure comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty.

H_o2:   Satisfaction (+), challenge (+) and game identification (+) do not positively influence the mobile gaming flow experienced by Generation Y students.

H_a2:   Satisfaction (+), challenge (+) and game identification (+) do positively influence the mobile gaming flow experienced by Generation Y students.

H_o3:   Flow (+) does not positively influence the psychological commitment of Generation Y students toward their favourite mobile game.

H_a3:   Flow (+) does positively influence the psychological commitment of Generation Y students toward their favourite mobile game.

H_o4:   Psychological commitment (+) does not positively influence Generation Y students' behavioural loyalty toward their favourite mobile game.

H_a4:   Psychological commitment (+) does positively influence Generation Y students' behavioural loyalty toward their favourite mobile game.

H_o5:   There is no statistically significant difference between male and female Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty concerning mobile gaming brand loyalty.

H_a5:   There is a statistically significant difference between male and female Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards their favourite mobile game.

1.5   RESEARCH DESIGN AND METHODOLOGY

The study comprised a literature review, together with an empirical study that was quantitative in nature.

1.5.1 Literature review

In order to fully explore the subject of mobile gaming brand loyalty, secondary data sources were incorporated that included relevant textbooks, journal articles, newspaper articles, online academic databases and Internet sources.

1.5.2 Empirical study

The empirical portion of this study followed a descriptive research design and utilised the single cross-sectional survey method for data collection. The study comprised several methodology dimensions, which are discussed in the sections below.

1.5.2.1 Target population

For this study, the target population comprised full-time South African Generation Y students registered at public South African HEIs located within the province of Gauteng. The target population was defined as follows:

- Element: Full-time Generation Y students

- Sampling unit: Publicly registered South African HEIs

- Extent: Gauteng, South Africa

- Time frame: 2017

1.5.2.2 Sampling frame

The sampling frame for this study comprised 26 public registered South African HEIs (Universities South Africa, 2018). Non-probability judgement sampling was used to narrow the selection down to three HEI campuses. The chosen HEIs included one traditional university, one university of technology and one comprehensive university.

1.5.2.3 Sample method

Following the selection of the sampling frame, a non-probability convenience sample of full-time Generation Y students was drawn from the three campuses.

1.5.2.4 Sample size

A sample size of 600 full-time Generation Y students was chosen for the study. The sample size is in line with similar studies conducted by Billieux *et al.* (2013:1) (sample size: 690), Van Looy (2012:126) (sample size: 544) and Park *et al.* (2011:748) (sample size: 556), and adheres to the minimum requirements set out to conduct factor analysis on 29 scaled response questions (Pallant, 2016:184) and structural equation modelling (SEM) for complex models containing six constructs (Hair, Black, Babin & Anderson, 2010:662). This sample size of 600 full-time Generation Y students was split equally between the three chosen HEI campuses, with a sample size of 200 participants per campus.

1.5.2.5 Measuring instrument and data collection method

The study utilised a self-administered questionnaire to gather the primary data. The questionnaire comprised two sections, namely Section A, which contained demographical questions and Section B, which included the mobile gaming brand loyalty scales.

The antecedents of brand loyalty were measured using scales from previously published literature. The constructs of satisfaction (five items), challenge (four items), game identification (five items), and flow (six items) were measured using adapted scales from studies conducted by Lu and Wang (2008:518-519), Teng (2013:887), Van Looy *et al.* (2012:134), and Choi and Kim (2004:16-17).

Brand loyalty, conceptualised as psychological commitment (four items) and behavioural loyalty (five items), was measured using adapted scales from research conducted by Prichard, Havitz and Howard (1999:345) and Bauer *et al.* (2008:225). Furthermore, the fifth item added to the behavioural loyalty scale: "I would follow the latest news and updates about my favourite mobile game on social media platforms (Facebook, Twitter, Instagram, etc.)", was done so due to the relevance and popularity of social media amongst Generation Y (Barton, Fromm & Egan, 2012:4). The questionnaire measured these scaled responses using a six-point Likert scale ranging from 1 = strongly disagree to 6 = strongly agree.

Owing to the limitations of convenience sampling, demographic questions concerning respondents' age, gender, home province and home language were included in Section A to determine the degree to which the sample represented the chosen target population. The questionnaire also included a cover letter explaining the nature of the study, as well as providing relevant contact details. This cover letter also explained that the data would be handled in a confidential manner.

Ethical clearance for the questionnaire was sought from the Ethics Committee of the Faculty of Economic Sciences and Information Technology at the North-West University (Vaal Triangle Campus). The Ethics Committee classified the questionnaire as a low risk status and issued the following ethical clearance number: **ECONIT 2017-003**.

Thereafter, lecturers at the chosen HEI campuses were contacted in order to obtain permission to distribute the questionnaires at a time that was convenient for them. The lecturers who agreed to allow their students to partake in the study were shown the ethical clearance certificate that was obtained. Importantly, participants were informed that their participation in the study was strictly voluntary and that their identities would remain anonymous. Thereafter, self-administered questionnaires were distributed to the full-time Generation Y students after their respective lecturer's class had concluded. The empirical portion of the study took place between February and April in 2017.

1.5.3 Statistical analysis

Self-administered questionnaires were used to collect primary data, which were captured and analysed using IBM's statistical package for Social Sciences (SPSS) and Analysis of Moment Structures (AMOS) Version 25.0 for Windows. The following statistical methods were used on the empirical data sets:

- Exploratory factor analysis

- Descriptive analysis

- Structural equation modelling (SEM)

- Two independent-samples t-test

1.6 DEMARCATION OF THE STUDY

This research study was undertaken amongst full-time Generation Y students aged between 18 and 24 years. The participating students were registered at a South African HEI in 2017. The study was limited to three public HEI campuses located in the Gauteng Province of South Africa, and included a campus from a university of technology, one from a comprehensive university and one from a traditional university.

1.7 CHAPTER CLASSIFICATION

Chapter 1: Introduction and background to the study

This chapter introduced the topic of mobile gaming brand loyalty, which included a brief introduction and background on brand loyalty and mobile gaming. This was followed by the problem statement, which identified a gap in the literature pertaining to mobile gaming brand loyalty amongst the Generation Y cohort in South Africa. In accordance with the problem statement, one primary objective, nine theoretical objectives and four empirical objectives were formulated to guide this study. The research methodology followed in this study was briefly outlined. The chapter concluded with the contribution and structure of the study.

Chapter 2: The rise of mobile games and their marketing potential

The purpose of Chapter 2 is to discuss mobile games and the marketing opportunities they present. It includes a review of the history and development of mobile games and outlines the various mobile gaming business models. The global performance of mobile games is briefly discussed, and the chapter concludes with an examination of the marketing potential for mobile games.

Chapter 3: Antecedents of mobile gaming brand loyalty and the Generation Y cohort

Chapter 3 reviews the literature regarding branding, the emergence of mobile gaming brands, and brand strategies. Brand equity theory and brand loyalty are also defined and discussed. Thereafter, the antecedents of mobile gaming brand loyalty are presented and include satisfaction, challenge and game identification. The brand loyalty construct is

conceptualised as a two-dimensional construct comprising psychological commitment and behavioural loyalty. This is followed by an in-depth discussion of the Generation Y cohort and their value to marketers in the field of mobile gaming. Lastly, a model is proposed at the end of the chapter containing antecedents of mobile gaming brand loyalty amongst Generation Y students.

Chapter 4:   Research design and methodology

This chapter discusses the research paradigm, research design, and methodology followed in the study. It includes an outline of the target population, sampling method, sample frame and data collection method. The statistical procedures used to analyse primary data, namely exploratory factor analysis, descriptive analysis, SEM and a two independent-samples t-test are explained in detail.

Chapter 5:   Analysis and interpretation of the empirical findings

In accordance with Chapter 4, the results from the empirical portion of the study were analysed and the results are presented and interpreted in Chapter 5.

Chapter 6:   Conclusions and recommendations

This chapter comprises a review of Chapters 1 to 5. It provides conclusions and recommendations derived from the main findings of the study. The limitations and contributions of the study, as well as suggestions for further research are also discussed in this chapter.

1.8   CONCLUSION

This chapter encompassed the context and background of the study. In addition, the chapter identified the research problem in the problem statement, outlined the studies objectives and research methodology. The chapter concludes with a brief overview of the chapters that make up the thesis.

The proceeding chapter, Chapter 2, aims to address the first two theoretical objectives and reviews the literature on mobile gaming and the marketing potential thereof.

CHAPTER 2

THE RISE OF MOBILE GAMES AND THEIR MARKETING POTENTIAL

2.1 INTRODUCTION

In accordance with the first two theoretical objectives outlined in Chapter 1, Chapter 2 presents an insight into mobile gaming and its marketing potential. Moreover, this chapter provides a theoretical background for mobile gaming, which will aid in the discussion of mobile gaming brands, brand loyalty and antecedents of mobile gaming brand loyalty amongst Generation Y students, as laid out in Chapter 3.

Since their introduction into the mobile services market nearly a decade ago, mobile games have continued to grow in popularity and usage each year (Browne & Anand, 2012:1-2). By the end of 2016, mobile games were leading download charts on mobile application stores, with consumer expenditure exceeding $35 billion worldwide (Statista, 2016a; App Annie, 2016). The dominance of mobile games is evident throughout the entertainment industry, with revenue trends suggesting that mobile gaming is on track to overtake traditional video games (Console and Computer video games) as market leaders (Kar, 2016). Heightened consumer interest coupled with the rapid adoption of mobile games have greatly increased their marketing potential (Erlichman, 2015). As such, organisations have spent billions of dollars on in-game advertising to promote their brands through a mobile technology platform (Amuzo, 2015). This underpins the importance that mobile games - beyond revenue generation – could have towards organisations who aim to advertise, promote and/or build their brands.

The purpose of this chapter is to discuss mobile games and the marketing opportunities they present. As such, Section 2.2 discusses the history and development of mobile games, whilst Section 2.3 outlines the various mobile gaming business models. The global performance of mobile games is briefly discussed in Section 2.4. The chapter concludes with an examination of the marketing potential for mobile games.

2.2 MOBILE GAMES

A mobile game is a type of video game that can be played on a hand-held mobile device, such as a smartphone or a tablet (Jeong & Kim, 2009:186). Mobile games have fast become the dominant player in the video gaming industry (Granic, Lobel & Engels, 2014:66). Their success can be attributed to the popularity of traditional arcade and console video games (Waldron, 2014).

Video games can be traced as far back as the early 1960s and 1970s, with games such as Space Wars and Pong, of which the latter kick-started the video games revolution. The objective in Pong was to hit a digitalised ball between two rectangular paddles and the winner was determined when the opposing player or computer missed the ball. Pong was played on a coin operated arcade machine and became the first commercialised video game in 1972. The game became wildly popular and its success propelled the video game industry into what is now known as the mobile game industry, nearly four decades later (Postigo, 2003:193; Anderson & Bushman, 2001:354; Kent, 2001).

2.2.1 Video gaming history

The popularity of Video games boomed throughout the 1970s and 1980s due to big hits such as Pong, Pac Man, Donkey Kong and Super Mario Bros. (Kent, 2001). However, these games were restricted to arcade machines until Nintendo and Sega introduced home video game entertainment systems into the market (Gallagher & Park, 2002:70). These video game consoles contained more processing power than that of arcade machines and allowed for video game developers to create more sophisticated video games for consumers that could be enjoyed in the comfort of their homes (Granic *et al.,* 2014:67; Anderson & Bushman, 2001:354). Console video games such as Doom, Wolfenstein, and Sonic the Hedgehog dominated the market in the early 1990s, transforming video games into one of the most highly lucrative products in the entertainment industry during that period (Williams, 2002:43; Kent, 2001). This success was compounded by the introduction of more sophisticated video game consoles such as Sony PlayStation and Microsoft Xbox in the late 1990s and early 2000s. Today, PlayStation and Xbox remain the premium platforms for console video gaming (Lendino, 2015).

The success and on-going development of video games has resulted in the emergence of various types of video gaming categories (Hurst, 2015). These categories include the traditional "Beat 'em up" concept games like Tekken and Mortal Kombat, to the more complex "Puzzler" games like Super Monkey Ball and Columns (Lambie, 2014; Vas, 2013). According to Vince (2018), there are multiple categories and sub-categories into which video games can be classified. These video game categories are explained in more detail in the following section.

2.2.2 Video game categories

There are several categories of video games, including sport simulation, adventure, role-playing and fantasy, puzzlers, platformers, fighting, shooters, and the modern video gaming category, as discussed in the following sections.

2.2.2.1 Sport simulation

Sport simulation refers to the video game category in which one plays real-world sports such as football, basketball, rugby, golf, and even racing. These games present objectives that require the player to progress and level up by mirroring real athletes/vehicles and their movements, and are often based on popular competitions or tournaments within that sporting code (Vince, 2018; Hurst, 2015).

2.2.2.2 Adventure, role-playing and fantasy

Adventure, role-playing and fantasy refer to video games that allow players to assume the role of a character exploring a fictional world with various tasks to complete. Every decision the player makes affects the game's storyline and the main character's narrative. The difficulty increases as a player progresses in the game and in-game tasks are usually complemented by complex puzzles or mysteries that need to be solved (Moore, 2016).

2.2.2.3 Puzzlers

Puzzlers are video games that challenge the mind of the player by having them solve intricate puzzles or complete difficult tasks within the game. The tasks become more complicated as the game progresses and tests the limits of one's thinking ability. The best

puzzler video games are able to bamboozle players, often leaving them stranded for hours, and even days, on a particular level (Petite, 2017; Hurst, 2015).

2.2.2.4   Platformers

Platformers are video games that are known for having many buildings/platforms that need to be climbed in order to progress. These games are strongly influenced by the discipline of parkour, whereby the controllable character can move rapidly through environments by running, jumping and climbing (Klappenbach, 2018).

2.2.2.5   Fighting

Fighting video games or Beat 'Em Ups, refer to one of the more popular video game categories which usually involve close combat between controllable in-game characters. Typically, fights take place in a virtual arena and are broken down into multiple rounds, with each character having his/her own unique skill set or fighting moves (Vas, 2013).

2.2.2.6   Shooters

Shooters refer to video games that use weapons and militaristic settings as part of their gameplay. Shooters are one of the more successful video gaming categories and are characterised by frenetic pace and action, particularly first-person shooters (Jensen, 2017). First-person shooters offer a unique gameplay experience for players, whereby one's entire TV screen represents an in-game character's field of vision. As such, players feel as if they are at the centre of the action and their ability to react with instinctive precision is constantly tested by the game (Beekman, 2014).

2.2.2.7   Modern day video games

The emergence of Sony PlayStation and Microsoft Xbox allowed video game developers to create more sophisticated video games, compared to the earlier arcade video games which were simpler and focused on one main category of gameplay (Minotti, 2015; Peckham, 2014). The new generation of video games incorporated multiple gaming categories into their gameplay and required more skill from players wanting to progress (Griffiths, 1999:210).

Grand Theft Auto, a highly successful video game franchise developed by Rockstar games, is a good example of a modern video game comprising multiple gameplay categories. In Grand Theft Auto, players are presented with an 'open-world' type of gameplay that allows users to assume the role of a criminal with a variety of missions to complete, most surrounding crime-related activities. The core gameplay elements of Grand Theft Auto contain a mixture of the Adventure, Puzzler, Beat 'em up, Shooters and Sport simulation categories. By incorporating multiple gaming categories into an open-world setting, Rockstar games have managed to create a highly profitable and successful video game franchise that has spanned the past two decades (Klappenbach, 2017). It is important to note that successful video games like Grand Theft Auto quickly became a valuable medium for marketers wanting to showcase their brands through realistic brand placement (Krishan, 2016).

2.2.3   The origin of mobile games

While traditional console video games dominated the video games industry during the 1980s and 1990s, another innovation was introduced into the market called the Nintendo Game Boy. In 1989, Nintendo Game Boy released the world's first hand-held, non-colour, portable console, which operated with batteries and utilised cartridges to play video games (Greenberg, Sherry, Lachlan, Lucas & Holmstrom, 2010; Rosas, Nussbaum, Cumsille, Marianov, Correa, Flores, Grau, Lagos, Lopez, Lopez & Rodriguez, 2003:77). The Nintendo Game Boy was the gateway concept from which "mobile games" ensued, as video games could now be played 'on-the-go'. This unique selling proposition, in conjunction with the success of console video games at the time, made the Nintendo Game Boy a significant success in the video game market and set the benchmark for future mobile games (Wong, 2015).

Technological advancements allowed for Nintendo to release the Game Boy Colour in 1998. It was the first hand-held, portable console to display video games in colour and was even more successful than its predecessor. The Game Boy Colour gave video game developers the freedom to create more expansive and colourful game worlds that were not previously seen in mobile games (Villapaz, 2014). As such, mobile games rapidly integrated into the video games market and were fast becoming a viable alternative to traditional home console video games (Keating, 2015).

It is noteworthy to highlight that the initial success of Nintendo Game Boy can be attributed to the wildly popular Pokémon series. Pokémon, short for Pocket Monsters, was originally conceptualised as a video game for Nintendo Game Boy and was released in 1996 (Falconer, 2014). It is a role-playing video game in which players assume the role of a Pokémon trainer, whereby they attempt to catch ("catch 'em all" - the Pokémon catch phrase) and train various Pokémon creatures for battle against other Pokémon trainers, with the goal of becoming the 'Pokémon Gym' champion in various regions contained within the game's world. The video game became an instant sensation, turning Pokémon into a multibillion dollar franchise. A television anime series was created shortly after the game's initial release, which also went on to become a major success (Stuart, 2014; Shinn, 2004). Pokémon's popularity continued to grow throughout the 1990s and 2000s, becoming a powerful entertainment brand. It even led to various spin-offs being created, such as trading card games, Japanese mangas, movies, musicals, and even theme parks. As such, Pokémon can be considered as the first successful mobile gaming brand (IHS Market Insight, 2016; Russel, 2012).

2.2.4 First generation mobile telephones and mobile gaming

Rapid technological advancements in the communications field, around the same period of the earliest video games, led to the creation of the world's first hand-held mobile telephone. In 1973, the telecommunications company, Motorola, created the world's first functional prototype of the mobile telephone: The Motorola Dyna TAC. The Motorola Dyna TAC weighed 1.1kg, measured 228.6mm x 127mm x 44.4mm, and allowed for up to 30 minutes of talk time before needing to be charged for 10 hours. It was a revolutionary breakthrough that would prove to be paramount for the future of mobile gaming (Deffree, 2018; Goodwin, 2017; Waldron 2014; Alfred, 2008).

After a decade of research and development on the initial prototype, Motorola released the first commercial telephone called the Motorola Dyna TAC 8000X. The new and improved Dyna TAC 8000X had a talk-time for up to 30 minutes, with six hours of standby power and could store around 30 phone numbers in its on-board memory capacity. However, as was the case with the earliest Nokia telephones that competed with Motorola in the late 1980s and early 1990s, the average consumer struggled to afford these mobile telephones. These handsets were priced around $4000 per device (Goodwin, 2017; Fox

News, 2013; Seward, 2013). The earliest mobile telephones, the Motorola Dyna TAC 8000X and the Nokia Mobira Cityman 900, are depicted in Figure 2-1.

| Motorola DynaTAC 8000X | Nokia MobiraCityman 900 |

Figure 2-1: **The earliest mobile telephones**

Source: Wolpin (2014)

As technology advanced through the years, organisations began placing more emphasis on improving mobile telephones by their design, portability, and reducing their cost through economies of scale (Goodwin, 2017). In 1997, Nokia released the more affordable 6110 mobile telephone that became popular amongst consumers and proved to be a major success in the telecommunications market (Munoz, 2018). More importantly, it was the first mobile telephone to have pre-loaded mobile games on the device, thus becoming the pioneering device for video games on mobile telephones. It contained one of the most well-known mobile games in telephone game history, 'Snake' (Wright, 2016). Snake is a video game where the player manoeuvres a line that grows in length every time the line swallows a virtual "mouse", with the line itself being a primary obstacle (Walton & Palitt, 2012:354).

Another popular and successful mobile game, Tetris, is a puzzler video game that requires players to manoeuvre and rotate randomly spawned geometric shapes (containing four square blocks) to fit into one another in order to create a continuous horizontal line. Thereafter, the line/lines disappear, and the player progresses to another

level; failure to create these lines results in a player having to retry the level due to a loss of space to manoeuvre any newly spawned shapes (Anthony, 2014: Levy 2014). Both Snake and Tetris were highly successful games that form part of the first generation of mobile games. These games are depicted graphically below in Figure 2-2.

Tetris   Snake I
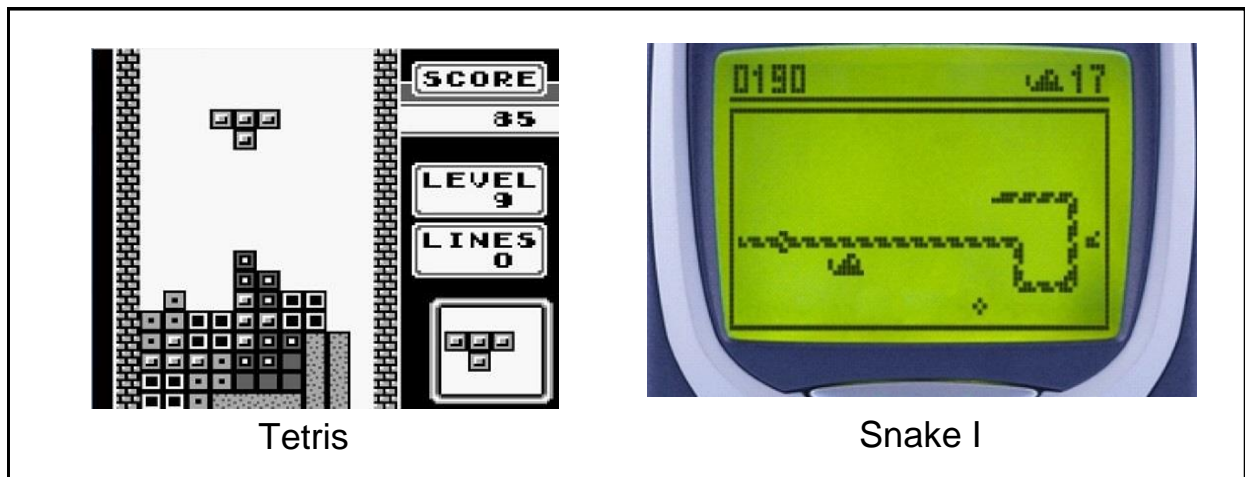
Figure 2-2:   **Snake and Tetris: The first mobile games**

Source: Wright (2016)

By 1999, mobile telephone technology continued its technological escalation and saw the introduction of WAP (Wireless Application Protocol). The Nokia 7110 was the first device to incorporate this new technology into its operating systems. WAP games could be downloaded from the web onto a mobile telephone and offered the ability to play multiplayer games over the internet (Wright, 2016). This created exciting new opportunities for developers wanting to create more innovative games with greater interactivity. For example, the ability to play multiplayer games over the internet meant that players no longer needed to be in the same room, as was the case with infrared-enabled games such as Snake II. Therefore, multiplayer mobile gaming was open to a global community for the first time (Crews, 2016; Microsoft Devices Team, 2013).

2.2.5   Second generation mobile telephones and mobile gaming

From 1999 to 2002, mobile games developed steadily, but never made any significant penetration into the mainstream video games market. The WAP platform became outdated quickly and could not run advanced fast-paced games. As such, mobile games

were restricted to being either simple card-based multiplayer games or board game-themed, such as Noughts and Crosses (Wright, 2016). The breakthrough came towards the end of 2002, when Java software was made available for mobile phones. Java is a platform that provides flash support (a type of multi-media software platform) and greatly increased the functionality of mobile telephones released from that year onwards (Lawton, 2002). This meant that developers could now move away from WAP, which was fast becoming obsolete, and utilise Java to create even better mobile games. This advancement coincided with the release of mobile telephones, like the Nokia 3510, which came equipped with a colour screen and more advanced processing capabilities that could support Java (Mayra, 2015:3).

Well-known video game organisations such as Sega, Namco, and Gameloft began testing and developing video games solely for mobile phones. Even popular traditional console video games, like Sega's Super Monkey Ball and Ubisoft's Splinter Cell, were reworked into mobile games and made available for download on mobile telephones with Java-enabled support (Crews, 2016; Wright, 2016; Langshaw, 2011). Figure 2-3 shows a snapshot of three popular java-enabled mobile games: Splinter Cell, Super Monkey Ball, and Bounce which is still played today and is considered a classic.

| Splinter Cell | Bounce | Super Monkey Ball |
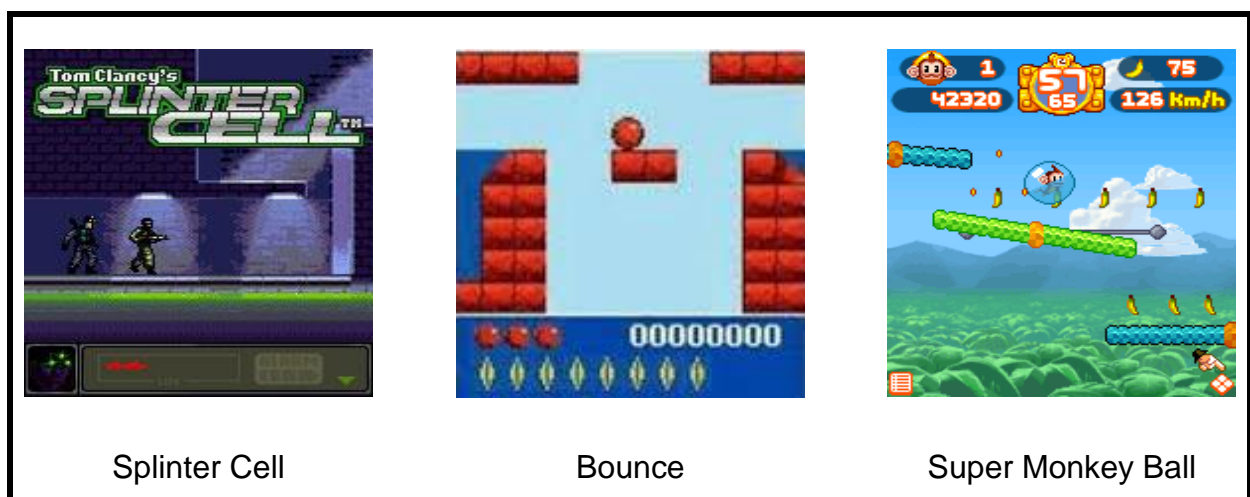
Figure 2-3:   Java-enabled mobile games

Source: Purewal (2011)

Mobile moguls Nokia took notice of the ever-increasing success of mobile gaming and took the opportunity to capitalise on this growing market. In 2003, Nokia developed and launched the Nokia "N-Gage", which was the world's first mobile phone-based gaming

system (Mayra, 2015:3). The Nokia N-Gage is an amalgamation of Nintendo's Game Boy and Nokia's series 60 mobile telephone. The N-Gage was a combination of a successful mobile video game system and an advanced telecommunications device. Nokia aimed to take control of the portable video games market whilst remaining at the forefront of the telecommunications industry (Langshaw, 2011). However, Sony and Nintendo announced the arrival of two new portable video gaming consoles that would be Nokia's direct competition - the Sony PlayStation Portable (PSP) and Nintendo DS. At the time, Sony was dominating the console video games market with the PlayStation 2 and the prospect of having a PlayStation 'in your pocket' was a unique selling point that could not be matched by either Nokia or Nintendo (Brachmann, 2014; Schreier, 2011). Therefore, Nokia's N-Gage never gained much traction in the market and consumers were drawn away from mobile games and opted to purchase portable video game consoles instead (Keane, 2015; Toor, 2014; Patsuris, 2004).

The success of the Sony PSP proved to be a setback for the mobile games industry; however, developers continued to invest their time and money into the development of more competitive mobile games (Beaudette, 2011). Between 2003 and 2005, organisations began testing and developing 3D mobile games on new and improved mobile telephones – including the Nokia N90, which was one of the earliest mobile telephones to have a camera. The most significant 3D mobile game released during this period was Namco's Ridge Racer 3D (DHCC, 2016). Ridge Racer 3D was a racer-type video game that was based on the popular Ridge Racer franchise from Sony PlayStation, and was met with high adoption rates when released on the mobile telephone platform (Wright, 2016). This success was vital for the mobile game industry as it gave rise to the possibility that traditional console video game players could make the change-over to playing mobile games (Langshaw, 2011). Two of the most popular 3D mobile games at the time, Ridge Racer 3D and Extreme Air Snowboarding, are depicted in Figure 2-4.

Namco's Ridge Racer 3D	Extreme Air Snowboarding

Figure 2-4: **Popular 3D mobile games: Ridge Racer and Air Snowboarding**
Source: Wright (2016)

Despite having 3D capabilities, mobile telephones still lacked the hardware capabilities needed to run more complex video games in order to compete with console video games. The breakthrough finally came in 2007 when Apple launched the iPhone; this proved to be the catalyst for a third generation of mobile games that would go on to dominate the video games market (Langshaw, 2011).

2.2.6 Third generation mobile telephones and mobile gaming

In 2007, the mobile telecommunications market took a massive stride forward with an innovation that changed the way consumers perceived mobile phones. This time it was not Nokia, the company that dominated the mobile telephone market for the past decade, but Apple Inc., led by innovator Steve Jobs, who introduced the world's first multi-touch interface 'smartphone' called the Apple iPhone (Chen, 2009; Cusumano, 2008:22). The iPhone allowed users to "pinch-to-zoom", while providing physics-based interactivity that "included inertial scrolling and rubber banding". The multi-tasking features allowed users to navigate easily between multiple functions, such as switching from listening to music to taking a call or accessing the web and then seamlessly reverting back to music.

The iPhone combined all the capabilities of the Apple Mac computer, the music functionality provided by the Apple iPod, as well as the basic features of a camera-enabled mobile telephone all in one device (Ritchie, 2017). Apple's iPhone kick-started a new generation of 'smart phones' which were not just communication devices but also

functioned as personal computers with internet connectivity. As such, consumers could access emails, shop online, participate in social media activities, and gain instant access to a plethora of information available online (Kim, 2013:42-43). These complex capabilities stem from advanced operating systems, processing systems, and hardware components that are embedded into the smartphone (Bhojan, Akhihebbal, Chan & Balan, 2012:21). The original Apple iPhone is depicted in Figure 2-5.

Apple iPhone (2007)

Figure 2-5: **The revolutionary multi-touch screen Apple iPhone**

Source: Ritchie (2017)

Smartphones were an instant success and experienced high adoption rates amongst consumers (Canalys, 2010). As such, the sheer size of the growing smartphone-user market and the advanced capabilities of smartphones made them an ideal platform for a new era of mobile games (Silva, Hjorth, 2009:603).

Video game developers needed to respond quickly to the rapid changes experienced in the mobile telecommunications market. The introduction of the revolutionary smartphone resulted in the dissipation of WAP games and preloaded mobile games (Lescop & Lescop, 2014:104). As a result, new multi-media platforms were needed for developers to convey their mobile service applications to consumers. Apple responded to this need by creating the application or 'app' store for iPhones (iOS). Competitors shortly followed suit with versions of their own such as Google's Play Store, Samsung's Galaxy Apps and LG's Smart World for Android-enabled smartphones. The iOS app store and Google Play Store are the two largest app stores available for smartphones (Ranger, 2015; Sims, 2015).

An app store is defined as a digital distribution platform containing mobile service applications created by various developers that can be downloaded by consumers onto an iOS, Windows, or Android-enabled smartphone (Noyons, Macqueen, Johnstone, Robertson, Palm, Point &Behrmann, 2012:10). This platform bridges the gap between developers and consumers by providing an easy and secure way for developers to sell their applications to smartphone users anywhere in the world, in an instant. Consumers can purchase these applications by means of electronic payments using application store vouchers or credit card payments (Liu, Au & Choi, 2014:327; Liu, Au & Choi, 2012:2).

Mobile games truly made an impact in 2009, with the release of Angry Birds (Cheng, 2012:50). Angry Birds is a third-generation mobile game in which a player must catapult 'angry' multi-coloured birds at various objects, while exposing and eliminating the green-coloured pigs who try to steal the birds' eggs. Progression to the next level is attained by eliminating all the pigs and obtaining a minimum of a one-star rating out of a possible three stars (Feijoo, Gomez-Barroso, Aguado & Ramos, 2011:213). Shortly after the game's release it became a global success and video gaming sensation. By 2011, Angry Birds players had amassed over 648 million downloads and had 200 million active monthly users, this netted over $100 million in revenue for the creators of the game, Rovio (Cheng, 2012:52; Zibreg, 2012).

Another highly successful mobile game that dominated the market between 2012 and 2017 is Candy Crush Saga, more commonly known as Candy Crush (Chen, 2014:3). Candy Crush was released in 2012 and is a simple puzzle game that challenges players to match three or more coloured pieces of candy; once matched, they are removed from play and replaced with new ones that help create further matches (Filipowicz, 2017). To pass a level, players are required to complete various challenges, such as obtaining high scores or eliminating certain candies before time runs out (Jones, 2013). A mere one year after the game's release, Candy Crush had approximately 90 million players and contributed significantly towards a total profit of $560 million for King Games (creator of Candy Crush) in 2013. The profound success of third-generation mobile games like Angry Birds and Candy Crush has been attributed to their portability and simplicity, as well as the rapid adoption rate of smartphones (Jeong & Kim, 2009:290).

2.2.7 Types of third generation mobile games

The focus of video gaming organisations quickly shifted into the mobile games market, with a considerable amount of time and money being invested in mobile game development. As such, five main mobile gaming categories emerged as unique mobile games were being released into the market. Each one tapped into one or more of the advanced capabilities offered in modern day smartphones (Curran & George, 2012:25-26; Joselli & Clua, 2009:136).

2.2.7.1 Touch-based mobile games

All mobile games or apps require some sort of touch-based input. This can be basic input such as tapping on the screen to select something, or more complex input such as swiping fingers across the screen to control movement in a certain direction (Thomas, 2015a).

2.2.7.2 Location-based mobile games

One of the most-used features of a smartphone is the Global Positioning System (GPS). GPS receiver technology is used to provide the position of your smartphone on a map in accordance with satellites. This function is used in conjunction with built-in map software to help people find nearby locations or provide directions to their next destination (Wilson, 2006). Popular mobile games like Geocaching and Ingress use the location of a smartphone to alter the gameplay in accordance with a player's movement patterns and physical location (Avouris & Yiannoutsou, 2012:2120).

2.2.7.3 Voice-controlled mobile games

Advancements in speech technology and speech recognition software coincided with the release of smartphones. This technology was quickly integrated into smartphones to help simplify day-to-day tasks, such as allowing people to action tasks or send messages using their voice (Kilic, 2018). Speech recognition software was also used to create unique mobile games that require players to "speak" in order to progress (Van der Velde, 2018). These mobile games recognise speech and voice commands and gameplay is influenced accordingly. Popular games include My Talking Tom Cat and My Talking Angela, whereby the in-game character can replicate what was said and repeat it back to

the player in a different tone of voice (Zyda, Thukral, Ferrans, Engelsma & Hans, 2008:143-144).

2.2.7.4   Augmented-reality mobile games

Augmented-reality (AR) technology uses the camera of a smartphone to project or create a virtual or 'augmented' reality on a phone's display. An AR mobile game uses real imagery combined with creative content to create a virtual playing experience (Capin, Haro, Setlur & Wilkinson, 2006:765-773). For many years, the revolutionary concept of AR technology was believed to be highly experimental and would not be seen for the foreseeable future (Bajarin, 2017). This changed in 2016, when Niantic released Pokémon Go for smartphones. Pokémon Go contained elements of both AR and GPS technology (See Section 2.2.7.6), and the game's success proved to be the catalyst in AR technology for smartphones (Jansen, 2018). One year later, Apple's AR Kit and Google's AR Core were released for developers, which allowed the creation of AR apps using a streamlined development framework. Since then, the market has been inundated with innovative AR apps and mobile games that continue to push the boundaries of smartphones (Stolyar, 2017).

2.2.7.5   Accelerometer-based mobile games

Smartphones are pre-equipped with various motion sensors such as gyroscopes and accelerometers. Gyroscopes track the rotation or twist of the smartphone, while accelerometers detect orientation. When combined, these sensors accurately measure the rate of change in directional movement and orientation of a device (Sundar, 2011). This allows developers to create immersive apps that detect motion that is upwards/downwards, left/right, forward/backward, as well as rotational, such as swing or tilt (Baek, Jang, Park, Kang & Yun, 2006:510). Mobile games that use this technology detect motion and gestures made by a player, and simulate the input to play the game. This can include moving around a room to find objects in shooting games, shaking or tilting the device to cause a change of direction in racing games, or even cast a rod in a fishing game (Joselli & Clua, 2009:137).

2.2.7.6   Pokémon Go and other unique mobile games

As with traditional video games, some mobile games incorporate multiple gameplay categories to increase the challenge and uniqueness of a gameplay experience (Joselli & Clua, 2009:137). For example, Temple Run is an 'endless' running mobile game that contains elements of both accelerometer and touch-based gameplay. The aim of the game is to keep the main character alive by dodging obstacles in his path, while he is on the run. The longer the main character stays alive, the faster the game becomes and more points are rewarded to the player (Holt, 2014). The player can dodge oncoming obstacles such as rocks or branches by swiping the display screen up or down, left or right. By using the accelerometer, players can also turn corners by tilting their smartphones in different directions (Kohler, 2012).

Even more complex is Pokémon Go, which many consider to be the pioneer game for Augmented Reality (Hobbs, 2016). Pokémon Go is a mobile game based on the popular Pokémon video game series and incorporates elements of Location-based, Camera-based, Accelerometer-based and Touch-based gameplay into the overall gaming experience. Players can catch Pokémon that spawn in real world locations and in real time utilising a smartphones' GPS for location and camera for AR. Thereafter, accelerometer- and touch-based controls are used to catch and train Pokémon and battle other Pokémon trainers at a location designated as a Pokémon Gym (Gilbert, 2016; Russel, 2012).

A few of the popular third-generation mobile games are depicted below in Figure 2-6.

| Angry Birds | Candy Crush |

Temple Run	Pokémon Go

Figure 2-6:   Third-generation mobile telephone games

Mobile games, like the ones seen above, are being rapidly adopted by smartphone users due to their unique, simple, and fun gameplay (Hill, 2014).

2.3   MOBILE GAMING BUSINESS MODELS

Most third-generation mobile games, including the ones mentioned above, are available for consumers to download and play free of charge from the app store. Despite this, organisations are still able to generate large profits by implementing a freemium business model (Cassell, 2013). These 'free of charge' mobile games mislead consumers into thinking the entire mobile game is free to play. However, when playing these mobile games, it is noticeable that certain gameplay elements - even some that are critical for progression - are locked and require a monetary purchase transaction from players before becoming available (Nash, 2014). These are known as in-app or in-game purchases. In-app purchases involve the inexpensive or expensive purchase of virtual goods inside a mobile game that assist in gameplay progression. Often these virtual goods include the unlocking of certain missions/levels in order to progress further, or provide players with gameplay 'tools' that can be used during missions/levels to gain an advantage (Moreira *et al.,* 2014:3). Examples of in-game purchases from Angry Birds and Candy Crush are depicted in Figure 2-7.

Angry Birds 2 'Pink Gems'   Candy Crush's Candy Shop
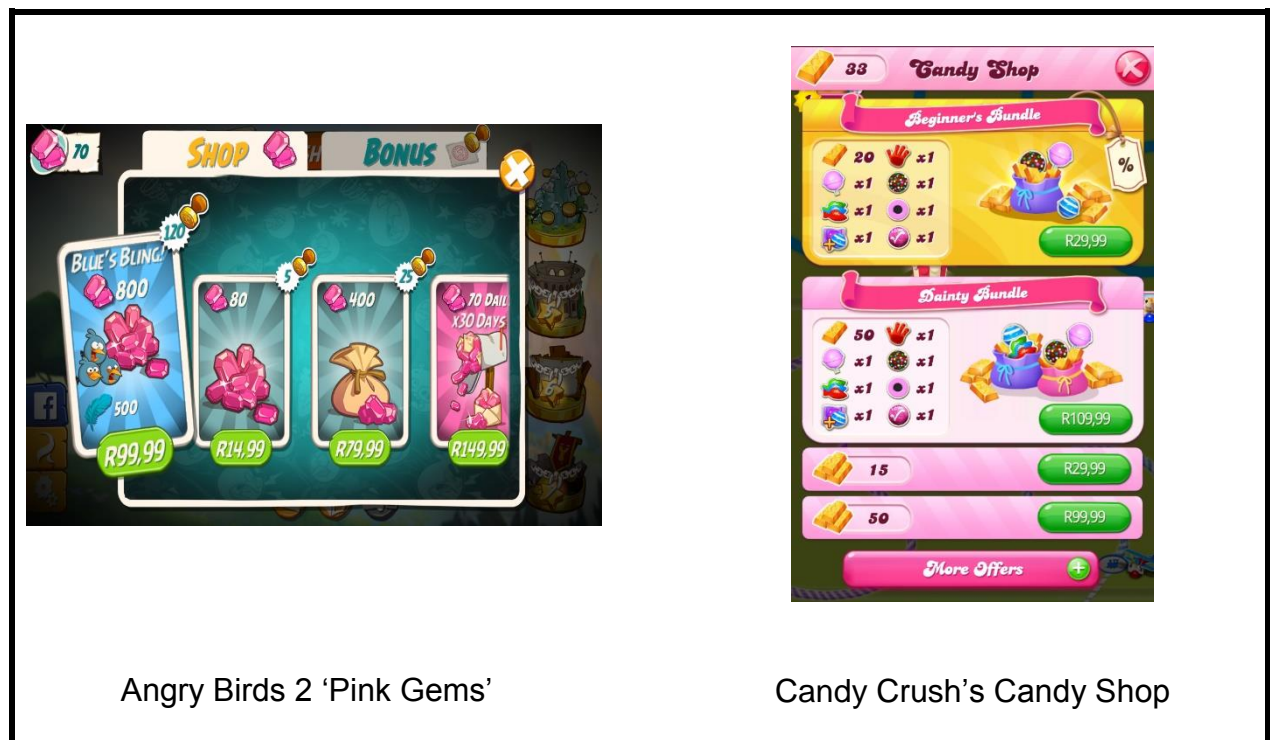
Figure 2-7:   In-game purchases from Angry Birds 2 and Candy Crush

Figure 2-7 shows in-game items that boost a player's progression in Angry Birds and Candy Crush which can range in price from a relatively inexpensive amount of R6.99, to an amount up to R149.99.

The freemium business model has become common practice in the mobile games industry. It has been implemented by organisations wanting to generate revenue even if a mobile game is free to play (Schoger, 2014). This has led to three distinct kinds of mobile gaming apps, namely Free-to-play, Pay-to-play and Paymium apps.

2.3.1   Free-to-play

Free-to-play apps give consumers a chance to experience the app without having to pay an initial fee to download it. More often than not, these apps have limited functionality and provide users with only a partial experience, with additional features becoming available through an in-app purchase or micro-transaction (Nations, 2017). Free-to-play mobile games will initially experience mass exposure to a multitude of first-time players. Thereafter, those who enjoy the game may be required to purchase in-game items to help speed up progression or improve overall experience. As seen in Figure 2-8, these

purchases range anything from inexpensive (R6.99) to expensive (R149.99), in some cases mobile games can require purchases exceeding that of R149.99 (Hall-Stigerts, 2013).

Another technique used to generate revenue from free-to-play games involves the insertion of interactive pop-up advertisements. This marketing technique known as pop-up advertising contains promotional information about a brand in the form of a 'pop-up' window (Boone, Secci & Gallant, 2010:244). These small windows are placed at the top or bottom of the screen while the user is playing a mobile game. The earliest free-to-play mobile games were notoriously inundated with pop-up advertisements, which, in turn, negatively affected the overall playing experience (King Jnr, 2016). However, this was the only way developers could generate revenue from free-to-play games aside from in-game purchases (Truong & Simmons, 2010:241).

In recent times, free-to-play mobile games have experienced a backlash from non-paying players due to their perceived "pay-to-win" systems. Developers have responded by introducing restrictions which include preventing players from using purchased items in certain missions or in matches between players. These restrictions help balance the gameplay for both paying and non-paying players (Torres, 2014).

2.3.2 Pay-to-play

In contrast to free-to-play, pay-to-play apps offer the full experience without restrictions for a once-off fee. The pay-to-play mobile game model is very similar to traditional console video games, whereby the mobile game in its entirety is available to play after one makes a purchase. These mobile games are devoid of obtrusive in-game advertising and/or in-app purchases (Dredge, 2014). Although the model is preferred by traditional video game players, it is rarely implemented by developers as it fails to attract casual players and only generates short-term revenue (Thomas, 2015b).

2.3.3 Paymium apps

Paymium apps characteristically adopt elements of both free-to-play and pay-to-play. An initial purchase is needed to download the app, with further in-app purchases required to further enrich the overall experience. This allows developers to not only generate revenue

from an initial download, but continually generate money over the lifetime of the app (Torres, 2014). Paymium mobile games usually require a small fee to download and have additional elements and items that are only available through in-game purchases. These mobile games will generate money even after the initial purchase, thus increasing their longevity in the market (Lovell, 2011).

2.3.4 Reasons to choose a freemium model

Freemium models have become the best way for organisations to earn profits via internet and digital-based content (Wagner, Benlian & Hess, 2014:260). When comparing the three models used in mobile games, free-to-play remains the most popular, contributing more than 90 percent of all revenue generated. Free-to-play mobile games are also popular because of their ability to attract a multitude of casual and serious players, who can freely play the game without being forced to pay upfront (Davidovici-Nora, 2014:83; Lescop & Lescop, 2014:104). Research by Liu *et al.* (2012:13) into freemium apps revealed that free-to-play titles are vitally important for increasing app awareness and developing player retention, which can lead to increased sales revenue. Furthermore, the study found that a positive free-to-play gaming experience will likely influence a player to consider purchasing the pay-to-play or paymium version of that game.

Freemium models also have the ability to convert casual trial users into consumers who are comfortable in making in-app purchases. In most cases, these games present a risk-free scenario for first time players who do not have to make a monetary commitment to play the game (Kumar, 2014). Players who enjoy the game and are 'sold' by the experience are often presented with a 'limited time only' offer to purchase the game at a discounted price (Sukhraj, 2017). Alternatively, they are only given access to a portion of the game with the rest being locked behind an in-game purchase. Often the fear of loss or missing out will compel these players to buy the full version or purchase an in-game item. This segment of video game players often becomes brand loyal and are very valuable to organisations (discussed in Chapter 3) (Teng, 2013:884).

2.3.5 The influence of brand loyalty theory and flow theory on mobile gaming business models

Understanding consumer behaviour is an important part of any business strategy. As with the freemium business model, the success is reliant on a consumers' initial reaction and acceptance of the 'technology' (Jung *et al.,* 2008:124). Mobile games, as a form of mobile service, is created for entertainment purposes and the most popular games have been developed into major brands (See Chapter 3, Section 3.2.1). Therefore, it is prudent to consider both brand loyalty and theory flow theory to predict consumer adoption and loyalty behaviour towards mobile gaming (Alzahrani, Mahmud, Ramayah, Alfarraj & Alalwan, 2017:242; Chang, 2013:311; Teng, 2013: 884; Van Looy *et al.,* 2010:127; Choi, 2004:13).

Brand loyalty, as a central concept of brand equity theory, is a major asset to any organisation and is the driving force behind creating brand value (Choi, 2013:54; Severi & Ling, 2013:128). This places the brand at the forefront of consumers' minds and greatly influences their intention to continually purchase a product or service offered by their favourite brand (Javadein, Khanlari & Estiri, 2008:4). Furthermore, flow theory posits that the quality of an experience is determined by the challenges imposed and the skills required to overcome the predetermined challenges (Jung *et al.,* 2009:124). When individuals overcome these challenges, master's new skills, and becomes cognitively absorbed in the experience, they achieve a state flow. Flow theory is often integrated into studies focusing on mobile services created to illicit fun and enjoyment, much like mobile games (Zhou & Lu, 2011: 883-884; Zaman, Anandarajan & Dai*,* 2010:1011). As brand loyalty theory and flow theory underpins the current study, it is discussed in further detail in Chapter 3.

2.4 GLOBAL PERFORMANCE OF MOBILE GAMES

Today, there are over 1.2 billion people playing mobile games worldwide, which is more than an eighth of the earth's total population. In the United States of America, the average lifetime spend per user is approximately $42, with the overall mobile gaming revenue surpassing $4.7 billion (Statista, 2017b; Worldometers, 2017). Importantly, mobile phones have become more affordable and accessible over the past few years, which has

led to a more balanced demographic of consumers playing mobile games (Bezerra, 2015). As such, the number of males (51%) and females (49%) playing mobile games were almost equal in 2017. Also, the rapid rise and growth of mobile games is attributed to more casual gamers being attracted to mobile games as opposed to traditional video games, with hardcore gamers also making the switch due to the accessibility and popularity thereof (Mediakix, 2017; Nielsen Entertainment, 2016). Total global revenue generated from mobile games was estimated at $46.1 billion at the end of 2017 (Newzoo, 2017).

2.4.1 Mobile games in South Africa

Mobile games have been available on worldwide app stores since 2007. Despite this, they have only been available for download in South Africa since 2010, with iOS games only becoming officially available in 2013. The delay was attributed to strict government regulations and policy constraints regarding online content distribution. Initially, South African consumers accessed mobile games on Android-enabled smartphones by downloading them illegally from mirror sites, while on Apple smartphones they were downloaded by logging onto the American app store with false address information. However, not all consumers had the time or the technical know-how to go through these processes. As such, most consumers had to wait until the Film and Publications Board (FPB) released new policies allowing mobile games to be launched on South African app stores (Vermeulen, 2013a, Vermeulen 2013b, Vermeulen, 2012; Vermeulen, 2011).

The impact of mobile games was immediately noticeable in the local entertainment sector. Within a span of two years, mobile gaming accounted for 32 percent of the South African local video game market and was projected to continue to grow at an annual growth rate of 56 percent (PwC, 2013). At the end of 2015, PwC (2015) reported that mobile games had surpassed traditional console games in terms of revenue generated and market share in South Africa. The same report also revealed that Clash of Clans and Candy Crush topped the download charts - with nine of the top ten downloaded apps for that year being mobile games.

According to a report published by Statista (2018a), local mobile gaming revenue totalled half a billion rand in 2018, revealing that mobile gaming revenue has increased at over

25 percent year-on-year between 2013 and 2018. In addition, revenue generated from mobile games overtook traditional video games (both PC and Console video games combined) in South Africa – a trend which is being experienced globally. Mcilhone (2015) states that the rapid dissemination of smartphones amongst the South African population along with the low-cost simplicity and accessibility of mobile games are the keys to their overwhelming success in the local market.

From a developer's point of view, South Africa was officially put on the map during June 2018 when teenager Brandon Kynoch released his new mobile game called Torus (Bratt, 2018). Points are accumulated by connecting dots to progress, and the player loses when he/she misses a dot (Oberholzer, 2018). The mobile game became an instant hit, and was downloaded over 100 000 times within 24 hours of going live on the app store. Torus made it as the 'app of the day' and was wildly popular among gamers (Timeslive, 2018). As with Angry Birds and Candy Crush, Torus is known for its simple yet addictive gameplay that has only one objective for players: to score as many points as possible.

2.4.2   Policy barriers that mobile game development faces in the South African context

South Africa is experiencing a loss in the video games economy, with an estimated 99 percent of mobile gaming revenue generated from local consumers being distributed to international video game developers (Fripp, 2016). Consequently, the half a billion-rand revenue is not directly benefitting the local economy of South Africa. A major contributing factor to this stems from the regulatory policies which are restricting the creative freedom of video game developers. This makes it difficult for potential investors to invest in the South African local video game industry (News24 Wire, 2016).

Alfreds (2016) states that the FPB's draft bill on content distribution continues to be a major barrier for developers and investors alike. The bill states that video game content must be classified correctly and approved by FPB before distribution, and failing to do so may lead to a jail sentence. The process can be time-consuming and costly, while the jail sentence for non-compliance is a great concern for local video game developers.

The significance of this policy constraint presents a needless barrier when compared to other countries that do not have rigid regulations in place for content classification. In

contrast to the South African context, international video game developers are free to create and distribute video games without incurring high costs or waiting extended periods of time for approval (Alfreds, 2016; News24 Wire, 2016). The general perception of local organisations is that government lacks both knowledge and understanding of the video game industry and its ever-growing importance in the economy, which is why there are inadequate or obsolete policies in place (Alfreds, 2016; Usmani, 2016). Research into the significance of video games and mobile games in the South African context is vital to bring awareness to the South African government on how the video game industry can benefit the local economy (Oxford, 2014).

The following section provides an in-depth look at the marketing potential of mobile games.

2.5 MARKETING POTENTIAL OF MOBILE GAMES

The success and vast reach of mobile games has greatly increased their marketing potential (Amuzo, 2015). As such, organisations have been exploring ways in which to leverage the success of mobile games to promote and grow their brands (Lawlor, 2015). There are various marketing opportunities presented by mobile games, with many already being successfully practiced. These include merchandising, films and TV series, product placement, and Augmented Reality.

2.5.1 Branded merchandising

Merchandising refers to the activity of promoting and selling products in a visually appealing manner, within a retail environment, to entice customers to purchase those items (Kotler & Armstrong, 2018:392). Branded merchandise aims to authentically include an image, logo, or company name on promotional materials; for example, caps, t-shirts, bags, pens, or any other material capable of showcasing a brand in an appealing manner (England, 2015).

Following the success of Angry Birds, Rovio implemented branded merchandising to further develop and grow the Angry Birds brand. This included releasing a line of Hasbro toys, various clothing items, accessories, books, and board games (Ciabai, 2017; Greene, 2015; Cheshire, 2011). This formula was followed by other popular games such

as Candy Crush and Clash of Cans, and led to major co-branding deals such as the one between Angry Birds and Star Wars. This marketing technique is discussed further in Section 3.2.1.4.

2.5.2 Films and television series

The past two decades has seen popular video games being developed into films and/or TV series to further assert their success and expand their respective brands in the retail world. Franchises such as Warcraft, Tomb Raider, Prince of Persia, and Resident Evil have experienced great success when these games were introduced into the film industry. The result has seen these brands gross millions of dollars in revenue through loyal gaming fans (Mertes, 2018).

Notably, mobile games have not been adapted to film as often as traditional video games. However, Pokémon is a prime example of a mobile gaming franchise having accomplished this feat during the late 1990s and early 2000s, with the Pokémon Anime TV series and films (Falconer, 2014). The anime TV series is often considered one of the most successful adaptions of a video game, as it has been airing on TV for the past 20 years (Bailey, 2016). Another noteworthy mention is Rovio and the Angry Birds franchise, with the Angry Birds Toons TV series and the Angry Birds movie, both experiencing massive success and critical acclaim. In particular, the Angry Birds movie grossed $349 million worldwide from movie ticket sales, making it the second highest-grossing video game movie of all-time (McNary, 2017).

2.5.3 Product placement

Product placement or in-game advertising is commonly used in video games as it has the ability to promote brand recall and brand recognition months after a video game has been played (Hang, 2014:193). For mobile games, product placement often comes in the form of pop-up advertisements which generally leads to negative responses from gamers (Lewis & Porter, 2010:55). However, there are different strategies that companies could implement; for example, Honda avoided the use of pop-up ads by collaborating with Zynga in 2013 to promote the new Honda Accord motor vehicle. Zynga included words related to the vehicle in their popular Scrabble With Friends mobile game. This strategy

was further reinforced by rewarding players with in-game tokens whenever they found words such as 'accord', 'luxury', and 'new' (Erik, 2017).

A study conducted by Lin (2015:37) revealed that gamers respond positively to high-familiarity brands showcased as an integral part of a game, as opposed to low-familiarity brands that are simply added to the background during gameplay. This was observed in the success of the Angry Birds Star Wars spin-off mobile game. The game included Star Wars product placement and went a step further by adapting the Angry Birds storyline and gameplay and aligning it with the Star Wars films. Angry Birds Star Wars proved to be a massive hit in 2012; it was downloaded over 100 million times in under a year (McCorvey, 2013; Dredge, 2012; McCorvey, 2012).

2.5.4 Augmented reality

Augmented reality (AR) is artificially and/or digitally altering one's current reality in order to induce a particular experience. Using GPS or an advanced camera, a person's reality can be 'augmented' by virtual objects that are combined with a real landscape. Simply put, computer-generated AR graphics can change or enhance someone's entire experience of a location or environment (Taş, 2017; Vise, 2017). AR presents exciting new opportunities for marketers within the mobile marketing landscape, where consumers are able to interact more freely with marketing content. This leads to increased brand awareness and promotes brand recall, as consumers who engage directly with a brand tend to be more receptive to that brand's promotional content (Dajee, 2017). More importantly, interactive marketing of this nature allows consumers to have a more personal connection to a brand, while creating a fun and enjoyable experience (Levski, 2017; Olilla, 2017).

Examples of AR marketing is evident in games such as Pokémon Go and Ingress from Niantic or Jurassic World™ Alive from Ludia Games, whereby real-world locations, such as shopping centres and fast-food restaurants, are used alongside in-game elements (Section 2.2.5.6). These games create vast amounts of foot traffic at or nearby business locations (Gilbert, 2016). For example, McDonald's Japan paid Niantic millions of dollars (approximately $900 000 per day) to have all 3 000 of their local Japanese restaurants become the location for Pokémon Gyms (Constine, 2017). The influx of Japanese players

to various McDonald's restaurants to battle for control of these Pokémon Gyms led to a major increase in food sales, as players consumed food and drinks while playing the game (Russel, 2016; Smith 2016; Soble, 2016; Vizard, 2016).

A market analysis conducted by Reuters (2018) predicts that the AR mobile gaming market could reach $285 billion by the end of 2023. Furthermore, Statista (2017c) forecasts that global advertising expenditure in mobile games will reach $50 billion by 2020, which is a massive 42 percent increase on advertising and promotion expenditure at the end of 2015. This is attributed to organisations recognising the value and potential of mobile games as a medium to market their respective brands.

2.6 CONCLUSION

Despite their relatively short life-span in the market, mobile games have become the leading video game platform in South Africa. This has been experienced in international markets, where global expenditure on mobile games has exceeded $46 billion. The increasing accessibility, affordability and rapid adoption of smartphones is a major contributing factor to the success of mobile games. The prevalence of mobile gaming is such that one in every eight people on the planet are currently playing at least one mobile game, with an almost equal constitution of male and female players. The popularity and sheer reach of mobile games has made them a valuable marketing medium for organisations that wish to promote their brands on a mobile technology platform. Forecasts suggest that advertising expenditure in mobile games will reach $50 billion by 2020. As such, mobile games are extremely lucrative products to the developers who create them, and are an important marketing medium for organisations wishing to promote their products and services through a social technology platform.

In Chapter 3, branding, brand loyalty and mobile gaming brands and are extensively discussed in order to propose a model of the antecedents of mobile gaming brand loyalty amongst Generation Y students. Chapter 3 also includes an in-depth review of the Generation Y cohort, their characteristics, and their importance to marketers within the mobile gaming landscape.

CHAPTER 3

ANTECEDENTS OF MOBILE GAMING BRAND LOYALTY
AND THE GENERATION Y COHORT

3.1   INTRODUCTION

Chapter 2 addressed the first and second theoretical objectives set out in Chapter 1. Wherein the chapter provided a theoretical background explaining mobile games and acted as a precursor towards the antecedents of brand loyalty and the Generation Y cohort. Therefore, Chapter 3 addresses theoretical objectives three to nine outlined for this study.

The ability to build and maintain a strong brand is crucial to the long-term success of an organisation (Iacobucci, 2013:78). Brand management has become an important marketing strategy for organisations seeking to differentiate themselves in saturated markets, where new start-ups and innovations lead to an increased level of competition on a daily basis (Hsiao & Chen, 2016:18). In addition, an interconnected online society results in savvy consumers that are quick to dismiss false advertising and/or inadequate products and services. As such, managing and developing a strong and trustworthy brand is vital for any organisation (Nisar & Whitehead, 2016:743). A strong brand attracts loyal consumers who are known to be less price sensitive and who are not easily persuaded by competition (Nam, Ekinci & Whyatt, 2011:1009). Ultimately, the goal of building a strong brand is to foster authentic brand loyalty, whereby consumers prefer to consume products and services related to one brand (Clow & Baack, 2014:52-52). The same holds true for mobile gaming brands, as game developers spend large amounts of money (often millions) on marketing programmes aimed at attracting and retaining brand loyal players/consumers (Teng, 2013:884).

In accordance with Chapter 1, the purpose of this study was to propose and empirically test a model of factors that determine mobile gaming brand loyalty amongst Generation Y students in the South African context. Section 3.2 describes the importance of brands and outlines various brand strategies, while Section 3.3 provides an in-depth discussion of brand equity and brand loyalty, as well as brand loyalty in mobile gaming. Thereafter,

Section 3.4 discusses the antecedents of mobile gaming brand loyalty and Section 3.5 outlines the literature on the Generational Y cohort. The chapter concludes by proposing a model of antecedents of mobile gaming brand loyalty amongst Generation Y students, in Section 3.6.

3.2 THE IMPORTANCE OF A BRAND

A brand is built around an associative name, logo, design or symbol attached to a product or service that clearly differentiates itself from other products within the same category (Nisar & Whitehead, 2016:743; Schiffman *et al.,* 2014:7; Chaudhuri & Holbrook, 2001:81). Successful brands create a perception of quality and value through unique features, attributes and benefits that appeal to a particular target market. If conveyed correctly by an organisation, these qualities create a distinct association with the brand and places it at the forefront of consumers' minds during the purchasing phase (Schiffman *et al.,* 2014:9; Jang, Ko & Koh, 2007:1). Essentially, a brand is more than just a product or service, it is an organisation's promise to consistently deliver on unique offerings in terms of features and benefits. The ability to uphold this promise is crucial for organisations wishing to establish a strong bond between brand and consumer, which ultimately leads to enhanced brand loyalty and profitability (Hudson, Huang, Roth & Madden, 2016:28).

Modern-day society is technologically driven; new start-ups and new innovations flood the market on a daily basis. This has created barriers for organisations to effectively differentiate their product offerings (Hsiao & Chen, 2016:18). In a similar vein, consumers are well-informed and have access to a plethora of information over products and services and are quick to dismiss false advertising (Nisar & Whitehead, 2016:743). Therefore, building a strong trustworthy brand is imperative for any organisation to become successful in today's saturated markets. This attracts loyal consumers who are known to be less price sensitive and who are not easily persuaded by competition (Nam, *et al.,* 2011:1009). For example, like many other organisations, Apple Inc. has spent billions of dollars to persuade consumers to become emotionally attached to their brand (Wijaya, 2013:55). The Apple brand is associated with luxury and invokes a sense of quality, innovation and elegance. This perception has attracted millions of loyal consumers and was developed through an umbrella branding approach, which continually delivers excellent product functionality and quality through all of Apple's product categories

(Montgomerie & Roscoe, 2013:290). The approach taken by Apple is one of many branding strategies available to organisations. It is vital that organisations adopt an appropriate branding approach into their overall marketing strategy. This will allow organisations to determine how brand equity will be measured as well as how their brand will stand out from that of competitors (Clow & Baack, 2014:48-49).

3.2.1 Brand strategies adopted in mobile gaming

Global mobile gaming revenue is expected to make up a staggering 76 percent of the expected $92.1 billion mobile app revenue in 2018 (Taylor, 2018). Moreover, mobile gaming has a 42 percent share of the entire video gaming market and will represent more than half of the total games market by 2020 (Brightman, 2017; McDonald, 2017). At the forefront of their success are the 'big' mobile gaming brands that lead the video games market; namely, Angry Birds (Rovio Entertainment), Candy Crush (King), Clash of Clans (Supercell), Pokémon Go (Niantic), Mobile Strike (Common Sense Media), and Toon Blast (Peak Games) (Statista, 2018b).

Each of these brands have followed a distinct branding blueprint utilising various marketing strategies. These techniques and examples of their implementation are outlined below.

3.2.1.1 Social media marketing and online brand communities

Understanding the sociology of consumers can help marketers identify what makes them loyal amongst themselves and towards a brand (Iacobucci, 2013:173). Consumers identify with certain communities due to the cognitive significance of being associated with or adopted into a social entity (So, King, Sparks and Wang, 2013:7). Social media networks have made it possible for consumers to belong to certain groups without being physically present, while making it easier for people to build relationships and connect with one another. Social media comprises user-generated content, social networking sites, virtual game worlds, online review sites, video sharing platforms, and online communities (Bolton *et al.,* 2013:255). Marketers incorporate social media into their integrated marketing communications strategy due to its social and human-driven element. Social media provides a platform for instant, open dialogue between consumers

and a brand. Thus, eliminating one-way communication (monologue) that is prevalent through more traditional media channels (Hoffman & Fodor, 2010:41-43).

The creators of the popular Clash of Clans mobile game, Supercell, follow their own distinct social media branding strategy. The key ingredient to their strategy is a focus on the players rather than the game itself (Yeoman, 2016). The gameplay mechanics of Clash of Clans requires players to build war bases and train armies to battle against other players. An important element is the inclusion of social 'clans' that are made up of players from around the world, with these clans battling each other in 'clan wars' (Desmond, 2017). The 'social' element is most likely the biggest success factor for Clash of Clans and has successfully attracted millions of players. Supercell encourage players to share their gameplay experiences and tips on the Clash of Clans official website. This creates a plethora of user-generated content that Supercell push through social media platforms such as Facebook, Instagram, and YouTube. As such, a highly interactive connection is formed between players and the Clash of Clans brand (Suckley, 2017; Tanasoiu, 2017).

Supercell have also made use of YouTube successfully to grow the Clash of Clans brand. Supercell hand pick players who have gained a large following on their YouTube channels. These players are likely to have a significant influence over other their fellow players (Orlanski, 2015). Thereafter, the chosen players are given access to new Clash of Clans gaming content before it is officially released to the general public. In turn, they are required to create and share videos of their experience for other players to view and comment on, which creates anticipation and hype in the Clash of Clans community (Ernest, 2016). This is further compounded by Supercell's cross-platform marketing approach, whereby additional 'snippets' or previews of new content is also promoted on Facebook and the Clash of Clans website (Yeoman, 2016). Another unique approach followed in some of their commercials is to incorporate the real life 'stories' or gameplay moments of players that have been shared on the official website. This shows how Supercell value the input and engagement of the Clash of Clans community. Jang *et al.* (2007:1) state that the establishment of a brand community greatly contributes to long-term success as it allows consumers to express themselves through the brand and builds a strong emotional attachment.

The fun of playing Clash of Clans with/against friends, coupled with the level of brand engagement and interactivity, is crucial to the success of the Clash of Clans mobile game (Riolfi, 2016). Importantly, players who can socially identify with the brand will display higher levels of loyalty and may be driven to obtain high scores, progress rapidly, and gather in-game symbols of success which, in turn, may lead players to share their game experience with their friends and family online (Moon, Hossain, Sanders, Garrity & Jo, 2013:6; Van Looy *et al.,* 2012:132). According to TMD (2017), Supercell spend approximately $1 million per day on marketing Clash of Clans and return over $5 million in revenue during that same period.

3.2.1.2   Psychological marketing techniques

It is not uncommon for marketers to utilise psychological marketing techniques to influence consumer behaviour (Miller, 2014). These techniques evoke emotional responses and stem from advertising that promotes emotion, exclusivity, fear, scarcity, uncertainty and even doubt (Rosenthal, 2014). Marketing of this nature often causes consumers to stop and rethink their current behavioural patterns.

Candy Crush (King Games) is most likely the largest proponent of using psychological techniques. This has led many of its users to become known as 'crush-a-holics': consumers who are addicted to playing the game (Dooley, 2013). The game itself has simple graphics and basic gameplay elements and is available as a free-to-play title. As a player completes a level the difficulty increases slightly, but the 'lives' and 'moves' are limited and only replenish after a certain period of time (Brockes, 2014). Once the moves are finished or the player's lives are up, the game prompts the player to buy more moves or lives through in-game purchases. Scarcity is a popular psychological marketing technique that leads to increased desire to react. This gameplay mechanic has led millions of users to constantly want more, even if it means making in-game purchases (Miller, 2014; Baruchin, 2013).

During 2016, Candy Crush had over 93 million active players, with the average player spending a total of $25 on in-game purchases; this equates to approximately R260 (Pahwa, 2016). This statistic is made more significant by the fact that Candy Crush is free to download. From a psychological perspective, consumers are known to react positively

to items that are free (Dooley, 2008). Thus, Candy Crush uses a freemium business strategy alongside scarcity to entice crush-a-holic players to make in-game purchases (Pahwa, 2018). The players who become crush-a-holics are encouraged to be product champions who promote the game to their friends and family members through social media. They are also contacted to provide feedback on how to improve the overall Candy Crush experience (Digital Eye Media, 2017). These factors build and maintain the 'likability' of the Candy Crush brand. It also generates a perception of 'social proof' (wherein people's actions are deemed appropriate due to the actions of others), which leads to a positive perception toward the brand. Both likability and social proof are components of psychological marketing (Bhashin, 2017).

3.2.1.3 Celebrity endorsements

Celebrity endorsements feature a popular public figure who acts as a spokesperson or 'influencer' on behalf of a brand. Endorsements of this nature are a powerful marketing tool, as celebrities are recognised by consumers all over the world (Money, Shimp & Shakano, 2006:882). For this reason, marketers must ensure that an endorser personifies and complements their brand, thus transferring the celebrity's existing credibility over to the brand (Spry, Pappu & Cornwell, 2011:885). It is also important that the celebrity who is used to endorse the brand has positive associations linked to their personal brand. This will lead to an "affect transfer" or "association transfer" (Iacobucci, 2013:152). However, a brand's image can be tarnished if the celebrity endorser is perceived negatively in society. As such, extensive marketing research is required to select a celebrity who best fits the desired image portrayed by the brand (Bush, Martin & Bush, 2004:110-111).

The Clash of Clans brand is widely-known for creating quirky TV commercials and video advertisements based off popular in-game characters. These commercials are used to promote new content and have featured popular celebrity actors like Liam Neeson and Christoph Waltz (Tanasoiu, 2017). The advert that featured Liam Neeson proved to be a great success and was selected as the top trending gaming video of 2015. Supercell spent an estimated $9 million to have the commercial aired at the 2015 America Super Bowl and it has over 165 million views on YouTube as of 2018 (Dredge, 2015).

A similar strategy was employed in the game, Mobile Strike (Epic Games). Arnold Schwarzenegger, famous for his role as The Terminator, was used to endorse Mobile Strike in a commercial at the 2015 America Super Bowl. The advert boosted awareness around the Mobile Strike brand, helping it become one of the top grossing mobile games in 2015 (Grubb, 2017).

In a unique approach to celebrity endorsement, Peak Games kick-started the "first ever" celebrity-driven performance marketing campaign in 2018 (Bennet, 2018). The campaign utilised one of the most recognisable actors of Hollywood, Ryan Reynolds, as a brand ambassador. The campaign involved releasing 30 different video commercials simultaneously which were assessed within a 24-hour period by Peak Games (Lopez, 2018). Thereafter, the videos which proved most popular amongst audiences were shown. This created a highly focused campaign with video content that is almost perfectly matched with the target audiences' preferences (Diaz, 2018). According to the Director of Strategy at Peak Games, Ryan Reynolds was selected because of his celebrity status and signature humour, which were believed to make the Toon Blast brand more relatable to consumers. The advertisements centre around Ryan Reynold being a famous movie star who cannot focus on his job, as he is distracted by the addictive nature of Toon Blasts gameplay (Zanger, 2018).

It is evident that celebrity endorsements are a popular marketing technique for mobile games wanting to raise brand awareness and enhance their brand image. However, celebrity endorsements should not be viewed as a singular marketing mechanism that leads to instant success. Instead, Lazarevic (2012:45) states that marketers need to be able to successfully integrate branding, marketing communications, and celebrity endorsements in order to convince individuals to become more brand loyal.

3.2.1.4   Co-branding

Co-branding involves the strategic coming together of multiple brands to promote a singular product or service. This is also referred to as dual branding and is undertaken with the aim of leveraging the equity of the existing brands to enhance a new brand's reputation (Kotler, 2000:194). According to Clow and Baack (2014:50), co-branding can

be divided into three forms: ingredient branding, cooperative branding, and complementary branding.

Ingredient branding involves a secondary brand being used to add value to an already existing 'primary brand'. Iacobucci (2013:85) states that the secondary brand does not overshadow the primary brand but merely complements it. For example, when a car manufacturer, like BMW, recommends only using Bridgestone tyres for performance purposes or only Brembo brake callipers should be fitted for quality purposes (Maverick, 2017). However, ingredient branding is not common in mobile games.

Cooperative branding is the strategic alliance between two or more brands, where the brands are equally represented in a new product or service (Kotler & Armstrong, 2017:269). A good business case involving successful cooperative branding for mobile gaming took place during 2012 and 2014: Rovio (creators of Angry Birds) announced it had successfully secured a co-branding deal with one of the biggest franchises in the world, Star Wars (from LucasFilm) (Gaudiosi, 2012). Together, LucasFilm and Rovio created a mobile game that incorporated characters and story elements of Star Wars and combined it with the gameplay elements of Angry Birds, which was aptly called Angry Birds Star Wars (Dredge, 2012). It proved to be a massive hit with both Angry Birds and Star Wars fans and was downloaded over 100 million times in under a year. This led to a sequel being released less than a year later: Angry Birds Star Wars II. The profound success and popularity of Angry Birds Star Wars led to the unveiling of an "Angry Birds Space Encounter" by NASA (National Aeronautics and Space Administration). It was an interactive space-themed park located at the Kennedy Space Center Visitor Complex and was created to promote the release of Angry Birds Star Wars II (McCorvey, 2013; McCorvey, 2012).

Lastly, complimentary branding is when two or more brands combine to promote co-consumption or co-purchase of their product and/or services (Clow & Baack, 2014:50). In 2016, Pokémon Go teamed up with McDonald's on a global scale. McDonald's Japan paid Niantic (creators of Pokémon Go) millions of dollars to have all 3 000 of their local Japanese restaurants become 'Pokémon Gyms', thus encouraging players to play the game at their restaurants. This proved to be a major success, as the influx of Japanese players to various McDonald's restaurants led to a major increase in food sales, as

players consumed food and drinks while playing (Russel, 2016; Smith 2016; Soble, 2016; Vizard, 2016).

3.2.1.5 Brand extension

Robust branding creates opportunities for organisations to grow current offerings by introducing new products and services. This is a common marketing strategy known as brand or product extension (Clow & Baack, 2014:49). Brand extensions rely on an organisation's ability to clearly convey information to consumers about new products. This information must include an offer of quality assurance and the promise of distinctive status in line with the existing brand (Iacobucci, 2013:83). Effectively communicating this will reduce advertising costs and increase sales, whilst lowering consumer risk. The consumer decision-making process is also made easier, as consumers already know what to expect from the product offering (Baig, Zia-Ur-Rehman, Saud, Javed, Aslam & Shafique, 2015:2). Moreover, consumers with no prior experience with the parent brand may be persuaded to switch brands if they have a positive experience with an extension product. There are two forms of brand extensions, namely, line extensions or category extensions (Riley, Pina & Bravo, 2015:2).

The strategy employed by Rovio was to create various spin-off games and sequels that allowed the Angry Birds brand to grow and reach various markets outside of mobile gaming (Gunelius, 2017). Rovio implemented a category extension approach when transforming Angry Birds beyond an ordinary mobile game by leveraging its popularity and success and extending the Angry Birds offering over into other markets (Darabiha, 2016). It was re-released as a computer and console video game and entered the traditional video game market. Thereafter, it entered the film market as a cartoon TV series, the toy market as a line of Hasbro toys, the clothing market with various clothing merchandise (T-shirts, jackets etc.), the literature market with various book adaptations, and it was even fashioned into a board game (Ciabai, 2017; Greene, 2015; Cheshire, 2011).

In addition, Rovio officially announced that an Angry Birds movie was going to be produced and distributed by Sony Pictures Entertainment, with a release date set for the second quarter of 2016. This would be the first movie based off a third-generation mobile

game (Makuch, 2013; Rovio, 2013). In May 2016, The Angry Birds Movie was released worldwide and had an estimated filming budget of $80 million. Although it received mixed reviews from critics, it proved to be a box-office success and grossed $349 million worldwide, making it the second highest-grossing video game movie of all-time (McNary, 2017; Berman, 2016). The success of the Angry Birds movie had a profound effect on Rovio's latest mobile games - Angry Birds 2, Angry Birds Friends, and Battle Bay - with sales increasing over 76 percent during its release (Reuters, 2017; Dredge, 2015). Rovio announced that a sequel to the Angry Birds Movie will be released in 2019. Rovio has since listed Angry Birds on the stock market, with shares floating on the Helsinki stock exchange shortly after the first movie (Makuch, 2017; McGoogan, 2017).

According to Kim, Park and Kim (2014:2), a line extension is defined as the use of an established brand name for a new product and/or service in the same product category. King Games implemented a line extension strategy when developing a wide range of mobile games similar to Candy Crush, with each of their names aptly ending with 'Saga'. Mobile games such as Candy Crush Soda Saga, Bubble Witch Saga, Pet Rescue Saga, and Farm Heroes Saga have become popular amongst gamers (Tassi, 2015). King Games leveraged the success and brand power of Candy Crush to cross promote these games to their loyal following of players (Seufert, 2014). This strategy has helped the King Games brand equity grow exponentially, while greatly reducing advertising and acquisition costs (Nouch, 2012). By the end of 2017, the King Games brand was estimated to be worth $7.1 billion (Digital Eye Media, 2017).

In conclusion, organisations must adopt an appropriate brand strategy into their overall marketing plan to build strong brands. Brand strategies provide a benchmark for measuring brand equity and help set the precedent for how the brand will stand out from competitors (Kotler & Armstrong, 2017:265-270; Clow & Baack, 2014:48-49).

The following section discusses the theory of brand equity and the concept of brand loyalty, which is conceptualised from a behavioural stochastic and attitudinal deterministic approach.

3.3 BRAND EQUITY AND BRAND LOYALTY

The increased importance of branding and its function as part of the marketing mix has led to marketers trying to uncover how much a brand is worth (Iacobucci, 2013). Marketers perceive a brand as being an intangible asset that adds value to a product or service through brand equity. Brand equity is the encompassment of brand reputation, brand performance, brand connection and brand meaning that adds value to the product and the organisation (Odin, Odin & Valette-Florence, 2001:76). Aaker (1991:15) defines brand equity as a "set of brand assets and liabilities linked to a brand, its name and symbol, that add or detract from the value provided by a product or service to a firm and/or to that firm's customers". Keller (2001:3) states that a brand with significant equity provides a host of benefits to an organisation, with the most important being brand loyalty.

3.3.1 Measuring a brand through brand equity

Brand equity is the inherent value assigned to a brand. It is formed through a consumer's trust, identification, and perception of a brand (Chaudhuri & Holbrook, 2011:81). Brand equity is a key driver in creating greater value for the brand name, which is one of the most valuable assets to an organisation (Datta, Ailawadi & van Heerde, 2017:1). Developing and growing a brand name is of utmost importance for marketers due to the incremental value it adds to a product and/or service (Dehgan, 2011:2). Organisations strive to create a strong brand identity through the brand name component, which is known as the vocalisation of a brand (Huang & Sarigollu, 2014:113).

Brand equity is measured through two levels of marketing outcomes, namely, organisational-level outcomes and consumer-level outcomes (Datta *et al.,* 2017:1). Marketers analyse metrics such as a brand's market share, revenue, and premium price when measuring organisational-level outcomes. Consumer-level outcomes are measured using attitudinal associations such as a consumer's brand awareness, knowledge, attitude, and behavioural intention towards the brand (Cifci, Ekinci, Whyatt, Japutra, Molinillo & Siala, 2016:3742). Therefore, brand equity is viewed from two separate but related perspectives: a financial perspective (organisational) and a consumer perspective (Farquhar, 1989:25-27). Neal and Strauss (2008:10) explain that changes from a financial perspective, such as pricing structure, sales volume, or profit levels will likely result in

changes in perception of brand equity from a consumer's perspective, such as perceived brand image and attitude toward the brand.

A thorough review of brand equity literature revealed two widely recognised authors, namely Aaker (1991) and Keller (1993). Aaker's (1991:13-15) study proposed a model of brand equity that includes brand loyalty, brand name awareness, the perceived quality of the brand, and brand associations. The model illustrates the importance of these dimensions in creating brand equity which, in turn, will lead to increased consumer value and organisational value. Aaker's model of brand equity is depicted in Figure 3-1.
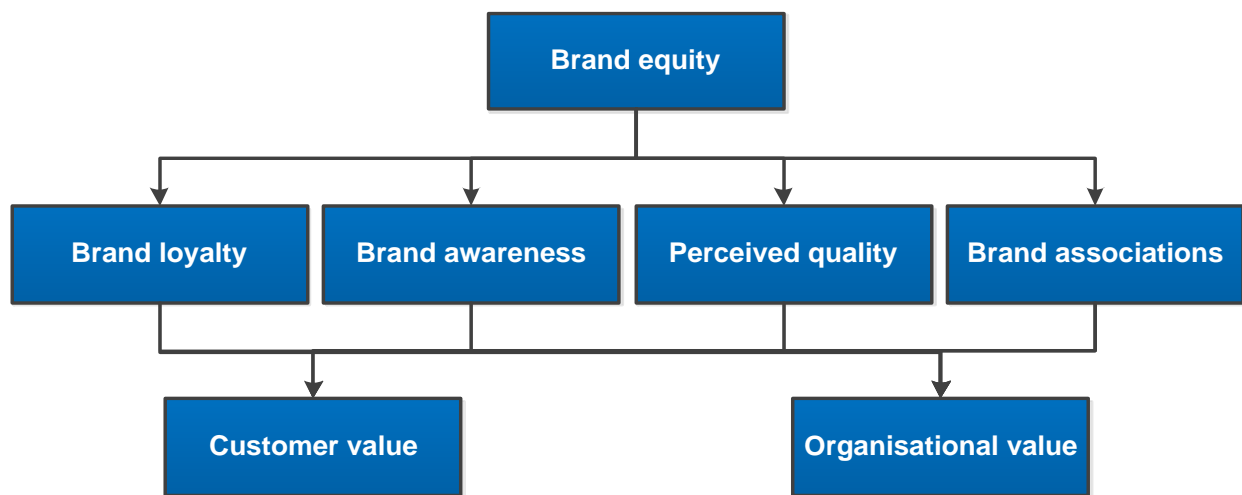
Figure 3-1:   Aaker's illustration of brand equity
Source: Aaker (1991:15)

Keller (1993:1) defines brand equity as the "differential effect of brand knowledge on consumer response to the marketing of the brand". Keller (1993:8) posits that increased brand awareness and a positive brand image will positively influence consumer loyalty and help detract competition. A simplified version of Keller's model of brand equity is presented in Figure 3-2.
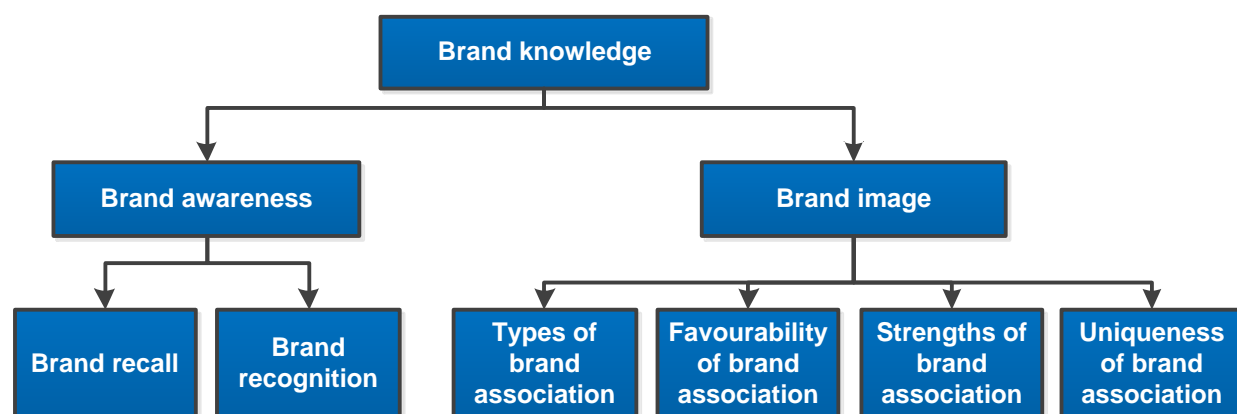
Figure 3-2:   Keller's illustration of brand equity
Source: Keller (1993:7)

According to Aaker (1991:16) and Keller (1993:8), brand loyalty is a key driver of brand equity and organisations must attract and retain brand loyal consumers to ensure long-term success.

3.3.2   What is brand loyalty?

Brand loyalty remains one of the most extensively researched topics within marketing (Cleff, Walter & Xie, 2018; Nisar & Whitehead, 2016; Kim & Ko, 2012; Bauer *et al.,* 2008; Jang *et al.,* 2007; Gounaris & Stathakopoulos, 2004; Chaudhuri & Holbrook, 2001; Amine, 1998; Fournier & Yao, 1997; Krishnamurthi & Raj, 1991). Brand loyalty is loosely defined as the act of loyalty shown by a consumer towards a brand, demonstrated by their intention to buy the products offered by the brand as their primary choice (Baig *et al.,* 2015:1). Brand loyal consumers drive brand profitability as they are willing to pay more for their favourite products due to their belief that no alternative brand can match the offering and benefits of their favourite brand (Nisar & Whitehead, 2016:745). Loyal consumers require less frequent advertising, which greatly reduces costs to an organisation while contributing to significant increases in sales generated from repeat purchases.

Developing brand loyalty amongst consumers is imperative for any organisation, as it can have a positive effect on profitability and long-term success (Hsiao & Chen, 2016:18). It is an important business strategy because the cost of acquiring new customers often

outweighs the cost of maintaining an existing customer base (Keller, 2003:3). Chaudhari and Holbrook (2001:82) state that despite the existence of situational constraints and competitor marketing, brand loyal consumers will continue to exhibit repeat purchase behaviour and resist switching due to their trust in the brand. As such, Jacoby and Chestnut (1978:1) state that the long-term success of a brand lies not in the number of consumers that purchase its products once, but rather loyal consumers who believe and purchase the brand on a regular basis.

Based on the seminal works of Day (1969) and Jacoby and Chestnut (1978), brand loyalty is conceptualised into two philosophical approaches, namely, an attitudinal deterministic approach and a behavioural stochastic (behavioural loyalty) approach. The two approaches are discussed in the proceeding sub-sections.

3.3.2.1   Behavioural stochastic approach to brand loyalty

The behavioural stochastic approach views brand loyalty as being a consumer's propensity to exhibit repeated purchase behaviour (Keller, 2003:42). This type of behaviour suggests that consumers' inclination to repurchase products stems from their satisfaction and past experiences of the brand (Bauer *et al.,* 2008:207). Nisar and Whitehead (2016:746) suggest that satisfaction is a key driver of loyalty where there is evidence of repeat purchase behaviour. This downstream approach suggests that loyalty is predicted through repeat purchase behaviour and by assessing purchase frequency or probability distribution (Nam *et al.,* 2011:1011).

A common concern with the stochastic approach is that it does not consider personal motivations behind the purchase, as marketers are unable to accurately predict the reasoning behind consistent purchasing behaviours, especially within monopolistic markets or niche markets (Jacoby & Kyner, 1973:1). Gounaris and Stathakopoulos (2004:284) state that stochastic measures place too much emphasis on the most regularly purchased brands in a product category, whereas a deterministic approach measures actual overall brand value and uniqueness. For this reason, many researchers believe that brand loyalty must be seen as a dynamic process that is not limited to a singular behavioural response or by frequency of purchase and it should include an

attitudinal component (Cleff *et al.,* 2018:12; Laroche, Habibi & Richard 2013:78; Teng, 2013:885; Lin, 2010:6; Bauer *et al.,* 2008:207; Keller, 2003:15).

3.3.2.2   Attitudinal deterministic approach to brand loyalty

An attitudinal deterministic approach assumes that an individual's predisposition to exhibit repeat purchase behaviour is a biased expression of that individual's preference (Keller, 2003:15). As such, this view criticises a stochastic approach for focusing on arbitrary factors that do not provide a true reflection of brand loyalty (Amine, 1998:307). Nisar and Whitehead (2016:745) posit that in order to distinguish between spurious loyalty and true brand loyalty, one should focus on the effect of antecedents, such as an individual's attitude, beliefs, feelings, and intentions in order to engage in repeat purchase behaviour. As such, Day (1969:30) states that a deterministic approach is assumed when an individual's attitude, including the independent variables affecting attitude, is studied along with behavioural intention when measuring brand loyalty.

The theory behind a deterministic approach typically views a true brand loyal consumer as one who is wholly committed to one brand (Bloemer & Kasper, 1995:313). This conceptualisation helps discern true brand loyalty from that of repeat purchase behaviour, by focusing on brand commitment and attitudinal attachment (Baig *et al.,* 2015:5). Consumers who display a high level of commitment become psychologically dependent on the brand to satisfy their needs, which leads to a strong resistance to switch brands (Cleff *et al.,* 2018:8). Furthermore, Mabkhot, Shaari, and Salleh (2017:4) posit that a consumer's commitment to purchase their favourite brand will grow stronger if they continue to hold a positive attitude towards that brand or organisation. This has led to the attitudinal dimension of brand loyalty being commonly referred to as psychological commitment (Huang, 2017:5; Yeh, Wang & Yieh, 2016:245; Liu, Wu, Yeh, & Chen, 2015:144; Lee & Kyle, 2014:657; Nam *et al.,* 2011:1015; Lin, 2010:6; Bauer *et al.,* 2008:27; Kim, Walsh & Ross, 2008:52; Chaudhuri & Holbrook, 2001:82; Gahwiler & Havits, 1998:7). Ultimately, consumers who are psychologically committed will exhibit consistent attitudinal responses when faced with similar situations in future, whilst remaining unhindered by competitive stimuli (Lin, 2010:6).

3.3.2.3 Measuring brand loyalty from a behavioural and attitudinal perspective

According to Huang (2017:3), marketers should not only focus on purchase behaviour, as it does not always provide a reflection of true brand loyalty. Instead, brand loyalty must be conceptualised as a two-dimensional construct that includes both attitudinal and behavioural loyalty to be able to distinguish between true brand loyalty and repeat purchasing behaviour (Bauer *et al.,* 2008:207). Jacoby and Kyner (1973:1) describe brand loyalty as non-random and manifests as a consumer's behavioural commitment to purchase the same brand despite the existence of alternatives which, over time, leads to a significant increase in psychological commitment to that brand. As such, Amine (1998:306) posits that marketers should consider both an attitudinal deterministic and behavioural stochastic approach when trying to predict, track and assess true brand loyalty. This will ultimately lead to the identification of salient predictors of loyalty that can be used to develop strategies to improve the current brand offering (Yeh *et al.,* 2016:245). Figure 3-3 illustrates both approaches to brand loyalty.
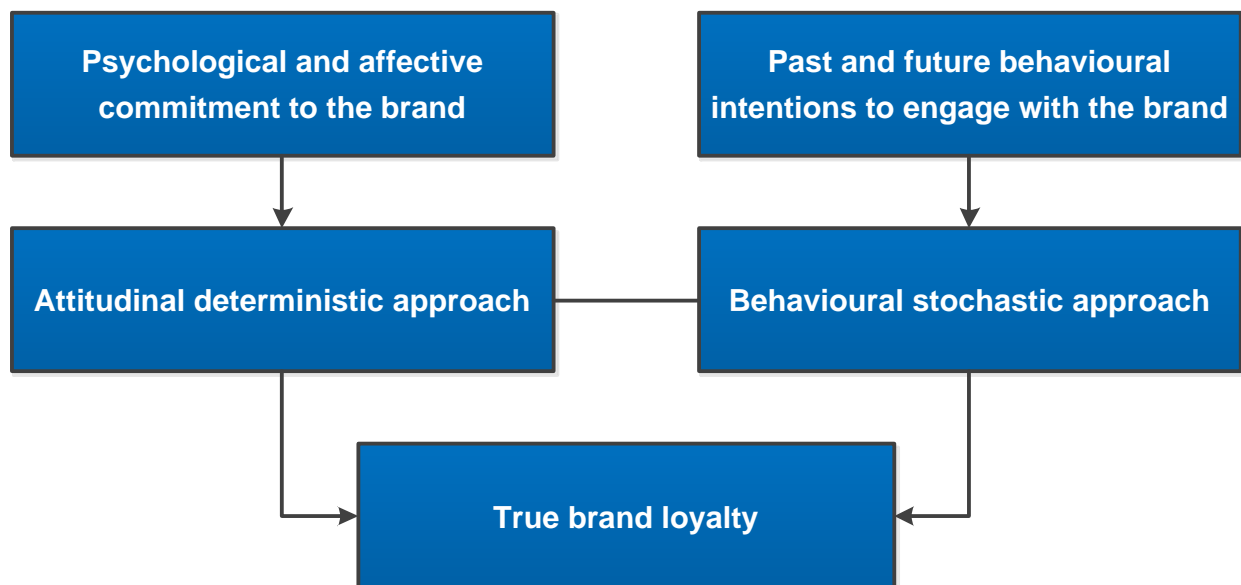
Figure 3-3:   **A stochastic and deterministic approach to brand loyalty**
Source: Kabiraj and Shanmugan (2011:288)

The above conceptualisation of brand loyalty assumes an attitudinal deterministic approach alongside a behavioural stochastic approach (Cleff *et al.,* 2018; Keller, 2013;

Laroche *et al.,* 2013; Kabiraj & Shanmugan, 2011; Lin, 2010; Bauer *et al.,* 2008; Keller, 2003; Chaudhuri & Holbrook, 2001; Amine, 1998; Jacoby & Kyner, 1973).

3.3.3 Brand loyalty in mobile games

Mobile gaming brand loyalty is demonstrated by a player's intention to continually make in-app purchases in their favourite mobile game (Hsiao & Chen, 2016:18). Park and Kim (2013:1353) posit that players who have an optimal experience (Section 3.4.4) are known to exhibit strong loyalty towards the game and drive profitability as they are willing to make multiple in-app purchases and share their positive experience with other players. Loyal players tend to pay more for in-app purchases and display a strong resistance to switch as they believe no alternative mobile game can match the value and benefits offered in their favourite mobile game (Merikivi, Tuunainen & Nguyen*,* 2017:411). The advantage of attracting and retaining brand loyal players is that they require less frequent advertising, which greatly reduces costs while contributing to significant increases in sales generated from repeat purchases (Teng, 2013:885).

Developing brand loyalty amongst consumers is an important business strategy because the cost of acquiring new customers often outweighs the cost of maintaining an existing customer base (Keller, 2003:3). Su, Chiang, Lee and Chang (2016:240) believe it is imperative for video game developers to retain loyal players in order to meet long-term goals and ensure sustainability in the market. Understanding the attitudinal and behavioural tendencies of video game players has helped popular brands such as Angry Birds, Candy Crush Saga, and Clash of Clans to thrive in the market for numerous years. The developers of these mobile games spend millions of dollars on marketing programmes aimed at attracting and retaining brand loyal players and are well-positioned as premium mobile gaming brands (Loveday, 2015; Takahashi, 2014; Newzoo, 2013; Teng 2013; Sinha, 2012; Cheshire, 2011). As discussed in Section 2.3, the developers of these mobile gaming brands utilise a freemium business strategy, which has allowed them to build strong brand communities and generate millions of dollars from in-game purchases (Moreira *et al.,* 2014:3). In addition, these brands ensure that gaming content is constantly improved upon and updated through feedback obtained from loyal players; thus, greatly extending their life-span in the market (Teng, 2013:884).

Despite the growing importance of mobile games branding, limited research exists to explain why video game players become brand loyal to their favourite mobile game. The next section identifies and discusses potential antecedents that may be used to predict mobile gaming brand loyalty.

3.4   ANTECEDENTS OF MOBILE GAMING BRAND LOYALTY

As discussed in Section 3.3.2, brand loyalty is a key component for any organisation wishing to achieve long-term success. However, consumer behaviour surrounding mobile services (such as mobile games) has become increasingly difficult to predict. This is attributed to rapid technological change and the impact of context-based usage (Wu & Chien, 2015:6; Venkatesh, Thong & Xu, 2012:159). Consumers have become more tech-savvy and have access to a plethora of information at their fingertips allowing them to make well-informed decisions (Alzahrani *et al.,* 2017:242; Chen, Shing-Han & Chien-Yi, 2011:125). From a relationship marketing perspective, brand loyalty is a key indicator of strong customer relations (Lee & Kyle, 2014:657). As such, researchers have strived to predict various antecedents of brand loyalty within academic literature (Nisar & Whitehead, 2016:744).

After an extensive review of the literature, six pertinent factors were identified as vital to predict brand loyalty in mobile games. These factors include flow (Kaur, Dhir, Chen & Raja, 2016; Teng, 2013; Liu & Li, 2011; Jung *et al.,* 2009; Ha *et al.,* 2007; Hsu & Lu, 2004; Koufaris, 2002; Moon & Kim, 2001; Ghani & Deshpande, 1994), satisfaction (Yang, Yang, Chang & Chien, 2017; Hsiao *et al.,* 2016; Hsu, Chang & Chen, 2012; Lee, Shin, Park, Kwon, 2010; Lu & Wang, 2008; Yang & Peterson, 2004), challenge (Shim, Forsythe & Kwon, 2015; Teng, 2013; Zhou, 2012; Koo, 2009; Hsu & Lu, 2004; Choi & Kim, 2004), game identification (Nikhashemi, Paim, Osman and Sidin, 2015; Moon *et al.,* 2013; Blake, Hefner, Roth, Klimmt & Vorderer, 2012; Van Looy *et al.,* 2012; Bauer *et al.,* 2008; Hefner, Klimmt & Vorderer, 2007), psychological commitment (Huang, 2017; Datta *et al.,* 2017; Nisar & Whitehead, 2016; Lin, 2010; Bauer *et al.,* 2008; Keller, 2003), and behavioural loyalty (Cleff *et al.,* 2018; Teng, 2013; Bauer *et al.,* 2008; Lu & Wang, 2008; Choi & Kim, 2004).

These factors are discussed in the proceeding sub-sections.

3.4.1 Satisfaction

The goal of any marketing strategy is to satisfy the needs and desires of the targeted consumer (Teng, 2013:884). This is equally true when it comes to a brand strategy. Consumer satisfaction is deeply rooted in the consumer orientation principle of marketing philosophy (Yang *et al.,* 2017:2287). Bloemer and Kasper (1995:314) define satisfaction as the positive feeling one experiences after consuming a product and/or service which meets or exceeds one's expectations. The level of satisfaction experienced is evaluated in the difference between consumer expectation and actual brand performance. Hsiao *et al.* (2016:344) state that consumer expectation is formed from a multitude of aspects including buying motivations, past consumption experiences, and the advertising efforts of the organisation. This creates a reference point in which a product and/or service can be evaluated. Lee *et al.* (2010:61) state that a positive consumption experience directly impacts consumers' attitudes towards a brand and, in turn, increases the likelihood of repeat purchase behaviour and brand loyalty. Conversely, when brand performance does not meet expectations, consumers are more likely to express dissatisfaction towards the brand and switch to an alternative brand (Lee *at al.,* 2010:61).

According to Yang and Pietersen (2004:803), consumer satisfaction is grouped into two dimensions, namely, transaction-specific and cumulative (overall) satisfaction. The transaction-specific dimension defines consumer satisfaction as an emotional evaluation made by the consumer during the initial experience with an organisation or brand. Lu and Wang (2008:504) state that the response occurs at a specific time during the post-purchase phase and is dependent upon various situational variables. In contrast, the second dimension of satisfaction is defined by Lee *et al.,* (2010:61) as an overall affective state formed by the cumulative evaluation of transactions with an organisation or brand over time. Hsu *et al.* (2012:554) describes transactional-specific satisfaction as the immediate affective response to a specific purchase, whereas overall satisfaction represents a consumers' long-term consumption experience with an organisation. Bloemer and Kasper (1995:316) emphasise that positive cumulative satisfaction has a direct positive influence on a consumer's commitment towards a brand, which is a prerequisite for true brand loyalty.

3.4.1.1 Satisfaction as a predictor of mobile gaming flow

For the purpose of this study, satisfaction is defined as a gamer's cumulative evaluation of the fulfilment provided by his/her favourite mobile game. According to Liu and Li (2011:892), the goal of any mobile game is to create an immersive experience that can be measured based on flow and usage context. Prior research has revealed a significant correlation between flow (Section 3.4.4) and satisfaction, where both have a positive impact on consumers' psychological commitment (Section 3.4.5) and behavioural loyalty (Section 3.4.6) towards a brand (Chang, 2013; Zhou, 2013:266; Hsu *et al.,* 2012:550).

A study conducted by Chang (2013:318) on social network games found that satisfaction has a significant positive impact on flow. The study further elaborated on the importance of positive cumulative satisfaction in maintaining a constant state of flow which, in turn, leads to continued use and brand loyalty. This finding was reciprocated by Teng (2010:1549), who suggested that satisfaction and flow are interlinked. The author posits that true flow is achieved when a player is satisfied with the feeling of total immersion. Brand loyalty research carried out by Baig *et al.* (2015:12) and Hsu *et al.* (2012:563) reported similar findings. The research of Zaman *et al.* (2010:1012) showed that satisfaction and challenge are interlinked as a consequence of flow. The authors also state that players derive satisfaction from overcoming challenges, with their overall satisfaction strengthened through in-game rewards, such as special in-game items or new levels. This is explored further in the next sub-section.

3.4.2 Challenge

Flow theory posits that the quality of an experience is determined by the challenges presented and the level of skills required to overcome those challenges (Zhou, 2012:29). A person may be required to develop new skills to overcome new challenges, thus, growing from the experience and gaining knowledge at the same time. The reward for overcoming the challenge is progression to the next level and this accomplishment leads to an overall sense of satisfaction (Zaman *et al.,* 2010:1012). Video games are designed to present varying degrees of challenges which are dependent on the level of difficulty chosen by the player. These challenges manifest as specific goals that need to be met for a player to progress to the next stage (Choi & Kim, 2004:11).

Closely linked to challenge is goal setting theory, whereby concrete goals are set within manageable rules; the aim being to test the ability of the user. These goals are achieved when the user becomes motivated enough to expend the right amount of skill and ability required (Jin, 2012:170). Goal setting theory from a video gaming perspective proposes that goals must be achievable, challenging, and provide appropriate rewards that induce maximum effort from players (Teng, 2012:491). If this is achieved, players will be motivated to play a game repeatedly which, in turn, manifests into loyalty (Teng, 2013:884-885). However, players will cease playing the game if they perceive it to have a low probability of overcoming challenges. In this case, a state of flow is not achieved and players will respond negatively to the experience provided by the video game (Shim *et al.,* 2015:57-58). This outcome is reciprocated when players view challenges as inconsequential or overly easy, which quickly leads to a decrease in concentration and, ultimately, the motivation to play (Liao, Huang, Teng, 2016:65).

3.4.2.1   Satisfaction and challenge as predictors of mobile gaming flow

It is imperative for a video game to evoke a constant state of flow by providing an optimal balance between skill and challenge which, in turn, encourages a repeated use of the game and stimulates brand loyalty (Jin, 2012:183). This provides evidence of a distinct link between satisfaction, challenge, and flow from a video gaming perspective when inducing brand loyalty (Hamari, Shernoff, Rowe, Coller, Asbell-Clarke & Edwards, 2016; Teng, 2013; Jin, 2012;169; Teng *et al.,* 2012; Koo, 2009; Hsu & Lu, 2004).

3.4.3   Game identification

As stipulated in section 3.2, brand identification is one of the key drivers of brand loyalty. Nikhashemi *et al.* (2015:183) posit that brand identification roots in social psychology and can be described as the consumption of a brand to alter one's self-perception or fulfil one's need for social identity. Simply, identification theory focuses on the study of 'the self' and how one can be influenced by society (Hefner, 2007:40). This suggests that consumers' brand preference is not entirely rooted in utilitarian value but rather considers symbolic value (Bauer *et al.,* 2008:212). As such, a brand is often selected as a statement of social status and the level of brand identification is determined by the degree to which a brand can satisfy the egotistical need of the consumer. A higher level of brand

identification leads to increased commitment and a stronger emotional bond between brand and consumer (Kuenzel & Halliday, 2010:170). As such, brand identification is viewed as an antecedent of the attitudinal component of brand loyalty (Madrigal & Chen, 2008:719). Prior research has revealed that brand identification has a positive influence on flow experienced and psychological commitment which, in turn, positively affects behavioural loyalty (Souter & Hitchens, 2016; Lin, 2013; Moon *et al.,* 2013:6; Blake *et al.,* 2012; Kuenzel & Halliday, 2010; Lee *et al.,* 2010; Kim, Han & Park, 2001).

3.4.3.1 Game identification as a predictor of mobile gaming flow and brand loyalty

Considering a video games perspective, identification includes the degree to which players' self-perception is altered through the adoption of the values portrayed by an in-game character (Hefner *et al.,* 2007:39). This process involves the loss of self-awareness and temporary replacement of one's identity with that of the character. According to Blake *et al.* (2012:76), video games provide a unique conceptualisation of identification because characters are not distinct celebrities or social figures but are directly controlled and shaped by the player. Soutter and Hitchens (2016:1035) found that character identification positively correlates with higher level of flow, as the loss of self-awareness and cognitive absorption are antecedents of flow. It is important to note that character identification can occur in games where players do not control a character but assume the role of an invisible manager (Van Looy *et al.,* 2012:27).

Kuenzel & Halliday (2010:168) explain that brand identification is not limited to the image, values, or personality traits portrayed by the brand; it also includes social identification. Social identification manifests when a consumer identifies himself/herself with a certain group. According to So *et al.* (2013:7), this type of identification is derived from the cognitive significance of being associated or adopted into a social entity. This is often found in video games, whereby players feel a strong urge to participate within virtual communities (Badrinarayanan, Sierra & Taute, 2014:857). Prominent mobile games such as Angry Birds, Clash of Clans, and Candy Crush Saga all have a core social element to their gameplay (Section 3.2.1.1). The multi-player element allows for scores to be shared or requires players to work in teams to progress (Chen, 2014:3). Moon *et al.* (2013:6)

found that players with a strong social identity will display higher levels of loyalty toward games.

Van Looy *et al.* (2012:128) state that character identification and social identification form part of a three-dimensional concept of identification in video games, which includes game identification. Game identification refers to the degree to which a player identifies with the world presented by the video game and the community that encompasses it (van Rooij, Schoenmakers, Vermulst, van den Eijnden & van de Mheen, 2011:206). Van Looy *et al.* (2012:132) found players' identification in online games revealed that those who develop a strong sense of game identification become driven to obtain high scores, progress rapidly, and gather in-game symbols of success. They are also more likely to make in-app purchases to speed up their progress (Hamari, 2015:306). Research conducted by Soutter and Hitchens (2016:1035) and Moon *et al.* (2013:6) found that players with a strong social identity will display higher levels of loyalty toward games and that the game identification will manifest into higher levels of flow.

3.4.4   Flow

Flow, as a construct, has often been linked to research which relates to products or services created for entertainment purposes. Flow is often incorporated into renowned behavioural models such as the Theory of Reasoned Actioned (TRA) and Technology Acceptance Model (TAM) to predict consumer adoption tendencies (Kaur *et al.,* 2016; Liu & Li, 2011; Ha *et al.,* 2007; Hsu & Lu, 2004; Koufaris, 2002; Moon & Kim, 2001; Ghani & Deshpande, 2001). Csikszentmihalyi and LeFevre (1989:816) describe flow as the process of optimal experience that manifests from various interrelated factors such as goal-setting and feedback, challenge and skill, concentration, focus, sense of control, and loss of self-awareness. A simpler conceptualisation posits flow being a state of total cognitive absorption achieved through intrinsic enjoyment (Jung *et al.,* 2009:124).

Video games create a sense of enjoyment from the overall experience (Alzahrani *et al.*, 2017:242). This perception of enjoyment is compounded by the experience of successfully overcoming a challenge to progress further. This creates value for players as they can learn new skills while enjoying the overall gameplay experience (Wu & Chien, 2015:3). Players who become fully immersed enter a state of 'flow', where they become

oblivious to their surroundings and are compelled to continue playing for an extended period of time (Teng, 2013:885). According to Su *et al.* (2016:247), players who experience a state of flow are more likely to succumb to in-app purchases to enhance their gaming experience and are most likely to recommend a game to their friends and family.

3.4.4.1 Flow as a predictor of mobile gaming brand loyalty

Merikivi *et al.* (2017:412) state that when studying mobile games, the importance of flow cannot be overstated as games are enjoyed more by consumers when they become cognitively absorbed during play. A study by Liu and Li (2011:896) revealed that evoking a state of flow is imperative when creating a positive attitude towards a mobile game. This will lead to repeated use of the game and increase brand loyalty. Teng (2013:889) found similar results and posits that flow has a positive significant influence on game brand loyalty. Furthermore, Hamari's (2015:306) study on why people purchase virtual goods revealed that continued use of a mobile game has a positive effect on a player's intention to make in-app purchases. The study also noted that free-to-play mobile games that provide an enjoyable experience do not automatically foster purchase intentions, instead purchase intentions are manifested from continued use. This underpins the importance of correctly implementing a freemium business model (refer to section 2.3) in conjunction with a mobile game which evokes a state of flow (Georgieve, Arnab, Romero & de Freitas, 2015:29; Mantymaki, 2015:125). Ultimately, players who become fully immersed (enter a state of flow) in a gaming experience will become psychologically committed, which leads to increased behavioural loyalty towards the game and/or the game's developer (Choi & Kim, 2004:12).

3.4.5 Psychological commitment

Day (1969:30) states that true brand loyalty occurs when a consumer displays a positive attitude toward the brand in addition to repeat purchase behaviour. Contrastingly, consumers who display spurious loyalty are characteristically non-committal and will easily switch to another brand should the opportunity arise. These consumers will purchase a brand repeatedly, but typically switch brands when a competing brand offers a discount or a better deal (Mabkhot *et al.,* 2017:73). Therefore, the psychological

commitment dimension of brand loyalty helps discern true brand loyalty from that of repeat purchase behaviour and places greater emphasis on brand commitment and attitudinal attachment.

A consumer who is truly brand loyal is wholly committed to the brand and will only purchase that brand in future due to their level of commitment (Bloemer & Kasper, 1995:313). This level of commitment illustrates one's desire to remain loyal to their favourite brand and an ability to develop a lasting attachment because of the value provided by the brand (Datta *et al.,* 2017:6). Their loyalty preference will continue to grow if they hold a positive attitude towards a brand or organisation (Baig *et al.,* 2015:5). These consumers are not swayed by incongruous information about their favourite brand (Teng, 2013:885; Lin, 2010:6; Bauer *et al.,* 2008:2007; Keller, 2003:15). When distinguishing between inauthentic loyalty and true brand loyalty, it is recommended to evaluate a consumer's beliefs, feelings, and intentions (Nisar & Whitehead, 2016:745).

3.4.6 Psychological commitment as a predictor of mobile gaming behavioural loyalty

Psychological commitment in mobile games manifests as a resistance to switch to another mobile game despite the marketing efforts of competitors or recommendations from friends and family (Lin, 2010:13). Teng (2013:884) states that video games often integrate seamlessly into consumers' daily lives because of the optimal experience presented through challenging and addictive gameplay. This often leads to excessive gameplay and a preference to play video games from the same developer. According to Lu and Wang (2008:500), consumers become psychologically dependent on their favourite video game due to its ability to create a state of flow (refer to Section 3.4.4). Another study by Choi and Kim (2004:12) indicates that players who achieve flow will become psychologically committed which will likely result in increased behavioural loyalty towards the mobile game or the mobile game's developer.

The behavioural dimension of mobile games brand loyalty includes past loyal behaviour as well as future intended behaviour (Teng, 2013:884). Such behaviour is shown by making in-app purchases while playing, purchasing game-related merchandise, engaging with online communities, participating in discussions in online blogs, or following the latest

news and updates on social media platforms (Hsiao & Chen, 2016:19; Lu & Wang, 2008:503; Choi & Kim, 2004:12). Retaining behavioural loyalty amongst gamers is imperative for any mobile gaming organisation, as it has a positive effect on profitability and long-term success (Hsiao & Chen, 2016:18). Behaviourally loyal players require less frequent advertising, which greatly reduces costs, while contributing to significant increases in sales generated by recommending the game to their friends and family or from repeatedly making in-app purchases (Teng, 2013:885).

The next section provides an in-depth discussion on brand loyalty amongst generational cohorts with a specific focus on Generation Y, as it is the target group for the current study.

3.5 BRAND LOYALTY AMONGST GENERATIONAL COHORTS

It is imperative for any organisation to correctly identify a suitable target market for a product or service which they wish to sell or promote (Iacobucci, 2013:43). The needs of consumers can greatly differ due to their demographical and socio-cultural backgrounds, therefore, not all products and services offered by an organisation will appeal to every consumer (Burgess, 2011:38). As such, marketers segment consumers into homogeneous groups according to their age (typically generational cohorts), gender, income levels, personality traits, morals, values, social standings, and cultural differences (Jansen van Rensburg, 2014:132). Marketers strive to group consumers together that are best suited to a product or service in order to improve targeting effectiveness (Burgess, 2011:38).

It has become common practice for marketers to segment consumers into generational cohorts. Consumers who form part of a generational cohort have underlying similarities due to having grown up during the same time period (Debevec, Schewe, Madden & Diamond, 2013:20). The consensus amongst researchers is that significant societal events, such as wars, economic change, popular culture, globalisation, and technological development that occur during certain time periods are pivotal in shaping consumers' attitudes, values, and beliefs (Fernandez-Duran, 2016:435). However, there are varying opinions as to which time period a generational cohort should belong. Markert (2004:21) postulates that a 20-year time period exists between generational cohorts, during which

any major events that occur will distinguish one generation from the next. According to Markert (2004:21), there are currently three distinct generational cohorts in existence today; namely, Baby Boomers (born between 1946 and 1965), Generation X (born between 1966 and 1985), and Generation Y (born between 1986 and 2005). The three generational cohorts are summarised as follows:

Baby Boomers are individuals who were born after World War II, between 1946 and 1965. They are characterised as having rejected and redefined many of the traditional values held before the Second World War. They are characterised typically as late adopters; heeding caution before making any decisions (Debevec *et al.,* 2013:21). This may be attributed to their age coupled with experience gained over many years, allowing for informed rational decisions to be made (Parment, 2013:191). Most Baby Boomers currently are preparing for retirement and are making use of assets they have built up over many years, such as retirement annuities, to fund their lifestyle. As such, they often have more time and disposable income than their generational counterparts, making them a lucrative market, particularly for the healthcare industry (Migliaccio, 2018:27).

Following Baby Boomers is the Generation X cohort, comprising individuals born between 1966 and 1985 (Markert, 2004:15). This generational cohort has been defined by harsh economic times following the Second World War. Tough economic periods meant that Generation X parents had to work exceptionally hard in order to live a sustainable lifestyle (Yang & Jolly, 2008:274). As such, Generation X individuals were often separated from their parents during their childhood and adolescent years. This disconnect endorsed the development of independence and self-reliance within the cohort (Dhanapal, Vashu & Subramaniam, 2015:109). In addition, the Generation X cohort are characterised as being highly educated, sceptical, and pragmatic individuals (Lissitsa & Kol, 2016:304).

The target market for this study are the Generation Y cohort. This cohort is discussed at length in proceeding subsections.

3.5.1   Generation Y

Generation Y, also known as Millennials, is the largest cohort of the three generations and comprises individuals born between 1986 and 2005 (Markert, 2004:21). As of 2018, the Generation Y cohort consists of individuals between the ages of 13 and 32 years old.

The Generation Y cohort are characterised as 'tech-savvy' individuals, having grown up during the rapid technological advancement era (Au-Yong-Oliveira, Goncalves, Martins & Branco, 2018:955). The prevalence of social media and the importance that society places on social influences has shaped them into image-conscious individuals whose decisions are driven largely by emotional connotations (Balakrishnan, Dahnil & Yi, 2014:179).

Globalisation has played an integral part in the shaping of the typical Generation Y consumer. Innovations such as the Internet, mobile telephones, social media, and reality television have made the world an instantaneously interconnected habitat (Hamidi & Chavoshi, 2018:1053-1054). Consequently, this rapid dissemination of smart phones and portable computers has exposed this cohort to a plethora of readily available sources of information (Bilgihan, 2016:103). Having information accessible at their fingertips has increased the buying power of Generation Y individuals. As a result, this cohort is quick to dismiss false advertising and is less likely to respond to outdated common marketing techniques (Chuah, Marimuthu, Kandampully & Bilgihan, 2017:125). Moreover, this cohort is not particularly brand loyal and does not hesitate to switch brands if a new trend presents itself. This is particularly evident on social media or reality TV, as popular celebrities have the power to influence the purchasing decisions of this cohort (Lissitsa & Kol, 2016:305). A study by Lazarevic (2012:45) concerning the encouragement of brand loyalty revealed that marketers need to successfully integrate branding, marketing communications, and celebrity endorsements in order to induce Generation Y individuals to become more brand loyal.

Despite their resistance to traditional marketing strategies, Generation Y individuals still display higher adoption rates of new technologies than their counterparts, Baby Boomer and Generation X cohorts (Mostert, Petzer & Weideman, 2016:25). Witt, Massman and Jackson (2011:763) found that an average member of the Generation Y cohort spends up to 12 hours a day using various technologies such as smartphones, personal computers, or playing video games. Baby Boomers and Generation Xers are not as technology inclined, thus Generation Y's opinions on various technological advancements are sought after by marketers and video gaming developers (Zhang, Lu & Kizildag, 2017:489-490).

3.5.2 Generation Y in South Africa

The Digital market outlook released in 2016 revealed that South African mobile gamers are predominantly between the ages 16 and 34 (Statista, 2016a). This result suggests that a large share of South Africa's mobile game market falls within the Generation Y cohort range. At the end 2017, members of the Generation Y cohort made up approximately 36.2 percent of the South African population, making it the largest represented cohort in the country (Statistics South Africa, 2017).

Over the past decade, the influx of low-cost mobile phones and prepaid subscriptions has greatly increased internet access for the wider Generation Y cohort in South Africa (Matangira, 2018). As such, this cohort has been known to consume large amounts of digital media which they share via mobile phones using social media platforms (Kreutzer, 2009:1). Previously, video games were only accessed by higher income groups who could afford expensive consoles such as Xbox and Sony PlayStation consoles. However, today's affordable mobile telephones have made mobile gaming an easily accessible gaming platform for the wider South African population (Walton & Pallitt, 2012:6).

According to the 2017 Global Mobile Consumer Survey released by Deloitte (2017:11), 68 percent of respondents aged between 18 and 25 years (Generation Y) indicated that they use their mobile phone to play mobile games. This age range is typically associated with university students and various scholars have noted the importance of studying these members of the Generation Y cohort (Chuah *et al.,* 2017; Price, 2017; Akpojivi & Bevan-Dye, 2015; Synodinos, 2014; Amory & Molomo, 2012). Generation Y university students are highly valuable in terms of market potential because individuals who obtain higher educational qualifications through a tertiary institution have a higher future earning potential, greater social influence, and more disposable income than their peers that do not possess a tertiary qualification (Sharp & Bevan-Dye, 2014:88).

3.5.3 Gender differences in Generation Y brand loyalty towards video games

Consumers generally tend to display similar characteristics and traits, however, gender differences remain apparent within generational cohorts (Pentecost & Andrews, 2010:45). Prior literature dictates that the typical video gamer is most likely an adolescent male and

least like a female (Witt *et al.,* 2011:768; Lucas & Sherry 2004:500). However, the inundation of smartphones into the market, coupled with globalisation, has led to an almost equal representation of both male and female players of mobile games (Knoke, 2017).

Two studies conducted on Generation Y South African video gamers revealed non-significant gender differences, whereby the majority of male and female participants played similar video games, evaluated their experiences in the same manner, and displayed equally positive attitudes and adoption intentions towards mobile games (Price, 2017:108; Amory & Molomo, 2012:193). Marketers can equally promote both male and female oriented products in mobile games and careful consideration needs to be taken of both genders when planning marketing campaigns. This study will further investigate if gender differences exist in mobile gaming brand loyalty

3.6 PROPOSED MODEL TO PREDICT MOBILE GAMING BRAND LOYALTY

This chapter reviewed the literature on branding, brand strategies adopted by mobile games, brand equity, brand loyalty, and mobile gaming brand loyalty. It also included a discussion on the antecedents of mobile gaming brand loyalty and the Generation Y cohort in South Africa. This section incorporates the reviewed literature to propose a model that explains the antecedents affecting mobile gaming brand loyalty. This section, thus, addresses the last theoretical objective formulated in Chapter 1.

The model proposes that satisfaction, challenge, and game identification are significant predictors of mobile gaming flow and that flow has a significant influence on psychological commitment which, in turn, has a direct effect towards behavioural loyalty. Figure 3-4 presents the proposed model and the hypothesised antecedents of mobile gaming brand loyalty, as outlined in the literature review.
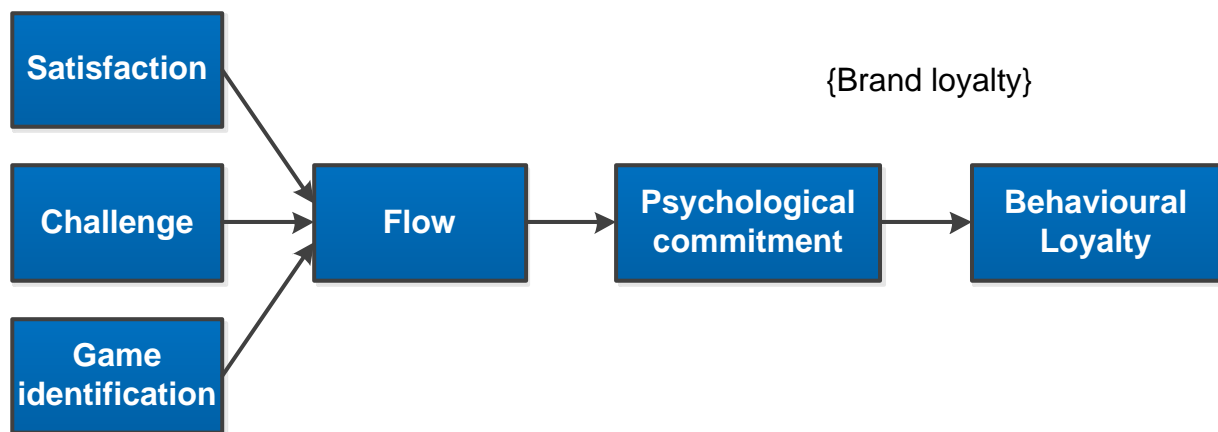
Figure 3-4:   **Proposed model of the antecedents of mobile gaming brand loyalty amongst Generation Y students**

The proposed antecedents of mobile gaming brand loyalty presented in Figure 3-4 will be empirically tested in Chapter 5, with the results and recommendations thereof reported in Chapter 6.

3.7   CONCLUSION

The purpose of this chapter was to review the literature on mobile gaming brand loyalty and the Generation Y cohort in order to propose a model of antecedents affecting mobile gaming brand loyalty amongst Generation Y students in the South African context.

Mobile games remain at the forefront of the video game market. It has become evident that video gaming organisations must build a strong mobile gaming presence, to both enhance their brand and stay current within today's gaming industry needs. The longevity and success of mobile game franchises such as Angry Birds, Candy Crush Saga, and Clash of Clans is a testament to their ability to nurture and grow a brand and successfully attract and retain a massive following of loyal video gamers. In turn, these mobile gaming brands effectively leverage the loyalty of these players to expand their brand portfolio beyond video games and into various other markets. Gaining an in-depth understanding of how these mobile gaming franchises have successfully created strong brands is of utmost importance to new video game organisations and their marketing teams who aim to make a noticeable mark in the industry.

In accordance with the literature, the antecedents of mobile gaming brand loyalty include satisfaction, challenge, game identification, flow, psychological commitment, and behavioural loyalty. Flow refers to a state of optimal experience and was identified as a salient predictor of psychological commitment and consequent behavioural loyalty. The literature also revealed that flow is mediated by the satisfaction a consumer derives from playing mobile games, the challenge of the overall gameplay experience, and the level that one identifies with the game.

The Generation Y cohort, as the focus group of this study, was discussed in depth. This cohort is characterised as having grown up in a time of rapid technological development and growing social influence, which has shaped them into tech savvy individuals and made their opinions on various technologies sought after by marketers. Furthermore, the South African Generation Y cohort makes up around 36.2 percent of the total population, with research showing that most of the mobile game players in the country can be grouped into this cohort. The literature revealed that the focus should be on university students making up the Generation Y cohort, as they have a higher future earning potential and have a greater social influence on other members of the Generation Y cohort. Importantly, when targeting this cohort, marketers should avoid using conventional marketing techniques, as members of this cohort are quick to reject them.

The research methodology followed in collecting and analysing the data used to test the model proposed in this chapter is fully discussed in the following chapter, Chapter 4.

CHAPTER 4
RESEARCH DESIGN AND METHODOLOGY

4.1   INTRODUCTION

Marketing research connects members of the external business environment to the marketer through crucial information, which is used to identify and define potential opportunities and problems that may exist in the market (Malhotra, 2010:39). Thereafter, marketers analyse market opportunities and problems through data analysis and present the relevant findings in the form of managerial applications (Smith & Albaum, 2010:1). This makes marketing research essential for any organisation, as it allows for both effective and efficient decision-making and the creation of optimised strategies aimed at the organisation's target market (Kent, 2007:3-4).

The marketing research process consists of a number of interrelated elements that function sequentially (Shukla, 2010:15). The first step in marketing research is to identify and define the problem (Berndt & Petzer, 2011:26). In this study, the problem was defined in Chapter 1 (Section 1.2) and it led to one primary objective that guided the study (refer to Section 1.3.1). The primary objective was then translated into four empirical objectives (refer to section 1.3.3) that required the collection of the following data:

- Generation Y students' satisfaction with their favourite mobile game.

- Generation Y students' perceptions of the level of challenge experienced when playing their favourite mobile game.

- Generation Y students' level of identification with their favourite mobile game.

- Generation Y students' perceived state of flow when playing their favourite mobile game.

- Generation Y students' psychological commitment towards their favourite mobile game.

- Generation Y students' behavioural loyalty towards their favourite mobile game.

The next step was to pursue a suitable research paradigm (Section 4.2), which underpinned the selection of an appropriate research design (Section 4.3), sampling procedure and data collection method (Section 4.4 & Section 4.5), questionnaire administration (Section 4.6), data preparation method (Section 4.6) and data analysis techniques (Section 4.8) (Creswell, 2014:3-11; Peter & Donnelly, 2012:30-38; Berndt & Petzer, 2011:25-26; Malhotra, 2010:41-42; Smith & Albaum, 2010:5-12; Blythe, 2005:102-103).

4.2   RESEARCH PARADIGMS

A research philosophy, often referred to as a research paradigm, is described as the researcher's general philosophical view of the world in which the research will be carried out. It encompasses participants who form part of that world, the methodology followed to gather and interpret data collected from the participants, the relationship between the participants and the researcher and the objective of the research project (Creswell & Clark, 2007:38). In other words, the beliefs of the individual carrying out the research will influence the overall design of that research. According to Creswell (2014:3), all research must be grounded within a philosophical worldview, which guides the specific methods and procedures followed by the researcher. This is critical in ensuring all elements of the research project fit together to achieve the research objectives of the study (Johnson & Onwuegbuzie, 2004:14). The proceeding subsections describe the four philosophical world views identified by Creswell (2014:4-6), namely constructivism, transformative, pragmatism and post-positivism.

4.2.1   Constructivist

A constructivist research paradigm, which incorporates an interpretivist view, is defined as one where individuals seek to understand the world in which they live or work. It relies on an individual's subjective view of their experiences related to an object or variable. This approach leads to the collection of complex views for analysis and seeks to avoid diluting meanings into narrow categories (Nieuwenhuis, 2016a:60-62; Creswell, 2009:37-38). As such, social constructivists prefer asking participants open-ended questions, as these tend to generate broad answers that provide an unhindered subjective view of the situation. These questions often deal with situations involving social interactions between

individuals within a specific cultural setting. The researcher inserts himself/herself into the middle of the study when interpreting findings in order to better understand (interpret) how others view the world they live in (Lincoln, Lynham & Guba, 1994:113).

4.2.2 Transformative

Nieuwenhuis (2016a:63-65) describes a transformative worldview as being grounded in social reality that is historically developed, produced and reproduced by people. Transformative research is action-based and focusses on marginalised individuals in society and deals with issues such as social power and justice, inequality, discrimination and oppression (Creswell, 2014:38). The purpose of this type of research is to provide actionable outcomes that can be used to improve the lives of the marginalised individuals who from part of the target population of the study. Such individuals include, but are not limited to, racial minorities, disabled persons and members of the lesbian, gay, bisexual, and transgender (LGBT) community (Mertens, 2007:212).

4.2.3 Pragmatic

The pragmatic worldview is concerned with developing practical solutions to 'real world' problems. Pragmatists believe that the world should not be viewed from a one-dimensional approach, but rather from multiple perspectives free from any constraints or 'tainted' worldviews (Feilzer, 2010:8). As such, Creswell (2009:39-40) states that pragmatists are not bound by a particular research method or technique but have the freedom of choice to select any method they deem appropriate and credible to solve the research problem.

4.2.4 Post-positivist

Post-positivist research assumptions follow a scientific methodology and are typically found in research that is quantitative in nature as opposed to qualitative (Creswell, 2014:36). Creswell (2009:36) and Nieuwenhuis (2016a:59) describe the post-positivist paradigm as an approach where reality is multifaceted, subjective and mentally constructed by individuals. Reality is not fixed, but a creation of the individuals involved in the research. In addition, knowledge is based on careful observations that exist "out there" in the world. Therefore, developing numeric measures of observations and

studying the behaviour of individuals is of the utmost importance for a post-positivist. According to Guba and Lincoln (1994:110), positivist researchers condense ideas into discrete variables represented by hypotheses or research questions, which are then tested and verified through empirical research.

The purpose of this study was to propose and test a model of antecedents that may be used to predict mobile gaming brand loyalty among Generation Y students. Therefore, following a quantitative approach that is rooted within a post-positivist research paradigm was deemed suitable. This approach allows for the researcher to remain neutral and objective as he/she assumes a non-interactive role in the study (Orlikowski & Baroudi, 1990:11). Maintaining this level objectivity is what makes post-positivistic research valuable, as it allows for findings to interpreted in a manner that is rational, precise, clear and robust (Creswell, 2014:37).

4.3   RESEARCH DESIGN

A research design is a comprehensive blue-print or plan utilised to address the research problem or question in a research study (Kotler & Armstrong, 2017:133; Clow & James, 2014:34). A different systematic approach is followed in each research design, which is dictated according to the various methods or procedures outlined by that specific research design (Smith & Albaum, 2010:21). Malhotra (2010:103) states that research designs are either exploratory or conclusive in nature and must be selected according to the type of research conducted. Figure 4-1 provides a detailed composition of the two research designs.
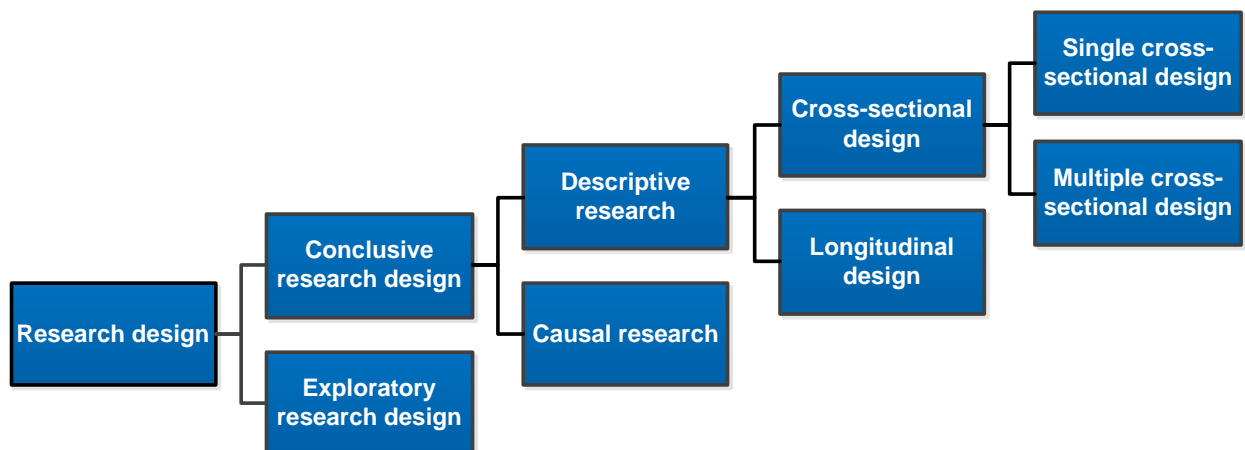
Figure 4-1: **Illustration of the marketing research designs**

Source: Malhotra (2010:103)

An exploratory research design is employed to gain more insight into a specific research problem (Bradley, 2013:509). It is qualitative in nature and focuses on a small non-representative sample size (Smith & Albaum, 2010:21). The findings of this type of research are generally regarded as tentative and are used as an input for more conclusive research (Malhotra, 2010:103).

Conclusive research is a two-sided mechanism consisting of causal research and descriptive research (McDaniel & Gates, 2015:54). Kotler and Armstrong (2017:131) explain that causal research is used to test cause-and-effect relationships between variables, whereas descriptive research aims to provide further insight and understanding into an observed variable. Hair, Bush and Ortinau (2002:50) state that descriptive research follows a pre-calculated and structured approach to collect data on existing characteristics of a target population, such as attitudes, intentions, preferences and purchase behaviours. Shukla (2010:35) further asserts that descriptive research can also be used to validate and further understand findings derived from exploratory research. Generally, this type of research is quantitative in nature and is drawn from large representative samples of the target population (Clow, 2014:28; Malhotra, 2010:106). In marketing, descriptive research is commonly used for product research, promotion research, distribution research and pricing research, with the findings used to make predictions and for strategic optimisation (Smith 2010:23). Given the nature of this research project, a descriptive research design was followed.

Descriptive research can be carried out in two main ways namely, longitudinal studies or cross-sectional studies. In a longitudinal study, a fixed sample of participants is used repeatedly to measure the same variables. This gives insight into whether participants' opinions on a subject have changed over time or remained consistent throughout the allocated time (Creswell, 2014:203). Owing to time restrictions and financial constraints, it was not deemed feasible to conduct a longitudinal research design for the purpose of this study. As such, a single cross-sectional design was employed in this study. This is commonly used when researchers aim to collect information from a sample of participants only once and provides researchers and marketers with a snapshot in time of the subject/s under study (Shukla, 2010:38).

The following section describes the sampling procedure utilised for this study.

4.4   SAMPLING PROCEDURE

Sampling is the process of selecting a smaller sub-group from the total population. This sub-group, also known as population elements, needs to be representative of the total population (Blythe, 2005:108). Kotler and Armstrong (2017:138) state that it is imperative to select a sample that is representative of the population because it is not always feasible to reach an entire target population. Malhotra (2010:372) opines that a five-step systematic sampling process should be applied when selecting a suitable sample. This process is depicted in Figure 4-2 below.
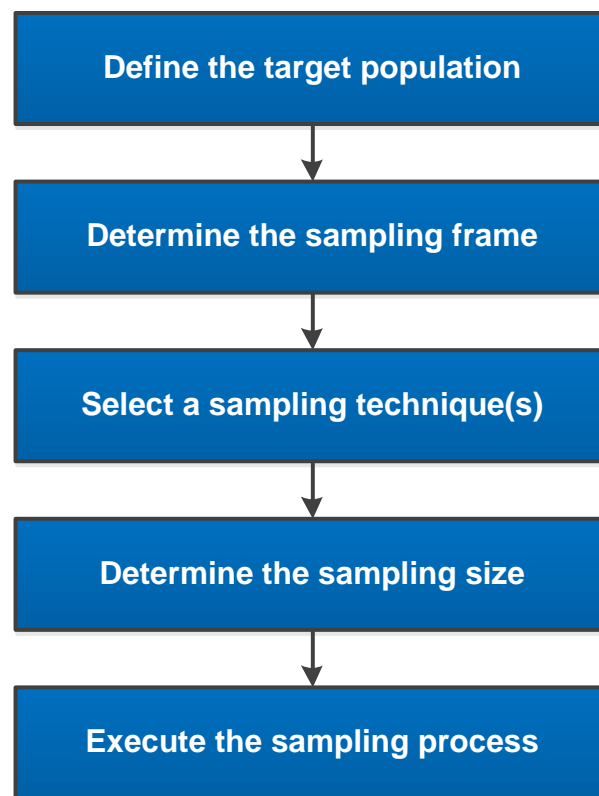
Figure 4-2:   **Sampling design process**

Source: Malhotra (2010:372)

The following sub-sections detail the steps of the sampling design process.

4.4.1   Define the target population

Correctly defining the desired target population is a vital component in the sampling design process. It is by no means a rudimentary definition of participants that will form part of the study, in that it should also specify if any limitations or boundaries of exclusion are present (Clow & James, 2014:226). Entire populations are too large to include into a total sample (Maree & Pietersen, 2016:192). Smith and Albaum (2010:10-11) conclude that small and manageable sample groups should be drawn from a target population that best represents that target population. Malhotra (2010:370-371) adds that a target population consists of sample groups or "population elements" that share homogenous attributes or traits that can be affiliated with the research problem. Bernd and Petzer (2011:65) further describe population elements as variables, objects or people that are a researcher's specific target for data collection.

The target population of this study comprised full-time Generation Y students ranging between the ages of 18 and 24 years who were enrolled at public registered South African HEIs in 2017.

4.4.2   Determine the sampling frame

According to Bradley (2013:155), a sample frame contains a summary of key information associated with population elements and forms the basis on which participants are selected. Typically, researchers identify an appropriate sampling frame for a study by specifying a procedure to be followed in order to select a list of population elements (McDaniel & Gates, 2015:56). However, Malhotra (2010:373) cautions that such a list may include certain population elements that are not part of the sampling frame and advises researchers to screen potential participants during the data-collection phase in order to avoid any sampling frame errors.

The sample frame selected for this study included the 26 publicly registered South African HEIs (Universities South Africa, 2018). From the initial sample frame, judgement sampling was used to select three campuses located within the Gauteng province. The three HEIs comprised one from a comprehensive university, one from a traditional university and one from a university of technology.

4.4.3   Select a sampling technique(s)

There are several sampling techniques that aid in selecting a representative sample. These sampling techniques are grouped into two main categories, namely probability and non-probability sampling (Zikmund & Babin, 2010:311).

Probability sampling relies on random selection, whereby every member, object or variable of the target population has an unbiased chance of being selected within the final sample (Blythe, 2005:109). Samples are drawn through precise estimations, thus allowing for the generalisation of findings drawn from that sample (Berndt & Petzer, 2011:175). Probability sampling comprises the following techniques, namely simple random sampling, systematic sampling, stratified sampling, and cluster sampling (Iacobucci & Churchill, 2010:285).

In contrast, samples drawn using non-probability sampling are not estimated but are selected based on the subjective judgement of the researcher (Malhotra, 2010:376). This can lead to desirable results; however, Maree and Pietersen (2016:197) caution that these findings may not be as precise and unbiased as those derived from samples chosen in probability sampling. This creates an opening for problematic generalisations when reporting to the entire target population. That being said, it is not always feasible to obtain a complete sampling frame from which to draw a probability sample and sometimes, as was the case in this study, the only pragmatic approach it to use a non-probability sampling method. The main techniques of non-probability sampling consist of judgemental sampling, snowball sampling, quota sampling, and convenience sampling (Sarstedt & Mooi, 2014:40).

The sampling techniques associated with probability and non-probability are depicted in Figure 4-3 below.
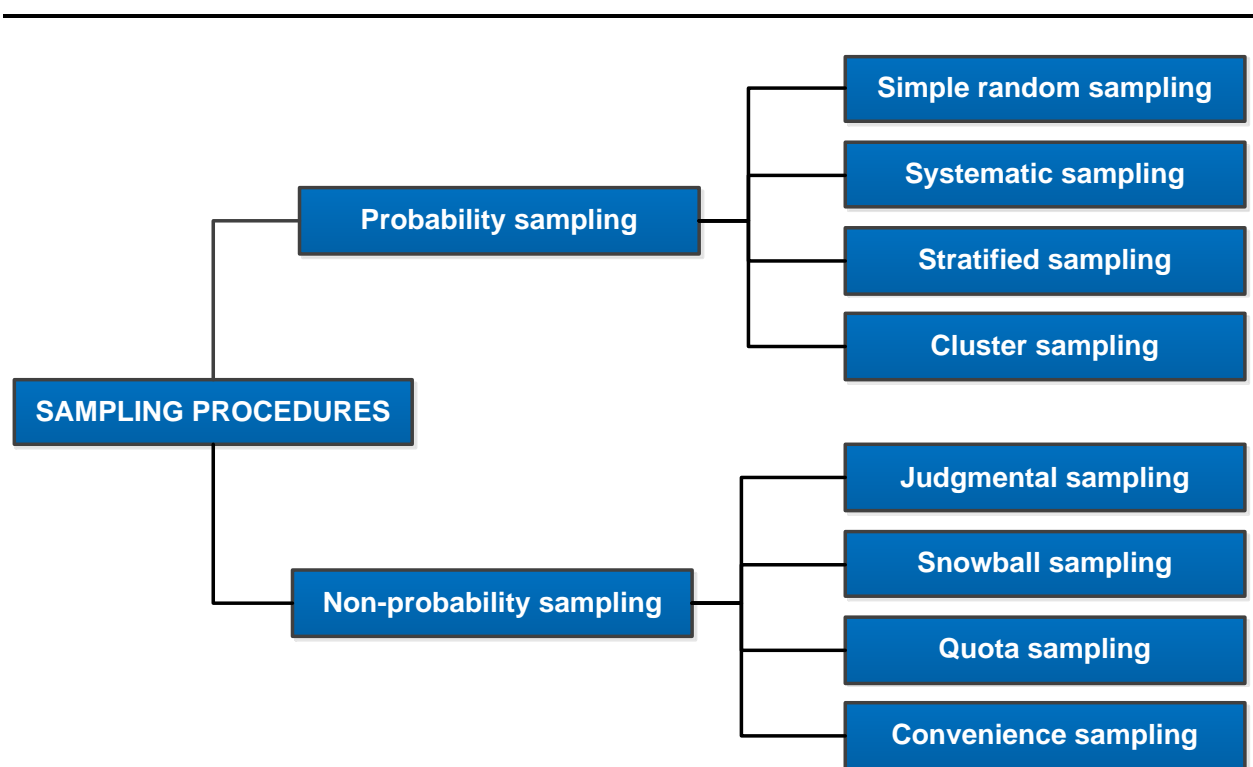
Figure 4-3: **Probability and non-probability sampling techniques**
Source: Sarstedt and Mooi (2014:40)

In this study, judgemental sampling was used to narrow down the sampling frame to the selected three HEI campuses. Burns and Bush (2014:260) indicate that judgmental sampling relies solely on the personal judgment of the researcher selecting the sample. In addition, this study made use of convenience sampling, a technique in which participants are selected by chance because they are in the right place and time when a research study is being conducted (Berndt & Peter, 2011:174). Malhotra (2010:377) warns that the findings derived from these sampling techniques need to be interpreted cautiously due to possible selection bias. However, convenience sampling remains a commonly used technique in studies such as the current one, where both financial constraints and time restrictions make it the only practical method to gather the required data (Sarstedt & Mooi, 2014:42).

In order to overcome the limitations associated with non-probability sampling, the questionnaire utilised in this study included demographic questions pertaining to the participants' gender, ethnic group, province of origin and home language. These questions assisted in determining the extent to which the sample was representative of the target population.

4.4.4 Determine the sampling size

Sample size is simply defined as the total number of population elements or individuals that will be measured during a research study (Kotler, 2000:112). Malhotra (2010:374) describes several factors that need to be considered when selecting sample size. These factors include resource limitations, intended statistical analysis, the research design, size of samples used in similar studies, completion rates and the ease of access to population elements (Zikmund & Babin 2010:301-303). For the purpose of this study, a sample size of 600 full-time Generation Y students was chosen.

The chosen sample size was validated by means of previously published studies similar in nature with comparable sample sizes. Such studies include Billieux *et al.* (2013:1) (sample size: 690), Van Looy (2012:126) (sample size: 544) and Park *et al.* (2011:748) (sample size: 556). In terms of conducting successful SEM, Hair *et al.* (2010:662) assert that studies comprising seven or less constructs should have a minimum sample size of 300 participants. Furthermore, Pallant (2016:184) suggests having 10 responses per

variable for factor analysis. This study contained six constructs with 29 variables necessitating a minimum sample size of between 290 and 300 valid responses. There seems to be consensus amongst researchers that a larger sample size typically produces greater reliability, accuracy, precision and generalisability of a study (Hair *et al.,* 2014:22; Malhotra, 2010:374). Based on these arguments, it was deemed that the selected sample size of 600 full-time Generation Y students was sufficient and would be split equally amongst the three chosen campuses (200 questionnaires per campus).

The following section details the data collection method carried out in this study.

4.5 DATA COLLECTION METHOD

Once the research design had been selected, the appropriate method of data collection was chosen. Within descriptive research, there are two common methods used for collecting data, namely, the observation method and the survey method (Clow & James, 2014:35). The observation method involves directly observing people in a natural environment and recording their natural responses, whilst the survey method utilises self-administered questionnaires, mail surveys or online surveys to collect data from participants regarding their beliefs, thoughts or attitudes towards an observed variable or phenomenon (Kotler, 2000:107-109).

This study utilised the survey method in the form of a self-administered questionnaire, which was used to collect data pertaining to the factors that influence South African Generation Y students' mobile gaming brand loyalty. The questionnaire was submitted to the Ethics Committee of the North-West University (Vaal Triangle Campus) for ethical clearance before distribution took place. The Ethics Committee classified the questionnaire as a low risk status and issued the following ethical clearance number: **ECONIT 2017-003**.

4.5.1 Questionnaire design

Questionnaires consist of statements or questions aimed at drawing specific information from responding participants (Shukla, 2010:43). It is a popular research instrument amongst researchers and is commonly used to collect primary data. Questionnaires are popular research instruments due to their flexibility, inexpensiveness and ease of

implementation (McDaniel & Gates, 2015:128-129). However, their construction must be done carefully. They must be tested and cleared of any errors before their administration (Kotler, 2000:110). Questions need to be formulated in line with the research objectives of a study to allow for relevant data to be collected (Sarstedt & Mooi, 2014:61). Burns and Bush (2014:217-220) stress that questionnaires should flow effectively, be brief and understandable and void of any double-barrelled or ambiguous questions. In addition, a questionnaire should contain a cover letter to explain the purpose of the study and stipulate how the information provided by the participants will be used (Bradley, 2013:193-194).

In this study, the questionnaire underwent rigorous assessment to ensure it adhered to the prescribed guidelines of a good quality questionnaire. Questions were designed according to the empirical objectives set out in Chapter 1, Section 1.3.3. A cover letter, which explained the purpose of the study and provided brief instructions on how to answer the questions, accompanied the questionnaire. A pilot test was conducted on students who did not form part of the final sample in order to determine whether the language used throughout the questionnaire was consistent and easy to understand. The questionnaire was then distributed amongst Generation Y students who formed part of the prescribed sample set out in Section 4.3.1.

4.5.2 Questionnaire content

The questionnaire content was carefully formulated in line with the empirical objectives set out in Chapter 1, Section 1.3.3. This was done to ensure data collected from participants were relevant in answering the empirical objectives set out for the study. This study made use of previously published scales, which were identified whilst perusing the literature in Chapters 2 and 3, and were carefully adapted to suit the nature of this study. The scales measured both the antecedents of brand loyalty and brand loyalty itself. Furthermore, the questionnaire used nominal scales aimed at obtaining demographical information from the participants.

To analyse the antecedents of brand loyalty, the following scales were used, namely satisfaction (five items) (Lu & Wang, 2008:518-519), challenge (four items) (Teng, 2013:887), game identification (five items) (Van Looy *et al.,* 2012:134), and flow (six

items) (Choi and Kim, 2004:16-17). As per the literature, brand loyalty around mobile gaming was conceptualised as a two-dimensional scale comprising psychological commitment (four items) (Prichard, 1999:345) and behavioural loyalty (five items) (Bauer *et al.,* 2008:225).

The questionnaire utilised a six-point Likert-type scale ranging from "1 = strongly disagree" to "6 = strongly agree" in order to measure scaled responses. McDaniel and Gates (2015:253) describe a Likert-type scale as an instrument comprising a series of questions aimed at determining participants' level of favourable or unfavourable attitude towards a topic under study. Likert-type scales are popular amongst researchers as they lack complexity and are easy to construct (Zikmund & Babin, 2010:255). The six-point Likert scale was chosen because it excludes a neutral response, which Pallant (2016:5) indicates is an indecisive and redundant option. Furthermore, McDaniel and Gates (2015:260) indicate that a neutral response presents an easy way out for participants and the exclusion thereof compels one to concentrate more deeply on their perception towards an object or variable before answering. It follows that the resulting response provides more valuable insight for the researcher.

The following section details the layout of the questionnaire.

4.5.3   Layout of the questionnaire

According to Burns and Bush (2014:22), researchers should take special care when structuring a questionnaire to rank the questions according to their difficulty. This aids in guiding the participants through the topic at hand, and to understanding and completing the questionnaire.

The self-administered questionnaire (refer to Appendix A) used for this research study comprised two sections. The first section, Section A, contained simple and easy-to-answer demographic questions. Section B contained questions aimed at measuring the influential factors driving mobile gaming brand loyalty amongst Generation Y students.

4.5.4   Pre-testing and pilot testing of the questionnaire

McDaniel and Gates (2015:128) stress the importance of conducting a pre-test of a questionnaire to assess the clarity of the questions posed and it offers an opportunity to

revise them, if necessary. Zikmund and Babin (2013:302) state that a pre-test should be conducted on participants who possess similar characteristics to that of the main target population in order to gauge the performance of the questionnaire under actual data-gathering conditions. According to Bernd and Petzer (2011:146), this allows researchers the opportunity to rectify any problematic errors before the pilot test is conducted. Failure to do so could result in financial loss and/or a loss of time.

Once the pre-test has provided satisfactory results, the questionnaire undergoes the pilot test. The pilot test should be conducted on a small sample (≤50) of participants who are similar to the target population, but who do not form part of the main study (Zikmund & Babin, 2010:179-180). The purpose of the pilot test is to assess the internal-consistency of the scaled responses and to identify any errors that may have been overlooked (Malhotra, 2010:354).

The pre-test for this study was carried out on two experienced academics and four university students who were representative of the target population. The results obtained from the pre-test allowed for the refinement of the comprehensibility and efficiency of the questionnaire.

Thereafter, a pilot test was carried out on a convenience sample of 50 Generation Y university students that did not form part of the final sample in the study. The results were analysed using IBM's SPSS for Windows, Version 25.0, to test the reliability and validity of the measurement instrument. The questionnaire was deemed to have adequate reliability and validity and was used for the main study (see Chapter 5, Section 5.2).

The proceeding section describes the questionnaire administration process.

4.6   QUESTIONNAIRE ADMINISTRATION

This study utilised a self-administered questionnaire to gather requisite data from a sample of 600 participants, and was distributed evenly amongst the three selected campuses (200 per HEI). The main survey was carried out between April and July 2017.

Lecturers at the chosen HEI campuses were contacted in order to obtain permission to distribute the questionnaires at a time that was convenient for them. The lecturers who agreed to allow their students to partake in the study were shown the ethical clearance

certificate that was obtained. Participants were informed that their participation in the study was strictly voluntary and that their identities would remain anonymous. Thereafter, self-administered questionnaires were distributed to the full-time Generation Y students after their respective lecturer's class had concluded. Students were presented a copy of the questionnaire, with a cover letter informing them of the process to be followed, and requesting their consent to participate. Once the questionnaires were completed, they were returned to the fieldworker.

4.7 DATA PREPARATION

The data preparation stage of the research process consists of editing, coding and tabulation of the collected data. This ensures that data can be correctly contextualised and interpreted in a meaningful manner (Nieuwenhuis, 2016b:114; Blythe, 2005:111).

4.7.1 Step 1: Editing

The editing of returned questionnaires involves conducting a thorough analysis to ensure that there are no response errors or omissions (Malhotra, 2010:453). The purpose of the editing process is to safeguard data quality by identifying inconsistent, ambiguous, unclear or incomplete responses in a questionnaire before it is used for data capturing (Berndt & Petzer, 2011:33-34).

In this study, the minimum quality standards entailed discarding all questionnaires that had more than 10 percent of the responses missing, as well as those where participants fell outside of the age bracket of 18 to 24 years.

4.7.2 Step 2: Coding

After the editing process, data is coded by assigning numerical values to all responses contained within a questionnaire (Clow & James, 2014:365). Thereafter, responses are placed into demarcated groups (tabulation), thus, enabling effective data capture that is then used for further analysis (Shukla, 2010:40).

The codes assigned in the questionnaire are presented in Table 4-1.

Table 4-1:   Coding information

Section A: Demographical data			
Question	**Code**	**Target Variable**	**Value assigned to responses**
Question 1	A1	Name of institution	A (1), B (2), C (3)
Question 2	A2	Year of study	1st year (1), 2nd year (2), 3rd year (3), Post-graduate (4)
Question 3	A3	Gender	Female (1), Male (2)
Question 4	A4	Ethnicity	African (1), Coloured (2), Indian/Asian (3), White (4)
Question 5	A5	Home province	Eastern Cape (1), Free State (2), Gauteng (3), KwaZulu-Natal (4), Limpopo (5), Mpumalanga (6), North West (7), Northern Cape (8), Western Cape (9)
Question 6	A6	Home Language	Afrikaans (1), English (2), IsiNdebele (3), IsiXhosa (4), IsiZulu (5), Sesotho sa Leboa (6), Sesotho (7), Setswana (8), SiSwati (9), Tshivenda (10), Xitsonga (11)
Question 7	A7	Age	Younger than 18 years (1) 18 years (2), 19 years (3), 20 years (4), 21 years (5), 22 years (6), 23 years (7), 24 years (8), Older than 24 years (9)
Question 8	A8	Smart Phone usage experience (years)	Less than 1 (1); 1-2 (2); 2-3 (3); 3-4 (4); 4-5 (5); More than 5 (6)

Section B: Antecedents of mobile gaming brand loyalty			
Item	**Code**	**Construct measured**	**Value assigned to responses**
Items 1-5	B1-B5	Satisfaction	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 6-9	B6-B9	Challenge	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 10-14	B10-B14	Game identification	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)

Table 4-1:   Coding information (continued …)

Section B: Antecedents of mobile gaming brand loyalty			
Question	Code	Target Variable	Value assigned to responses
Items 15-20	B15-B20	Flow	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 21-24	B21-B24	Psychological commitment	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 25-29	B25-B29	Behavioural loyalty	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)

4.7.3   Step 3: Tabulation

Once the questionnaires have been edited and coded, the final step is to tabulate the data. In simple terms, tabulation is the process of tallying the number of responses found within each group or variable as outlined in the data coding. Tabulation exists in two forms, namely univariate tabulation and multivariate tabulation (Malhotra, 2010:466; Hair *et al.,* 2002:511). This study utilised univariate tabulation, in which the number of responses or observations found under each variable is calculated and presented in the form of a frequency table (Sarstedt & Mooi, 2014:99-100).

The statistical techniques employed to analyse the prepared data are discussed in the following section.

4.8   STATISTICAL ANALYSIS

The captured data in this study was analysed using IBM's SPSS and AMOS (Version 25.0) statistical programs for Microsoft Windows. The following sub-sections provide a detailed discussion of the statistical methods applied to the data set.

4.8.1 Factor analysis

Given that this study made use of several different scales, *albeit* validated scales, it was deemed prudent to do an exploratory factor analysis in order to check for any items that cross-loaded of loaded on the incorrect factor.

In order for an exploratory factor analysis to be conducted, Pallant (2016:184) advises on selecting a suitable sample size - a larger sample size tends to produce more reliable results. Malhotra (2010:639) further suggests the use of a rule of thumb, where there should be at least five observations for each item to be factor analysed. Thereafter, factorability of the data is assessed through two components, namely the Bartlett's Test of Sphericity, which is used to test the significance of correlations within a correlation matrix and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy, which tests the applicability and appropriateness of conducting a factor analysis (Hair *et al.,* 2014:90-91). The sample size is proven adequate and factor analysis appropriate when the KMO produces a value greater than 0.6 and the Bartlett's Test of Sphericity is significant at the a=0.05 level (Pallant, 2016:126; Field, 2009:647).

4.8.1.1 Method of factor analysis

When conducting a factor analysis, there are two basic approaches that can be used, namely common factor analysis and principle components analysis.

In principle components analysis, large sets of correlating variables are reduced into a minimum number of factors, while all communalities are initially set at 1.0 so that the total variance of the variables are still accounted for (Hair *et al.,* 2014:105). This indicates a no-error variance, creating an optimal number of factors to be extracted that best represents the interrelations between a set of variables (Pallant, 2016:126). For the sake of simplicity, it can be said that a principle components analysis is used to break down large datasets by grouping highly correlated variables into factors. Factors are not tangible or visible, but can be used to describe "a joint meaning" of the correlated variables (Sarstedt, 2014:238). A potential limitation to this method is the size of the sample needed to conduct the analysis. Pallant (2016:126;180) suggests the use of larger sample sizes in order to achieve higher component reliability. In contrast, a common

factor analysis is more complicated in that it assumes each variable has a degree of variance and error variance related to measurement error.

This study utilised the principle components analysis approach, which is, generally speaking, the most commonly used technique (Malhotra, 2010:643).

4.8.1.2   Number of factors

Factors can range from one up to as many factors as there are variables. However, the more factors are extracted, the more difficult they become to interpret (Sarstedt, 2014:248). When determining the optimal number of factors to be extracted, Malhotra (2010:643-644) suggests using several methods, namely specifying the number of factors using prior knowledge of the expected number of factors, only retaining factors with eigenvalues greater than 1.0, utilising a scree plot, considering the level of cumulative percentage of variance by the factors extracted (must be ≥60%), retaining factors with high-correspondence based on split-half reliability or using significance tests to retain statistically significant factors only.

This study used the prior knowledge approach to guide the number of factors to extract. As such, six factors were extracted.

4.8.1.3   Factor rotation

At first, extracted factors can be difficult to interpret and may need to be rotated into a simpler structure for easier interpretation. Factor rotation is especially important in studies that have a large number of items, as it optimally categorises factors to facilitate easier interpretation (Sarstedt & Mooi, 2014:249). There are two main categories of rotation, those being orthogonal rotation and oblique rotation. Orthogonal rotation includes varimax, quartimax and equamax rotation, while oblique rotation includes direct oblimin and promax rotation (Pallant, 2010:185). In this study, oblique promax rotation was utilised.

4.8.1.4   Factor loadings and communalities

According to Bradley (2013:321), factor loadings show how closely related a variable is to its factor. It is the degree to which each variable correlates with a factor and is assessed as follows:

- A loading of 0.50 and higher indicates a significant and practical factor loading.

- A loading between 0.30 and 0.50 indicates an acceptable factor loading, but is not recommended.

- A loading below 0.30 suggests that the variable does not contribute significantly to the factor and should be ignored.

Sarstedt and Mooi (2014:251) indicate that communalities must also be considered when assessing factor loadings. Communalities indicate how much variance in each variable is explained by the factor solution (Pallant 2016:137). In this regard, Hair *et al.* (2014:117) state that variables with communality values below 0.50 should not be included in the final analysis. Likewise, items that cross-load across more than one factor should be deleted, unless its exclusion alters the intended purpose of the factor significantly. For the purpose of this study only items that achieved factor loadings and communalities above 0.5 were accepted, this ensured a high standard of data quality.

4.8.2   Descriptive statistics

Descriptive statistics involves the summation of findings from each of the questions found within a questionnaire. This study made use of three descriptive statistical techniques, namely, measures of location (mean), measures of variability (standard deviation) and measures of shape (skewness and kurtosis).

4.8.2.1   Measures of location

Malhotra (2010:486) states that measures of location or central tendency, are used to indicate where the central point of a frequency distribution lies. The mean, median and mode are common measures of location (Zikmund & Babin, 2010:328). For the purpose of this study, the mean values of all scaled response items were computed.

The mean, or average value, is one of the most commonly used measures of location and involves simply adding up all the response values of an item and then dividing that answer by the total number of responses for that item (Hair *et al.,* 2002:533). Even though this is a simple procedure, Malhotra (2010:486) believes it is a robust measure that is not easily affected when response values are added or deleted.

4.8.2.2   Measures of variability

Measures of variability allow one to quantify the spread of a distribution over a range of values or to determine the degree to which data-scores group together (Pietersen & Maree, 2016:208). Variability measures include the range, interquartile range, variance, standard deviation and coefficient of variation, which are calculated on interval or ratio data (Malhotra, 2010:487). This study made use of the standard deviation measure.

The standard deviation is loosely defined as the average distance of each variable from the mean score, making it the most appropriate measure of spread whenever the mean is used as the measure of location (Bradley, 2013:268).

4.8.2.3   Measure of shape

The shape or normality of any distribution is described by two numerical measures called the degree of skewness and the degree of kurtosis (Pietersen & Maree, 2016:210). Hair *et al.* (2014:69) state that the kurtosis and skewness of a normal distribution are assigned values of zero and any values recorded above +2 or below -2 indicate a strong deviation from normality. Measures of kurtosis and skewness can help one understand the nature of distribution of the data, and are best represented by using a graph whereby an upside bell that is relatively symmetric in shape is considered normally distributed (Malhotra, 2010:488-489).

Skewness comprises two types of distributions, namely symmetrical distributions and skewed distributions. In symmetrical distributions, the mean, median, and mode of data values are all equal, thus, having equal data values on both sides of the centre of the distribution (Malhotra, 2010:488). In contrast, skewed distributions do not have equal data values on both sides. In this case, the standard deviation from the mean is larger in one direction than in another (Shukla, 2010:45). Pietersen and Maree (2016:211) describe

skewness to the right as a positively skewed distribution, and skewness to the left as a negatively skewed distribution.

The relative "peakedness" or "flatness" observed in a distribution is referred to as kurtosis (Hair *et al.,* 2014:69). Kurtosis, which is closely linked to the standard deviation of a distribution, is classified into three main types of distributions. The first is a normal distribution where data values are near or equal to zero. The second is an abnormally peaked distribution, which contains a positive kurtosis value, and the third is an abnormally flat distribution, which contains a negative kurtosis value (Pietersen & Maree, 2016:211; Malhotra, 2010:488).

The following section details the process to be followed when conducting SEM.

4.8.3 Structural equation modelling

SEM combines multiple statistical techniques into one unified approach aimed at answering formulated hypotheses. SEM can be deconstructed into two procedures, namely confirmatory factor analysis and path analysis (Malhotra, 2010:726-727). According to Hair *et al.* (2014:565), there are six stages that need to be followed in order to conduct SEM successfully. The procedure is outlined in Figure 4-4.
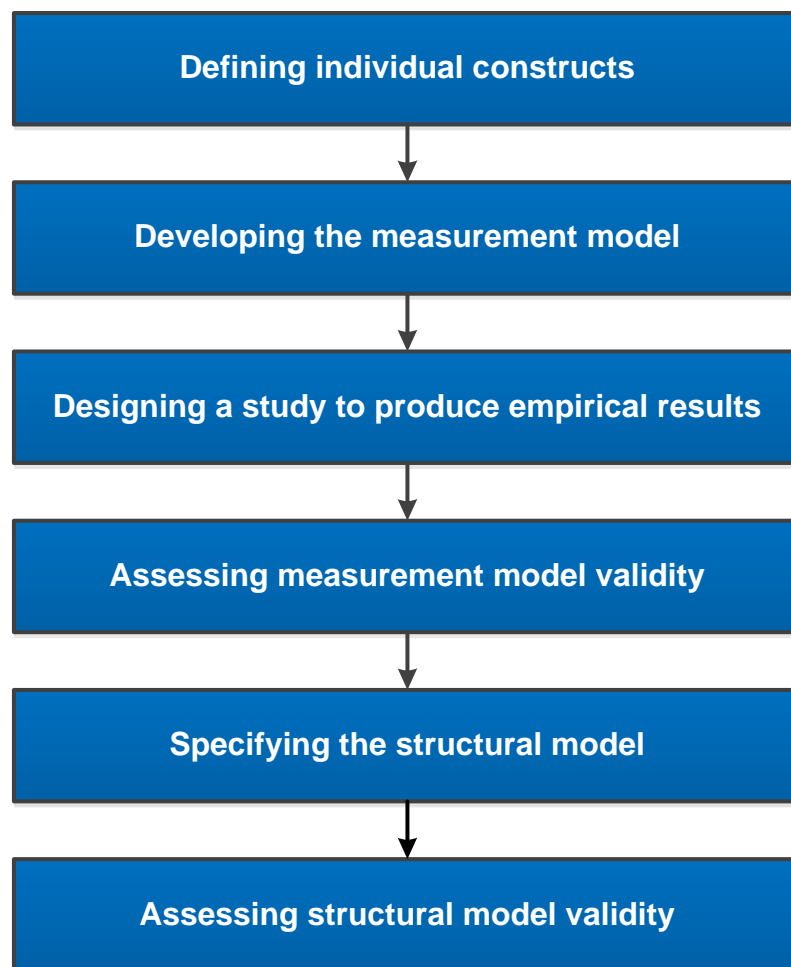
Figure 4-4:   **Six stages in Structural Equation Modelling**
Source: Hair *et al.* (2014:565)

As illustrated in Figure 4-4, the six stages of SEM include the defining of individual constructs, development of the measurement model, designing of an empirical study, assessment of measurement model validity, specification of the structural model, and an assessment of the structural model validity. These stages are discussed in more detail below.

4.8.3.1   Defining individual constructs

SEM is conducted based on sound theoretical roots and prior literature. As such, it is imperative to define individual constructs before specifying a measurement model (Lei & Wu, 2007:35). It is of utmost importance to use measures that have good psychometric properties, as a failure to do so may lead to biased results (Kline, 2011:6). Hair *et al.*

(2014:567) stress the use of a validated measurement theory when defining constructs in order to achieve optimal results. Taking this into account, the study made use of previously validated scales as per prior literature that have been found to be valid and reliable measures.

4.8.3.2 Developing the measurement model

The measurement model is developed and specified once the constructs have been defined. Through a confirmatory factor analysis, the measurement model tests hypothesised constructs as specified by the literature (Malhotra, 2010:729). In other words, a measurement model is used to confirm if previously unexpressed relationships between observed variables and latent (unobserved) factors are valid (In'namie & Koizumi, 2013:25). This is done by assigning the relevant observed variables to each latent factor and is represented graphically by arrows leading from defined constructs (latent factors) to each of the observed correlated variables assigned to those constructs (Teo, Tsai & Yang, 2013:6; Kline, 2011:95). The parameters of the measurement model consist of loading estimates, error estimates, and latent factor correlations; whilst the first loading of each of the latent factors is fixed at 1.0 (Teo *et al.,* 2013:8-9).

Once the parameters of the measurement model have been set, the model must be scrutinised for any problematic estimates. Any standardised factor loadings above 1.0 or below -1.0 must be avoided, as well as any problematic Heywood cases, which are negative error variances. If problematic estimates do occur, the corresponding loading(s) may need to be excluded to rectify the measurement model (Hair *et al.,* 2014:616; Malhotra, 2010:735).

4.8.3.3 Designing a study to produce empirical results

According to Hair *et al.* (2014:569), it is important to select an appropriate research design to avoid unexpected issues or errors when carrying out SEM. Undesirable results often occur due to the chosen sample size and/or model estimation technique(s). Therefore, it is prudent to avoid such issues before assessing the validity of the measurement model. As such, Byrne (2010:76) indicates that smaller sample sizes (≤100) must be avoided as they generally produce unreliable results.

When model estimation takes place, various techniques are used to determine the value of the unknown parameters and the error associated with the estimated value (Teo *et al.,* 2013:12). The selection of an appropriate technique is vitally important and Hair *et al.* (2014:575) opines the use of the maximum likelihood estimation (MLE). MLE is an estimation technique that is popular amongst researchers as it is both effective and efficient in assuming multivariate normality.

This study had a sample size of 600 Generation Y students and made use of the MLE technique to assess multivariate normality.

4.8.3.4   Assessing measurement model reliability and validity

When assessing measurement model reliability and validity, it is necessary to consider the internal-consistency and composite reliability, and the construct validity.

The Cronbach's alpha coefficient is the most commonly used measure for testing internal-consistency reliability and was the measure utilised in this study. Sarstedt and Mooi (2014:256) indicate that scales producing Cronbach's alpha values of ≥0.60 are deemed acceptable, but ideally should not fall below 0.70. Moreover, scales that are larger (contain ten or more items) and more complex usually lead to higher Cronbach's alpha values being produced. In this case, it is recommended that scales produce Cronbach's alpha values of ≥0.80. Hair *et al.* (2014:90) state that scales are deemed as having excellent reliability when producing values of ≥0.90.

Malhotra (2010:733) defines composite reliability as the relationship between true score variance and total score variance extracted from the variables. According to *Hair et al.* (2014:619), a measurement model's latent factors that obtain CR values above 0.70 are deemed reliable, while any values ranging between 0.60 and 0.70 are also acceptable.

The formula to calculate CR is as follows:

$$[(Fl_1+Fl_2+Fl_3+...)^2 / (Fl_1+Fl_2+Fl_3+...)^2 + (err_1+err_2+err_3+...)]$$

In construct validity, one tests if the constructs clearly measure what they intended to measure based on the theory (Malhotra, 2010:30). Therefore, construct validity bridges the gap between the theoretical background and the measurement scale. There are three

types of construct validity. These are convergent validity, discriminant validity and nomological validity.

Nomological validity tests the degree of correlation between constructs in the measuring instrument, revealing relatable constructs (Shukla, 2010:27). In this study, nomological validity was assessed using Pearson's Product-Moment correlation coefficient.

Clow and James (2014:271) describe convergent validity as the degree of correlation between measures of a construct and if those measures were meant to be correlated. Malhotra (2010:734) states that convergent validity is assessed through SEM by looking at two measures, namely the size of the factor loadings and by estimating the average variance extracted (AVE). Hair *et al.* (2014:618-619) indicate that factor loadings and AVE values calculated at 0.50 or above are considered acceptable for construct convergence. The AVE is calculated using the following formula:

$$[(Fl_1^2 + Fl_2^2 + Fl_3^2 + ...) / (Fl_1^2 + Fl_2^2 + Fl_3^2 + ...) + (err_1 + err_2 + err_3 + ...)]$$

Discriminant validity indicates how measures are uniquely associated to one construct, with no signs of high correlation with other constructs (Zikmund & Babin, 2010:251). Through SEM, discriminate validity is evaluated by comparing correlation coefficients of the measurement model to the square root of the construct AVE values (Byrne, 2010:290-291). Discriminant validity is proven when the square root of the AVE of one construct is higher than the correlation coefficients of the remaining constructs (Hair *et al.,* 2014:620).

Once all three types of validity have been proven, the measurement model must be assessed for acceptable levels of goodness-of-fit indices. Hair *et al.* (2014:576) state that goodness-of-fit indicators determine "how well the measurement model reproduces the covariance matrix amongst the indicator items". There are three goodness-of-fit measures, namely, absolute fit indices, incremental fit indices and parsimony fit indices (Malhotra, 2010:731). Absolute fit indices determine the degree to which a measurement model recreates observed data. Incremental fit indices compare the improvement in fit of the measurement model with a baseline model, and parsimony fit indices are used to compare models of different complexity (Teo *et al.,* 2013:14; Kline, 2011:196; Malhotra, 2010:731).

This study made use of both absolute fit indices and incremental fit indices. The absolute fit indices used include the chi-square, degrees of freedom, standardised root mean residual (SRMR), and the root mean square error of approximation (RMSEA). The incremental fit indices used include the goodness-of-fit index (GFI), comparative fit index (CFI), incremental fit index (IFI), and Tucker-Lewis index (TLI). Hair *et al.* (2014:631) state that values greater than 0.90 are considered acceptable for GFI, CFI, IFI and TLI, and Malhotra (2010:732) indicates that a value of less than 0.08 for SRMR and RMSEA suggests an acceptable model fit.

4.8.3.5 Specifying the structural model

Once reliability and validity is proven and the measurement model displays acceptable goodness-of-fit, a structural model may be specified. Specification of a structural model involves drawing path arrows from one construct to another, thereby indicating a relationship between them as defined by the literature (Hair *et al.,* 2014:631). This is known as path analysis and is used to determine a pattern of relationships between constructs. These patterns indicate the direct or indirect effect of independent constructs on other dependant constructs (Seker, 2013:159). The individual paths observed between constructs represent hypothesised relationships that are based on existing literature (Hair *et al.,* 2014:585).

4.8.3.6 Assessing structural model validity

As with the measurement model, the validity of the structural model must be assessed once it has been specified. This last stage in SEM commences once the validity and reliability of the measurement model was deemed acceptable. The hypothesised theoretical relationships specified through path analysis are typically tested at the a=0.01 level. It is also necessary to assess the model fit indices outlined in Section 4.8.3.4.

In addition, Malhotra (2010:736) states that the structural model should be compared with competing models to assess whether or not it represents the best possible fit. Kline (2011:220) indicates that one must consider both the Akaike's information criterion (denoted as AIC) and Bozdogan's consistent version of the AIC (denoted as CAIC) when comparing two or more models, where smaller values between competing models suggest better fit.

4.8.4 Two independent-samples t-test

A t-test utilises the t-distribution to determine if there are any statistically significant differences between two groups or samples. It was created as an alternative to the previously popular Z-test (Malhotra, 2010:504-505; Hair *et al.,* 2002:542). The Z-test, which is used to determine the location of a distribution in a data set, is based on rigid assumptions and produces results that are difficult to justify (Smith & Albaum, 2010:299). The t-test eliminates this by focusing only on sample means and variances (Hair *et al.,* 2002:542).

There are three main types of t-tests, namely, the one sample t-test, the two independent-samples t-test, and the paired sample t-test (Zikmund & Babin, 2010:378-382). This study made use of the two independent-samples t-test to test if there are any significant differences in gender in terms of Generation Y students' mobile gaming brand loyalty. The main aim of the two independent-samples t-test is to determine if incongruences observed are indeed significant and not attributed to random sampling error (Clow & James, 2014:300)

4.8.5 Cohen's D-statistic

After conducting a t-test, Pallant (2016:144) suggests using the Cohen's D-statistic (denoted as D) to determine the practicality and size of any statistically significant difference. Cohen's D-statistic categorises the levels of practical significance as follows:

- $0.20 \leq d \leq 0.50$: indicates a small practical significance

- $0.50 \leq d \leq 0.80$: indicates a medium practical significance

- $0.80 \leq d$: indicates a large practical significance.

4.9 CONCLUSION

The primary purpose of Chapter 4 was to discuss, in detail, the research methodology followed in obtaining and analysing requisite data for the empirical portion of this study. A descriptive research design using the single cross-sectional survey method was employed to achieve the research objectives formulated in Chapter 1.

The sample frame comprised three publicly registered HEI campuses: one traditional university, one university of technology, and one comprehensive university. The survey method, specifically using a self-administered questionnaire, was chosen as the most appropriate technique for collecting the required primary data. The questionnaire was distributed to a convenience sample of 600 Generation Y students located at each of the three campuses (200 students per campus). The data was captured and analysed using the statistical programmes Microsoft SPSS and AMOS versions 25. The statistical methods applied to the data set included exploratory factor analysis, reliability and validity analysis, descriptive statistical analysis, SEM and a two independent-samples t-test.

In Chapter 5, the empirical findings from the pilot test and main study are analysed and interpreted, with conclusions drawn based on the formulated hypotheses.

CHAPTER 5

DATA ANALYSIS AND INTERPRETATION OF FINDINGS

5.1   INTRODUCTION

In accordance with the research methods and data collection procedures outlined in Chapter 4, the objective of this chapter is to report and interpret the empirical findings of the study. These findings are linked to the primary objective of this research study, which is to determine the antecedents of mobile gaming brand loyalty amongst Generation Y students in South Africa.

The data analysis presented in this chapter involved a two-stage process. The first stage analysed the pilot test results (Section 5.2) of the questionnaire and the data gathering process (Section 5.3), preliminary data analysis (Section 5.4) and concluded with a demographic profile of the participants (Section 5.5). The latter provided meaningful background and context to the sample, as well as displaying the extent to which the sample is representative of the total population.

The second stage of the data analysis reported the findings from the main survey. Once the pilot test revealed acceptable results and the acquired data was thoroughly analysed and cleaned, statistical analysis was carried out using an exploratory factor analysis (Section 5.6), a descriptive statistical analysis (Section 5.7), nomological validity analysis and a collinearity diagnostics assessment (Section 5.8). The hypotheses are outlined in Section 5.9. Thereafter, SEM was carried out (Section 5.10), which included specifying a measurement model through confirmatory factor analysis and specifying structural models. The measurement model was evaluated by scrutinising various model fit indices and was tested for reliability and validity using Cronbach alphas, CR, AVE, squared root of the AVE values and the correlation coefficients of the model. Competing models were introduced to test the formulated hypotheses using path analysis after the measurement model displayed acceptable levels of fit, reliability and validity. The final section (Section 5.11) presents the findings of the two independent-samples t-test, which was used to test the hypothesis concerning gender differences related to Generation Y students' mobile gaming brand loyalty and the antecedents thereof.

5.2   PILOT TESTING OF QUESTIONNAIRE

To assess the internal-consistency reliability of the measuring instrument, a pilot study was conducted before implementing the main study. The test was conducted on 50 Generation Y students at a South African HEI campus that did not form part of the sampling frame stipulated in Chapter 4. Of the 50 questionnaires that were distributed, 41 viable questionnaires remained for analysis after data cleaning. Table 5-1 provides a summary of the pilot test results.

Table 5-1:   Pilot testing results

Constructs	Number of items	Mean	Std. Deviation	N	Cronbach's alpha coefficient (α)
Satisfaction	5	4.56	0.77	41	0.64
Challenge	4	4.30	0.99	41	0.77
Game identification	5	3.43	1.31	41	0.87
Flow	6	4.48	0.85	41	0.78
Psychological commitment	4	3.79	1.13	41	0.82
Behavioural loyalty	5	3.30	1.15	41	0.80

As indicated in Table 5-1, there is evidence that all constructs with scaled responses achieved Cronbach's alpha coefficients values above the acceptable limit of 0.60 (Hair *et al*. 2014:90). In terms of the six-point Likert scale used, the mean values of the responses were close to or greater than 3.5 for all six constructs; therefore, suggesting a slight level of agreement amongst Generation Y students pertaining to the antecedents of mobile gaming brand loyalty.

As such, the constructs used during the pilot test displayed acceptable internal-consistency reliability and the measurement instrument was deemed suitable for the main study.

The next section summarises the data gathering process followed during the main study.

5.3   DATA GATHERING PROCESS

The final questionnaire utilised in the study contained 29 scaled response items, seven demographic questions and one question pertaining to smartphone usage. These questions were grouped into two sections (see Section 5.4.1). The data was collected from registered full-time students who were enrolled at one of three HEI campuses located in the Gauteng province. Lecturers at each of the participating HEIs were asked to act as a custodian for the students, and were presented with a copy of the questionnaire and the ethical clearance certificate. Upon their confirmation that the study was not in breach of any ethical code, fieldworkers distributed questionnaires at a time specified by the lecturer in order to avoid any unintended disruptions to learning sessions.

The students were informed that their participation was strictly voluntary and that all information they provided, including the name of the HEI they were registered at, would remain in anonymity. As indicated by the sampling method set out in Chapter 4 (Section 4.3.4), 600 questionnaires were distributed equally between the three HEI campuses chosen.

5.4   PRELIMINARY DATA ANALYSIS

A preliminary data analysis undertaken in this study included the coding, cleaning and tabulation of the collected data.

5.4.1   Coding

The questionnaire used in the main study comprised two sections, namely Section A, which contained eight demographical questions, and Section B, which measured the antecedents of mobile gaming brand loyalty. The latter comprises the constructs of satisfaction, challenge, identification, flow, psychological commitment and behavioural loyalty. All respondents received the same questionnaire. Table 5-2 presents the variable codes and assigned values.

Table 5-2:   Coding information at the main study

Section A: Demographical data			
Question	**Code**	**Target Variable**	**Value assigned to responses**
Question 1	A1	Name of institution	A (1), B (2), C (3)
Question 2	A2	Year of study	1st year (1), 2nd year (2), 3rd year (3), Post-graduate (4)
Question 3	A3	Gender	Female (1), Male (2)
Question 4	A4	Ethnicity	African (1), Coloured (2), Indian/Asian (3), White (4)
Question 5	A5	Home province	Eastern Cape (1), Free State (2), Gauteng (3), KwaZulu-Natal (4), Limpopo (5), Mpumalanga (6), North West (7), Northern Cape (8), Western Cape (9)
Question 6	A6	Home Language	Afrikaans (1), English (2), IsiNdebele (3), IsiXhosa (4), IsiZulu (5), Sesotho sa Leboa (6), Sesotho (7), Setswana (8), SiSwati (9), Tshivenda (10), Xitsonga (11)
Question 7	A7	Age	Younger than 18 years (1) 18 years (2), 19 years (3), 20 years (4), 21 years (5), 22 years (6), 23 years (7), 24 years (8), Older than 24 years (9)
Question 8	A8	Smart phone usage experience (years)	Less than 1 (1); 1-2 (2); 2-3 (3); 3-4 (4); 4-5 (5); More than 5 (6)

Section B: Antecedents of mobile gaming brand loyalty			
Item	**Code**	**Construct measured**	**Value assigned to responses**
Items 1-5	B1-B5	Satisfaction	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 6-9	B6-B9	Challenge	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 10-14	B10-B14	Game identification	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)

Table 5-2:   Coding information at the main study (continued …)

Section B: Antecedents of mobile gaming brand loyalty			
Item	**Code**	**Construct measured**	**Value assigned to responses**
Items 15-20	B15-B20	Flow	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 21-24	B21-B24	Psychological commitment	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)
Items 25-29	B25-B29	Behavioural loyalty	Strongly disagree (1), Disagree (2), Slightly disagree (3), Slightly agree (4), Agree (5), Strongly agree (6)

The data cleaning carried out on the data set is described in the following section.

5.4.2   Data Cleaning

For the purpose of this study, questionnaires that contained more than 10 percent of missing responses were discarded. Furthermore, in the case of questionnaires that had less than 10 percent missing responses, the missing responses were replaced by using the mode of the total responses for those items.

5.4.3   Tabulation of variables

Following the coding and cleaning of data, came its organisation into response categories using the tabulation process. Table 5-3 displays the frequencies of the scaled responses observed in the study.

Table 5-3:   **Frequency table of responses**

Scale item	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
	1	2	3	4	5	6
Construct 1: Satisfaction						
B1	11	19	39	114	170	111
B2	16	29	52	135	161	71
B3	17	17	47	114	167	102
B4	37	64	52	105	119	87
B5	8	16	31	87	181	141
Construct 2: Challenge						
B6	16	25	50	129	141	103
B7	14	27	63	116	149	95
B8	16	39	70	128	145	66
B9	35	52	68	114	126	69
Construct 3: Game identification						
B10	64	66	76	109	96	53
B11	41	58	67	122	121	55
B12	75	68	89	95	83	54
B13	96	83	63	84	92	46
B14	85	72	76	99	90	42

Table 5-3:   Frequency table of responses (continued …)

Scale item	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
	1	2	3	4	5	6
Construct 4: Flow						
B15	26	28	61	114	158	77
B16	13	10	32	74	189	146
B17	39	58	59	108	120	80
B18	9	23	35	85	133	179
B19	18	21	58	90	166	111
B20	34	46	67	134	123	60
Construct 5: Psychological commitment						
B21	28	39	83	123	137	54
B22	38	63	67	128	109	59
B23	46	63	76	99	122	58
B24	44	66	76	106	100	72
Construct 6: Behavioural loyalty						
B25	78	71	65	99	101	50
B26	70	77	60	100	100	57
B27	92	68	64	93	102	45
B28	119	71	63	90	67	54
B29	74	66	53	97	107	67

The next section provides an analysis of the demographic data obtained from the participants observed in this study.

5.5   DEMOGRAPHIC ANALYSIS

This section presents a detailed analysis of the sample's characteristics. Of the 600 questionnaires that were distributed, 540 were returned, of which, only 464 were viable

for use after data cleaning. This equals a response rate of 86 percent. Note that the percentages in the figures that follow have been rounded off to the nearest whole number for easier interpretation.

As illustrated in Figure 5-1, there was almost an equal response rate amongst the selected HEI campuses. University A made up 35 percent of the sample, followed by University B with 33 percent and University C made up the remaining 32 percent.

Institutions

32%
35%
33%

■ University A - Traditional

■ University B - Technical

■ University C - Comprehensive
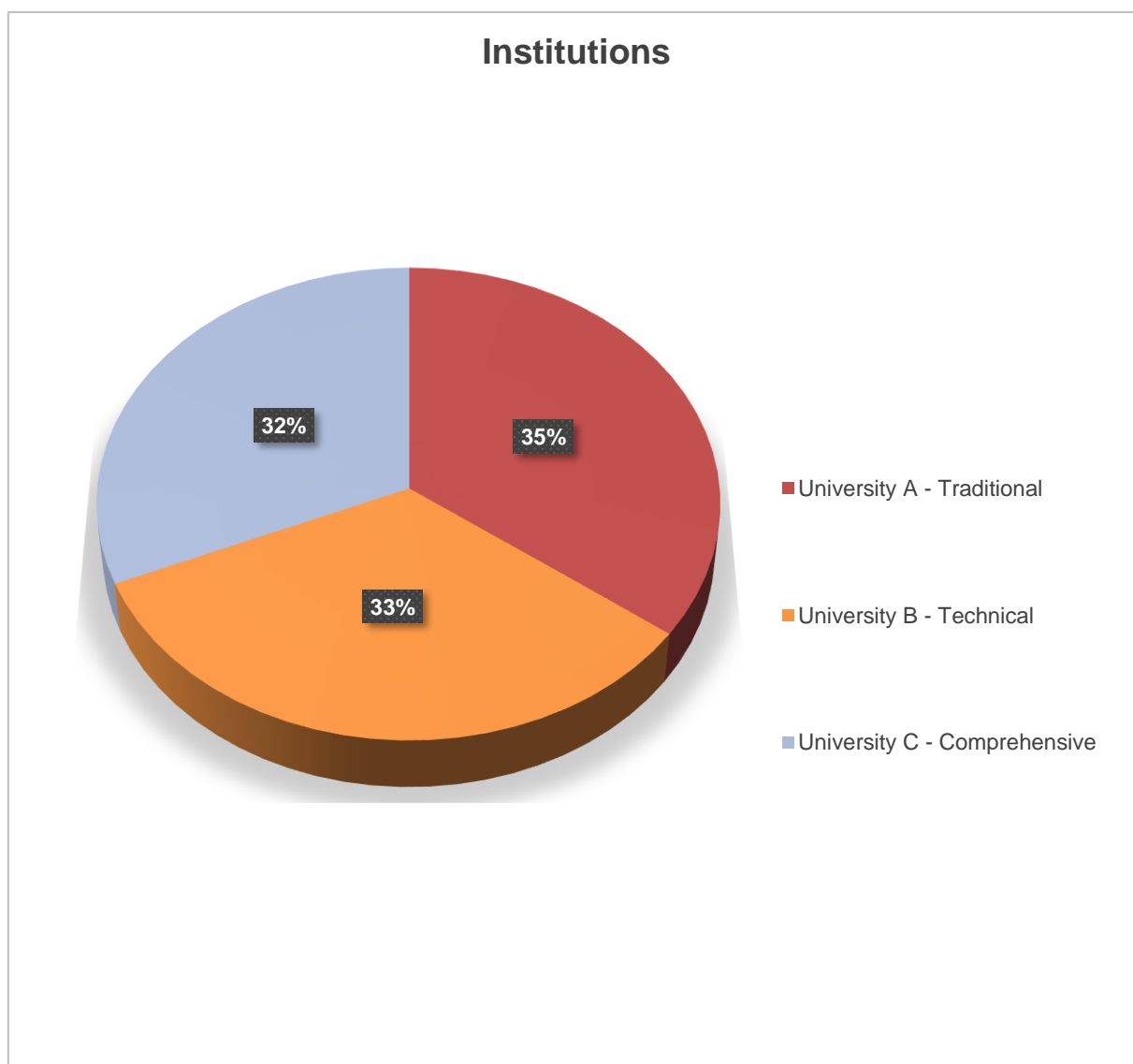
Figure 5-1:   Response rate of Institutions

Figure 5-2 displays the respondents' current year of study. It shows that 39 percent of the sample was first year students, which was the same amount recorded for second year

students. Third year students constituted a further 21 percent, and the final 1 percent was made up from post-graduate students.
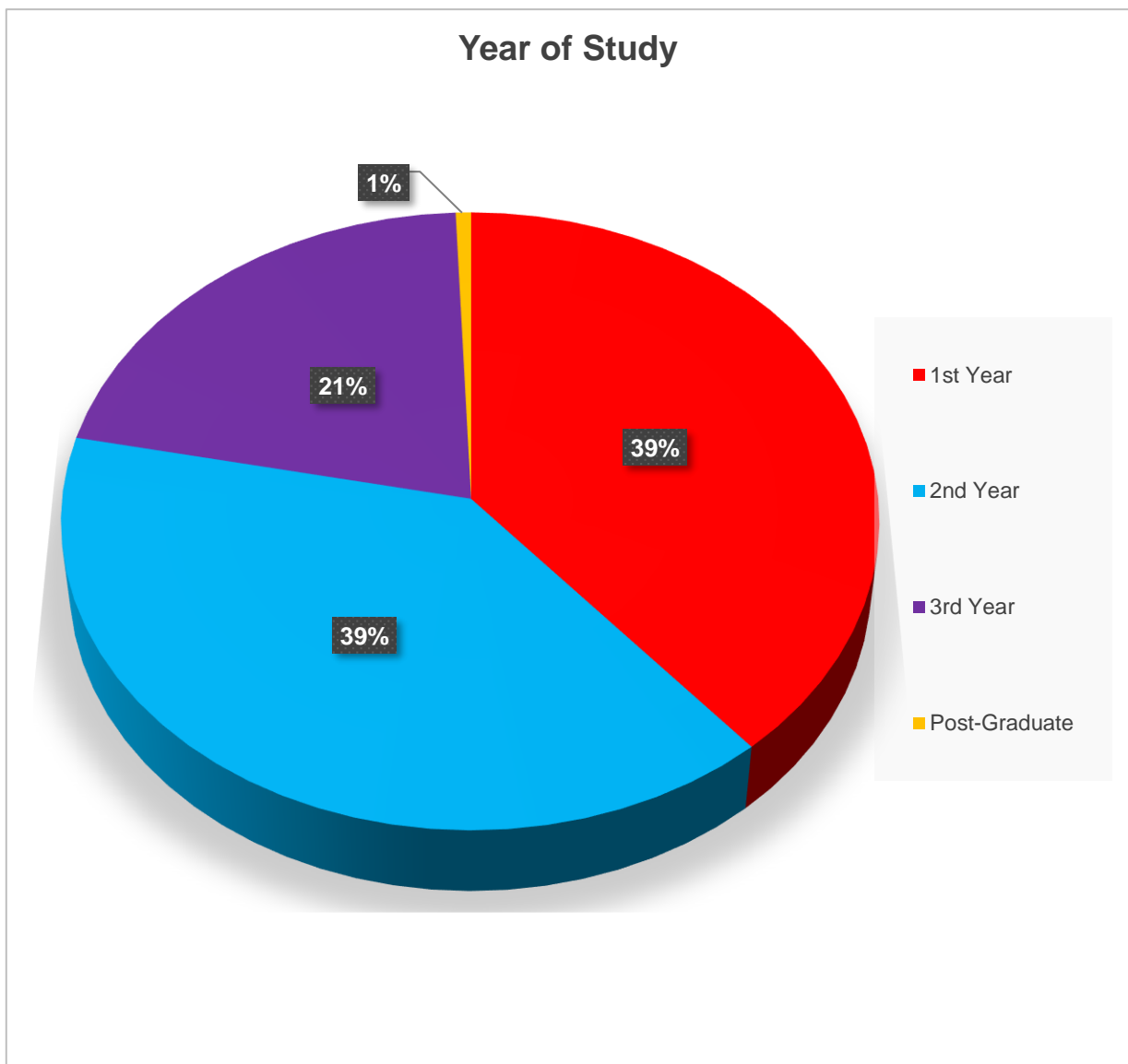
Figure 5-2:   Respondents' current year of study

As seen in Figure 5-3, there were slightly more female respondents (53%) than male respondents (47%) within the sample.
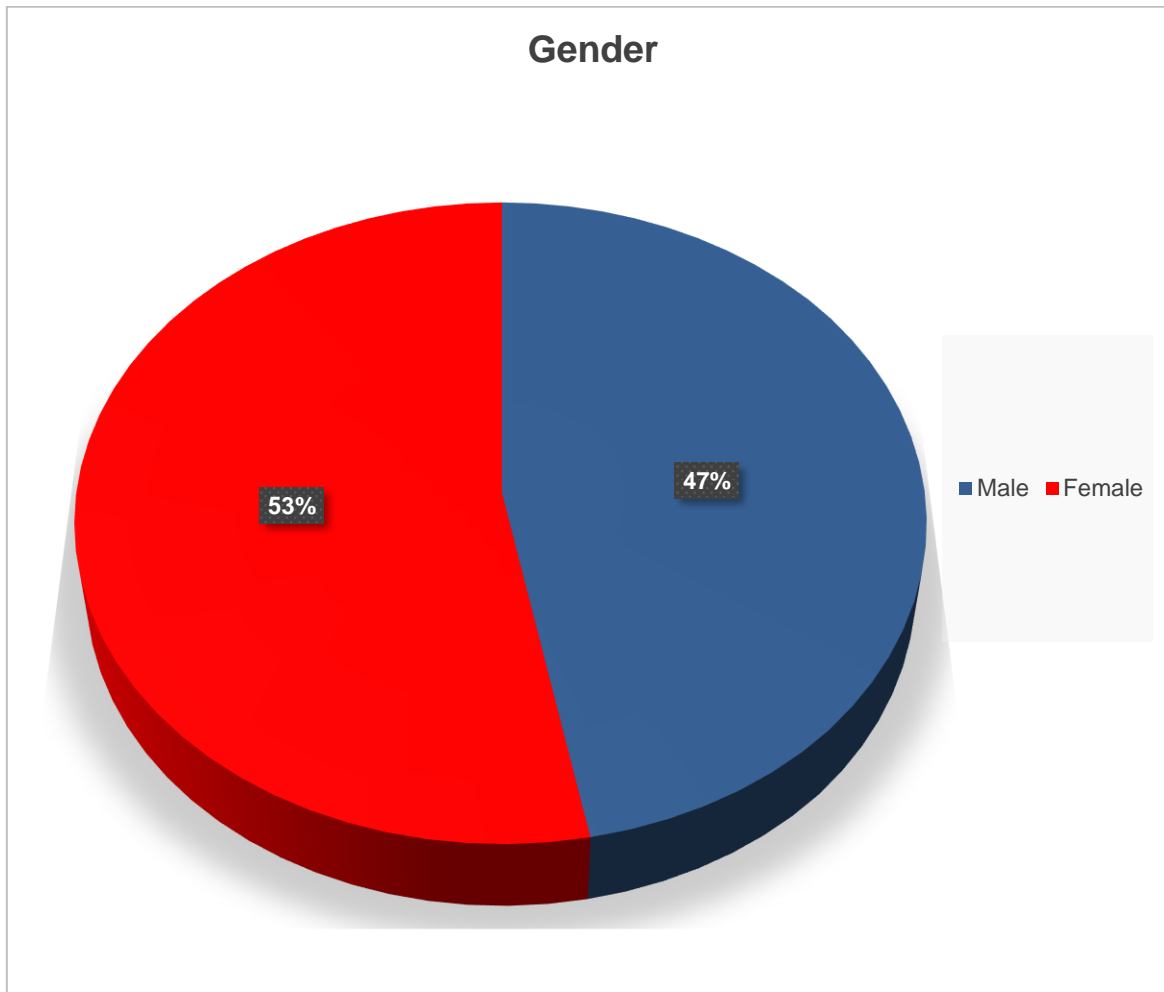
Figure 5-3: **Gender profile of respondents**

Figure 5-4 depicts the designated ethnic groups of respondents in the sample. The majority of respondents indicated their designated group as being African (86%), followed by White (11%), Coloured (2%) and Indian/Asian (1%).
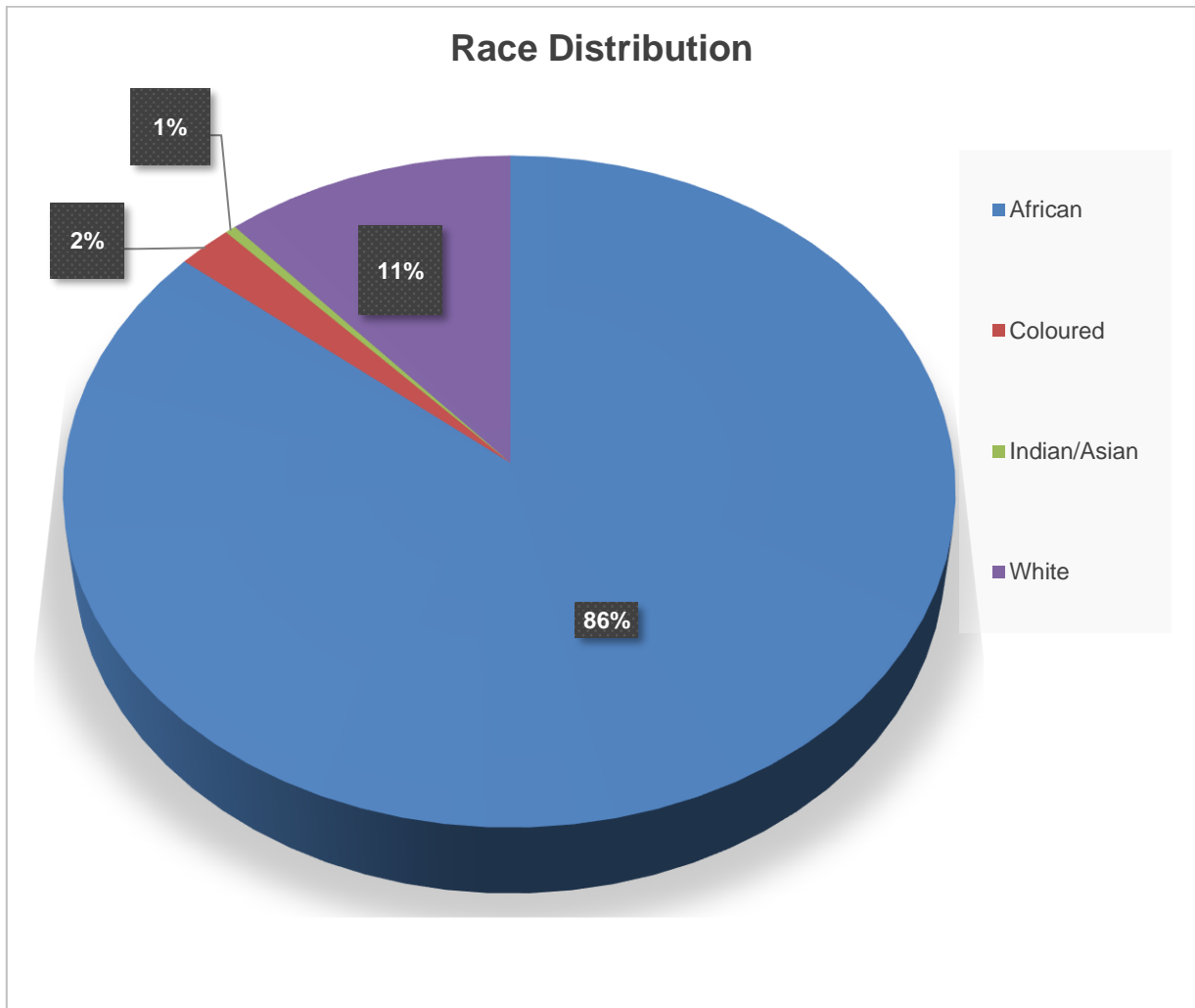
Figure 5-4:   Race distribution of respondents

Although the study was carried out in Gauteng, HEIs are known to have a diverse range of students who originate in various areas around the country. Figure 5-5 shows that the sample is represented by respondents from each of the provinces in South Africa. The bulk of the respondents originate from Gauteng (58 percent), followed by 14 percent from Limpopo, 8 percent from the Free State, 6 percent from Mpumalanga, 5 percent from Kwa-Zulu Natal, 4 percent from both the North-West and the Eastern Cape, and the remaining 1 percent comes from the Northern Cape and Western Cape combined.
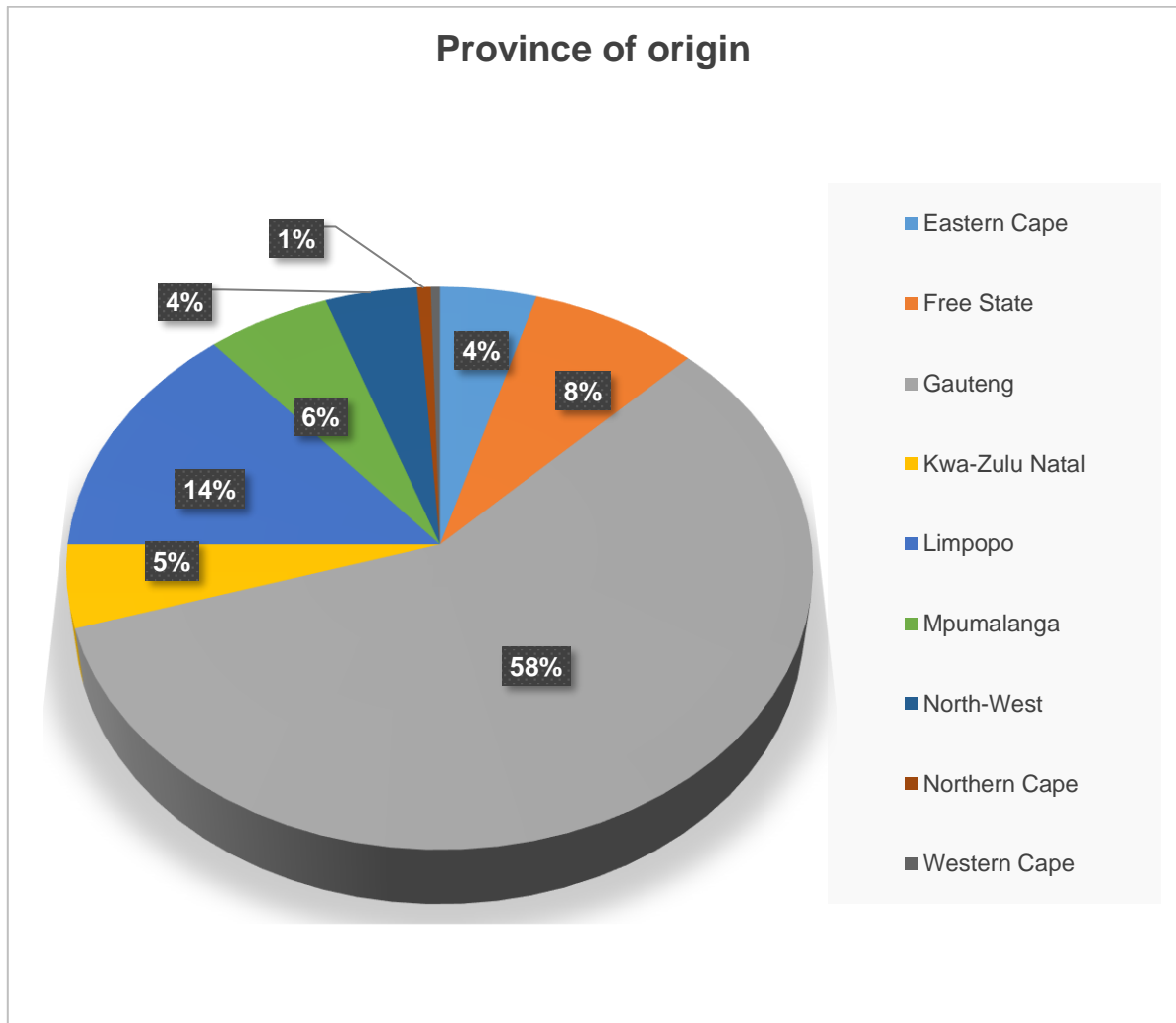
Figure 5-5:   Respondents' province of origin

Figure 5-6 indicates the respondents' home language. Results show 21 percent of respondents indicated that their home language is isiZulu, followed by Sesotho (20%), Afrikaans (10%) and Setswana (10%), Xhosa (9%), Xitsonga (8%) and Sesotho sa Leboa (8%), English (4%) and SiSwati (4%), Tshivenda (3%), and Ndebele (2%). As such, all of South Africa's 11 official languages were represented in the sample.

Mother tongue language

Legend:
- Afrikaans
- English
- Ndebele
- Xhosa
- Zulu
- Sesotho sa Leboa
- Sesotho
- Sestswana
- Siswati
- Tshivenda
- Xitshonga
- Other
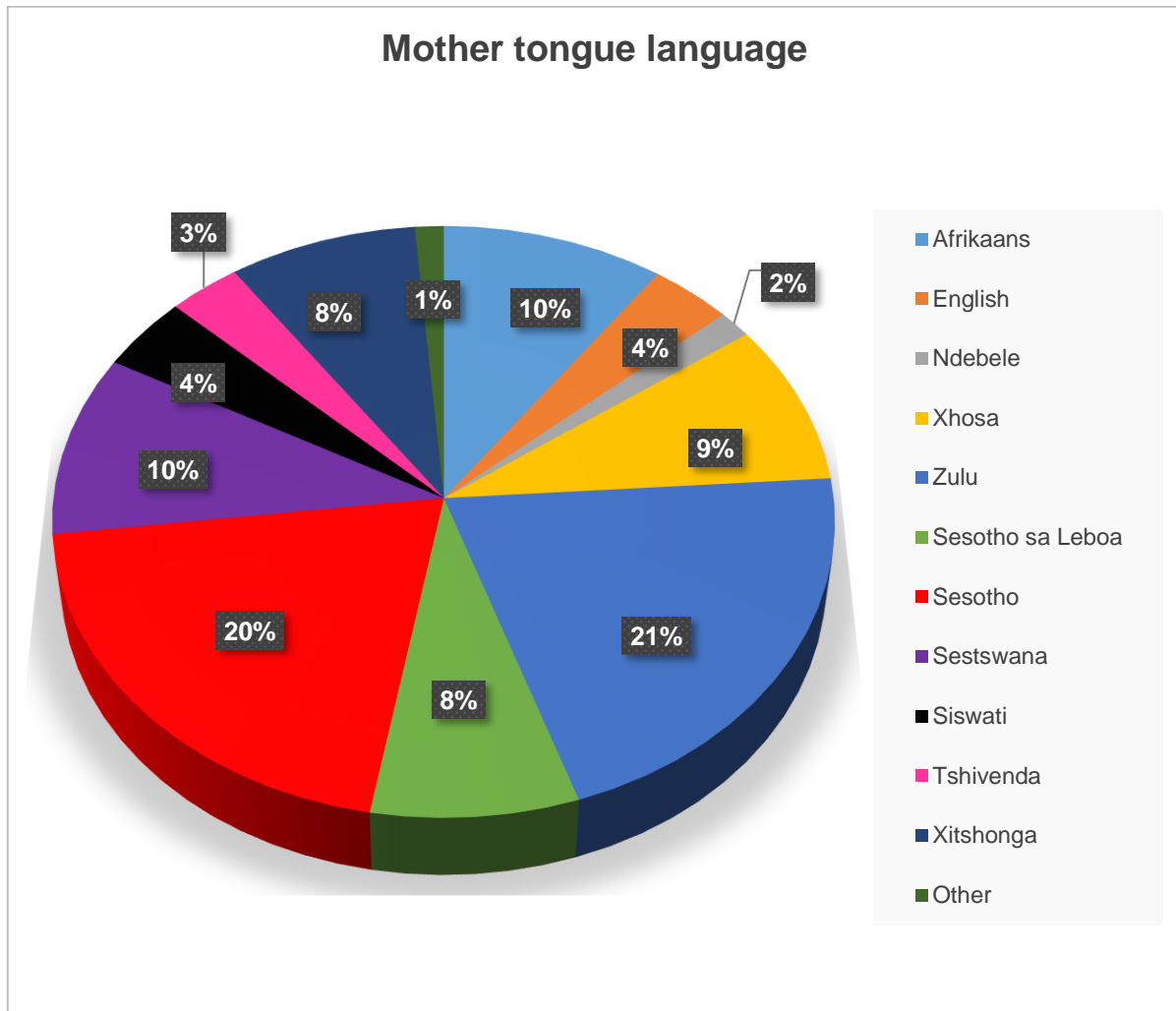
Figure 5-6   Respondents' home language

As illustrated by Figure 5-7, the respondents' age distribution ranged from 18 to 24. This indicates a representative sample of the target population as outlined in Chapter 4 (Section 4.3.1). The respondents aged 21 (24%) and 20 (22%) make up most of the sample size, but are closely followed by respondents of the age of 19 (16%). The rest of the age distribution is as follows: 22 years old (15%), 23 years old (12%), 18 years old (7%), and 24 years old (4%).
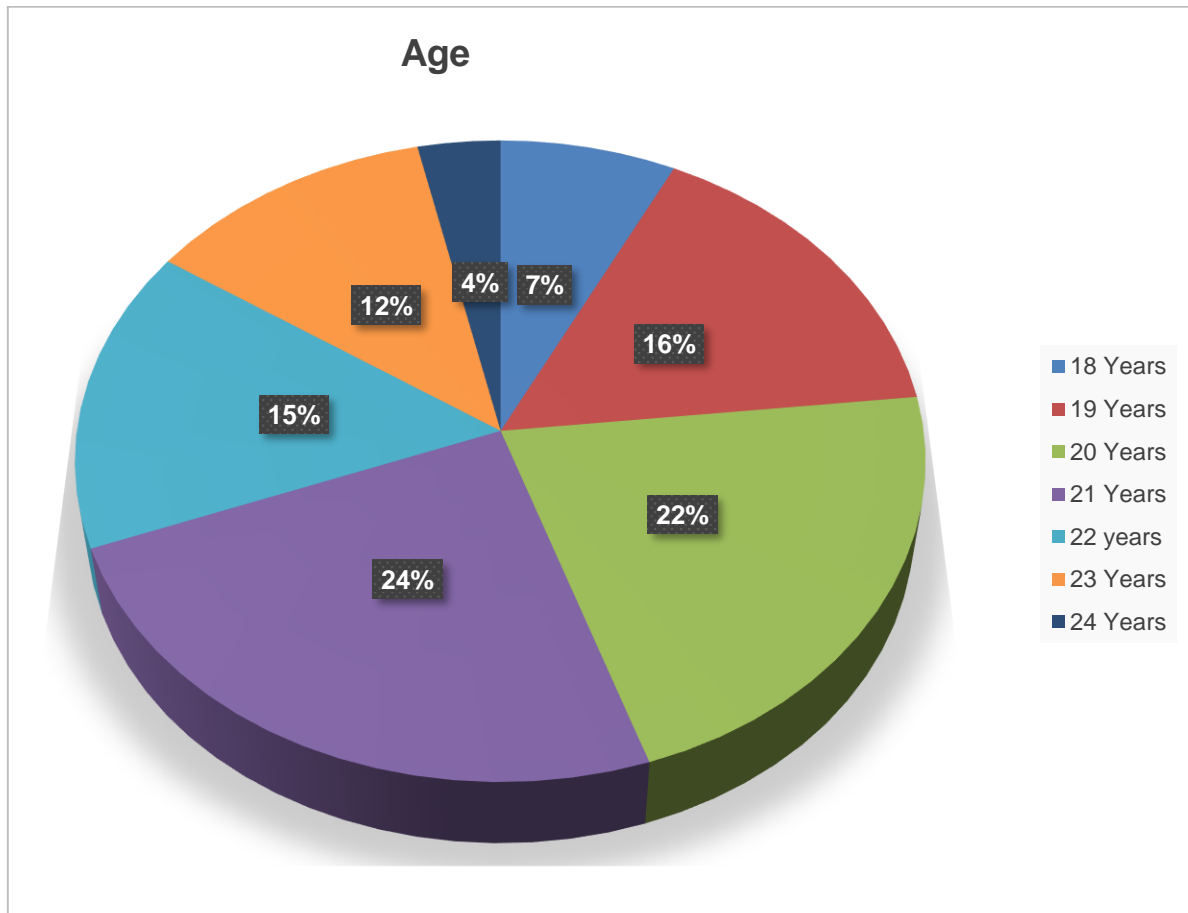
Figure 5-7:   Age distribution of respondents

The proceeding section outlines the exploratory factor analysis conducted.

5.6   EXPLORATORY FACTOR ANALYSIS

In this study, an exploratory principle components analysis using oblique promax rotation was followed to determine if any items loaded on the incorrect factor or cross-loaded. As the point of departure, the Kaizer-Meyer-Olkin (KMO) test of sampling adequacy and Bartlett's Test of Sphericity were performed on the data. The tests returned satisfactory values with a KMO=0.940 and chi square Bartlett test=6750 (df=351) at a significance level of $p=0.000<0.05$.

Once the factorability of the data was established, communalities emanating from the exploratory principle components analysis were assessed and items with values below 0.50 were excluded from the final factor analysis as indicated by Hair *et al*. (2014:117). These items include B17 (0.44) and B20 (0.49) from the construct flow. Thereafter, six

factors were specified for extraction based on prior literature. Based on the results from the extraction, the six factors explained 66.30 percent of total variance. Problematic cross-loadings were observed in the items B1 and B5 in the satisfaction scale (Lu & Wang, 2008:518-519) and B15 in the flow scale (Choi & Kim, 2004:16-17). Upon careful examination, it was decided that these items could be deleted without altering the intended purpose of the original constructs. As such, satisfaction and flow then become three-itemed scales.

The exploratory factor analysis was then rerun excluding the aforementioned items. The analysis produced a KMO of 0.934 and a Bartlett's test score of 5811.810 (df=276; p=0.000 < 0.05), which explained 68.30 percent of the variance. Table 5-4 below depicts the rotated factors from the pattern matrix, communalities of the factors and the percentage variance extracted.

Table 5-4:   **Exploratory principle components analysis**

Items	Factor loadings						Communalities
	1	2	3	4	5	6	
B2						.704	.645
B3						.800	.672
B4						.784	.595
B6				.851			.715
B7				.839			.678
B8				.829			.660
B9				.703			.569
B10		.695					.645
B11		.615					.602
B12		.849					.742
B13		.938					.751
B14		.712					.663

Table 5-5:   **Exploratory principle components analysis (continued…)**

Items	Factor loadings						Communalities
	1	**2**	**3**	**4**	**5**	**6**	
B16					.790		.711
B18					.965		.805
B19					.578		.585
B21			.827				.685
B22			.808				.752
B23			.856				.692
B24			.854				.729
B25	.825						.726
B26	.755						.719
B27	.856						.710
B28	.833						.662
B29	.810						.680
Percentage variance	39.48	9.44	5.90	5.27	4.54	3.67	

As is evident in Table 5-4, in the second exploratory factor analysis the factors aligned with the specified constructs indicating that the variables loaded as expected and were all above the 0.50 cut-off level. Furthermore, the factors explained 68.30 percent of the total variance (Hair *et al*., 2014:117).

The subsequent section, Section 5.7, provides a summary of the descriptive statistics derived from the acquired data.

5.7   DESCRIPTIVE STATISTICS

This section addresses the first empirical objective of the study. Given that this study employed a six-point Likert scale that ranged from "strongly disagree" (1) to "strongly agree" (6), mean values of ≥3.5 are associated with a positive agreement towards the

antecedents of mobile gaming brand loyalty amongst the sampled Generation Y students. As such, descriptive statistics is used to address the first empirical objective of this study (refer to Section 1.3.3 in Chapter 1). The results are presented in Table 5-5.

Table 5-6:   **Descriptive statistics**

Factors	Valid N	Mean	Std. Deviation	Skewness	Kurtosis
Satisfaction	464	4.30	1.05	-0.67	0.40
Challenge	464	4.24	1.07	-0.54	0.07
Game identification	464	3.50	1.29	-0.17	-0.80
Flow	464	4.72	1.03	-1.10	1.29
Psychological commitment	464	3.90	1.24	-0.34	-0.62
Behavioural loyalty	464	3.50	1.38	-0.14	-0.99

As seen in Table 5-5, means of ≥3.5 were recorded for all constructs, with satisfaction (mean=4.30), challenge (mean=4.24), game identification (mean=3.50), flow (mean=4.72), psychological commitment (mean=3.90) and behavioural loyalty (mean=3.50). This indicates that Generation Y students exhibit both positive psychological commitment and behavioural loyalty toward their favourite mobile game, meaning they are brand loyal to their favourite mobile game. Moreover, Generation Y students experience satisfaction with their favourite mobile game, while responding positively to the challenges posed in their favourite mobile game. Generation Y students also identify positively with their favourite mobile game, in terms of in-game characters, social communities and/or the virtual worlds they present. Lastly, the strongest positive response displayed by Generation Y students is concerning the flow construct, meaning that their favourite mobile game has created an optimal gaming experience for them.

Data normality is assumed as the kurtosis values provide no indication of irregularity and all skewness values fall within the range of -2 and +2, as recommended (Berndt & Petzer, 2011). The negatively skewed values are indicative of high scores in the distribution, which means that the distribution falls into the agreement area of the scale. The highest standard deviation was recorded for behavioural loyalty (Std. Deviation=1.38), thereby

indicating a larger data spread around the mean for that construct. Contrastingly, the lowest data spread recorded was of the mean value for the construct called flow (Std. Deviation=1.03).

The following section describes the correlation analysis that was conducted to assess the nomological validity of the hypothesised model of antecedents of mobile gaming brand loyalty, together with the collinearity diagnostics.

5.8 NOMOLOGICAL VALIDITY AND COLLINEARITY DIAGNOSTICS

This section describes the measures used to assess the nomological validity of the latent factors proposed for inclusion in the measurement model, as well as the measures to assess if there were any series multi-collinearity issues with these factors.

Malhotra (2010:321,565) indicates that constructing a correlation matrix is a practical way for assessing nomological validity of a proposed structural model. In this study, a correlation matrix was constructed using the Pearson's Product-Moment correlation coefficients for this purpose. The correlation matrix displaying the correlation coefficients between each of the pair of factors is presented in Table 5-6.

Table 5-6:   Correlation matrix

Factors	F1	F2	F3	F4	F5
Satisfaction					
Challenge	0.44**				
Game identification	0.39**	0.51**			
Flow	0.46**	0.50**	0.44**		
Psychological commitment	0.37**	0.50**	0.66**	0.53**	
Behavioural loyalty	0.36**	0.42**	0.65**	0.33**	0.56**

**Correlation is significant at the $p \leq 0.01$ level (2-tailed)

As is evident from Table 5-6, all corresponding factors recorded positive significant correlation coefficients (p≤0.01). The strongest coefficients were between game identification and psychological commitment (r = 0.66, p<0.01), and between psychological commitment and behavioural loyalty (r = 0.56, p<0.01). These results are indicative that the proposed constructs to be included in the measurement model display nomological validity.

Checking for multi-collinearity between independent factors is a necessity when conducting multivariate statistical techniques. As such, SPSS Statistics Collin instruction was used to evaluate if any multi-collinearity was present between the independent constructs. The case number was set as the dummy dependent variable. The collinearity diagnostics output is reported in Table 5-7.

Table 5-7:   Collinearity diagnostics

Dimension	Condition index	Constant	F2	F3	F4	F5	F6
1	1.000	0.0	.00	.00	.00	.00	.00
2	8.42	.08	.05	.01	.36	.02	.09
3	12.55	.00	.19	.00	.45	.05	.60
4	13.68	.00	.42	.72	.00	.00	.09
5	14.60	.53	.33	.26	.17	.04	.07
6	16.72	.39	.01	.01	.02	.89	.15
Tolerance	.71	.61	.51	.60	.48		
VIF	1.40	1.64	1.96	1.67	2.10		

Table 5-7 shows no evidence of multi-collinearity between the independent variables of satisfaction, challenge, game identification, flow and psychological commitment, owing to the last root has a condition index below 0.30 and none of the factors have more than one variance proportion greater than 0.50 (Field, 2009:242). In addition, tolerance values indicate the level of variance in the independent variable, which has not been accounted for by the remaining independent variables. Using the formula $1-R^2$, tolerance levels of

≤0.10 and variance inflation factor (VIF) values of ≥10 are problematic (Orme & Combs-Orme, 2009:27).

The formulated hypotheses, which were tested using SEM and a two independent-samples t-test, are outlined in the next section.

5.9 HYPOTHESIS TESTING

This section reiterates the hypotheses set out in Chapter 1 (Section 1.3.3). Hypothesis formulation occurred after the literature was comprehensively reviewed in Chapter 2 and Chapter 3. For this study, the significance level was fixed at the 99 percent confidence interval; that is, a=0.01. The following decision rule was applied:

If P-value ≥ α, then conclude H_0.

If P-value < α, then conclude H_a.

The following five hypotheses were formulated and tested:

H_o1: Antecedents of mobile gaming brand loyalty is not a six-factor structure comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty.

H_a1: Antecedents of mobile gaming brand loyalty is a six-factor structure comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty.

H_o2: Satisfaction (+), challenge (+) and game identification (+) do not positively influence the mobile gaming flow experienced by Generation Y students.

H_a2: Satisfaction (+), challenge (+) and game identification (+) do positively influence the mobile gaming flow experienced by Generation Y students.

H_o3: Flow (+) does not positively influence the psychological commitment of Generation Y students toward their favourite mobile game.

H_a3: Flow (+) does positively influence the psychological commitment of Generation Y students toward their favourite mobile game.

H_o4:   Psychological commitment (+) does not positively influence Generation Y students' behavioural loyalty toward their favourite mobile game.

H_a4:   Psychological commitment (+) does positively influence Generation Y students' behavioural loyalty toward their favourite mobile game.

H_o5:   There is no statistically significant difference between male and female Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty concerning mobile gaming brand loyalty.

H_a5:   There is a statistically significant difference between male and female Generation Y students' mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards their favourite mobile game.

The following section details the SEM process used to test the proposed model of antecedents that affect the Generation Y students' mobile gaming brand loyalty.

5.10   STRUCTURAL EQUATION MODELLING

In this study, SEM was conducted to test the formulated hypotheses, H_o1 to H_o4.

5.10.1   Measurement model specification

Confirmatory factor analysis was conducted in order to address the second empirical objective set out in Chapter 1. In accordance with the literature reviewed in Chapter 2 and Chapter 3 and the factor analysis in this chapter, the hypothesised measurement model was specified as a six-factor structure comprising the following latent or unobserved factors, namely satisfaction (F1) (three indicators), challenge (F2) (four indicators), game identification (F3) (five indicators), flow (F4) (three indicators), psychological commitment (F5) (four indicators) and behavioural loyalty (F6) (five indicators). The MLE method was applied in both CFA (measurement model) and path analysis (structural model) procedures, as advised by Hair *et al.* (2014:575). The hypothesised measurement model is specified in Figure 5-8.
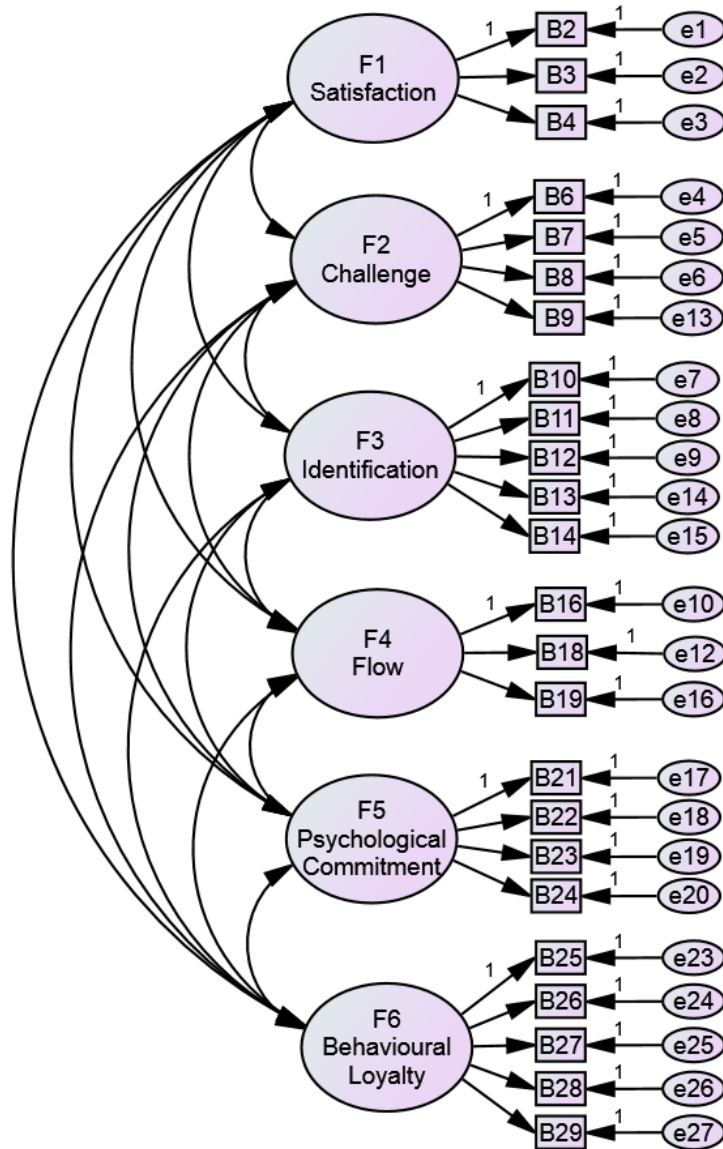
Figure 5-8:   Specified measurement model

For model identification purposes, the first loading of all six factors were fixed at 1.0. There are 300 distinct sample moments and 63 parameters to estimate, thus, giving a total of 237 degrees of freedom (df) based on the over-identified model. A chi-square value of 502 was returned at a probability level of p=0.000<0.05. The measurement model was scrutinised for any problematic estimates by evaluating the standardised factor loadings and error variance estimates. Hair *et al.* (2014:618) state that negative error variances (Heywood cases) must be avoided, while factors should load above 0.50 and

below 1.0. Table 5-8 displays the estimated standardised coefficients of the measurement model.

Table 5-8: **Estimated standardised coefficients of the measurement model**

Latent factors	Constructs	Indicators	Estimated factor loadings	Error variance
F1	Satisfaction	B2	0.74	(+) 0.55
		B3	0.69	(+) 0.47
		B4	0.50	(+) 0.25
F2	Challenge	B6	0.79	(+) 0.62
		B7	0.73	(+) 0.54
		B8	0.74	(+) 0.55
		B9	0.67	(+) 0.45
F3	Game identification	B10	0.76	(+) 0.58
		B11	0.71	(+) 0.50
		B12	0.81	(+) 0.66
		B13	0.78	(+) 0.60
		B14	0.77	(+) 0.59
F4	Flow	B16	0.75	(+) 0.56
		B18	0.73	(+) 0.53
		B19	0.71	(+) 0.50
F5	Psychological commitment	B21	0.77	(+) 0.59
		B22	0.84	(+) 0.70
		B23	0.75	(+) 0.56
		B24	0.78	(+) 0.61

Table 5-8: Estimated standardised coefficients of the measurement model (continued …)

Latent factors	Constructs	Indicators	Estimated factor loadings	Error variance
F6	Behavioural loyalty	B25	0.82	(+) 0.68
		B26	0.83	(+) 0.69
		B27	0.78	(+) 0.61
		B28	0.71	(+) 0.51
		B29	0.75	(+) 0.56

As seen in Table 5-8, there is no evidence of any problematic estimates or negative error variances; all factor loadings were above the 0.50 threshold and no negative error variance estimates were recorded. The model fit was assessed using the fit indices specified in Chapter 4, namely the chi-square, the SRMR, the RMSEA, the GFI, the IFI, the CFI and the TLI. The significant chi-square value of 502 (df:237), with a probability level equal to p=0.000 suggested a poor fit model. This is not uncommon as the chi-square statistic is known to be a highly sensitive to large sample sizes (Byrne, 2010:76; Malhotra, 2010:732). Despite this, the remaining fit indices produced by AMOS displayed an acceptable degree of fit and are displayed in Table 5-9.

Table 5-9: Fit indices for the measurement model

Fit indices	SRMR	RMSEA	GFI	IFI	CFI	TLI
Recommended value	≤ 0.08	≤ 0.08	≥ 0.90	≥ 0.90	≥ 0.90	≥ 0.90
Measurement model result	0.05	0.05	0.92	0.95	0.95	0.95
Conclusion	√	√	√	√	√	√

As indicated in Table 5-9, SRMR and RMSEA values were below the recommended ≤ 0.08, while values for the GFI, IFI, CFI and TLI were all recorded above the 0.90 cut-off level. Therefore, the measurement model displayed an acceptable model fit. The next step is to assess the reliability and validity of the measurement model.

5.10.2 Reliability and validity of the measurement model

Before proceeding to the structural model, it is important to verify the reliability and validity of the factors making up the model for mobile gaming brand loyalty. Nomological validity was established in Section 5.8. In this section, internal-consistency and composite reliability, as well as convergent and discriminant validity are assessed. This process involves reporting on the Cronbach alphas, CR, AVE, square root of AVE and the correlation coefficient values calculated in the measurement model. Table 5-9 displays the calculated values of the Cronbach alphas, CRs, AVEs, the square root of the AVEs, and the correlation coefficients.

Table 5-10: Correlation matrix, CR values, AVE values, square roots of AVE values

Factors	CR	Cronbach alpha	AVE	√AVE	Satisfaction	Challenge	Game identification	Flow	Psychological commitment
Satisfaction	0.75	0.89	0.50	0.71					
Challenge	0.80	0.87	0.50	0.71	0.59				
Game identification	0.83	0.86	0.50	0.71	0.45	0.58			
Flow	0.80	0.82	0.50	0.71	0.67	0.66	0.77		
Psychological commitment	0.80	0.77	0.50	0.71	0.47	0.58	0.76	0.70	
Behavioural loyalty	0.83	0.68	0.50	0.71	0.44	0.48	0.74	0.47	0.65

As indicated in Table 5-10, internal-consistency reliability is evident as all factors displayed satisfactory Cronbach's alpha values ranging from 0.68 to 0.89, which are above the acceptable level of ≥0.60 (Hair *et al.*, 2014:90; Malhotra, 2010:319). In addition, all CR values fell between 0.75 and 0.83, and are above the recommended cut-off level

of 0.70, which indicates acceptable composite reliability. Moreover, the AVE values were all calculated at 0.50, which is equal to the recommended cut-off level of 0.50, thereby indicating convergent validity (Hair *et al.,* 2014:632-633). For discriminant validity, all correlation coefficients were smaller than the square root of the AVE, except for three out of the 15 cases. However, a certain degree of inter-correlation is to be expected as the six-dimension model is measuring similar aspects of brand loyalty. A similar result was observed in the studies by Teng (2013:887) and Bauer *et al.* (2008:217). In addition, the amount by which the three violations exceeded the square root value of the AVE (0.03, 0.05 and 0.06) were considered to be miniscule and may also have occurred through chance due to the large size of the correlation matrix.

In conclusion, the specified measurement model displayed acceptable levels of reliability, convergent validity, discriminant validity and nomological validity, as well as demonstrating an acceptable model fit. Based on this evidence, it is concluded that the null hypothesis, H_o1, should be rejected and the alternate hypothesis, H_a1, be accepted. As such, antecedents of mobile gaming brand loyalty can be considered to be a six-factor structure. Therefore, statistical accuracy of the measurement model is proven and path analysis can be carried out.

In the following section, the hypothesised structural model and the results of path analysis are presented.

5.10.3   Structural model

This section addresses the third empirical objective set out in Chapter 1. The first hypothesised structural model (Structural Model A) was used to test hypotheses H_o2 to H_o4. As such, it hypothesised that satisfaction (F1), challenge (F2) and game identification (F3) have a direct positive influence on flow (F4). Thereafter, it was theorised that flow (F4) has a direct positive influence on psychological commitment (F5), which, in turn, positively influences behavioural loyalty (F6). Note that the covariance lines between the interdependent variables, the residuals of the interdependent variable and the indicator variables of the latent factors have been omitted from all structural models in this chapter to allow for improved visual representation and interpretation. The complete detailed models can be perused in Annexure B, which is included at the end of the thesis.

Figure 5-9 depicts the regression path estimates (denoted as β) for Structural Model A.
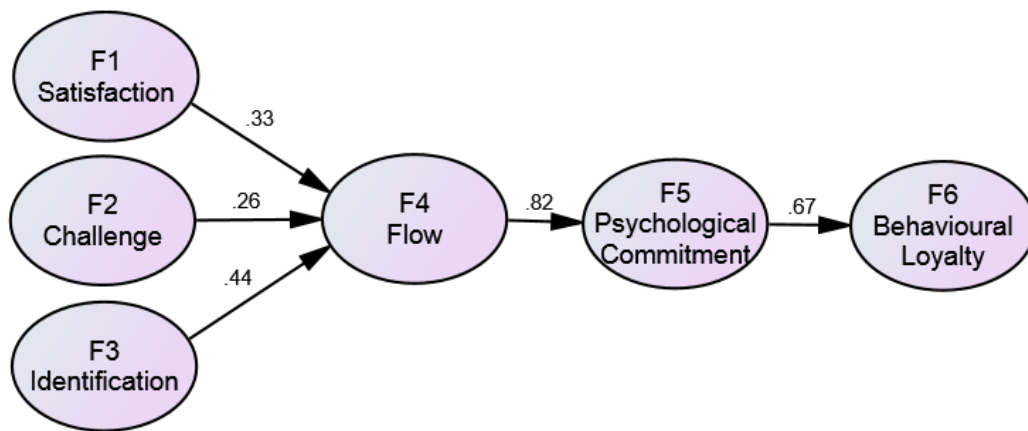
Figure 5-9:   Structural Model A

In terms of model fit, Structural Model A provided an expected problematic chi-square value of 708.96 with 244 degrees of freedom at a probability level of p=0.000<0.05. The fit indices for GFI=0.88 fell just below the acceptable level, while the remaining fit indices computed acceptable values of RMSEA=0.06, SRMR=0.08, IFI=0.92, CFI=0.92 and TLI=0.91.

The results from Structural Model A revealed that satisfaction (F1) (β=0.33, p=0.000<0.01), challenge (F2) (β=0.26, p=0.000<0.01), and game identification (β=0.44, p=0.000<0.01) have a significant positive influence on the flow (F4) experienced by Generation Y students playing their favourite mobile game. This infers that null hypothesis H_o2 is rejected and the alternate hypothesis H_a2 is accepted. In addition, flow (F4) (β=0.82, p=0.000<0.01) displayed a strong and significantly positive influence on Generation Y students' psychological commitment towards their favourite mobile game. As such, null hypothesis H_o3 is rejected and the alternate hypothesis H_a3 is accepted. Lastly, psychological commitment (F5) (β=0.67, p=0.000>0.01) also displayed a strong and positive significant influence on the behavioural loyalty (F6) of Generation Y students towards their favourite mobile game. Therefore, the null hypothesis H_o4 is rejected and the alternate hypothesis H_a4 is accepted.

Despite Structural Model A achieving good fit indices and significant positive structural paths, Hair *et al.* (2014:542) suggest introducing competing models to determine if the original structural model provides the best possible model fit. Furthermore, Kline (2011:220) proposes using Akaike's information criterion (AIC) and Bozdogan's consistent version of the AIC (CAIC) when determining a better model fit; lower AIC and CAIC suggest a better fitting model. Structural Model A delivered an AIC value of 821 and a CAIC value of 1109.

Based on the literature, a competing model (Structural Model B) was introduced to determine if it would improve overall model fit. In Structural Model B, a direct path was introduced from the independent factors of satisfaction (F1), challenge (F2) and game identification (F3) to test if they could directly affect the psychological commitment (F5) of Generation Y students towards their favourite mobile game. Figure 5-10 below depicts the competing Structural Model B.
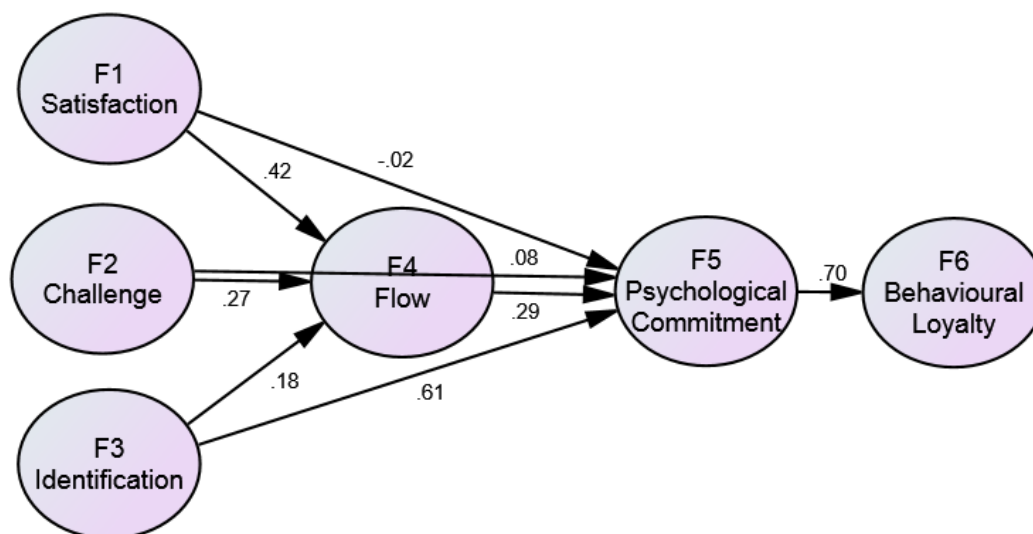
Figure 5-10:   Structural Model B

Structural model B produced an improved chi-square of 572.45 (df=241) and reported slightly improved fit indices for RMSEA=0.06, SRMR=0.06, GFI=0.90, IFI=0.94, CFI=0.94, and TLI=0.93. In addition, Structural Model B provided slightly lower AIC (690) and CAIC (994) values than Structural Model A, which suggests an improvement of model fit (Kline, 2011:220).

However, when looking at Structural Model B, the new paths from satisfaction (F1) (β=0.02, p=0.732>0.01) and challenge (F2) (β=0.08, p=0.166>0.01) to psychological commitment (F5) are not significant. The finding for satisfaction contradicts previous brand loyalty literature (Baig, 2015:2; Nam *et al.,* 2011:1022; Amine, 2008:311; Lu & Wang, 2004:504). Despite this, satisfaction still has an indirect influence on psychological commitment via its direct influence on flow, which is in line with prior theories of flow (Alzahrhani *et al.,* 2017:248; Chang, 2013:319; Lee & Tsai, 2010:613; Lee, 2009:849). The finding for challenge is in line with a study conducted by Teng (2013:889) on customer loyalty towards online video games, which revealed that it does not directly affect loyalty but invokes a state of flow, which, in turn, leads to consumer loyalty. Note that the above findings are new for mobile gaming brand loyalty and require further research investigation.

Taking the above into account, a third structural model, Structural Model C, was introduced, which omitted the two insignificant paths (F1→F5, p=0.732>0.01; F2→F5, p=0.166>0.01) seen in Structural Model B. As such, Structural Model C is depicted in Figure 5-11.
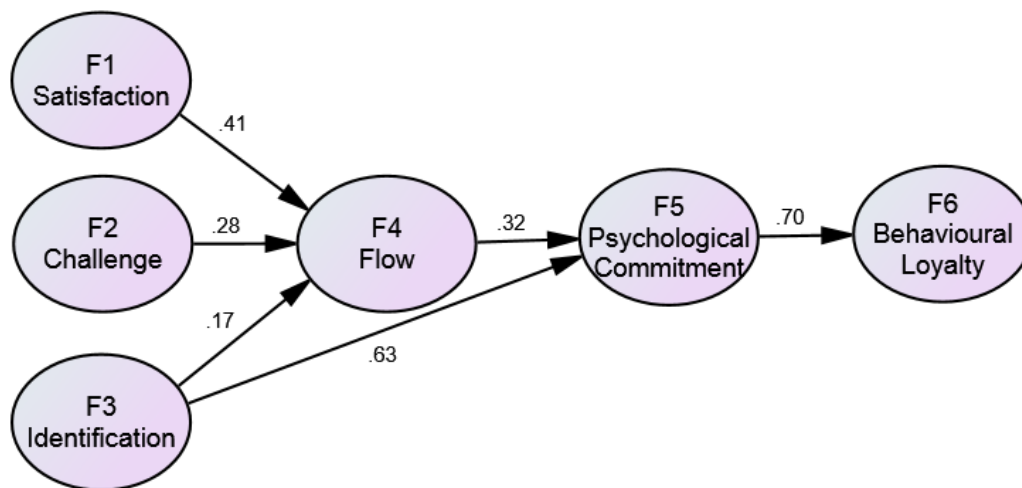
Figure 5-11: **Structural Model C**

In terms of model fit, Structural Model C produced a slightly higher chi-square of 574 (df=243) when compared to Structural Model B. However, it reported improved fit indices for RMSEA=0.05 and GFI=0.91, while the fit indices for SRMR=0.06 IFI=0.94 CFI=0.94

and TLI=0.93 remained the same. Crucially, Structural Model C displayed the best model fit thus far, with the lowest recorded values of the three models, for AIC (688) and CAIC (981).

All path estimates in Structural Model C are significant, much like in Structural Model A. The difference being the additional path from game identification (F3) (β=0.63, p=0.000<0.01) to psychological commitment (F5), which proves to be positively significant. With game identification being a conceptualisation of brand identification, this finding is not new in brand loyalty and identification literature, and is in line with previous studies (Gabbiadini, Riva, Andrighetto, Volpato & Bushman, 2016:11; Badrinarayanan *et al.,* 2014:886; Bauer *et al.,* 2008:212; Hefner *et al.,* 2007:39-40; Chaudhari & Holbrook, 2001:81; Amine, 1998:308). In addition, the positively significant influence of flow (F4) (β=0.32, p=0.000<0.01) on psychological commitment (F5) was also found in the study done on online video games, conducted by Choi and Kim (2004:22). However, Choi and Kim's (2004:22) study viewed loyalty as a one-dimensional construct and not two-dimensional, as is the case in this study. As such, this is a new finding in mobile gaming brand loyalty and warrants further investigation. Lastly, psychological commitment (F5) (β=0.70, p=0.000<0.01) displayed a strong positive significant influence on behavioural loyalty (F6). Although this finding is new for mobile gaming brand loyalty, it is consistent with previous studies and brand loyalty literature (Bauer *et al.,* 2008:212; Amine, 1999:308).

In terms of the squared multiple correlation coefficient, satisfaction, challenge and game identification explain 54 percent of the variance in flow experienced by Generation Y students when playing their favourite mobile game. In turn, flow and game identification explain 72 percent of the variance in Generation Y students' psychological commitment towards their favourite mobile game. Lastly, psychological commitment explains 50 percent of the variance in Generation Y students' mobile gaming behavioural loyalty.

A comparison of the results produced from Structural Model A, B, and C is provided in Table 5-11 below.

Table 5-7:   Structural model comparison

Measures	Recommended value	Model A	Model B	Model C
Chi-square (X^2)	Low X^2 value	709	573	574
GFI	≥0.90	0.88	0.90	0.91
IFI	≥0.90	0.92	0.94	0.94
TLI	≥0.90	0.91	0.93	0.93
CFI	≥0.90	0.92	0.94	0.94
RMSEA	≤0.08	0.06	0.06	0.05
SRMR	≤0.08	0.08	0.06	0.06
AIC	Small positive values	821	690	688
CAIC	Small positive values	1109	994	981

Table 5-11 shows that fit indices improved from Model A to Model B and then to Model C. In addition, Structural Model C has the best fit indices, with the exception of X^2. Although Structural Model B had a lower final X^2 value, the AIC and CAIC values for Structural Model C show a better fit when compared to Structural Model B. As such, the results suggest that the competing Structural Model C demonstrates a better model fit than the initial hypothesised Structural Model A and the first revised model, Structural Model B.

The outcome of the two independent-samples t-test is detailed in the next section.

5.11   TWO INDEPENDENT-SAMPLES T-TEST

In this section, the fourth empirical objective is addressed. This study utilised a two independent-samples t-test to determine if any significant differences exist between male and female respondents on the constructs measured in this study. The two independent-samples t-test tested the last hypothesis, H_o5.

Table 5-12 reports on the mean, standard deviation, t-statistic, and p-value for male and female Generation Y students' satisfaction, challenge, game identification, flow,

psychological commitment, and behavioural loyalty concerning mobile gaming brand loyalty.

Table 5-12:   Gender difference

Constructs	Male Mean N=218	Male Std. Dev.	Female Mean N=246	Female Std. Dev.	*t*-value	p-value	Cohen's D
Satisfaction	4.10	1.07	4.43	1.00	3.42	0.001	0.32*
Challenge	4.10	1.11	4.37	1.02	2.68	0.008	0.25*
Game identification	3.45	1.28	3.54	1.31	0.77	0.444	****
Flow	4.59	1.09	4.84	0.97	2.52	0.012	0.24*
Psychological commitment	3.86	1.19	3.84	1.28	-0.22	0.827	****
Behavioural intention	3.56	1.30	3.34	1.44	-1.76	0.078	****

*	Small effect, practically non-significant
**	Medium effect and moving towards practical significance
***	Large effect, practically significant
****	Cohen's D-statistic not calculated as the variable was not statistically significant

As is evident in Table 5-12, there were no statistical significant (p≤0.01) differences between male and female Generation Y students' game identification, psychological commitment and behavioural loyalty concerning mobile gaming brand loyalty. As such, the null hypothesis, H_o5, cannot be rejected for these four constructs. However, statistically significant differences were observed for satisfaction, challenge and flow, whereby female Generation Y students were found to experience a statistically significant higher level of satisfaction, challenge and sense of flow with their favourite mobile game than their male counterparts. Therefore, the null hypothesis, H_o5, is rejected for satisfaction, challenge and sense of flow, and the alternative, H_a5, concluded.

The Cohen's D-statistic was calculated to determine if the differences of female Generation Y students' satisfaction, challenge and flow had any practical significance. The results indicated that the effects of these differences were practically non-significant, according to the Cohen's D-statistic.

5.12   CONCLUSION

The purpose of this chapter was to report and interpret the empirical findings of the study. The chapter provides a discussion of the results derived from the pilot test with specific focus on reliability and validity measuring instrument. The results proved that the scale to be used in the main study was both reliable and valid. The preliminary data analysis comprising the coding, cleaning, and tabulation of data is also discussed. The demographic profile of the sample is illustrated and reported on. An exploratory factor analysis was conducted to determine the factorability of the data, and items that loaded poorly were removed. Thereafter, descriptive statistics were computed on the data set. This included reporting on the mean, standard deviation, skewness, and kurtosis values. Data normality was proven and means of ≥3.5 were recorded, indicating a positive agreement towards the scales. Moreover, nomological validity of the scales was tested using Pearson's Product-Moment correlation coefficient to determine if there are any significant relationships between the constructs in the scale. All constructs displayed significant positive correlations at a significance level of $p \leq 0.01$ (2-tailed) and no serious signs of multi-collinearity were evident.

Based on the aforementioned results, SEM was then implemented. A hypothesised measurement model was tested for reliability and validity using correlation coefficients, CR values, AVE values, and square root of the AVE values. Model fit was also assessed, and the results revealed that the antecedents of mobile gaming brand loyalty are defined by a six-factor structure. Once this was established and path analysis was carried out, Structural Model A was specified and resulted in null hypotheses H_o2, H_o3, and H_o4 being rejected and their alternatives accepted. A competing model, Structural Model B, was introduced to determine if the original Structural Model A provided the best fit. Structural Model B provided improved fit indices over structural Model A, but contained two insignificant paths. A third structural model, Structural Model C, was then concluded where the two insignificant paths were omitted. As such, Structural Model C produced the best model fit of the three structural models. In conclusion, Structural Model C was the accepted model for this research study as it is both theoretically justified and empirically validated through hypothesis confirmation.

Finally, a two-independent samples t-test was carried out to test if any significant gender differences exist concerning Generation Y students mobile gaming brand loyalty. The test revealed no statistical significant differences between male and female Generation Y students' game identification, psychological commitment, and behavioural loyalty concerning mobile gaming brand loyalty. Therefore, the null hypothesis, H_o5, was not rejected for these three aspects. Interestingly, female Generation Y students displayed a stronger positively significant stance towards satisfaction, challenge and flow, leading to the rejection of null hypothesis H_o5, and the alternative H_a5 being concluded for those three aspects. However, the effects of these differences were deemed practically non-significant according to Cohen's D-statistic.

The next chapter presents the main findings, recommendations, limitations, contributions, and concluding remarks emanating from this study. The findings are presented in line with the initial objectives set out in Chapter 1 of this study.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The rapid dissemination of smartphones into global markets over the past decade has given rise to many popular mobile service applications. None have been as popular, or as successful, as mobile games. A report released by market intelligence organisation, Newzoo, revealed that mobile games will contribute a staggering 76 percent of the expected $92.1 billion mobile app revenue in 2018 (Taylor, 2018) (Section 2.1). The most popular mobile games such as Angry Birds, Candy Crush Saga, and Clash of Clans have been transformed into thriving mobile gaming brands that have crossed over into other markets. The developers of these mobile games have successfully implemented freemium business models, whereby these games generate significant amounts of revenue through in-app purchases from loyal video game players (Section 2.3). Retention of loyal players is critical to the ongoing success of these mobile gaming brands (Section. 3.3.3). As such, developers spend billions of dollars on consumer-centric marketing programmes to build and maintain brand loyalty across all extensions of their mobile gaming brands (Section 3.2.1).

A key factor in building strong brand equity and brand loyalty is being able to correctly identify, attract and retain a suitable target market (Section 3.3). In South Africa, the average consumer playing mobile games ranges between 16 and 34 years old (Section 3.5.2). This range falls predominantly under the Generation Y consumer classification, a generation that made up approximately 40 percent of the South African population in 2017, making it the largest represented age cohort in the country. Generation Y individuals are the most tech-savvy of all generations to date, and spend half their day using modern technologies. This has made the opinions of Generation Y members on various technologies highly sought after by marketers (Section 3.5.1). Members of this generation who attend a tertiary institution are of particular value to marketers due to their market potential, high future earning potential, and significant social influence on the wider Generation Y segment (Section 3.5.2).

Understanding the antecedents of mobile gaming brand loyalty amongst the Generation Y cohort is likely to make a valuable contribution towards current brand strategies. The primary objective of this study was to develop and empirically test the influence of satisfaction, challenge, game identification and flow on South African Generation Y students' mobile gaming brand loyalty. The findings may provide further insight into this phenomenon which, in turn, marketers and video game developers can adapt into future strategies aimed at this cohort.

The purpose of Chapter 6 is to summarise the entirety of the study and it begins with an overview of the previous chapters (Section 6.2). The main findings of the empirical portion of this study are presented in Section 6.3, while the contributions of the study are discussed in Section 6.4. The recommendations are outlined in Section 6.5, followed by the limitations and future research opportunities in Section 6.6. Lastly, Section 6.7 concludes the chapter with brief remarks.

6.2 OVERVIEW OF THE STUDY

The purpose of this section is to outline the observations concluded from the preceding five chapters. Additionally, this section serves as a backdrop to the final recommendations based on the findings of this study.

Chapter 1 introduced the topics of mobile gaming and brand loyalty (Section 1.1) and outlined the need to develop a model of antecedents of mobile gaming brand loyalty (Section 1.2). This formed the basis of the study's primary objective in Section 1.3.1, which was to determine the antecedents of mobile gaming brand loyalty amongst Generation Y students. The primary objective was broken down into nine theoretical objectives and four empirical objectives set out in Section 1.3.2 and Section 1.3.3, respectively. In line with the four empirical objectives, five hypotheses were formed and presented in Section 1.4. Thereafter, the proposed research methodology and research design used to achieve these objectives were outlined in Section 1.5. The methodology included following a descriptive research design that used a cross-sectional survey method for data collection. Section 1.6 covered the demarcation of the study. The chapter classifications were discussed in Section 1.8, concluding the chapter.

In Chapter 2, a literature review was carried out in line with the first two theoretical objectives that were set out in Section 1.3.2. The chapter provided theoretical background and insight into mobile gaming and its marketing potential. Section 2.2 provided an in-depth review of mobile gaming literature and revealed that mobile games have eclipsed traditional video games in terms of revenue and market share. Section 2.3 outlined the various mobile gaming business models and illustrated how successful the freemium game model has become in attracting and converting first-time players into brand loyal consumers, who possibly may make in-app purchases. This section also conceptualised the prediction of brand loyal behaviour by exploring flow and brand loyalty theory. These theories may greatly influence how an organisation implements their mobile gaming business model. The global and local performance of mobile games is briefly outlined in Section 2.4, followed by an in-depth discussion of their marketing potential in Section 2.5. This revealed that global advertising expenditure in mobile games could reach $50 billion by 2020. The high advertising expenditure can be attributed to mobile gaming's value and potential as a marketing medium. Moreover, there are over 1.2 billion people currently playing mobile games that contributed towards an estimated $46.1 billion of revenue generated from mobile games in 2017.

Following the theoretical background provided in Chapter 2, the remaining seven theoretical objectives were addressed in Chapter 3. The importance of branding and the various branding strategies adopted by mobile gaming brands were discussed in Section 3.2. This was followed by the introduction of the concept of brand equity and how it is used to measure a brand's worth, in Section 3.3. Based on the seminal works of Aaker (1991) and Keller (1993), brand loyalty proved to be the most significant driver of brand equity and maintaining brand loyal consumers is critical to the long-term success of any organisation. Brand loyalty theory posits two theoretical approaches, namely an attitudinal deterministic approach (psychological commitment) and a behavioural stochastic (behavioural loyalty) approach. Section 3.3.2.3 discussed incorporating both approaches, which, according to Day (1969), will allow researchers to clearly distinguish between spurious loyalty and true brand loyalty. Thereafter, Section 3.4 introduced and discussed the six factors identified in the literature as being pertinent antecedents of mobile gaming brand loyalty. These factors include satisfaction (Section 3.4.1), challenge (Section 3.4.2), game identification (Section 3.4.3), flow (Section 3.4.4), psychological

commitment (Section 3.4.5) and behavioural loyalty (Section 3.4.6). Flow was revealed to be a major predictor of positive attitude, repeated game use and, consequent loyalty, while satisfaction, challenge and game identification are all key drivers in creating a state of flow. Section 3.5 reviewed the literature on generational theory and provided justification for the selection of South African Generation Y students as the target group. Furthermore, Section 3.5.1 outlined the characteristics and technologically-driven nature of Generation Y, while Section 3.5.2 revealed that the typical South African mobile gamer belongs to Generation Y. Mobile games were found to be gender-neutral for this particular generation, which greatly increases their marketability (Section 3.5.3). The final section, Section 3.6, proposed a model of the antecedents of mobile gaming brand loyalty amongst South African Generation Y students in Figure 3-3. This model was in accordance with the literature review. The model hypothesised that the factors of satisfaction, challenge and game identification induce mobile gaming flow, and that mobile gaming flow significantly influences psychological commitment towards mobile games. This, in turn, has a significant influence on behavioural loyalty toward mobile games.

Chapter 4 presented the theory and rationale in following a post-positivist research paradigm, and the consequent research design followed in the empirical portion of this study. Section 4.2 outlined the various research paradigms and justifies the selection of a post-positivist approach, followed by Section 4.3, which explained the theory of a descriptive single cross-sectional research design. The sampling procedure employed was described in Section 4.4, from which a non-probability convenience sample of 600 full-time Generation Y students registered at one of three selected South African HEI campuses, was selected as the target population. This was validated by means of previously published studies, and was within the boundaries required to conduct SEM (Section 4.4.4). Section 4.5 outlined the data collection method, the formulation of a self-administered questionnaire, as well as the pre-test and pilot procedures that were conducted in the study. Section 4.6 detailed the administration of the questionnaire, while Section 4.7 described the data preparation process. The chapter concluded with Section 4.8, which detailed the statistical techniques utilised to analyse the cleaned data set.

Chapter 5 reported on the empirical findings on the study. These findings address the four empirical objectives set out in Section 1.3.3 and are discussed in detail the following section.

6.3 MAIN FINDINGS OF THE STUDY

In this section, the main findings of the study are presented in line with the empirical objectives set out in Chapter 1 (Section 1.3.3).

The first empirical objective sought to determine Generation Y students' level of satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards mobile games. Descriptive statistics were used to address this objective. Means calculated equal to or above 3.5 are indicative of positive associations. As shown in Table 5-5 in Section 5.7, means equal to or above 3.5 were recorded for all factors. This suggests that Generation Y students experience satisfaction when playing their favourite mobile game, respond positively to the challenges posed, and can identify with their favourite game in terms of in-game characters, social communities and the virtual worlds they present. The strongest positive indicator was that of flow (mean=4.72). This result suggests that Generation Y students respond strongest to games that evoke a state of flow, thus creating an optimal experience for them. Finally, the results indicate that Generation Y students are brand loyal towards their favourite mobile game in terms of both psychological commitment and behavioural loyalty.

The second empirical objective was to test whether mobile gaming brand loyalty amongst Generation Y students is a six-factor model comprising mobile gaming satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty. The outcome from the confirmatory factor analysis indicated that the antecedents of Generation Y Students' mobile gaming loyalty is indeed a six-factor structure. Furthermore, the six-factor model demonstrates acceptable internal-consistency and composite reliability, as well as construct validity. The model was also found to have acceptable model fit.

The third empirical objective was aimed at empirically testing a proposed model of mobile gaming brand loyalty amongst Generation Y students. In accordance with the literature review discussed in Chapter 3, a structural model was specified to test hypotheses 2 to

4 found in Section 1.4 and Section 5.9. The results from Structural Model A (refer to Figure 5-9) show that satisfaction (F1), challenge (F2) and game identification (F3) have a significant direct positive influence on flow (F4), which, in turn, was found to be a significant positive predictor of psychological commitment (F5). Psychological commitment (F5) also displayed a positive significant influence on behavioural loyalty (F6) (Section 5.10.3). In addition, Structural Model A concluded acceptable model fit indices and represented a working structural model.

Despite Structural Model A producing acceptable fit indices (refer to Table 5-10) that are indicative of working a structural model, Hair *et al.* (2014:542) propose introducing competing models to ascertain if the original model provides the best possible fit. Structural Model B (refer to Figure 5-10) was introduced to test if the latent factors of satisfaction (F1), challenge (F2) and game identification (F3) have a significant direct positive influence on psychological commitment. Although Structural Model B provided a better model fit than Structural Model A, the paths of satisfaction (F1) and challenge (F2) towards psychological commitment (F5) were not significant. Despite this, satisfaction (F1) and challenge (F2) have a significant indirect positive influence on psychological commitment (F5) via their significant direct positive influence on flow (F4). These results are in keeping with previous studies (Alzahrhani *et al.,* 2017:248; Chang, 2013:319; Teng, 2013:889; Lee & Tsai, 2010:613; Lee, 2009:849).

As such, a third model (Structural Model C as per Figure 5-11) was introduced that omitted the two insignificant paths (F1→F5 and F2→F5). Crucially, Structural Model C displayed the best model fit of all three models and produced lower AIC and CAIC values (refer to Table 5-10). In Structural Model C, satisfaction (F1), challenge (F2) and game identification (F3) had a significant positive direct influence on flow (F4), with game identification also having a significant direct positive influence on psychological commitment (F5). Flow (F4) was found to have a statistically significant positive influence on psychological commitment (F5), which, in turn, is a significant positive predictor of behavioural loyalty (F6). These findings are in accordance with prior brand loyalty literature (Alzahrhani *et al.,* 2017:248; Gabbiadini *et al.,* 2016:11; Baig, 2015:2; Badrinarayanan *et al.,* 2014:886; Chang, 2013:319; Teng, 2013:889; Lee & Tsai, 2010:613; Lee, 2009:849; Bauer *et al.,* 2008:212; Choi & Kim, 2004:22; Amine,

1999:308). The additional path (F3→F5) from game identification (F3) to psychological commitment (F5) that was found to be positively significant is a finding was echoed in the literature (Chung & Park, 2017:58; Yeh *et al.,* 2016:253; Badrinarayanan *et al.*, 2014:886; Bauer *et al.,* 2008:212; Hefner *et al.,* 2007:39-40; Chaudhari & Holbrook, 2001:81; Amine, 1999:308).

Taking the above findings into account, this study proposes that the antecedents of mobile gaming brand loyalty amongst Generation Y students in South Africa may be explained by the model presented in Figure 6-1.
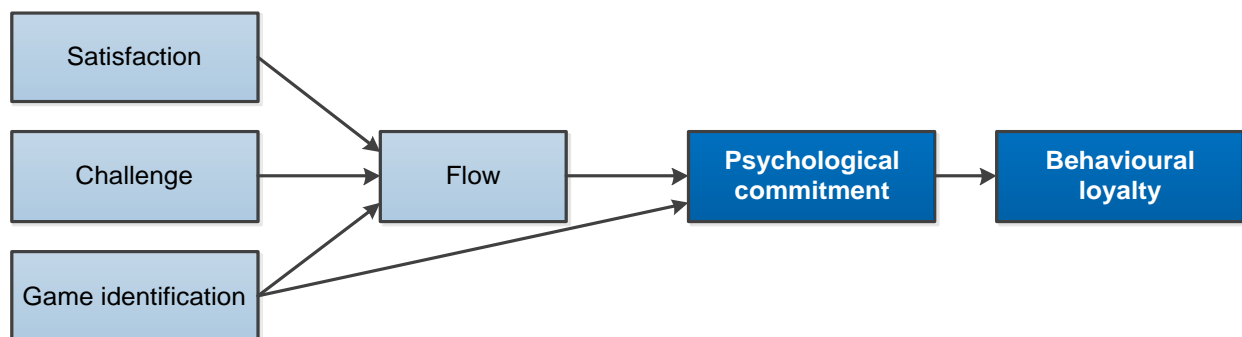
Figure 6-1: **Model of the antecedents of mobile gaming brand loyalty amongst Generation Y students**

The fourth and final empirical objective focused on determining if there were any gender differences concerning Generation Y students' satisfaction, challenge, game identification, flow, psychological commitment and behavioural loyalty towards their favourite mobile game. To address this objective and the final hypothesis (see Section 1.4 and Section 5.9), a two independent-samples t-test and Cohen's D-statistic were carried out (Section 5.11). The results revealed that no statistical significant differences were observed between male and female Generation Y students' game identification, psychological commitment and behavioural loyalty. However, female Generation Y students showed a stronger statically significant positive stance towards satisfaction, challenge and flow. Despite this, the Cohen's D-statistic computation revealed that the effect of these differences were practically non-significant. These findings have been reciprocated in previous studies conducted by Price (2017) and Amory & Molomo (2012) relating to video games preference among young male and female South Africans.

The proceeding section outlines the contributions of the study.

6.4 CONTRIBUTIONS OF THE STUDY

This study contributes towards the current dearth of literature regarding brand loyalty toward mobile gaming in both the South African and global context. Through empirical testing, a six-factor model for antecedents of mobile gaming brand loyalty was developed to assist in predicting the behaviour of Generation Y students in the South African mobile video games market. This study also contributes to existing Generation Y literature and may provide marketers with a more coherent understanding of this cohort's propensity to be loyal consumers. The findings emanating from this study further underpin the importance of mobile games as a marketing medium. Furthermore, this study provides insight to organisations seeking to utilise mobile games as a platform to directly serve the lucrative Generation Y market segment. Marketers and video game developers may tentatively use this model to predict brand loyalty for other generational cohorts but should proceed with caution until additional generational studies have been conducted on this topic. This study also forms part of and contributes towards the ProGenY (profiling the consumer behaviour of Generation Y in South Africa) project at North-West University (Vaal Triangle Campus).

The following section encompasses recommendations that can be incorporated by marketers and video game developers when building their mobile gaming brands and/or optimising their marketing campaigns.

6.5 RECOMMENDATIONS

This study found that Generation Y students are brand loyal toward mobile games. As such, the following recommendations have been established:

6.5.1 Design brand strategies around the social aspect of playing mobile games to enhance game identification

Top mobile gaming brands such as Pokémon Go, Clash of Clans and Candy Crush Saga all have a core social element to their gameplay which has made them successful. Their brand strategies are consumer-centric and encourage two-way engagement between video game players and the brand itself. The development of brand communities has

been crucial to their success. Jang *et al.* (2007:1) state that the establishment of a brand community allows consumers to identify with the brand and build a strong emotional attachment. This study found that Generation Y students positively identify with their favourite mobile game, whether it is in terms of in-game characters, social communities, or virtual worlds presented in them. In addition, game identification had a positive significant influence on flow and psychological commitment. This finding was reciprocated by Soutter and Hitchens (2016:1035) and Moon *et al.* (2013:6) who found players with a strong social identity will display higher levels of loyalty toward games, and that their identification with a mobile game will manifest into higher levels of flow. Van Looy *et al.* (2012:132) and Hamari (2015:306) agree that gamers develop a strong sense of game identification by being able to share high scores or in-game symbols of success with their friends or virtual communities, and are more likely to make in-app purchases to speed up their progress.

In order for mobile gaming brands to become a success, marketers need to ensure that brand strategies are consumer-centric in their approach and encourage interaction between loyal followers and the brand. As observed through the success of Candy Crush and Clash of Clans titles, marketers must engage with players via social media platforms and utilise the feedback from those loyal players to continually improve overall gameplay experience. This creates a strong brand community and may lead to increased behavioural loyalty. As such, mobile games should always include a core social element in their gameplay to ensure success.

6.5.2   Satisfaction from playing mobile games will not induce brand loyalty unless flow is achieved

This study found that Generation Y students experience positive levels of satisfaction when playing their favourite mobile game. It also found that satisfaction is the strongest predictor of flow which, in turn, induces psychological commitment towards mobile games. Liu and Li (2011:892) state that the goal of mobile games is to create an immersive, satisfactory experience. This positive cumulative satisfaction will sustain a constant state of flow, which leads to continued use and fosters brand loyalty (Chang, 2013:318). As such, video game developers must focus on creating mobile games that will satisfy the needs of players over a long period of time. This strategy is employed by

Angry Birds and Candy Crush Saga, whereby the game is continually updated with fresh content and new levels after seeking input from their loyal players. In addition, this study found satisfaction does not have a direct positive significant influence on psychological commitment. Therefore, transactional-specific satisfaction must be avoided, as it does not induce flow. Finally, developers should strive to continually update their mobile game offerings to ensure positive cumulative satisfaction and long-term success. These findings are supported by similar studies conducted by Hsu *et al.* (2012:563) and Baig *et al.* (2015:12).

6.5.3   Mobile games must present a challenge to enhance flow experience

Challenge is considered a precursor to a sustained flow experience (Section 3.4.2). Prior research indicates that a player is highly likely to stop playing a mobile game if there is no challenge, or low probability of overcoming challenges (Section 3.4.2). As a result, a state of flow is not achieved, and players will respond negatively to the experience provided by the mobile game (Shim *et al.,* 2015:57-58; Teng, 2013:884-885). This study concluded that Generation Y students respond positively to challenges posed in their favourite mobile game. In other words, the challenge motivates Generation Y students to continue playing as they believe the challenge can be overcome and this induces maximum effort. This study found challenge to have a positive significant influence towards the state of flow. As such, Generation Y students' favourite mobile games are challenging enough to motivate them to play repeatedly. This creates a constant state of flow as they overcome challenges and stimulates brand loyalty, simultaneously. This finding is in accordance with a study conducted by Teng (2013:884-885), which posits that challenge evokes a state of flow resulting in a positive direct influence on loyalty. Therefore, video game developers must ensure their mobile games provide realistic challenges which elicit the necessary effort to overcome them, allowing players to progress further in the game. It is essential that the reward given for progress in the game is worthy of the effort exerted by the player. This ensures that players will continue to revisit the game on a regular basis. Rewards can be anything from free in-game lives to a limited-edition version of an in-game character. Examples of these psychological marketing techniques can be found in popular games such as Candy Crush Saga and Pokémon Go (Russel, 2016; Dooley, 2013; Dooley, 2008).

6.5.4 Creating an optimal flow experience for mobile gamers fosters strong brand loyalty

Flow remains an important predictor when studying consumer behaviour in video games (Merikivi *et al.*, 2016:412). In this study, flow recorded the highest mean value of all factors indicating that Generation Y students react positively towards mobile games which evokes a state of flow. Moreover, flow displayed a strong positive influence on Generation Y students' psychological commitment towards their favourite mobile gaming which, in turn, displayed a positively significant influence on behavioural loyalty. These findings further underpin the importance of including flow as a predictor of loyalty in the study of video and mobile games (Section 3.4.4). Mobile games that are both challenging and addictive will lead to an optimal gaming experience (flow) and consumers may develop a preference towards playing other mobile games from the same developer as a result (Teng, 2013:884.)

Choi and Kim (2004:12) posit that players who become fully immersed (enter a state of flow) in a gaming experience will become psychologically dependent on the game, which leads to increased behavioural loyalty towards the game and/or the game's developer. The authors denote further that Generation Y students perceive flow as being created from a combination of cumulative satisfaction, the challenges posed, and their social identification with their favourite mobile game and its brand community. As such, mobile game developers should consider these factors when creating mobile games or when formulating brand strategies (Alzahrhani *et al.,* 2017; Chang, 2013; Lee & Tsai, 2010; Lee, 2009; Bauer *et al.,* 2008; Hefner *et al.,* 2007; Choi & Kim, 2004). Developers must ensure total immersion is achieved when playing a mobile game, which will induce psychological commitment from Generation Y members that may translate into long-term behavioural loyalty.

6.5.5 Target the tech-savvy, brand loyal Generation Y cohort

The success of a brand lies in its ability to adequately convey a unique market offering that is unmatched by competitors to its intended target audience (Hudson *et al.,* 2016:28). The ability to attract and retain an appropriate audience has become increasingly difficult in saturated markets, as consumers possess more buying power and are quick to dismiss

false advertising (Nisar & Whitehead, 2016:743). Therefore, an organisation's brand strategy must focus on attracting loyal consumers who are less price sensitive and not easily persuaded by competitor offerings (Section 3.2.1). The findings of this study revealed that Generation Y students are psychologically committed and behaviourally loyal towards their favourite mobile game. Despite Generation Y being characteristically fickle (Section 3.5.1), the findings suggest that marketers and/or video game developers should pursue this cohort when developing, improving, or promoting their mobile games. This is in accordance with studies conducted by Price (2017) and Amory & Molomo (2012).

In terms of gender differences, there was no practical significant difference observed between male and female Generation Y students' brand loyalty towards mobile games. Therefore, marketers can appeal equally to both male and female individuals when promoting their products (Knoke, 2017). In addition, marketers should avoid or limit the use of pop-up advertisements within mobile games as this marketing approach can foster negative attitudes among players (Kim *et al.,* 2015). Marketers should rather implement a cross-platform approach and make use of various platforms such as websites, social media, and television to promote and encourage engagement with their mobile game/s (Section 3.2.1.1).

6.5.6 Implement a free-to-play business model to attract and retain loyal video game players

Of the three freemium business models, free-to-play contributes more than 90 percent of the global revenue generated by mobile games (Section 2.3.4). Free-to-play mobile games attract casual video game players because no monetary commitment is required to play. This is crucial according to Liu *et al.* (2012); the authors emphasise that a positive free-to-play gaming experience is likely to influence a player to adopt the pay-to-play or paymium version of that specific game. As such, video game developers can follow the free-to-play business model while incorporating the proposed brand loyalty model presented in Figure 6-1. The model will aid in predicting attitudinal and behavioural loyalty and increase the chance of the mobile gaming brand becoming a success. Shi, Xia and Huang (2016:197) echo the importance of fostering social groups (virtual communities),

as they attract first time players and greatly influence their purchase propensity in freemium games.

6.5.7 Incorporate attitudinal metrics when measuring mobile gaming brand loyalty

Prior video game studies (Balakrishnan & Griffiths, 2018; Teng, 2013; Lu & Wang, 2008; Choi & Kim, 2004) focus on loyalty from a behavioural stochastic viewpoint. This approach is found often in the literature and suggests that loyalty is solely predicted by repeat purchase behaviour. Marketers should heed caution when focusing on brand loyalty in terms of behavioural commitment, as it does not consider personal motivations behind the purchase (Section 3.3.2). This is of particular importance when targeting the Generation Y cohort who are known to exhibit repeat purchase behaviour, yet switch brands at an instant when a new trend presents itself (Section 3.5.1). Huang (2017:3) stresses the importance of including an attitudinal component to brand loyalty that would help distinguish between spurious loyalty and true brand loyalty.

This study found that Generation Y students are both psychologically committed and behaviourally loyal toward their favourite video game. Additionally, psychological commitment has a strong positive influence towards behavioural commitment for this generational cohort (Figure 5-11). From a mobile games perspective, psychological commitment acts as a resistance to switch to another mobile game despite the marketing efforts of competitors or recommendations from friends and family. Strong psychological commitment leads to behavioural loyalty which includes both past and future intended purchase behaviour, such as making in-game purchases, buying gaming merchandise, engaging in online communities, participating on social blogs, and/or following the latest news and updates on social media platforms (refer to Section 3.5 and Section 3.6). Therefore, these findings warrant the inclusion of an attitudinal deterministic approach alongside a behavioural stochastic approach to predict and better understand mobile gaming brand loyalty in Generation Y consumers.

6.6 LIMITATIONS AND FUTURE RESEARCH OPPORTUNITIES

As with all studies, there are limitations that must be accounted for. A shortcoming of this study was that it followed a non-probability sampling method to select the sample. Various

demographic questions were included to enhance the representativeness of the sample and minimise the effect of convenience sampling. Despite this, one should proceed with caution when attempting to generalise the findings of this study to the wider population. Although attitudinal commitment and behavioural loyalty are believed to be strong and enduring, rapid technological innovation and increased competition have made it increasingly difficult to retain existing customers (Yeh *et al.,* 2016:245). As this study followed a single cross-sectional research design, which provides a single snapshot in time, there is a possibility of shifting situational contexts that may influence attitudes and behavioural loyalty. Therefore, future research could adopt a longitudinal design to measure predictors of mobile gaming brand loyalty that may develop over an extended time period, which may provide more accurate findings. Another research opportunity may be to include the other generational cohorts as well as the non-student members of the Generation Y cohort, and determine their level of brand loyalty toward mobile games. Finally, due to the rapid adoption of mobile phones and success of mobile games, it may be prudent for future researchers to study the effect of gamification as a form of mobile marketing for businesses seeking to promote non-game products and strengthen loyalty.

6.7   CONCLUDING REMARKS

Mobile games have officially surpassed traditional video games as the leading video gaming platform and account for almost 80 percent of the total revenue generated from mobile apps. They are fast becoming the most important advertising platform with a reach of over 1.2 billion people and an equal gender ratio of players. The most successful mobile games have developed into powerful brands that extend into various consumer markets such as TV, literature, and film. Despite this, limited studies exist that explain the phenomena surrounding mobile gaming brands and how they have established a vast following of brand loyal video gamers. This study proposed to bridge this gap by empirically testing a model comprising antecedents of mobile gaming brand loyalty amongst Generation Y students. The model can help video game developers and marketers predict brand loyal behaviour of a targeted segment in order to develop proactive strategies that foster this loyalty, and build sustainable mobile gaming brands.

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ANNEXURE A

QUESTIONNAIRE

Modelling the antecedents of mobile gaming brand loyalty amongst Generation Y students

Dear Student

My name is Dylan Price. I am registered as a full-time student for a PhD in Marketing Management at the North-West University (Vaal Triangle Campus) and I am currently working towards my thesis under the supervision of Dr C. Synodinos and Prof A.L. Bevan-Dye. The purpose of this study is to determine what influences mobile gaming brand loyalty amongst Generation Y students. Generation Y refers to any individual born between 1986 and 2005.

A mobile game is a video game that can be played on a smartphone or tablet device. Mobile gaming has become highly profitable in the South African market with consumer expenditure estimated at over R500 million. The companies of the wildly popular mobile games such as Angry Birds, Candy Crush Saga, Clash of Clans, Mobile Strike and Pokémon Go are able to make millions worldwide through their ability to attract and retain a loyal following of video game players. In turn, loyal video gamers make repeated in-app purchases, buy branded merchandise and promote their favourite mobile game to their friends and family members. As such, the abovementioned mobile games have become thriving brands and loyal video game players are crucial to their success.

Interesting fact: Candy Crush Saga generates about $400 000 (R5.5 million) per day from merchandise sales, advertising income and in-app purchases.

Please take a few minutes to assist me and complete the attached questionnaire. It should not take you longer than 10 minutes to complete. **All responses are confidential** and will merely be outlined in the form of statistical data in the analysis. All data will only be used for research purposes. The questionnaire has gone through the North West Universities ethical committee and passed ethical clearance. The ethical clearance number is: **ECONIT 2017-003**.

Thank you for your important contribution to this study.

Dylan Price
North-West University
dylan.torres@live.co.za

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Questionnaire

Section A: Demographical information

Please mark each question with a cross (**X**) in the appropriate box.

A1	Name of institution	Traditional University	University of Technology	Comprehensive University	

A2	Year	1st year	2nd year	3rd year	Post-graduate

A3	Gender	Female	Male	

A4	Race	African	Coloured	Indian/Asian	White

A5	Home province	Eastern Cape	Free state	Gauteng	KwaZulu-Natal	Limpopo
		Mpumalanga	North West	Northern Cape	Western Cape	Other

A6	Please indicate your mother tongue language:					
	Afrikaans	English	IsiNdebele	IsiXhosa	IsiZulu	Sesotho sa Leboa
	Sesotho	Setswana	SiSwati	Tshivenda	Xitsonga	Other

A7	Please indicate your current age:							
Younger than 18	18 years old	19 years old	20 years old	21 years old	22 years old	23 years old	24 years old	Older than 24

A8	How often do you play mobile games?	Everyday	3-4 times a week	Twice a week	Once a week	Not often	Never

Section B: Antecedents of mobile gaming brand loyalty

Please indicate the extent to which you agree or disagree with each of the following statements using a cross (**X)** where 1= Strongly disagree and 6= Strongly agree.

	Antecedents of mobile gaming brand loyalty	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
B1	I like the game content (environment, characters and story) of my favourite mobile game	1	2	3	4	5	6
B2	I am pleased with the level of service received from the creators of my favourite mobile game (news feeds, forums, updates, daily challenges and rewards).	1	2	3	4	5	6
B3	I am pleased with the rewards I receive when I progress in my favourite mobile game.	1	2	3	4	5	6
B4	I am satisfied with the ability to link my social media accounts with my favourite mobile game.	1	2	3	4	5	6
B5	Overall, I am satisfied with my favourite mobile game.	1	2	3	4	5	6
B6	The gameplay of my favourite mobile game challenges me to the best of my ability.	1	2	3	4	5	6
B7	The gameplay of my favourite mobile game provides a good test of my skills.	1	2	3	4	5	6
B8	The gameplay of my favourite mobile stretches my capabilities to the limit.	1	2	3	4	5	6
B9	The gameplay of my favourite mobile game challenges me more than other things I do on my mobile phone.	1	2	3	4	5	6
B10	My favourite mobile game means a lot to me.	1	2	3	4	5	6
B11	My favourite mobile game is not just a normal, average video game.	1	2	3	4	5	6
B12	Playing my favourite mobile game is more than just a hobby for me.	1	2	3	4	5	6
B13	Playing my favourite mobile game has become a way of life (A part of my daily routine).	1	2	3	4	5	6
B14	I feel I have become personally attached to my favourite mobile game (A part of who I am).	1	2	3	4	5	6
B15	I am very interested in playing my favourite mobile game.	1	2	3	4	5	6
B16	My favourite mobile game is fun to play.	1	2	3	4	5	6
B17	I do not think of other things while playing my favourite mobile game.	1	2	3	4	5	6
B18	After completing a stage/level, I become curious to see the next stage/level that my favourite mobile game has to offer.	1	2	3	4	5	6
B19	I feel in control when I play my favourite mobile game.	1	2	3	4	5	6

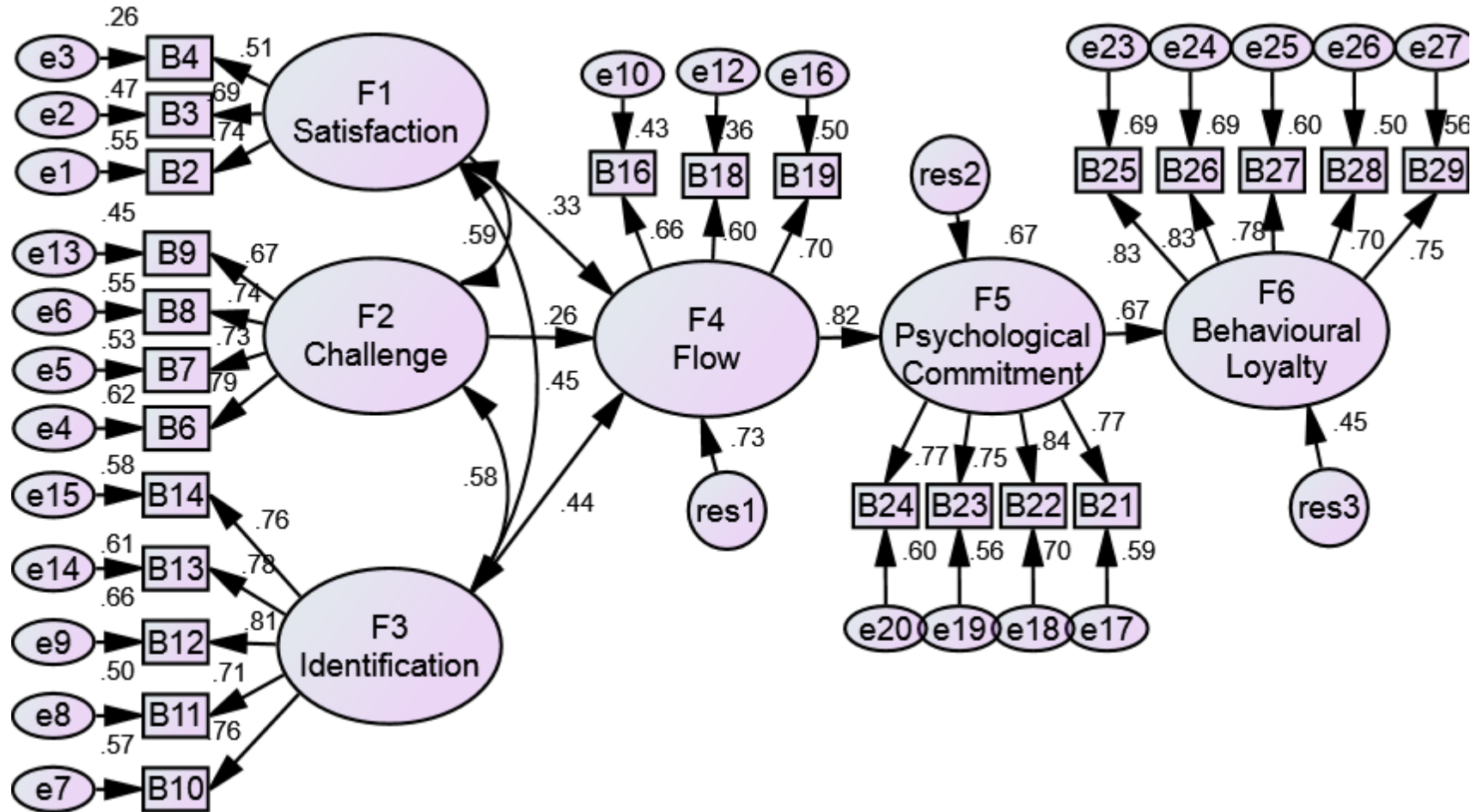|	Antecedents of mobile gaming brand loyalty	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
B20	I become entirely absorbed/engrossed when playing my favourite mobile game.	1	2	3	4	5	6
B21	My preference to play my favourite mobile game will not be easily changed.	1	2	3	4	5	6
B22	It will be difficult to change my beliefs about my favourite mobile game.	1	2	3	4	5	6
B23	Even if close friends recommend another mobile game, I would not stop playing my favourite mobile game.	1	2	3	4	5	6
B24	To stop playing my favourite mobile game in favour of another mobile game would require major rethinking.	1	2	3	4	5	6
B25	I would follow the latest news and updates about my favourite mobile game in the media (TV, magazines, newspapers, online news websites etc.).	1	2	3	4	5	6
B26	I would follow the latest news and updates about my favourite mobile game on social media platforms (Facebook, Twitter, Instagram etc.).	1	2	3	4	5	6
B27	I would make in-app purchases while playing my favourite mobile game (to unlock new items and speed up the game's progression).	1	2	3	4	5	6
B28	I would wear or use merchandise related to my favourite mobile game (shirts, watches, phone covers, headphones etc.)	1	2	3	4	5	6
B29	I would participate in discussions about my favourite mobile game (on blogs, online forums or with friends).	1	2	3	4	5	6

Thank you for your cooperation
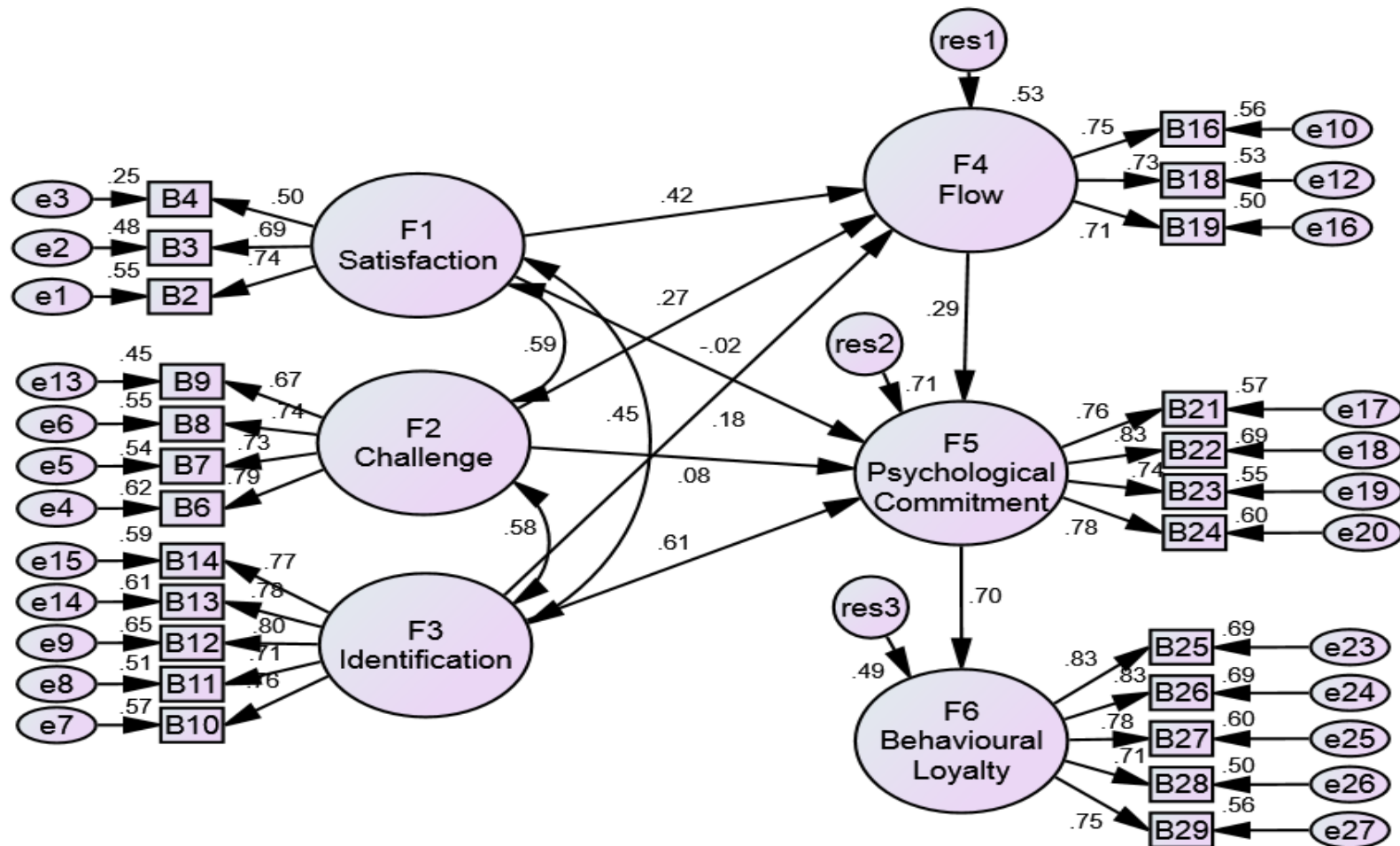
Ethical Clearance Number: ECONIT 2017-003

ANNEXURE B

STRUCTURAL MODELS

STRUCTURAL MODEL B