# PLAYING GAMES PEDAGOGY IN THE 21ST CENTURY

**By**

**ROBIN MARTIN CHALLENOR**

Submitted in fulfilment of the requirements for the degree

**MASTER OF EDUCATION**

in the

**DEPARTMENT OF POST GRADUATE STUDIES EDUCATION**

at the

**CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE**

**Supervisor: Dr CL Schlebusch**

**October 2018**

## DECLARATION

Student Number:

I declare that **PLAYING GAMES PEDAGOGY IN THE 21ST CENTURY** is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

RM Challenor

8 October 2018

## ABSTRACT

The more hours parents spend playing electronic games a week and the more years they have played, the less inclined they are to take part in the social activities of their children's school such as parents' evenings and sports meetings. Such gaming parents are also less inclined to help their children with their school work and be interested in their child's school. The study collected data from 248 quantitative respondents centred in Welkom, Free State, on the interplay between the playing of electronic games by parents of learners, school education and educators. Further, and crucially, the more respondents game, the less inclined they are to challenge what happens at schools. The findings give rise to a hegemonic recommendation that political leadership of schools, school leadership and educators should confront the problems of time and interest constraints created by gaming parents and address the issues, because ignoring the problems can impact negatively on education and educators.

Chapter one sets out the Introduction to the study. Chapter two discusses relevant literature. Chapter three discuss the research methodology used. Chapter four present the data. Chapter five discusses the data and offers recommendations.

Gaming parents are withdrawing from their children's schooling. Gaming parents have rendered themselves impuissant with regards to education and are abandoning their obligations under the Constitution to care for children. By not having the time for nor interest in schooling, gaming parents thus give education officials free reign to do as they like.

*Keywords: digital society, electronic games, quality of education, gamers, parents.*

## ACKNOWLEDGEMENTS

Dr Luzaan Schlebusch, supervisor. Computer Applications Technology, Department of Mathematics, Science and Technology Education, Faculty of Humanities, Central University of Technology. Thank you for your guidance. Thanks to you … I finished this work. In fact, if it was not for you, this work would never have been finished. I have so much to thank you for.

- Quantitative respondents
- Qualitative respondents
- Grade 12 learners in Welkom
- Kathy Challenor B Ed (Hons), Keah Challenor B Soc Sci (Hons) and Joel Challenor

## DEFINITIONS

| | |
|---|---|
| Authority | An opinion worthy to be taken as a precedent. |
| Cognition | A certain knowledge.<br>The act or process of knowing or perceiving. |
| Cognitive | Capable of cognition. |
| Community | A community is a group of people with a shared interest or goal. |
| Confident | Not doubting yourself. |
| Data | Information that helps a researcher to answer their research questions. |
| Electronic device | A piece of equipment that may or may not be handheld and on which gamers play electronic games. |
| Electronic games | An activity in which people challenge an electronic script, or other gamers, to contests of skill, usually involving shooting, capturing, destruction and or building. The activity is played out on a screen. Used interchangeably with the terms computer games, games and video games. |
| Epistemology | The branch of philosophy that examines the nature of knowledge, its presuppositions and foundations, and its extent and validity. |
| Etiology | The cause, set of causes, or manner of causation of a disease or condition. |

| | |
|---|---|
| Gamer | A person who challenges an electronic script, or other gamers, to contests of skill, usually involving shooting, capturing, destruction and or building. |
| Games | A contest of skill, usually involving shooting, capturing, destruction and or building that is played out on a screen and is a challenge against an electronic script or other gamers. Used interchangeably with the terms computer games, electronic games and video games. |
| Impuissant | Powerless. |
| Passive | Not questioning the world around you. |
| Pedagogy | The science or theory of teaching. |
| Platform | A medium to play an electronic game, including handheld consoles, portable computers, desk top computers, smartphones, tablets and cell phones. |
| Responsibility | To be called upon to answer for. |
| Video game | Means any type of computer, console, online or mobile contest. Used interchangeable with the terms computer games, electronic games and games. |
| Virtual | Not physically existing, but made by software to appear to be real. |
| Virtual reality | Computer generated stimulation of an image or environment that can be interacted with in a seemingly real way by using electronic equipment, but is not physically existing. |

The definitions are drawn from the literature review material.

# TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

# CHAPTER 1

# INTRODUCTION TO THE STUDY

## 1.1 INTRODUCTION

The more hours' parents spend playing electronic games a week and the more years they have played, the less time they have to take part in the social activities of their children's school such as parents' evenings and sports meetings, compared to non-gaming parents. Such gaming parents also have less time to help their children with their school work and are less interested in their child's school. Political leadership of schools, school leadership and educators should confront and address these two issues, as, left unattended, they could impact negatively on education and educators. This study explores these issues.

For gamers, gaming is fun and entertainment, pursued in the name of fun and entertainment, even if the time spent gaming causes problems elsewhere in their lives.

Going forward, the influence of gaming on education will not fade as the games become increasingly attractive, more and more fun to play, and popular. Game developers strive to make the games more attractive and parents are urged to play electronic games with their children, in the name of good parenting.

## 1.2 BACKGROUND OF THE STUDY

More and more people are playing electronic, computer games, as the games become more attractive, the supporting technology more user friendly and the hardware platforms more plentiful (Alfreds, 2016; French, 2010). Companies devising the games set out to make their games compelling and addictive (Shaffer, Squire, Halverson & Gee, 2005). The portion of gamers who are parents, and vice versa, will continuously expand. Ideally, parents should be involved in the schools their children attend and should impact the future of education. However, gaming parents live in a world where virtual reality is more important than reality. The virtual world is an imagined, non-

existing world where gamers are free to be whoever they want to be in a mythical place. French (2010) predicts that virtual reality will increasingly be part of peoples' lives in the future. As Moursund (2007) claims, for some people computer and video games are real and are sometimes more engaging than reality. Given the omnipresence of gaming in the lives of gaming parents, gaming parents can render themselves impuissant in the general education environment. As such, parents are falling foul of the Constitution of South Africa (1996) Section 28 (1) (b) which stipulates that every child has the right to family care or parental care.

This research project attempts to shed light on the interaction between gamers as parents and school education. There is attention also on the preparedness of educators to make changes in their work so as to live with gamers and gaming. One school of thought in education holds that education should encourage critical thinking and a social conscious.

One of the ramifications of the increasing number of gamers can be a hiatus between the interests of players of electronic games in their capacity as gaming parents and the interests of their children on the one hand, and on the other hand schools as an institution and educators. Unfortunately, gaming parents might not see, nor care about, the hiatus (Besson, Huber, Mompoint-Gaillard & Rohmann, 2015). The hiatus can become more pronounced as the average age of gamers' rises and gaming parents begat gaming children. Byron, Curran and McCarthy (2006, p 1) set down a time line in 2006:

*"If you are over 35, chances are you view games as, at best, an occasional distraction. If you are under 35, games are a major entertainment and a part of life. In that sense, they are similar to what rock' n' roll meant to boomers."*

The under 35s are now parents of children at school. Given the lure of games, known as E-sports (Cellan-Jones, 2014), school education may pale into insignificance. The problem that arises for schools is how to stay relevant in the lives of gaming parents and their no-doubt gaming children. Schools would be wise to prepare for the future: a future shaped largely by E-sports, because by playing games, gaming parents and their children could be playing with the future of education. If schools cannot compete

with games for the attention of learners, and if schools do not prepare learners for their future, then schools can be deemed, by young people, their families and their employers, to be increasingly irrelevant. And if schools are deemed as increasingly irrelevant, then so would educators stand so accused – of being increasingly irrelevant; at least in the eyes of gamers.

Crawford (2012, p ix) captures the essence of this research study:

"*As a sociologist what has always interested me is people – what people do, why they do it and what their actions mean to themselves and others. For me, people's passions and interests, whether in film, sport, video games or another cultural area, are what makes us all interesting and significant in our own specific ways."*

Crawford's writing (2012, p ix) is

*"… less about video games and more about people who play video games, their lives and their culture, and also the theoretical tools we might employ to better understand this."* This study would seek to emulate Crawford's (2012) approach.

McMillan and Schumacher (2014) say there is interest at all levels of education for decisions to be data driven and based on hard evidence. McMillan and Schumacher (2014) highlight the importance of basing impactful educational practices on scientific or evidence-based research. It is the humble intention of the work to extract data on gaming so as to drive decisions as need be.

## 1.3 RESEARCH FOCUS

This section sets out the problem statement, research questions and research objectives.

### 1.3.1 Problem statement

A problem statement suggests a research outcome of an association between the facts of the problems (Rossouw, 2009). The problem is that with gamers themselves becoming parents, the wariness parents may once have had towards games (Boyle,

2013) has dissipated. And, by extension, gamers as gaming parents have minimal interest in what happens at schools their children attend, so beguiled are they by games. In fact, gaming parents probably ignore their families (Crawford, 2012) and are averse to being involved in school life and education. They are so passive as to not play any part in schooling and education, apart from paying, if need be, so have rendered themselves impuissant. Their passiveness and disinterest thus leave education officials with a free hand to do what they like with education, as the study will suggest. And what the education officials are doing with education is not edifying. A World Economic Forum report ranked SA 139 out of 143 countries for overall quality of education (Van Wyk, 2016). This situation is unlikely to change in the face of gaming parent apathy.

More and more people around the world are playing computer games, as the games become more attractive, the supporting technology more user friendly and the hardware platforms more plentiful. The very success of the games, however, creates a dilemma for the rest of society: to the extent that games become more attractive, gamers spend more time playing them. And invariably the emotions, responses and expectations of gamers could be shaped, at least in the short term, by their experiences on their keyboards and screens. So, the playing of games can impact on other areas of life. The playing of games by parents and people recently out of school might have an effect also on education and educators and other aspects of society. Gamers might share the same pedagogical attitudes and responses once away from the key boards. The responses that need to be explored, for the purposes of this study, fall into the categories of how gaming parents regard school, see the future of school, their engagement with schooling and education, their response to unemployment and their propensity to think critically. At issue, is the efficacy of responses educators and the education system can make to the playing of computer games and gaming parents.

### 1.3.2 Research Questions

This study will explore the impact of the playing of computer games by parents of learners and people who will one day be parents of learners on school education. The

study will give rise to findings which can result in strategic recommendations to parents and guardians who play electronic games, educators, school management, designers of school curricula and the political leadership of school education. These recommendations constitute how education should respond to the playing of computer games. The research will thus lead to possible decisions on the future of education, the development of best practices, and shape engagement with social ills (social impact). In this study, the social ill of unemployment will be considered.

#### 1.3.2.1 Primary Research question

*What impact will the playing of electronic computer games by parents of learners, and young people soon to be parents of learners, have on schools, educators, teaching and learning, social ills (such as unemployment) and critical thinking?*

#### 1.3.2.2 Secondary research questions

The main research question gives rise to five secondary research questions.

**SQ1:** What are the critical aspects of gaming that impact parents and education?

**SQ2:** How does gaming behaviour influence participants' (parents) view on the effectiveness of the education system in a broad sense?

**SQ3**: How does gaming behaviour of participants influence parental involvement in schools?

**SQ4:** How does gaming behaviour affect general social interaction of participants?

**SQ5:** How does gaming behaviour contributes to the psychosocial development of participants?

### 1.3.3 Research Objectives

The research objectives of the study are based on the primary and secondary research questions presented in Section 1.3.2 and can be articulated as follows:

#### 1.3.3.1 Main objective

To determine the impact on schools, educators, teaching and learning, social ills (unemployment) and critical thinking by the electronic computer games playing behaviour of parents of learners and young people soon to be parents of learners.

#### 1.3.3.2 Secondary Objectives

This dissertation is intended to accomplish these secondary research objectives:

**SO1:** To determine the critical aspects of gaming that impact parents and education.

**SO2:** To ascertain the extent that gaming behaviour influence participants' (parents) view on the effectiveness of the education system in a broad sense.

**SO3**: To determine how the gaming behaviour of participants influence parental involvement in schools.

**SO4:** To determine how gaming behaviour affect general social interaction of participants.

**SO5:** To determine how gaming behaviour contributes to the psychosocial development of participants.

### 1.3.4 Significance of the Study

Given the tax spend of R240 billion on school education in 2017/2018 (Gordhan, 2017), and given the growing popularity of gamers, there is a need to study the interaction between the two. This study's academic contribution is that it explores the dynamic of the attitudes of gamers and non-gamers towards education. The stakeholders who have an interest in the findings of this study, to whom recommendations will be made in Chapter five - are parents who play electronic games, educators, school management, designers of school curricula and the political leadership of school education. This is not research into the efficacy of computer games as learning tools (Butler, 2015), but into how the playing of games impacts education and educators. Left un-researched, and in the absence of recommendations on how to live in a world of electronic games, education could be increasingly less

desired. The study could be a step towards formulating official policy on electronic education (e-education).

Lemmer and Van Wyk (2015) say much more research on parental involvement in education needs to be done, particularly on the involvement of fathers. The inequalities in academic achievement of learners would be better understood when research constructed stronger theoretical orientations to examine associations between family backgrounds and outcomes (Lemmer & Van Wyk, 2015). This work attempts to bridge the gap between, and explore, gaming within a family and interaction with education.

This research project upholds the dictates of section 7.3 of the South African Council of Educators (2016) code of professional ethics that enjoins educators to keep abreast of educational trends and developments. The Department of Basic Education (1998) stipulated seven roles for educators. Role number four is headed scholar, researcher and lifelong learner. Educators have to achieve ongoing personal, academic, occupational and profession growth through pursuing reflective study and research in their learning area, in broader professional and education matters, and in other related fields, the Department of Basic Education (1998) insists. Besson, Huber, Mompoint-Gaillard and Rohmann (2015) stress the importance of lifelong learning. Von Kotze (2005) argues that researchers and educators have to produce knowledge rather than merely transmit knowledge.

The research project partially meets Shapiro's (2014) call for responsible guidelines on gaming and gamers premised upon an evidence-based approach that weighs the relative benefits and drawbacks of varying levels of engagement. The research project also partially dovetails with what Rossouw (2009) calls for. Rossouw (2009) says given that teaching is so complicated, educators cannot not merely apply what they have learned. Educators need to continually reflect on their teaching practice, take responsibility for their actions and make thoughtful decisions and changes based on their own distinctive experiences in the classroom. Such an approach to teaching would improve teaching and learning practice. Educators could become more professional, more interested in pedagogical aspects of education and more motivated to integrate their research and teaching (Rossouw, 2009). This work reflects this call.

## 1.4 THEORETICAL FRAMEWORK

A theory explains or predicts. The function of theory is to guide intelligent practice and problem-solving. The study is shaped by two broad positions. On the one side is the intrinsic reasons that propel people to play games, and on the other side are what society sees and experiences of gamers: their extrinsic behaviour. Research into the intrinsic reasons people play games falls under the domain of psychological and medical investigation. For example, Billieux, Thorens, Khazaal, Zullino, Achab and Van der Linden (2015) explore gaming from the perspective of psychological risk factors. The authors seek to disentangle the psychological characteristics of problematic gamer subtypes as a necessary step in developing specific and empirically grounded psychological interventions to help gamers (Burke Guild, 2001). Shapiro (2014) draws on research into how different amounts of gameplay impact gamers' psychosocial development. Boyle and Connolly (2011) explore the role that theories and research in psychology play in understanding the impacts of playing games, the appeal of games and the potential of games.

Given the scope of the extrinsic position, no one theory or theorist covers the field entirely. Thus, theoretical work is drawn from the writings of manifold, selected authors. The research is premised on a behaviorist approach to teaching and learning. The behaviorist theorist B. F. Skinner argues that children are completely malleable (Encyclopaedia of Children's Health, 2016). Skinner's point is extended to adults, for the purposes of this study. Behaviorist learning theory focuses on the role of environmental factors in shaping the intelligence of children, especially on a child's ability to learn by having certain behaviors rewarded and others discouraged (Encyclopaedia of Children's Health, 2016). Playing games certainly evokes rewards. Games have a feature called levelling up, which means that a player cannot move on until the current level is completed. This spurs a gamer to achieve in the game because the reward is moving on to the next level (Wagner, 2016). Kemp (2013) says behaviourism theorises that all people's actions are conditioned responses – people learn how to behave through feedback from the environment.

A behaviourist approach is not in conflict with a constructionist approach to education, which also underpins this work. In keeping with a constructionist approach, learners

are active in constructing their own knowledge and social interactions are important in this knowledge construction process (Woolfolk, 2014).

Stanford Encyclopaedia of Philosophy (2008) states that a constructionist approach to education holds the view that each student in a classroom builds – constructs – their own individual body of understandings, even when all people in the group are given the same stimulus or educational experience. The Stanford Encyclopaedia of Philosophy (2008) traces this position back to writings of French philosopher Jean-Jacques Rousseau on empiricist epistemology and to philosopher John Locke. Constructivists believe that nobody, including educators, can directly access the bodies of understandings of anyone else, and each person is imprisoned in a world of their own making (Stanford Encyclopaedia of Philosophy, 2008). Education is therefore not so much a question of filling heads with present knowledge than to allow everyone to learn, to participate in the construction of knowledge, throughout their life (Besson, Huber, Mompoint-Gaillard & Rohmann (2015).

A constructivist approach stresses the idea that knowledge is not something that can be simply written in a book and transmitted to students; the construction of knowledge is a complex process in which people take part (Gros, 2003). Learning with computer games is consistent with constructivist theories of learning which emphasises learning as an active process in which learners construct new ideas or concepts based upon their current/past knowledge and where learning is individualised according to characteristics of the player (Boyle & Connolly, 2011). From a constructivist point of view, students need to be involved actively in acquiring knowledge. The knowledge needs to be used in restructuring information, manipulating, recreating, and testing so that it is more meaningful, well-planned and well-remembered (Ahmada & Jaafarb, 2012). Games can help players construct their own concepts and knowledge while they accomplish the objectives of their games (Hong, Cheng, Hwang, Lee & Chang, 2009; Moursund, 2007). Hong, Cheng, Hwang, Lee and Chang (2009) write that the pedagogical approaches presented by games are learning by doing, learning from mistakes, goal-oriented learning, role playing and constructivist learning. People achieve personal growth and effective learning through games and construct their own concepts and knowledge (Hong *et al.*, 2009).

Constructivist theorists are convinced that learning in context with authentic tasks improves transference and helps gamers to apply what they learn in one environment in other contexts (Gros, 2003; Riding, Fowell & Levy, 1995).

This study is into how gaming and non-gaming respondents behave, what society sees of games and interpretations of gaming behaviour. Theoretical inputs are drawn from contributors on the purpose of education, the functioning of educators and responsibilities of parents. The theory emerging from the study on what educators and education should do in an era of gaming, entitled *Towards an accommodation with E-sports,* can serve as a theoretical framework for future engagement between, and studies into, gaming and education.

## 1.5 CONCEPTUAL FRAMEWORK

The set of ideas upon which the research, research questions, literature review and data analysis are structured revolve around the growing popularity of gaming and the impact this has on education. The founding concept is that of play and a game. Gros (2003) notes that play is a human characteristic. All games have long been associated with entertainment, but with the influence of John Dewey (Gros, 2003), educational games began to play a major role in teaching methodology. Educational games were introduced into schools as something more than just entertainment (Gros, 2003) and were accepted as having major educational potential. Educational games can motivate people, and help students develop skills, abilities and ways to deal with challenges. For the purpose of this study, electronic games are seen as a form of game, as the logical next step from board games in an electronic era. What is different, however, is that some games can be played by millions of people at a time around the world, effectively taking down barriers between countries (Gros, 2003).

A gamer is a person who plays digital games on a screen. Digital games are also labelled computer games, electronic games, online games or video games. Such games are played online over the Internet, through servers or on networked computers (Wagner, 2016; Billieux, Thorens, Khazaal, Zullino, Achab & Van der Linden, 2015;

Lowood, 2014). The games are played on platforms such as stand-alone desktop computers, portable computers, handheld devices, general-purpose shared and personal computers, arcade consoles, video consoles connected to home television sets, handheld game machines and mobile devices such as cellular phones, smartphones and tablets, all with improving capabilities, technical specifications, colour and graphics. Lowood (2014) states that an electronic game is any interactive game operated by computer circuitry. The terms computer games, digital games, electronic games and video games are used synonymously and interchangeably in this study, and represent the totality of these formats (Wastiau, Kearney & Van den Berghe, 2009). McClarty, Orr, Frey, Dolan, Vassileva and McVay (2012) define a game as a system in which players engage in artificial conflict, defined by rules that result in a quantifiable outcome. For the purpose of this study, playing electronic games at all during a week qualifies a person to be classified as a gamer. The amount of playing will be a turning point in the analysis of data and in formulating recommendations.

At issue is not if gamers acquire knowledge and abilities through gaming, which they do (Burke Guild, 2001), but what they do with the knowledge and abilities. The concepts of critical thinking and social conscious are explored because these are two drivers of change in society. Were gamers to display a low regard for critical thinking and have little social conscious, this could have far reaching implications for society, including democracy.

## 1.6 RESEARCH METHODOLOGY

The study uses a mixed method design, bringing together quantitative methods and qualitative methods.

The study attempts to follow the dictates of evidence-based inquiry (education research) as set out by McMillan and Schumacher (2014) which seeks to improve educational practice. The first phase of the research will be phenomenological (wide-ranging bordering on free thinking) interviews with experts in education, with a knowledge of gaming. These interviews will set the scope of the study. Two

approaches will thereafter be used to gather data; namely a quantitative approach and a qualitative approach. The quantitative approach will enable the sentiments of respondents to be codified into numbers. The quantitative data will be subjected to the statistical techniques of correlation, regression and factor analysis. The quantitative data will form the basis of interviews with qualitative respondents. The use of a quantitative method and a qualitative method reflects the statement by Louw and Louw (2013) that quantitative researchers obtain information about people, while qualitative researchers obtain information from people (French, 2010).

## 1.7 POPULATION AND SAMPLE

### 1.7.1 Population

The population for this study is all people with links to the Lejweleputswa area in Free State who have an electronic device, are in some way linked to school education and are over 18 years of age. The population includes, parents, educators, young people, gamers and non-gamers.

### 1.7.2 Sample

The sample size is the number of individuals needed to provide the most meaningful information on the research questions (Hendricks, 2003; Rumsey, 2003). The study made use of nonprobability sampling (Saunders *et al.,* 2009). Two non-probabilistic alternative ways of contacting respondents will be used. The first technique is convenience sampling. The respondents are available, their electronic details are known, and so contacting them is convenient. (Research methods knowledge base, 2017). Respondents will be asked to identify other respondents in a snowball sampling technique (French, 2010; Statpac, 2017). Most of the respondents will be drawn from the Lejweleputswa area. However, responses from snowball respondents from outside this core area will be included as snowball respondents will not be asked to say where they reside.

## 1.8 DATA COLLECTION INSTRUMENTS

Data will be collected through a quantitative method and a qualitative method. The quantitative data will be collected through a questionnaire. The questionnaire will comprise of a demographic section and a research question section of 34 questions. The demographic data will be the tools of incision with which to interrogate the quantitative data.

The qualitative data will be gathered through semi-structured interviews. The qualitative data will be gathered in two stages. First, a series of phenomenological interviews will be conducted with education stakeholders, with a knowledge of gaming, to shape the rest of the study. The phenomenological respondents will be asked how gaming impacts education. The phenomenological data will be gathered at the outset of the study and before the literature review is undertaken and the research questions are formulated.

The quantitative data will thereafter be gathered and analysed, using the statistical technique of correlation, regression and factor analysis. The analysis will form the basis of questions used in the quantitative data gathering process. Quantitative and qualitative methods will be used in a triangulation (mixed method) design (McMillan and Schumacher, 2014).

## 1.9 DATA ANALYSIS

The quantitative data will be subjected to statistical analysis (correlation, regression and factor analysis). Additional statistical techniques will be use to unpack the data, including testing four constructs of dependent variables. The data will be tested for normality, substantiated through Kolmogorov-Smirnov (K-S) tests. The data will be subjected to the tests of homoscedasticity, analysis of variance (ANOVA) test, hypothesis making and measures of association. The qualitative data will be integrated with the quantitative data so as to add deeper insight into both sets of data.

## 1.10 VALIDITY AND RELIABILITY

The work will be subjected to the tests of validity and reliability (Terre Blanche, Durrheim & Painter, 2008). As the study focuses on schools, the tests of validity and reliability to be used are those put for by the school assessment body the Independent Examination Board (IEB, 2016). The data will also be subjected to the Cronbach Alpha technique, which indicates the internal consistency of the data (Terre Blanche *et al.,* 2008).

## 1.11 ETHICAL CONSIDERATIONS

The research proposal was first submitted to the research committees at the Central University of Technology, Free State. This served as the first steps in the ethical consideration. Possible respondents asked to participate will be free to decline. No respondent will be approached as representatives of any organization or state department. Respondents will be approached in their capacities as gamers and non-gamers, some of whom are also parents and educators. The study is not compulsory and is anonymous.

## 1.12 DELIMITATION OF THE RESEARCH

The major delimitation of this study is that the links between gaming and school education have not been widely researched in South Africa.

## 1.13 EXPECTED OUTCOMES

The study is expected to establish research-based findings that can inform school management, educators and political leadership on facing up to the problems and challenges posed by parents playing electronic games. There will be a recommendation to educators on the need to constantly improve what happens in the classroom and sustain the curiosity of people in the class. A recommendation will be made to gaming parents about their gaming behaviour and use of time. The study will also aim to make recommendations to curriculum designers and educators on using

games in the classroom. The recommendations will be strategic in that the recommendations will be *what should be done now* to secure a desired outcome in the face of gaming.

## 1.14 DIVISION OF CHAPTERS

The chapters for this study are divided as follows:

**Chapter 1**: The aim of Chapter 1 is to offer an introduction, setting out the problem statements and areas to be researched. The research questions developed from the problems identified lead to the objectives, significance, delimitations of this study. A brief discussion on the research methodology used to address the problem is presented.

**Chapter 2**: This chapter records the views of selected scholars on matters raised by the problem statement and aims of research. The overarching research question to be answered by the literature is how does gaming impact education, educators and parents? The literature directly informed the quantitative questions that were asked of respondents.

**Chapter 3**: This chapter discusses mixed research design. The chapter explains how the data will be gathered, captured on an Excel spread sheet and SPSS data sheets, and thereafter made use of. The chapter will reflect on the statistical techniques to be used.

**Chapter 4**: In Chapter 4 the results of the qualitative and quantitative data will be presented. The biographical data and the general statistical analysis will provide the descriptive data and also the inferential data. The statistical techniques include ANOVA testing, factor analysis, correlation and regression.

**Chapter 5**: This chapter will provide an interrogation (discussion) of the quantitative and qualitative data, integrated with literature review material. This chapter will further present the conclusions made based on the data analysis. Lastly, based on the data

analysis, specific recommendations will be made to the stakeholders. Limitations of the study and future possible research areas will be identified. The submission will be made that the study has explored the main research question and supplementary research questions. The study is thus the next step, or contribution, in the academic debate around gaming, education, educators and parents.

## 1.15 CHAPTER SUMMARY

Chapter one set out the introduction, problem statement and research questions. Chapter two will now set out what selected scholars offer on gaming, education, educators and parents.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 INTRODUCTION

Byron, Curran and McCarthy (2006) have no doubt: someday everyone will play electronic games (Gros, 2003). In the wake of these expectations, the literature review offers material from selected scholars, authors, commercial sites and media writers on the interplay between the playing of electronic games, school education, educators and parents. Against this background, French's (2010) point is relevant: virtual reality will play an increasingly important role in life in the future but virtual reality must never be taken as … reality. The literature material is offered and reviewed in four themes, namely gaming, education, educators and parents to reflect the research questions (*cf.* 1.3.2 Research questions).

This chapter synthesises the literature to answer the following research question:

**SQ1:** *What are the critical aspects of gaming that impact parents and education?*

The chapter opens with an exploration of the background and context of gaming.

## 2.2 GAMING

Steve Russell wrote the first video game in 1961, the two-player spaceship fighter Spacewar. Today, the gaming industry is a global economic juggernaut and staple entertainment around the world (Lenhart, Kahne, Middaugh, Macgill, Evans & Vitak, 2008). Computer games grew out of university and industrial computer laboratories. Some games functioned originally as technology demonstrations and amusement for learners and technical staff (Lowood, 2014). Electronic games and interactive fiction moved from laboratories into the mainstream of commerce and culture on social networks and computer-generated communities (Lowood, 2014). Boyle (2013) states

boldly that like it or not, electronic games are here to stay, as part of the world's media experiences (Moursund, 2007; Durkin, 1995).

Crawford (2012) notes that video gaming is economically, educationally, culturally and socially important and firmly cemented within contemporary life (Boyle, 2013). Rogers (2016) sees gaming as part of the Fourth Revolution, heralded by the interconnectivity of devices heralded the fourth industrial revolution. Rogers (2016) affirms that education has been impacted by each revolution over the past two centuries. Therefore, it is important that schools prepare learners for the fourth revolution (Rogers, 2016; Goldman & Berman, 2016; Wood, 2010; Gros, 2003). The global video game industry, worth $107 billion, is the fourth biggest entertainment market in the world, behind gambling, reading and TV (Blewett & Adam, 2016; Business Tech, 2015; RDM Newswire, 2015; Rheeders, 2014; Cortes, Alcalde & Camacho, 2010; Lenhart *et al*., 2008)

The video game industry will expand as a leisure activity in the wake of improved technology and improved Internet connections (Wagner, 2016). Essential facts (2015, p iii) notes:

"*Video games are ingrained in our culture. Driven by some of the most innovative minds in the tech sector, our industry's unprecedented leaps in software and hardware engages and inspires our diverse global audience. Our artists and creators continue to push the entertainment envelope, ensuring that our industry will maintain its upward trajectory for years to come."*

Kemp (2013, p1) endorses this: "There are people, working at development studios, who go into work every single day and try and figure out how to get you addicted to their game. These games are manipulating the way you think and behave." In 2013, video games were the fastest growing medium in the world (Carte Blanche investigates South African game development, 2015).

Gamers are part of this global trend. Educators and school leadership have no way, therefore, of avoiding the challenges posed by electronic gaming.

### 2.2.1 The nature of games

Electronic games exploit some level of brain simulation, offer virtual worlds to explore (McCauley, 2011) and are a competitive activity directed by rules (Ahmada & Jaafarb, 2012; McCauley, 2011; Hong, Cheng, Hwang, Lee & Chang, 2009). Games are played individually or by groups of players through online connections (McCauley, 2011) sitting all over the world (Wagner, 2016) and offer a source of fun and entertainment (Kirriemuir & McFarlane, 2003). Role playing games are intended to entertain, are educational and involve problem-solving. Connolly, Boyle, MacArthur, Hainey and Boyle (2012) state that gamers play because of the challenge, social interaction, diversion, fantasy (Butler, 2015) and arousal (McCauley, 2011). Ahmada and Jaafarb (2012) add the attractions of curiosity and the ability to control as reasons for gaming (Boyle & Connolly, 2011). Quick and Atkinson (2011) also list exploration, companionship and realism as elements that lead to player enjoyment and are critical to the creation of an effective game experience. Hong *et al*., (2009) claim the interest in gaming is because of the objectives, outcomes and feedback, conflict, opposition, interaction and representation. These elements give gamers the power of engaging peers in fun ways. Games offer enticing storylines and combine structure and motivation, while promoting involvement, creativity, novelty and fantasy worlds of fun (McCauley, 2011; French, 2010; Rapeepisarn, Wong, Fung & Khine, 2008; Griffiths, 2002). In addition McCauly (2011) states that players make decisions on how to advance through the game to achieve tasks and progress at their own pace. Gamers take on different roles and perspectives, which helps them apply gaming experiences to the real world (McCauly, 2011).

Games involve cooperation and/or competition and offer players a chance to improve their skills, attain a higher level of game complexity, persist in the face of obstacles and setbacks and exceed their own or some other target of excellence (Lenhart *et al*., 2008; Durkin, 1995).

Gaming is multifaceted, as the contributions above reflect. Some of the features of gaming will be discussed below.

### 2.2.2 Gaming as a sport

Gaming can be considered as a sport, similar to any other school sport. Gaming has its own world championships and the 2014 final was watched by 11,2 million digital viewers. The International e-Sports Federation has one overriding goal: to secure membership of the International Olympic Committee and so make e-sports an official Olympic event (Venktess, 2016; Ngcaba, 2016; Byung-yeul, 2016; Van Allen, 2015; Cellan-Jones, 2014; Evans, 2014; Rheeders, 2014). Gamers can earn millions of rands in global tournaments (Venktess, 2016; Ngcaba, 2016; Byung-yeul, 2016; Cellan-Jones, 2014, Hamari, Koivisto & Sarsa, 2014; Shaffer *et al*., 2005). People in the demographic 16 to 30 years are more interested in watching e-sports and streaming video games than watching TV (Venktess, 2016; Cellan-Jones, 2014). This point has relevance to this study as this is the age group who are already young parents or will be parents within a decade, and will make judgements on education. Governments around the world are investing heavily into e-sports (Venktess, 2016; Webster, 2016).

### 2.2.3 Gaming as a social activity

Durkin (1995) sets out the scope of the debate on gaming and education by saying some scholars foresaw computer games turning gamers into isolated, compulsive introverts cut off from normal social interchange (Louw & Louw, 2013; Wastiau *et al*., 2009). Other writers suggest games serve as focal points for friends and families (Lenhart *et al*., 2008). Gaming, McCauley (2011) insists, is a social activity (French, 2010). Gaming entails acquiring new friends, giving and receiving emotional support through online communication and socialising with people from different social and economic backgrounds (Billieux, Thorens, Khazaal, Zullino, Achab & Van der Linden, 2015; Durkin, 1995). Striving for in-game rankings and achievements does not necessarily interfere with daily life activities or social relationships and most gamers do not play to fulfil unsatisfied basic psychological needs (Billieux *et al*., 2015; Crawford, 2012; Dewar, 2012).

French (2010) claims that gaming is more inviting than the everyday world of family, school and work. Online international friendships replace real-world local friends.

Gamers play compulsively, isolating themselves from social contact, and focusing almost entirely on in-game achievements rather than real life events (French, 2010). Massively multi-player games linking possibly millions of players have become the mainstream forms of social interaction across the globe (French, 2010). The massively multiplayer online games where thousands of players simultaneously participate in virtual worlds with their own economies, political systems and cultures is a thoroughly social phenomenon (Moursund, 2007; Shaffer *et al*., 2005).

Social exchanges in gaming are based solely on fake identities and role-playing, with no overt class, race, age or gender issues, educational status or ethnicity, cutting across demographic boundaries (McCauley, 2011; Griffiths, 2002). Hence, gamers build social relationships with their peers (McCauley, 2011). Furthermore, Wagner (2016) and Shapiro (2014) add that people game because they enjoy the social and educational setting, therefore improving social relationships. An online community enables friendship building and is a social avenue that gamers might not experience in real life. Gaming constructs rules to live by and develops sets of standards or expectations of behaviour from members. Members have to adhere to the social boundaries to thrive.

#### 2.2.3.1 Gaming virtues

Selected virtues emanating from gaming are now set out.

Games that enforce positive values held in the real world can influence players to more actively portray these values in the real world (Billieux *et al*., 2015). Consequently, Griffiths (2002) with Matthews and Coyle (2010) claim that playing computer games (irrespective of genre) raises players' self-esteem. Video games help players set goals and ensure goal rehearsal. Gamers learn about impulse control (Griffiths, 2002).

Gaming enables gamers to learn about themselves, interact with other gamers and develop their thinking and skills that are useful in non-game environments (Moursund, 2007). Matthews and Coyle (2010) together with Istiau, Kearney and Van den Berghe (2009) feel games can help adolescents develop self-confidence, discussion skills and be more willing to accept responsibility.

Gamers can gain in mental maturity (Moursund, 2007). A mature person reflects on their experiences and thinks out ways to achieve a better outcome next time they have the same or similar experience (author generated). This work upholds Stein's (1999) thinking that parents can reflect critically on their experiences, integrate knowledge gained from experience with knowledge possessed, and act on insights they gain. Stein's work *(*1999) suggests that parents, gamers and otherwise, can interpret the world around and opt for a different and better future.

French (2010) cautions that the Internet can lead to social isolation, a breakdown of social communication and family life, as faceless people practice random sociability, while abandoning face-to-face interaction in real settings. A lack of social interaction because of gaming can have long-term social consequences. Gamers may not know how to make friends, talk to the opposite gender or just enjoy people's company. The social awkwardness created by the isolationism of gaming addiction, unfortunately, feeds the addiction. The gaming addict will likely retreat back to their online world where relationships are easier and already waiting for them (University of North Carolina, 2011; Siitonen, 2007).

#### 2.2.3.2 Gaming and fantasy

The Internet allows people to live online fantasies and escape the real world, leading to a culture increasingly dominated by virtual reality (French, 2010). Real life can be empty, lonely, and isolated, leaving people hungry to belong to something a little more established, such as online games, which they understand and in which they can participate (Billieux *et al*., 2015; French, 2010). In the virtual world, players chose to represent themselves as anything they wish, an option which is not available in the real world. The fantasy world leaves gamers feeling confident and more self-assured, and able to communicate better. Therefore, educators need to be mindful of the world of fantasy as some gaming parents could engage with educators in a misplaced fantasy world (French, 2010).

#### 2.2.3.3 Gaming and identity

Gaming enables gamers to explore, experiment with and take on different identifies, and explore their emotions (McCauley, 2011; Shaffer *et al*., 2005; Moursund, 2007; Boyle & Connolly, 2011). French (2010) fears gamers can lose their real-world identities and morph into their cyber identity, communicating only through Internet and not face-to-face. Billieux *et al*., (2015) fears that if gamers identify more with the virtual world, this could become an existential reality, even if it is only virtual reality. McCauley (2011) sees benefit in gamers taking on different identities in a game just as life calls upon citizens to play out different identities. The question of gamers assuming identities has bearing for educators. Gamers who are parents could see themselves playing out an assumed identify, and be comfortable with that (Hurst, 2016). Thus, educators would be advised to be mindful of such identify adoption, with possible out of character behaviour.

### 2.2.4 Gaming and emotions

Granic, Lobel and Engels (2014) maintain that gamers play as a way of emotional mastery. Gamers explore different emotional themes, such as anxiety and dominance. Boyle and Connolly (2011) report that gaming allows gamers to test their reactions to these emotions in a safe and controlled environment removed from reality. The relevance to this study is that educators need to be mindful of the emotional world that could impact a gaming parent they are dealing with.

### 2.2.5 Synergy of gamers

Multi-player games require collaboration to do well, which is an important skill to have (Wagner, 2016; McClarty *et al.*, 2012; Gros, 2003). This point is relevant to this study as parents would probably need to collaborate if they wanted to influence the future of education. Lowood (2014) explains that communities of gamers form multi-player teams and congregate on fan web sites devoted to specific games. These groups use the internet, broadband connections and local area network (LAN) parties and increasingly merge in-game and out-of-game social experiences. Moursund (2007) sees this as similar to consumers who use a credit card and participate in a massively

multi-user online financial system. Likewise, email users participate in a massively multi-user online communication system. Readers who use the Internet participate in a massively multi-user online virtual library system, as do purchasers from online businesses (Moursund, 2007). This lays the foundation for gaming parents to work together to address school issues if they so wish. The wide-ranging nature of games creates an impact on society, which is discussed next.

### 2.2.6 The possible impact of gaming

Like most technologies before them, computer games can have both positive and negative impacts (Connolly, Boyle, MacArthur, Hainey & Boyle, 2012; Billieux *et al*., 2015). Lenhart, Kahne, Middaugh, Macgill, Evans and Vitak (2008) are adamant that video games are neither good nor bad by themselves; they neither lead to violence or peace. They can be and do one thing in one family, social, or cultural context, quite another in other contexts. Individual psychological and physiological predispositions and social contexts play a major role in actual human behaviour. Therefore it would be wrong to argue that, by default, playing (certain) games would have (certain) effects on gamers' thoughts or actions (Ensslin, 2012; Bright Media, 2012). Amory notes (2012, p1): "You learn with technology, not from technology. It is not the thing, but what you do with it that matters. Tools like games mediate learning."

Games create new social and cultural worlds that help individuals learn by integrating thinking, social interaction and technology, all in service of doing things that society cares about. Like books and movies, games can be used in antisocial ways. Games are inherently simplifications of reality (Wastiau *et al*., 2009; Shaffer *et al*., 2005). French (2010) repeats that technologies, including TV, computers, books and games are neither good nor bad and have no effects all by themselves. However, like all tools they have effects, good, bad and neutral, depending on how they are used and the context in which they are used.

The impact of gaming on selected skills is discussed in the next section.

#### 2.2.6.1 Acquiring skills through gaming

To function in the world, people need to be able to use technology, address problems and communicate (McClarty *et al*., 2012; Randall, 2010). Games could impart such contemporary skills such as decision-making, collaboration and innovation by recognising several ways to address a problem (McClarty *et al*., 2012; Connolly *et al*., 2012). Skills required for success in games such as procedural thinking, planning, learning, problem-based learning and technical skills are also sought by employers (McClarty *et al*., 2012; Randall, 2010). Gamers are required to think abstractly, systemically and apply and adapt their knowledge to varying situations. Some games offer practice in logic skills.

Games enhance higher level cognition such as critical thinking and achievement, argumentation, prediction and hypothesis testing (Billieux *et al*., 2015; Ahmada & Jaafarb, 2012; McCauley, 2011; Moursund, 2007; Durkin, 1995). Games enhance self-regulation, creativity, negotiation and coordination, while teaching sequence learning, deductive reasoning and memorizing, which are skills required in the work place and in life generally (Ahmada & Jaafarb, 2012; Connolly *et al*., 2012; Boyle & Connolly, 2011; Cortes *et al*., 2010; Gros, 2003). Players have to instantly interpret, process and react to digital data provided by the game (McCauley, 2011).

The multiplicity of the sources of knowledge and demands upon knowledge make necessary the concept of lifelong learning (Besson *et al*. 2015; Randall 2010). Together with Lemmer and Van Wyk (2015) these authors further claim that knowledge is a continuous flow and spread over one's life. People should participate in the construction of knowledge, throughout their life and develop habits of mind and heart that are geared towards intellectual rigour. The point to be tested is if gamers respond to these demands.

Moursund (2007) draws parallels between gamers organising themselves into teams, each running an individual character, to carry out joint activities, fight or compete against other teams or against a computer and a team of workers in a company competing against workers from other companies to develop products that capture market share and make profit. As more jobs require working through and with a

computer-based game-like interface, there is some incidental transfer of learning from game playing into such jobs (Moursund, 2007). Wagner (2016) and Hamari, Koivisto and Sarsa (2014) note that many of the concepts and skills acquired in gaming are the kind of business skills needed to succeed in the business world such as marketing and customer engagement. Gamers are thus very much part of the skill set required for contemporary living. There is a need to gauge respondents' sentiments to the points above.

Authors have tabled countless life skills that can be acquired through gaming. This study tests the extent to which skills are transferred or not transferred. Selected skills are discussed here. Istiau *et al.* (2009) list skills acquired by learners through playing games:

- **Social skills**

The main purpose of gaming is social; gamers have to abide by a set of rules and conventions in order to play together. By promoting and encouraging these abilities, gamers learn to develop social intelligence that teaches them to better understand the conventions of group integration (Snodgrass & Blunt, 2009).

Hong *et al*., (2009) are of the opinion that gamers gain confidence through playing games, and that gamers concentrate better. Gamers experience learning by doing, not just watching or reading descriptions (Wagner, 2016; McClarty *et al*., 2012; Ahmada & Jaafarb, 2012).

McCauley (2011) further states that games promote social cohesion, interaction and collaboration among the gamers and increase the sense of belonging among members. Likewise, Boyle and Connolly (2011), Alkafaji (2010) as well as Hong *et al*., (2009) state that games promote teamwork among gamers. Learning through gaming is consistent with constructivist theories of learning which emphasise learning as an active process in which learners construct new ideas or concepts based upon their current/past knowledge. Learning is individualised according to characteristics of the player (Boyle & Connolly, 2011).

Games offer active engagement, content/story, interactive problem solving, quick adaptation and immediate reward. Some games encourage means-end analysis strategy and others encourage inferential and proactive thinking. Curiosity, fun and the nature of the challenge in the game adds to a game's educational potential (Griffiths, 2002, Young, 2009). Games can enhance scientific reasoning skills knowledge acquisition, content understanding and improve perceptual skills (Connolly *et al*., 2012).

Some gamers play to achieve in the game, some like to speak with other players, create new relationships or participate in teamwork-based cooperation. Some play to escape, to avoid thinking about real-life problems or because they have low self-esteem. These motives lead to addiction and negative outcomes (Billieux *et al*., 2015). Some gamers play to cope with distress or because of weak inhibitory control, poor self-control, traits of impulsivity and sensation seeking (Billieux *et al*., 2015). Some gamers play more to dissociate from real life than to succeed in the game.

- **Decision making skills**

Video games require players to make decisions, analyse ways forward and address problems, which are important skills not easily taught (Wagner, 2016; Matthews & Coyle, 2010; Hong *et al*., 2009; Griffiths, 2002) and are useful in non-game environments (McClarty *et al*., 2012; Moursund, 2007). Games teach participants to think about complex systems and to address problems in a complex world. Games make players think about decisions they make and how the decisions impact on the games (Rapeepisarn *et al*., 2008). A person adept at addressing problems cultivates the ability to read others, to collaborate and to bring in other knowledge as need be. Such a person can assess a problem situation quickly, gathering relevant information and draw on their experience as need be (Wagner, 2016; Moursund, 2007).

Games force players to choose and to prioritize, weigh evidence, analyse situations, consult goals and then decide (McCauley, 2011, Moursund, 2007; Gros, 2003). Learning comes from failures and poor decisions as well as making the right choices (McCauley, 2011) and winning the game. Gamers learn how to process and react to

a multitude of digital information and so acquire confidence (McCauley, 2011; French, 2010). Okeke (2014) links decision making to parental responsibility. Parents should attend parent-educator conferences, generally work with schools and their learners to benefit their children's educational outcomes and future success, and participate in school decision-making (Okeke, 2014). Parents should share responsibility for learner and school performance by working with educators, administrators, and other parents, Okeke (2014) insists. Decision making and working with other parents will be tested.

As noted above, games can impart skills, attitudes, values and knowledge that can be transferred to other others of life (Wagner, 2016; Kampf & Cuhavear, 2015; Ahmada & Jaafarb, 2012; Boyle & Connolly, 2011; Durkin, 1995).

- **Transferable skills**

Skills, knowledge and learning acquired through gaming are transferable to a gamers' life in new and everyday settings (Riding *et al.,* 1995; Rossouw, 2009; Moursund, 2007). Such transference helps gamers address real world problems (McClarty et al., 2012; McCauley, 2011; Wastiau *et al*.,2009; Rapeepisarn *et al*., 2008; Hong *et al*., 2009; Moursund, 2007). Transfer happens because gamers learn in the context of a new way of thinking, an epistemic frame that lets them see the world in a new way (Shaffer *et al*., 2005).

The above section contextualised games in contemporary society. At issue is how the points canvassed above impact education, educators and parents. The interplay between gaming and education are explored next.

## 2.3 GAMING AND EDUCATION

Education can be seen from two perspectives. The interpretation of education held by gaming parents is relevant so the two perspectives need to be discussed. On the one hand Chomsky (2013) feels that the purpose of education is to help learners to learn on their own. Education should equip learners to challenge and question, to question authority, to search for alternatives and not merely place learners in a framework

following explicit orders (Chomsky, 2013). He envisages an education system that enables learners to evaluate, interpret and understand. Encouraging creative exploration, independence of thought, a willingness to cross-frontiers and challenge accepted beliefs will create the technology that is going to produce economic gain, not that this is the prime purpose of education (Chomsky, 2013). Education should inspire and instil a burning desire to have a lifetime devoted to learning, citizenship and creativity (Webb, 2014). Besson *et al.* (2015) feel that education should serve as preparation for life as an active, contributory citizenship (Peterson, 2009). Education should prepare learners to be productive and responsible adult citizens in an era where the mind/brain and computer work together to address problems and accomplishing tasks (Moursund, 2007).

On the other hand, and differing from the sentiments above, Peterson (2009) and Muller (2016) state that the purpose of education is preparation for the labour market and to create workers with the skills and personal styles needed to fill and perform jobs. The perception of education held by respondents, gamers and otherwise, needs to be tested. Education and fun are not mutually exclusive.

### 2.3.1 Play, learning and gaming

Learners learn best when learning is fun and play (Rapeepisarn *et al*., 2008; Wagner, 2016). Learning through play is a natural and universal learning tool. Play is a valued contributor to a learner's development. The fictional nature of games and the opportunity to act out a role offer gamers an opportunity to understand their life experiences and help them to mature (Gros, 2003). Games transmit of society's predominant values and attitudes (Gros, 2003). Computer games bring together the idea of game, play, fun, and hands-on experience in the learning environment. Consequently, playing computer games can be seen as learning through play while offering skills and knowledge acquisition (Connolly *et al*., 2012; Rapeepisarn *et al*., 2008). Butler (2015) reports that play is an important part of learners' mental development, even if the imaginary situations children create are manifest in electronic games. In like manner McClarty *et al*., (2012), Butler (2015), Rapeepisarn *et al*.,

(2008), Moursund (2007) and Gros (2003) state that digital games are an integral part of learning and intellectual development

Gros (2003) further states that all games mediate players' understandings of other phenomena while acknowledging social and cultural contexts in which game play is situated. Learning occurs through the dynamic relations between subjects, artefacts, and mediating social structures. Gamers explore and interrogate information in a fun and interactive way (Wagner, 2016). Computer games are therefore an important part of contemporary culture and educators would be advised to accept this. This study might go some way into enabling educators to more meaningfully engage the world of gaming.

Regardless of age, economic, ethnic, or social background, people understand the language of play, Kirkland and O'Riordan (2010) note. Play is a human characteristic associated with entertainment. The influence of John Dewey ensured that games were introduced in schools as more than just entertainment, as a teaching method (Kirkland & O'Riordan, 2010; Gros, 2003). Electronic games can motivate and help learners develop skills, abilities and ways to tackle problems (Gros, 2003). Games aid intellectual development as gamers need to understand how things work and devise ways to play (McClarty *et al*., 2012; Turgut & Irgin, 2009).

### 2.3.2 Technology and education

Each new type of mass media from books, films, radio, recorded music, television, computers, and electronic games to the Internet was praised for its potential benefits and criticised for its potential harms to society and education (Cortes *et al*., 2010; Moursund, 2007). There has been consistent interest in harnessing the power of contemporary media to add contemporary relevance and improve instruction, teaching and learning (McClarty *et al*., 2012; DiPietro, Ferdig, Boyer & Black, 2007), to step up learner engagement and change the nature of learning (Gros, 2003). Educators have long used contemporary media to increase engagement and motivation in the classroom (McClarty *et al*., 2012; Besson *et al*., 2015).

Forms of new digital media are a quantum leap from traditional books, libraries and learning environments and institutions (Besson *et al*., 2015; Wagner, 2016). The issues facing educators in the digital world are how to maintain learner interest in school and maintain attention spans that require long sessions of sitting and listening (Besson *et al*., 2015).

### 2.3.3 Digital education

Computer games have become a major part of life and leisure time (Rapeepisarn *et al*., 2008) so need to be a part of education. Boyle and Hibberd (2005) point out that governments encourage the development of a creative/knowledge economy that places digital culture at its centre. Governments attempt to improve their higher education systems (Wildavsky, 2010) in a quest to build knowledge-based economies and understanding of the digital cultural landscape. Computer games are a central aspect (Boyle & Hibberd, 2005) of the digital landscape. Shaffer, Squire, Halverson and Gee (2005) are adamant: education has to use electronic games and the virtual worlds as preparation for meaningful activity in the post-industrial, technology-rich, real world.

Education systems have to prepare learners for contemporary life, given the rapid penetration of increasingly sophisticated technologies into every facet of society (McClarty *et al*., 2012). Learners worldwide are growing up immersed in a media-rich, ubiquitous, always connected world. Continuing to provide the same type of education as the world continued to change would not serve them well. McClarty *et al*., (2012 p 3) points out: “Training the workforce of tomorrow with the high schools of today is like trying to teach kids about today’s computers on a 50-year-old mainframe. It’s the wrong tool for the times.”

Moursund (2007) and Durkin (1995) caution that decreasing attention levels are driven by society’s constant use of technology. Learners in school and students at university occupy a hyper stimulating world and find it difficult to sit through a 40-minute lesson or focus on a single task (Blewett & Adam, 2016).

### 2.3.4 The purpose of teaching

Teaching, Chomsky (2013) insists, should inspire learners to discover on their own, to challenge if they do not agree, to look for alternatives if they think there are better ones, to work through great achievements of the past and try to master them on their own. Education should help learners get to the point where they can learn on their own, because that is what they are going to do during their life, and not just absorb materials given to them by the outside and repeat it.

The global challenges facing the world require members of society with strong and well-developed competence for innovation and creativity, able and inclined to think out of the box. The challenges require citizens to observe and analyse critically, to address problems through collaborative learning and working, and be able to live and work in diverse teams and social settings (Besson *et al*., 2015).

Besson *et al*. (2015) state that what is taught, the content of education curricula, is one side of the coin. The other side is how teaching takes place and how learning is facilitated. Pedagogy and methodology are not neutral, and need to reflect the values, principles and orientations of what society want to transmit or to develop in learners in order to effectively reach these aims. With gaming on the ascent, therefore, the opinion of gaming parents to what is taught will increasingly become relevant, even if possibly not expressed, hence this research task to ascertain such opinions.

### 2.3.5 Learning in a digital era

As cyber-citizens, gaming parents and learners are less and less willing to accept an educators' stories, Besson *et al*. (2015) as well as Kirkland and O'Riordan (2010) predict. At the same time, technological and communication advances are changing gamers' relationship with reading and ways of transmitting ideas, going from linear presentation of thought to multidimensional ones (pages in pages, hypertext, embedded media, high-speed sharing of content). This trend impacts immensely on society's relationship to knowledge and language. Cyber-citizens engage in language in creative ways, including replacing text with images (Besson *et al*., 2015).

Playing electronic games assists gamers to learn how to read (McCauley, 2011). Gamers encounter text throughout the game and can read about their games in magazine reviews and strategy guides. Lenhart *et al*., 2008 write of the tremendous educative power games have to integrate thinking, social interaction and education.

Shaffer *et al*. (2005) suggest individuals learn by doing something as part of a larger community with others who share common goals and ways of achieving those goals. Learners learn by becoming part of a community of practice and thus develop that community's ways of knowing, acting, being, and caring. These are a community's situated understandings, effective social practices, powerful identities and shared values. The way of thinking, the epistemology, of a practice determines how someone in the community decides what questions are worth answering, how to go about answering them, and how to decide when an answer is sufficient. The epistemology of a practice thus organises (and is organized by) the situated understandings, effective social practices, powerful identities and shared values of the community. In communities of practice, knowledge, skills, identities and values are shaped by a particular way of thinking into a coherent epistemic frame. If a community of practice is a group with a local culture, then the epistemic frame is the grammar of the culture, the ways of thinking and acting that individuals learn when they become part of that culture (Shaffer *et al*., 2005; French, 2010).

Von Kotze (2005) writes about the exploration of ideas and the debate about what counts as worthwhile knowledge. Von Kotze (2005) states that the starting point of education is the concrete experience of the learner. The relevance to this study is that at present the concrete experience of an unknown percentage of learners is gaming, often gaming by their parents.

### 2.3.6 Gaming in the classroom

There is much literature on the helpfulness or otherwise of electronic games being played in a classroom. A summative question for this study is the extent to which parents, educators, gamers and non-gamers want games played in class as part of learner's education. There are arguments for and against this. Shaffer *et al*. (2005)

state that video games are not going to replace schools, nor educators and classrooms, but might replace textbooks and laboratories. Games can supplement traditional learning but not replace it (McClarty *et al*., 2012; Wastiau *et al*.,2009). Research should not focus on whether games can be used for learning. Instead research should prioritize how games can best be used for learning and not on whether games can be used (McClarty *et al*., 2012; Connolly *et al*., 2012; Ahmada & Jaafarb, 2012)

Given the increasing popularity of gaming, education systems and educators would be unwise to ignore gaming, Wastiau, Kearney and Van den Berghe (2009) caution. Digital games are important because they are a popular and widespread leisure time activity. Games modernise education, develop advanced skills and prepare citizens to live in increasingly virtual worlds. Education is challenged by learners with a growing disaffection from an education system they perceive as remote from their everyday realities (Wastiau *et al*., 2009). The world of school needs to come closer to learners' everyday reality, where such games figure prominently (Wastiau *et al*.,2009; Shaffer *et al*., 2005). Gros (2003) and Kirkland and O'Riordan (2010) point a way forward for education by saying that good educators and good school leaders fight for new technologies and new practices.

Games that are intended to extend knowledge (epistemic games) are used by corporations, governments, militaries and political groups to express ideas and teach facts, principles, and world views. "Schools and school systems must soon follow suit or risk being swept aside," Shaffer *et al*. (2005, p1) insist. They further endorse games that are aligned with the epistemic frames of scientists, engineers, lawyers, political activists and other roles that are aligned with core skills, habits, and understandings. This is situated learning at its most profound - a transfer of ideas from one context to another (Adams, 2015; Fin24Tech, 2016). Boyle and Connolly (2011) fear that games encourage learners to think that learning should be easy, whereas in reality effective learning will always require hard work on the part of the learner (Griffiths, 2002).

Blewett and Adam (2016) caution that merely putting devices in learners' hands will not magically restore their attention during lessons. Games by themselves do not

foster learning, cognitive skills or knowledge acquisition - it is purely the context in which they are used that stimulates learning, Wastiau *et al*. (2009) note. Going forward, game-based learning will gain widespread use, McClarty *et al*., 2012 predict. As gaming becomes more prevalent in life, educators need to incorporate games into the classroom to positively impact learner learning (McCauley, 2011; Turgut & Irgin, 2009).

### 2.3.7 Gaming and the labour market

Peterson (2009) states that the labour market wants employees with problem-solving skills, international and intercultural competences, systemic thinking and collective knowledge building, critical thinking and a capacity to face new developments quickly. Employees need to cope with uncertainty, have co-operative disposition and skills, navigate multiple knowledge networks and be able to adjust to technological change with new patterns of work organisation (Besson *et al*., 2015). A successful employee has specialised vocational skills, is flexible and can adapt to the changing world (Randall, 2010). Graduates need important soft skills such as critical thinking, creativity, adaptability and flexibility, initiative and entrepreneurship (Randall, 2010). The point that arises is if games prepare people for lives such as the life described here.

### 2.3.8 Gaming and reading

Games can be used to teach English vocabulary, reading and writing, as gamers read reviews of games in magazines, on Internet sites, in gaming manuals, booklets and strategy guides (Turgut & Irgin, 2009). Gamers can improve their language skills through discussing, sharing and following (Griffiths, 2002). The question, however is if gamers do actually read.

### 2.3.9 School attendance and boredom

The reality of boredom at school has been blamed for many ills of education. Many learners find school boring (Morin, 2016). Schunk, Pintrich and Meece (2014), Morin

(2016) and Paton (2009) argue that the perception by some learners that school learning is meaningless, not important or not connected with their goals and interests, and not valuable in their lives, contributes to boredom. For some learners, learning can be meaningless if it is initiated by other people, requires little personal involvement by learners, affects (at best) a small part of learners' lives and is viewed by learners as not relevant to their goals. Much classroom teaching reinforces this perception, Schunk *et al*. (2014) claim, especially when unmotivated recipients passively listen (Morin, 2016).

Learning cannot be made meaningful to learners by simply telling them why the learning is important to them (Schunk *et al*., 2014). Learners find school boring when they do not enjoy the topic or skill that they are learning (Morin, 2016) or the work is unchallenging and too easy, or the material is presented in a way that does not engage them. Under-connected learners who have trouble forging a connection with their peers and/or their educator can be bored because they feel very isolated. Under–skilled learners also grow bored (Morin, 2016). Learners drop out of education because of boredom (McClarty *et al*., 2012; Paton, 2009). Giving the engaging world of gaming, the perception of gamers on boredom at school is important.

Gaming is fun and can help avoid frustration and boredom (McCauley, 2011; Gros, 2003) and contrasts to boring school homework (Moursund, 2007). Gamers can lose interest in sport and reading, and become bored, apathetic, uninteresting and uninterested when not plugged in (Kardaras, 2016). Playing games for negative reasons such as relieving boredom, reducing loneliness, passing the time or providing an escape can lead to players losing control over their ability to regulate the amount of time they spend playing games (Boyle & Connolly, 2011).

### 2.3.10 South African education budget

Gaming parents as taxpayers pay for the education their children experience. The perception taxpaying gamers have of the tax spend is relevant. In the 2017/18 financial year, the government planned to spend more than R240 billion, or 17.5 percent of the budget, on basic education (Gordhan, 2017). Van Wyk (2016) cautions that despite

government making education a priority, there is a very poor return on the money spent. A World Economic Forum report ranks South Africa 139 out of 143 countries for overall quality of education (Van Wyk, 2016). In Mathematics and Science, South Africa ranks last (Van Wyk, 2016). The school system is failing the majority of young learners and their families, Spaull (2013) claims, except for a wealthy minority. Most learners cannot read, write and compute at grade-appropriate levels, with large proportions being functionally illiterate and innumerate (Spaull, 2013). Of every 100 learners who start school, only 50 will make it to the Grade 12 National Senior Certificate (NSC) exam. The other 50 will drop-out, mostly in grades 10 and 11. Of those remaining in school, 40 will pass grade 12, but only 12 will qualify for university. The 18 to 24-year-olds who do not acquire some form of post-secondary education are at a distinct economic disadvantage. They struggle to find full-time employment and have a high probability of being unemployed for sustained periods of time, if not permanently (Spaull, 2013; Jordaan, 2016).

What parents do in their homes does matter, Ngoepe (2016) insists. This includes involving children in reading and maths from an early age and having high expectations of them. Thus, the example set by gaming parents is of importance. Spaull (2013) attributes learner's variation in achievement or otherwise at school to family background and socio-economic status, parental education and income.

### 2.3.11 Education in the future

Besson *et al*., (2015) anticipate that to face up to a digital future, schools should become places that foster a desire to learn and curiosity. Change in education is a shared responsibility of all stakeholders: learners, parents, educators, educator trainers, schools, higher education, education policy makers, educator associations and civil society. The challenge to education authorities and schools is to retain authority and acceptance as an important space for all of people individually and for society as a whole. To function in the digital age, people need a learning space that allows for critical analysis and for learners to approach the changing sources of knowledge and multiple places of information with confidence and curiosity. The issue of retaining authority and curiosity are canvassed in this research work. Pedagogy and

methodology are not neutral, and reflect the values, ethics/ethos and principles, and the orientations of what society seeks to develop in learners (Besson *et al*., 2015). Hence this exploration of gaming, school education, educators and parents. Besson *et al*., (2015) note that tomorrow's workforce will evolve with technological advances in information and biotechnology, providing expanded opportunities to increase the profitability of ideas. School cannot afford to be seen as irrelevant by some parents and learners (Shaffer *et al*., 2005) in the ever-changing digital environment (Gros, 2003).

The interplay between gaming and education is explored above. The focus shifts now to gaming and educators.

## 2.4 GAMING AND EDUCATORS

Educators are the single most important element of an education system (Spaull, 2014). The quality of a country's educators is intimately related with the quality of its education system, learner learning and learner achievement. He further defined educator quality as:

- Some requisite level of professionalism (values).
- The inclination to teach (attitudes and desires).
- The ability to teach (knowledge, skills and pedagogy).
- The competence to teach (imparting and instilling the knowledge, skills and values learners should be acquiring at school).

Schön (2009) highlights the need for educators to study their teaching methods and determine what works best for them in the classroom, in other words, to research education and their role in education. He believes educators need to develop personally so as to be able to lead positive changes in their classroom. Educators need professional knowledge, skills and dispositions necessary for effectively teaching in a diverse and global society. Such educators embody the qualities of an educated person and citizenship in a democratic society which they attempt to inspire in their classrooms. Such educators continuously critique the impact of their teaching and professional values upon learners, colleagues and learning (Schön, 2009; Rossouw,

2009). They have a critical awareness of the role played by their own educational, social, religious, financial and other background experiences and how these might have helped to shape their own values, their approach to teaching, and their assumptions about education (Schön, 2009). Educators need to continuously reflect upon what and how learners should be taught, based on their backgrounds, interests, understandings, and developmental levels (Rossouw, 2009). Effective educators exemplify the qualities that they seek to inspire in learners: intellectual curiosity and rigour, tolerance, fairness, common sense, respect for diversity and appreciation of cultural differences (Schön, 2009).

Given that teaching is so complicated, educators cannot merely apply what they have learnt (Rossouw, 2009). Through reflecting on what they did, educators can become more professional, more interested in pedagogical aspects of education and more motivated to integrate their research and teaching interests. This, in turn, can lead to greater job satisfaction, better academic programmes, improvement of learner learning and practitioner's insights and contributions to the advancement of knowledge in education (Rossouw, 2009). Educators who develop the habit of inquiry become more thoughtful and alert practitioners of teaching and are likely to be self-monitoring, reflective, adaptive, experimenters, problem solvers, hypothesis makers and clinical inquirers. The calls by Schön (2009) and Rossouw (2009) for educators to do research on education is laudable and is exemplified by this study, particularly as gaming becomes more prevalent. Success for learners calls for continual re-examination of educators' assumptions, expectations and biases (Burke Guild, 2001; Jonck, 2016). Schools need flexible, adaptable, co-operative teaching professionals, able and willing to maintain a high level of competence throughout their career to play their role as mediators/facilitators for learning with learners (Besson *et al*., 2015).
Educators are important actors for social change and the success of education for sustainable democratic societies depends significantly on the teaching profession, (Besson *et al*., 2015).

The suggestion is that educators should recognise the world of, and accommodate, learners who might be gamers and children of gamers (Killen, 2011; Istiau, Kearney & Van den Berghe, 2009; Henley, 2009).

### 2.4.1 Educators and teaching

The Stanford Encyclopaedia of Education (2010) points out there is no such thing as a school that transmits only knowledge. Educators, by the way they behave, by the language they use, by the methods and pedagogy they chose, communicate values to the learners and the world around them (Besson *et al*., 2015). Norms give a school, and decision makers in charge of a school, authority. The term *authority* means an opinion worthy to be taken as a precedent (Parrish, Smith Frederick & Williams, 1933). The response to gamer and non-gamers to authority needs to be tested.

Peterson (2009) feels that not all parents and educators want education for work as the prime outcome of schooling. They want much more, Peterson (2009) insists. What matters for educators and parents lies more in how learners are treated and their relationships, rather than how well they do in particular tests. In addition to cognitive learning of basic skills and even critical thinking skills, the emotional and social well-being of the learner is paramount (Besson *et al*., 2015; Amasa & Mathebula, 2011; Alkafaji, 2010; Peterson, 2009; Mathebula, 2009; Moursund, 2007). These sentiments are captured in the discussion below.

### 2.4.2 Educators and learners' emotion

An important norm in education is respect. Every learner and educator deserve to be treated with respect (Burke Guild, 2001). Learners have a need to be appreciated and to be acknowledged, which instils in them a feeling of being important and being good enough. Validation of a learner and their existence is crucial in developing a sense of self (Landsberg, 2016). Von Kotze (2005) speaks of respecting a person's knowledge. This entails understanding the context of their lives, respecting the specificities of their histories and their systems of knowledge. Moursund (2007) suggests learners ask: do I feel respected by the educator in this class? The pedagogical and educational relationship is based on mutual respect and caring (Besson *et al*., 2015). Educators have to build relationships of tolerance and respect (Besson *et al*., 2015). Learners take their own individual approach, talents and interests to the learning situation (Burke Guild, 2001). Learner's culture, family background and socioeconomic level

affect their learning (Burke Guild, 2001). Everyone does best in a supportive atmosphere free from excessive criticism (Burke Guild, 2001). The relationship of the values a learner is living and experiences in a classroom directly relate to the learner's school success academically, socially, and emotionally. The point emerging here is that for gamers, gaming is part of their lived values, and educators need to be mindful of this. Indeed, a deep understanding of this is important for educators, Burke Guild (2001) points out. A learner's background, which could include playing games, could impact academic performance (Killen, 2011; Landsberg, 2016). The implication is that educators need to be aware of the feelings and emotions of learners, including learners who play games and are the children of gamers.

To be successful, learners must want to learn and be curious about subjects (Killen, 2011). Educators have a major input into the desire and motivation of learners to learn (Connolly *et al*., 2012; McClarty *et al*., 2012; Rapeepisarn *et al*., 2008; Killen, 2011; McCauley, 2011; Kirkland & O'Riordan, 2010; Matthews & Coyle, 2010; Hwang, Lee & Chang, 2009; Wastiau *et al*.,2009; Moursund, 2007; Boyle & Hibberd, 2005; Durkin, 1995). Curiosity is a great driving force of mankind and is tested in this study.

Killen (2011) writes that learners enter a classroom with feelings and emotions that result from how they see themselves and how they think others see them. "These emotional factors play a big part in determining which learners feel a sense of belonging in the learning environment and which learners feel alienated," (Killen 2011, p 42).

### 2.4.3 Feedback

Games provide instant feedback (Kirkland & O'Riordan, 2010) that is clear, unobtrusive, and immediately responsive to the player's actions and help reinforce motivation (McClarty *et al*., 2012). Immediate feedback allows players to change their game play in order to improve their performance and reach their goals (Wagner, 2016; Butler, 2015; Ahmada & Jaafarb, 2012; McClarty *et al*., 2012; Boyle & Connolly, 2011; Kirkland & O'Riordan, 2010). Gaming parents will therefore be used to and want instant feedback on issues they might raise at school with educators. The question of

instant feedback as experienced by games can present challenges to educators, Gros (2003) suggests. Educators will be under pressure to offer significant rewards now to parents and learners instead of suggesting that studying will be rewarded in the long term. Learners want to know the immediate applicability and utility of what they are learning. Gaming parents used to instant feedback and reward might be impatient with long term aspects of education (Gros, 2003).

The discussion now focuses in gaming and parents.

## 2.5 GAMING AND PARENTS

This section explores parental responsibility in an education setting, the willingness, or otherwise, of parents to engage with educators and the education system, and factors that might impact engagement.

### 2.5.1 Parental responsibility

Education is a shared responsibility of educators, parents, guardians, education managers, peers, representatives of civil society and learners active in the facilitation of learning and development (Besson *et al*., 2015; Lemmer & Van Wyk, 2015; Carl, 2014). The South African Schools Act (2009) gives parents the responsibility to:

- Assist with the discipline of their child.
- Monitor their child's educational progress.
- Ensure they complete their homework.
- Ensure they attend school.
- Liaise with the school staff (South African Schools Act, 2009).

The act envisions parents, educators and learners articulating education for citizenship and democracy in schools (Mathebula, 2009; Besson *et al*., 2015). Parents have a responsibility to attend school meetings (South African Schools Act, 2009; Carl, 2014).

Lemmer and Van Wyk (2015) are of the opinion that learners succeed in school and life, and stay in school longer, when schools work together with families to support learning and parents are involved in their children's education. Osman (2015) identifies four variables that are essential for excellent education:

- Prioritising teaching and learning.
- A good partnership between home, school and community.
- Excellent school leadership.
- Educators who are learning all the time.

Parents have an important role in helping their children appreciate their education and fulfill their potential (Maughan, 2016). Children are influenced by their parents' attitudes and beliefs, so will benefit if their parents have a positive approach towards learning, education and take an active, involved interest in what children learn at school. When parents are involved in school work and support school learning through reading at home, children enjoy greater academic success, higher school attendance and higher self-esteem (Maughan, 2016). A positive attitude and encouraging a child to succeed can help them to appreciate education and can make a significant difference in the educational attainment of those children (Maughan, 2016; Okeke, 2014).

Parents can show interest by offering encouragement, help, guidance and encouraging reading at home. Children of parents who read will take an interest in books (Maughan, 2016). Parents inspire an appetite for learning and affect how well and how much children learn, Reed (2015) posits. Parental interest conveys a message that education is important for success in life. Parental interest instils a love of learning in children that translates into a sense of pride and achievement as young people accumulated knowledge and put it to good use (Reed, 2015; Child Development Institute, 2015).

Parental participation is a combination of supporting learner academic achievement and participating in school-initiated functions (Okeke, 2014). School-initiated functions can be seen as a gathering for the purpose of promoting fellowship. Parental

responsibility includes consistent communication with educators about learner's progress and achievement and collaboration with the school community (Okeke, 2014, Ahmada & Jaafarb, 2012).

A lack of involvement by parents in school activities might not be a lack of interest, but rather reflect the problems of poverty, single-parenthood, non-English literacy, the effects of the HIV/AIDS pandemic and cultural and socio-economic isolation (Okeke, 2014; Lemmer & Van Wyk, 2015). Barriers to parental involvement include parents' lack of time (Lemmer & Van Wyk, 2015), parents' fear of having nothing to contribute, fear of academic victimisation, language barriers and difficulties in attending academic meetings (Okeke, 2014). The way educators perceive their learners' parents has a significant impact on the level of involvement by the parents (Okeke, 2014).

Parents' sense of inferiority to educators, negative attitudes towards the school, inadequate knowledge and skills, economic status, demographic factors as well as educators' negative actions and attitudes also preclude parents' propensity to be involved in school matters (Okeke, 2014). Parental involvement in education promotes connections between adults in two of the child's primary micro-systems, the home and the school. Parent educational involvement at home conveys congruence in the attitudes and behaviour governing school and home, and reinforces the forms of knowledge, skills and education (Okeke, 2014). The importance here is that the interplay between parents, gamers and otherwise, and educators needs to be tested. At issue is the extent to which respondents would work with educators and be interested in their child's schooling.

### 2.5.2 Parents in the era of gaming

Parents might be wary of video games not because they misunderstand them, but because they know them all too well. Boyle (2013, p1) states:

"*These parents were once children who played video games themselves. They understand the magnetic pull a video game can have on a person's psyche, because they used to beg their parents to let them play video games.*"

Needleman (2015) and Shapiro (2013) advise parents and children to play video games together. Needleman (2015) advocates that parent-child gaming together teaches academics and important life skills and can be a great way for parents and children to bond. Parents who grew up playing games realise that videogames do not have to drive a wedge between generations. Intergenerational gaming could even turn an uncool parent into someone their children could tolerate for more than an hour, Needleman (2015) says. Gaming together gives parents an opportunity to pass on life lessons to their children, such as working towards a goal, persisting even after failure and critical thinking. The brains of gamers playing together tend to work in exactly the same way, so trust and empathy develops between gamers, even if they are adversaries. Trust and empathy could be good for families (Needleman, 2015).

Shapiro (2013) insists that parent-child gaming together could have a positive impact on adolescent development and long-term family outcomes. Such interest from parents *"is one of the best things you can do to be a good parent,"* Shapiro (2013, p 2) insists. Gaming gives parents a chance to speak to their children about anxiety, frustration, anger and emotional intelligence. Parents and children playing games together co-operate and work together to achieve a common goal. They can speak of expectations and transfer game metaphors into the real world. Parents can discuss real-life challenges confronting their children as if they are game scenarios (Shapiro, 2013). Gaming with their children offers parents ways to insert their own teaching moment into child's lives.

"*If you're trying to get your kids to give you more than monosyllabic answers and grumpy shrugs, try talking to them about the games they love,"* Shapiro (2013, p 2) advises. Games can become a point of conversation, not a point of conflict. Parents can use games to equip their children with a proper vocabulary and tools to navigate their way through virtual and tangible social scenarios.

*"Kids are kids. They need adults to help them make meaning out of imaginative play, especially when it comes to activities that are steeped in conflict and challenge. If they didn't need your help, they'd be adults,"* Shapiro (2013, p 2) writes. The lessons from games for young gamers need to be translated in the context of the real world by adults (Shapiro, 2013).

According to the Child Development Institute (1999) play time with parents is important. Children crave time with parents. It makes them feel special. Parents are encouraged to find time to spend playing with their children. Such play builds bonds that last forever. Such play lets the child know they are loved and appreciated. Play opens the door for sharing problems and concerns and helps parents understand the uniqueness of each child. Parent-children play leads to families that are cooperative, supportive and have open communication. These qualities increase self-esteem and social skills. Young people acquire a sense of connectedness and good judgment to make use of when confronted with difficulties and temptations (Kardaras, 2016; Moursund, 2007).

Shapiro (2014) saw little distinction between gaming and other favourable activities in terms of benefits to people.

*"Compared with factors shown to have robust and enduring effects on child well-being such as family functioning, social dynamics at school, and material deprivations, the influences of electronic gaming, for good or ill, are not practically significant,"* Shapiro (2014, p 1) notes. But, Kardaras (2016) and Moursund (2007) cautions, however, that parents should not let their children play games all day long.

The concepts of play, culture and social interactions foster cognitive development, according to Hurst (2016), and the development of higher mental functions such as speech and reasoning in children. Through play and education, adults convey to children the way their culture interprets and responds to the world. As adults interact with children, they show the meanings they attach to objects, events and experiences (Hurst, 2016; Moursund, 2007).

The point emerging here is that parents can set direction for their children through play. The direction set, whether emanating for gaming or other games, has an impact on the child's view of the world and of education. McCauley (2011) re-enforced this point by stating a child's intellectual ability is determined by a combination of heredity and environment. Thus, although a child's genetic inheritance is unchangeable, there are definite ways that parents can enhance their child's intellectual and cognitive development through environmental factors, including reading and talking with their

children, and helping children explore the world around them (Butler, 2015; Connolly *et al*., 2012; Hong *et al*., 2009; Burke Guild, 2001; Louw & Louw, 2013; Killen, 2011).

### 2.5.3 Parents and community

To function in a democracy, citizens need to strengthen their thinking, deal with problem-solving, make intelligent and informed decisions and act autonomously. A democratic ethos is fostered by people engaging in a communal search for understanding, and mutual understanding across differences of opinion and diversity of interest through dialogue and discussion (Amasa & Mathebula, 2011; Von Kotze, 2005). Democracy requires a learning community of inquirers who also develop a caring and reasonable interconnectedness with others and dynamic peer co-operation. Such a community will be social, affective and creative. The community's members will recognise their interdependence and encourage active engagement in communal life and democratic citizenship (Amasa & Mathebula, 2011). The test emanating from these points is the extent to which respondents, gaming and otherwise, wish to engage in communal life and democratic citizenship by working together to address education issues.

Amasa and Mathebula (2011) point out that democratic communities are characterized by face-to-face encounters that bring diverse individuals together in physical places to address shared concerns (Lenhart *et al*., 2008). Participants negotiate differences and identify common priorities. The growing use of the Internet has replaced time spent in face to face encounters. The isolating qualities of the Internet can undermine the social connections that make the addressing of shared concerns possible, even if some games offer the experiences of a democratic community, civic debates and gamers becoming virtual political leaders or in online fan communities (Lenhart *et al*., 2008; Stanford Encyclopaedia of Education, 2010; Mathebula, 2009).

Besson *et al*., (2015) hold the view that the expansion of digital space actually allows for an unprecedented interconnectedness of citizens and so creates new avenues for active and democratic citizenship, sharing and transcending barriers (Besson *et al*., 2015). Citizens can thus participate in politics actively and comprehensively

(Mathebula, 2009), organise, protest, participate and defend their human rights (Besson *et al*., 2015; Von Kotze, 2005). Electronic democracy upholds the democratic ideal, based on technologically informed and advanced citizens (Mathebula 2009).

Lenhart *et al*., (2008) raise the concern that technology and other forms of entertainment are replacing time people used to spend being involved in community activity (Mathebula, 2009). Moursund (2007) writes that to be a citizen of the online world, one must follow rules. The code of citizenship in some games is similar to traditional ideas of what it means to be a good citizen and is essentially indistinguishable from reality. What needs to be tested is if gaming respondents are more prone to act together on education issues than non-gaming respondents. The democratic trends identified above need to be tested.

Parents growing up in a digital society expect immediate results. They have less tolerance for passive situations, lectures, corporate classrooms and traditional meetings. Payoffs are more important than patience. Such attributes stem from computer games. There is constant revision of the action, without any planning of the processes. Trial and error is used (Butler, 2015; Rapeepisarn *et al*., 2008; Gros, 2003). Educators should be mindful of these points when dealing with gaming parents. Given their experiences with digital objects, the digital generation expect an immediate response to their each and every action (Ahmada & Jaafarb, 2012; McClarty *et al*., 2012; McCauley, 2011; Killen, 2011; French, 2010; Hong *et al*., 2009; Gros, 2003; Rheeders, 2014).

### 2.5.4 Gaming behaviour of parents

The University of North Carolina reports that gamers are torn between living life virtually or interacting with real world people. Sadly, the real world rarely won (University of North Carolina, 2011, McGonigal, 2011, Cheok, 2004). Social consequences are relevant to this study of gaming and parents. University of North Carolina (2011) notes that gamers allow relationships to break between them and their real-world friends because they live in a virtual world. Gamers neglect and lose friends and people in the real world. Addicted gamers set their mind to only video games, so

are left out of other conversations. Thus, gamers lose track of what is going on around them in the real world. Gamers' friends eventually find gamers annoying as they can speak only about games which can irritate non-gamers (University of North Carolina, 2011).

Addicted gamers spend so much time playing that their personal relationships are neglected and sometimes disappear altogether. Addicted gamers neglect the responsibilities of everyday life such as school and work (University of North Carolina, 2011). It is not just neglect that cost addicted gamers their relationships. Some gamers speak so much about their game of choice – to the exclusion of everything else – which people no longer want to be around them. They cannot, or will not, engage in real world conversations or be a source of support or encouragement to friends and family. Because their friends speak about other things, gamers begin to feel left out, which in turn causes them to feel irritated or offended. Gamers do not realise that they have chosen to be left out by devoting all their time to gaming (University of North Carolina, 2011).

Physical consequences of gaming addiction include poor personal hygiene which in turn leads to social consequences as well. An addicted gamer who loses sleep through playing so much simply does not have the energy to invest in relationships. Lack of sleep might also make gamers irritable and difficult to be around (University of North Carolina, 2011).

## 2.6 REFLECTIONS ON GAMING

Among the areas of concern about gaming are adverse psychological consequences (Billieux *et al*., 2015) unsociable behaviour, falling standards of literacy and a lack of interest in reading (Turgut & Irgin, 2009), emotional problems or low self-worth and esteem (Young, 2009; Griffiths, 2002; Durkin, 1995). Gaming can lead to social withdrawal, gaming addiction, increased aggressiveness and psychosocial effects that impair gamer, families and education performance (Young, 2009; Griffiths, 2002; Durkin, 1995). Gaming can consume excessive amounts of time, encourage aggressive behaviour, or foster undesirable problem-solving skills (Durkin, 1995).

Gamers who play for hours on end risk stunted brain growth and a loss of self-control (Matthews, 2001). The thought processes required by computer games are too simple to stimulate crucial areas of the brain, leading to underdevelopment and consequent behavioural problems such as violence. The greatest threat from computer games is not in their tendency to arouse aggression but in the lack of mental stimulation they provide (Matthews, 2001). Unlike doing a mathematics exercise, playing computer games does not stimulate the brain's frontal lobe, an area which plays an important role in the repression of anti-social impulses and is associated with memory, learning and emotion. A lack of stimulation in this area before the age of 20 prevents the neurons from thickening and connecting, thus impairing the brain's ability to control impulses such as violence and aggression (Matthews 2001). A more highly stimulated and thus more developed brain is able to keep such urges under check (Matthews, 2001). Matthews (2001) cautions that the generation of gamers presents problems unlike seen before. The implication is an increasingly violent society where people are doing more and more bad things and not doing other things like reading or learning arithmetic.

Gaming can be tiring as gamers log into their game at every opportunity, play into the night and then have to attend work (French, 2010). Games can stifle thinking and increase self-alienating behaviours (Hong *et al*., 2009). Olivier (2000) cautions that just as children's bodies can be affected by what they eat, their brains can be affected by what they repeatedly do (Violent video games tied to higher aggression in kids, 2014). It is thus suggested that emotional frames of mind, violent and otherwise, stay as lingering sentiments within some gamers after they have stopped gaming (Boyle & Hibberd, 2005).

There could be more sustaining issues at playing in gaming, such as addiction.

### 2.6.1 Gaming and addiction

IPads, smartphones and X-boxes are a form of digital drug (Kardaras, 2016; Moursund, 2007). Games that do not have an ending and are played by thousands of

players at a time are highly addictive social engagements (Cortes *et al*., 2010; Durkin, 1995).

An addiction to online life is inevitable, laments French (2010) and gamers would rather game than work. Durkin (1995) anticipates the spirit of this study when he notes the issue is not to make games less addictive but to make other learning experiences, particularly school, more addictive. Kardaras (2016) claims it is easier to treat heroin and crystal meth addicts than addicted gamers. This discussion raises the question of how easily gamers can move from indulging their addiction to immediately resuming normal human interaction, such as interacting as parents with educators. Gamers have trouble overcoming the immediate gratifications and excitement provided by the game (Billieux *et al*., 2015) point out. Immediate gratification and excitement are not always words associated with educators.

### 2.6.2 Gamers and time

The concept of time is included because of its irreplaceable nature. Gamers spend a substantial amount of time playing games (Boyle & Connolly, 2011; Moursund, 2007). Gaming takes parents away from other activities that are important parts of being a well-rounded, responsible and productive adult. Moursund (2007) speaks of the competition for attention and time between electronic games and other areas of life. Concerns about the amount of time spent playing games and social isolation are widespread (Connolly *et al*., 2012; Boyle & Connolly, 2011; Turgut & Irgin, 2009; Cortes *et al*., 2010; Blewett & Adam, 2016; Byung-yeul, 2016; Livingstone, 2016). The correlation between game time and poor quality of relationships with peers and parents is raised by Crawford (2012). In spending time alone, gamers have less time for social group interactions and possibly less inclination to participate (Lenhart *et al*., 2008). The question of the time that gaming parents have for their children is of importance to this study, not least because parental attention furthers academic achievement.

The degree to which parents and gamers respond to social ills and engage in critical thinking is also of relevance.

### 2.6.3 Social ills and critical thinking

At issue is if gaming enhances or weakens the desire of gamers to address social ills. This study is founded on the acceptance that education should develop a person's social consciousness and social critique. Social consciousness can be expressed as the desire to address the social ill; which in the case of this study is unemployment. An argument is set out below to link improving technology, of which gaming is a part, with unemployment. Social critique can be expressed as the desire to engage in critical thinking. One social ill, namely unemployment, is focused on, given the link between technological development and job losses.

#### 2.6.3.1 Unemployment (Social ill)

Iwasaki (2013) warns of technology-related unemployment. Breakthroughs in computing power, connectivity, artificial intelligence, robotics, manufacturing and medicine can lead to a better human condition but increasingly workers are just no longer needed, Iwasaki (2013) points out. The long-term killer of jobs is automation, more than foreign competition and globalisation (Miller, 2016). *"Workers are basically supervisors of machines,"* Miller (2016, p1) states, so fewer workers are required. This trend will lead to an unprecedented, sustained rapid decline in job opportunities that will strain social and economic institutions (Iwasaki, 2013; Washington, 2011). Washington (2011) reminds that fear of displacement from one's job by a super-efficient machine is as old as modern economic growth (which is about two centuries old). Ongoing innovation will yield enormous benefits to humanity but are likely to be significantly destabilising. Some classes of employees might face chronic underemployment and the persistent threat of displacement. There is something to be said for the dignity of gainful employment, so chronic underemployment is likely to prove corrosive (Washington, 2011).

Washington (2011) envisages a utopia where machines take care of everything, leaving humanity to sit around comfortably playing electronic games (Besson *et al*., 2015; Gambrel, 2014). Playing computer games on technologically advanced platforms manifests the interplay between technology and job losses. Gaming has to

be read in the context of improving technology and job losses. Games can enhance gamer's interest in entrepreneurship (McCauley, 2011; Lenhart *et al*., 2008; Moursund, 2007; Griffiths, 2002).

The South African labour market is depicted on the next page, in Table 2.1.

**Table 2. 1: South African Labour Market**

| | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| Informal sector excluding agriculture | 2 259 | 2 270 | 2 275 | 2 366 | 2 393 |
| Formal sector excluding agriculture | 9 627 | 9 942 | 10 222 | 10 524 | 10 822 |
| Agriculture | 665 | 644 | 696 | 740 | 702 |
| Households | 1 237 | 1 214 | 1 232 | 1236 | 1 230 |
| Total employment | 13 788 | 14 070 | 14 425 | 14 866 | 15 146 |

*Development Indicators (2014:23)*

Merten (2016), drawing on Statistics SA data in the Social Profile of Youth, 2009 – 2014 report, paints a bleak picture of failing policy interventions, particularly in education and youth employment, as reasons for sluggish employment growth. Entrepreneurism, often touted as the way to employment, has dropped among youths (Merten, 2016; Mantshantsha, 2016; Van Wyk, 2016). The issue of entrepreneurship is tested in this study. The study makes a link between entrepreneurship as a job-creating process and critical thinking. The suggestion is that job-creation will emanate from entrepreneurs who are critical of the status quo. The extent to which gaming dulls critical thinking and hence job-creation is tested.

#### 2.6.3.2 Critical thinking

The concept of critical thinking used in this study evokes citizens working towards improving the world and wanting to contribute to a more rational, civilized society. Critical thinkers attempt to consider the rights and needs of other people (Foundation for Critical Thinking, 2013; Shapiro, 2014). Society wants people to be precise in their thinking, be able to tackle complex problems (Killen, 2011; Huckle, 2010) and deliver

a better world (McClarty *et al*., 2012). One of the National Curriculum Statement's principles is active and critical learning (DBE, 2011). At issue in this study is the extent to which gamers are critical thinkers or not and hence might wish to play a role in ameliorating the social ill of unemployment.

## 2.7 GAMING IN SOUTH AFRICA

As the study is set in South Africa, a focus on South Africa is apt. The growth in the gaming industry nationally is attributed to the widespread penetration of Internet connectivity and new technology, which is especially seized upon by younger consumers (Alfreds, 2016; Mcilhone, 2015; French, 2010; RDM Newswire, 2015; Freemantle, 2016; Msolo, 2015; Ngcaba, 2016; Sydney Morning Herald, 2012; Lenhart *et al*., 2008). The use of electronic media and the number of gamers has to be considered against the number of people in the country, as shown in Table 2.2.

**Table 2. 2: Demographic trends - by age group (estimates)**

| Age brackets | Number of people |
|---|---|
| 0-14 | 16 169 764 |
| 15-19 | 5 217 560 |
| 20-24 | 5 267 118 |
| 25-29 | 4 954 531 |
| 30-34 | 4 090 281 |
| 35-39 | 3 503 216 |
| 40-44 | 3 121 823 |
| 45-49 | 2 753 471 |
| 50 plus | 8 914 190 |
| Total | 54 753 471 |

*Development Indicators (2014)*

Make Games South Africa (2015), which represents businesses in the gaming industry, reports that there were 40 game development companies in South Africa in 2014. The companies released 67 games between them in 2014. The value of the

companies was R53 million. The gaming companies created 253 jobs in 2014, which was a 5% increase from 2013. Five of the active companies have been in business for a year or less (Make Games South Africa, 2015; Rheeders, 2014; Carte Blanche investigates South African game development, 2015).

Success in the gaming industry demands as much work as anything else (Carte Blanche investigates South African game development, 2015). Increased opportunities for people to become connected through mobile devices has greatly enhanced consumer demand and sales of digital products and services, video games, and mobile devices, tablets and smartphones, Mcilhone (2015) reports. Consumer spending on games is expected to reach R3.6 billion by 2018 (Mcilhone, 2015). Gaming grows at 10% a year, outstripping the 4% annual growth rate for television, (Mcilhone, 2015). Mobile gaming has captured the biggest share of the gaming market, in the wake of a new generation of cheaper, Internet-connected phones and tablets. The popularity of mobile gaming cuts across demographics (Mcilhone, 2015). Increased Internet access and cheaper mobile devices have spurred greater consumer spending on mobile gaming in terms of rands and time (Mcilhone, 2015). The growth rate of Internet access is an estimated 22.6% a year (Mcilhone, 2015). An international game monitoring agency, Euromonitor International, supports this optimism (Country report, 2015). Demand is fuelled by an expansive penetration of smart devices, smartphones and tablets and relatively affordable mobile games (Country report, 2015; Betting on the future, 2012). The communications company Telkom stages a digital gaming league to boost e-sports, offering attractive prize money (Alfreds, 2016; Kemp, 2013; Venktess, 2016).

Mind Sports South Africa is recognised by the Department of Sport and Recreation as the national controlling body and sole authority for gaming (Mind Sports South Africa, 2016). The organisation reports a marked improvement in the way in which gamers see themselves. The organisation starts gaming clubs at schools and universities and feels that it encourages a culture of learning among players (Mind Sports South Africa, 2016). Mcilhone (2015) predicts that as the mobile gaming market grows, there will be an expansion in game app titles appealing specifically to African consumer. “African developers have a lucrative market they can tap into and consumers can expect more

Africa-centric titles to keep them entertained day and night on their smartphones and tablets.” Mcilhone (2015, p1) writes.

Information Technology spending was forecast to reach R266 billion in 2017, a 2.4% increase from 2016, according to research and advisory firm, Gartner (Spending on mobile devices in South Africa, 2017). The country traditionally underinvested in information technology, Gartner reports. Now, organisations prioritise investments in software so as to catch up with the rest of the world (Spending on mobile devices in South Africa, 2017; Venktess, 2016; Msolo, 2015; NWU, 2015; Moursund, 2007). The expected spend on information technology is shown in Table 2.3.

**Table 2. 3: Expected spending on Information Technology (in million Rands)**

| Spend on | 2016 Spending | 2016 Growth | 2017 Spending | 2017 Growth |
|---|---|---|---|---|
| Data Centre Systems | 8 097 | 3.5% | 8 192 | 1.2% |
| Software | 24 938 | 11.7% | 28 219 | 13.2% |
| Devices | 38 489 | -2.7% | 36 710 | -4.6% |
| IT Services | 67 228 | 12.3% | 70 996 | 5.6% |
| Communications Services | 121 115 | 0.5% | 122 019 | 0.8% |
| Overall IT | 259 867 | 3.9% | 266 136 | 2.4% |

*BusinessTech (201:7)*

## 2.8 A UNIQUE CONTRIBUTION

One purpose of a literature review is to identify gaps in the literature and academic field, to use the phrase of Booyse, Le Roux, Seroto and Wolhuter (2015). This study aims to cover new ground by exploring directly one such gap in the literature and research on gaming, namely the link between gaming parents and school education. This focus might be one of the first such focuses on gaming and school education research. This study thus makes a unique contribution in terms of timing and focus.

## 2.9 ADDRESSING A HIATUS

Before new ideas can be proposed to school leadership and educators, their prevailing behaviour and challenges needs to be articulated through research and analysed. A study such as this one breaks new academic and theoretical ground by articulating the challenges and suggesting a response from political leadership, school leadership, educators and curriculum designers. An academically-unexplored aspect of the debate on gaming is the interplay between gaming parents and schools' education. There needs to be research into, and an analysis of, this interplay. The study will proceed to address, and occupy, this hiatus by populating this academic space with research data to assess and express the interplay between gaming parents and school education. The study, therefore, will become the next step, or contribution, in the academic debate around gaming.

## 2.10 CHAPTER SUMMARY

The literature review offers material from selected scholars, authors, commercial sites and media writers on the playing of electronic games, parents and school education.

The quintessential focus of this research task is the interaction between gaming parents and school education. This study covers new ground by exploring directly the link between gaming parents and school education. Primary data was acquired to fuel this exploration. The gathering, integration and interrogation of data flows directly from the writings in this chapter. Chapter 3 addresses the research methodology.

# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1 INTRODUCTION

In the previous chapter a comprehensive literature review was presented. This chapter discusses the research methodology used to interrogate gaming and school education. The chapter justifies and explains the choice of the research techniques. This chapter discusses the instruments used to gather the data and discusses how the data is analysed. The data is presented in chapter four.

## 3.2 RESEARCH QUESTIONS

The study is guided by the following research questions.

### Primary research question

*What impact will the playing of electronic computer games by parents of learners, and young people soon to be parents of learners, have on schools, educators, teaching and learning, social ills (such as unemployment) and critical thinking?*

### Secondary research questions

The main research question gives rise to five secondary research questions.

**SQ1:** What are the critical aspects of gaming that impact parents and education?

**SQ2:** How does gaming behaviour influence participants' (parents) view on the effectiveness of the education system in a broad sense?

**SQ3**: How does gaming behaviour of participants influence parental involvement in schools?

**SQ4:** How does gaming behaviour affect general social interaction of participants?

**SQ5:** How does gaming behaviour contributes to the psychosocial development of participants?

## 3.3 RESEARCH PHILOSOPHY

Locating a study within a research philosophy lends to a better understanding of the project. This study adopted a realist research philosophy. Realism is based on a belief that a reality exists that is independent of human thoughts and beliefs (Novikov & Novikov, 2013; Saunders *et al.,* 2009).

Gaming can be seen as a social activity gamers engage in without them necessarily being aware of the existence of influences on their interpretations and behaviours (Saunders *et al.,* 2009). “Social objects or phenomena that are external to, or independent of, individuals will therefore affect the way in which these people perceive their world, whether they are aware of these forces or not” (Saunders *et al.,* 2009, p118). Realism recognises that people are not objects to be studied in the style of natural science. Realism recognises the importance of understanding people’s socially constructed interpretations and meanings, or subjective reality, within the context of seeking to understand broader social forces, structures or processes that influence and perhaps constrain the nature of people’s views and behaviours. This study is informed by a realist research philosophy because of the persuasive argument put forward by Saunders *et al*. (2009): namely that there are social forces and processes affecting people, without people necessarily being aware of such influences on themselves, so it is important to understand people’s socially-constructed, subjective, reality.

This study forms part of education research and is informed by the dictates of education research.

### 3.3.1 Education research

This study attempted to follow the dictates of evidence-based inquiry (education research) as set out by McMillan and Schumacher (2014) which seeks to improve educational practice. Durkin (1995) notes that one of the major obstacles to research in education is that human social behaviour is so complex and so multi-determined that it is very difficult to attempt to isolate the independent effects of a single factor,

such as computer game play in this research task. In addition to adopting a realism approach, and being hopefully meeting the requirements of education research, this work was also an exercise in gaming research.

### 3.3.2 Gaming research

Turgut and Irgin (2009) argue that gaming research needs to reflect on the social contexts in which games, fun, gamers' experience, attitudes and interests take place.

There has been much research into gaming. The research encompasses a wide range of investigations into topics as diverse as the reasons for games appealing to so many people, the effects on an individual and society of gaming, and ways in which games accurately and realistically model the real world (Kirriemuir & McFarlane, 2003). The popularity of gaming and their exponential adoption raises concerns in public and scientific communities, and a growing number of studies test the positive and negative impact on the gamers' daily life and well-being (Billieux, Thorens, Khazaal, Zullino, Achab & Van der Linden, 2015; Durkin, 1995).

## 3.4 RESEARCH DESIGN AND METHODOLOGY

The term research design refers to the overall strategy to integrate the different components of the study in a coherent and logical way. Research method refers to tools and techniques used to obtain and analyse data. The term includes questionnaires, observation and interviews as well as both statistical and non-statistical techniques. In contrast, the term methodology refers to the theory of how research should be undertaken and seeks to explain the logic behind the methods that were used (Saunders *et al*., 2009; Mouton, 2004; Griseri, 2002; Welman & Kruger, 1999). The method chosen to collect evidence has a major influence on the kind of result which might be obtained (Griseri, 2002). A method is not a neutral framework:

*"It is a series of choices in the light of what is believed about the field to be researched. It embodies such assumptions and mirrors these in the results it achieves. In other words, the method is part of the result,"* (Griseri, 2002, p 208).

The choice of method was influenced by Saunders *et al*. (2009), particularly their caution that the methods should always be based on the problem statement, research objectives research questions and appropriate to the task (Welman & Kruger, 1999). This study made use of both the quantitative and qualitative research methods. The two methods were combined in a triangulation (mixed) methods approach.

### 3.4.1 Mixed method research

The melding of the two approaches is termed mixed methods research (Saunders *et al*., 2009). This means that both quantitative and qualitative data collection techniques and analysis procedures are used in the research design.

Both quantitative and qualitative methods were used to gather data in this study. The quantitative data was gathered through a questionnaire and the qualitative data through phenomenological interviews and questions set to qualitative respondents. This constitutes a triangulation research design (McMillan & Schumacher, 2014; Stanford Encyclopaedia of Education, 2008).

Quantitative research is used to answer questions about relationships among measured variables, with the purpose of explaining, predicting and controlling phenomena (Leedy & Ormrod, 2005). Respondents are tested on how they respond to stimuli, with the propensity expressed as a quantitative variable (Weiers, 2008). A quantitative variable expresses how much of an attribute is possessed by a person and is expressed through assigning numbers to the perceived qualities of things (Weiers, 2008; Babbie and Mouton, 2001). The point of using quantitative research in this study is to gauge how much of an attribute in relation to gaming and education is possessed by respondents (Weiers, 2008). The use of numbers raises the questions of how many numbers to gather - sample – and what to do with the numbers – analysis. Quantitative research is descriptive in nature and Hamari, Koivisto and Sarsa (2014) caution that gaming can depend on several factors, such as the motivations of users or the nature of the games.

Qualitative research respondents provide inner emotions, thoughts and unique

information that a study would be poorer without (Louw & Louw, 2013). Qualitative research focuses on phenomena that occur in natural settings, that is, in the real world (Leedy & Ormrod, 2005). In this study, it involved interpreting experiences of gamers and the impact that these experiences have on schools, educators, teaching and learning, social ills and critical thinking. Qualitative research is relevant to this study as it is an approach that allows for different views of the research theme; participants have a more open-ended way of demonstrating their actions (Henning, Van Ransburg & Smit, 2004: 5). The qualitative interviews attempt to understand people's perceptions, perspectives and understanding of a particular situation. Such a study tries to answer the question: what is it like to experience such an event? (Leedy & Ormrod, 2005) from the perspective of respondents with direct experience of the phenomenon being studied. French (2010) cautions that qualitative research is subjective as extraneous factors threaten the quality of the information, processing and analysis. Leedy and Ormrod (2005) caution that gathering qualitative data is not necessarily gathering facts. Respondents offer perceptions rather than as facts.

## 3.5 POPULATION AND SAMPLE

The issues of how the population and sample were determined is discussed next.

### 3.5.1 Population

The set of all possible elements that can theoretically be observed or measured in a research project is called a population and needs to be defined correctly so that the proper sources from which data must be collected can be identified (Saunders *et al*., 2009; Weiers, 2008; Welman & Kruger, 1999). The population for this study was people in the Lejweleputswa District in the Free State Province who have an electronic device and is linked (either as a teacher or a parent) to school education and were at least 18 years of age.

### 3.5.2 Sampling

A sample is a small portion, piece, or segment that is selected from the population

(Free Dictionary, 2018). The sample size is the number of individuals needed to provide the most meaningful information on the research questions (Hendricks, 2003; Rumsey, 2003). The study made use of non-probability sampling, as opposed to probability sampling (Saunders *et al.,* 2009). A sample can be constructed through probability sampling or non-probability sampling.

Probability sampling involves a random selection of respondents (Research methods knowledge base, 2017). Non-probability sampling does not involve random selection of respondents. In applied social research there may be circumstances where it is not feasible, practical or theoretically sensible to do random sampling, as Research Methods Knowledge Base (2017) point out. This research work is one such circumstance. Stopping people in a street at random to ask about their game playing habits was not deemed feasible. Instead, two non-probabilistic alternative ways of contacting respondents were used.

The first technique is convenience sampling. The potential respondents are available, their electronic details are known, and contacting them is convenient (Research Methods Knowledge Base, 2017). The potential respondents are parents, some of whom might be gamers and educators, and young people. No claim is made that the respondents are representative of the population. Potential respondents, who became actual respondents, were asked to refer other potential respondents or to pass the questionnaire to them. Referring to other potential respondents is snowball sampling (French, 2010; Statpac, 2017). Snowball sampling locates information-rich key informants (French, 2010) with particular knowledge, skills or characteristics that are needed as part of a research process. As such, snowball sampling aims to make use of community knowledge about people who have skills or information in particular areas (French, 2010). The downside to this convenience sampling and snowball sampling combination technique is that it might not produce a big enough of a variety, in that all the respondents could have similar views towards gaming. A similarity of views can introduce biased outcomes, because the technique itself reduces the likelihood that the sample will represent a good cross selection from the population.

A large proportion of the quantitative respondents were reached by email. Louw and

Louw (2013) state that the least stressful research method should be used whenever possible. The number of units involved in a sample is more important than the percent of the total population that they represent, but need to have thorough enculturation, current involvement, and an adequate time in the field (Babbie and Mouton, 2001; Welman & Kruger, 1999).

Non-probability sampling cannot depend upon the rationale of statistical probability theory that allows for confidence intervals to be estimated. The question of generalisability is linked to probability and non-probability sampling techniques. With non-probability samples, as used in this study, it is not possible to answer research questions beyond the domain of the respondents canvassed, nor make statistical inferences about the characteristics of the population (Saunders *et al.,* 2009; Welman & Kruger 1999).

To summarise, the sample used in this study was a non-probability sample of parents and non-parents, some of whom might be gamers and non-gamers, and educators, with links to the Lejweleputswa area of Free State, who have an electronic device, were in some way linked to school education and who were at least 18 years of age. No claim is made that the respondents are representative of the population.

## 3.6 PILOT STUDY

A pilot study entails sharing the research instrument with a small group of respondents for them to test the instrument (Association of Qualitative Research, 2017). Both questionnaire and interview questions were pre-tested in a pilot study at different stages of the study. The pilot study was done by approaching convenient respondents who are deemed to have an interest or knowledge in the field of gaming.

Their feedback allowed for necessary adjustment to the instruments before final commitment to the questionnaire and interviews. Pilot studies are common in research studies, since adjustment after the beginning of fieldwork is seldom possible or wise (Association of Qualitative Research, 2017).

## 3.7 DATA COLLECTION

Data was gathered in two ways in this study, through a quantitative method and a qualitative method. Gathering both quantitative and qualitative data reflects a statement by Louw and Louw (2013) that quantitative researchers obtain information about people, while qualitative researchers obtain information from people. Qualitative and quantitative research methodologies differ in the philosophy that underpins their mode of inquiry as well as, to some extent, in methods, models and procedures used (French, 2010). Though the research process is broadly the same in both, quantitative and qualitative research are differentiated in terms of the method of data collection, the procedures adopted for data processing and analysis, and the style of communication of the findings.

The following paragraphs discuss quantitative and qualitative data collection methods.

### 3.7.1 Quantitative data

This section discusses how the questionnaire to be used in this study was compiled. The research questions prompted the literature review material that is covered. The literature review material and the research questions prompted the questions that were asked. The questions can thus be linked specifically to literature review material. This process is discussed below. The quantitative data used in the study was gathered through a questionnaire.

#### 3.7.1.1 Description of the quantitative data collection instrument

The questionnaire comprised of two parts, a demographic section and 34 research questions, emanating from the literature review. The questions were based on testable points unearthed in the literature material of chapter two. Each research question was explored sequentially in the literature review. The questions in the questionnaire thus follow the sequence of the research questions. The questions and sequence are set out in Table 3.1. The question matrix shows where each question was drawn from

material in Chapter 2. Each question gives rise to an identifying word or words that were used in the table, figures and graphs that follow[1].

**Table 3. 1: Question Matrix**

| No. | Question | Source (Chapter two) | Identifying word(s) used in graphs and tables |
|---|---|---|---|
| | **SQ1:** What are the critical aspects of gaming that impact parents and education? | | |
| 1. | To what extent would you like to be a professional international electronic gamer? | Gaming (*cf. 2.2)* | Professional gamer |
| 2. | To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience? | Gaming virtues *(cf. 2.2.3.1)* | Better outcomes with similar experiences |
| 3. | To what extent did/have you/would you get to know other parents at your child's school? | Gaming virtues *(cf. 2.2.3.1)* | Know |
| 4. | To what extent are you a confident person? | Gaming and fantasy *(cf. 2.2.3.2)* | Confident |
| 5. | To what extent do electronic games teach skills? | Acquiring skills through gaming *(cf. 2.2.6.1)* | Teaching skills |
| 6. | To what extent do you want to be a lifelong learner? | Acquiring skills through gaming *(cf. 2.2.6.1)* | Lifelong |
| 7. | To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended? | Acquiring skills through gaming *(cf. 2.2.6.1)* | Decisions |
| 8. | To what extent did you/do you/would you be involved in addressing problems at the school your child attended? | Acquiring skills through gaming (*cf. 2.2.6.1)* | Addressing Problems |

*(Table 3.1 continues next page)*

[1] Chapter 4 and Chapter 5

**Table 3.1 Question Matrix (continued)**

| No. | Question | Source (Chapter two) | Identifying word(s) used in graphs and tables |
|---|---|---|---|
| | **SQ2:** How does gaming behaviour influence participants (parents) view on the effectiveness of the education system in a broad sense? | | |
| 9. | To what extent does school prepare a person to be involved in their society as an adult? | Gaming and education *(cf. 2.3.)* | Adult world |
| 10. | To what extent does school prepare a person for employment? | Gaming and education *(cf. 2.3)* | Employability |
| 11. | To what extent should electronic games be used in a classroom? | Gaming in the classroom *(cf. 2.3.6)* | Classroom |
| 12. | To what extent does the playing of games prepare gamers for their lives? | Play, learning and gaming *(cf. 2.3.7)* | Preparedness |
| 13. | To what extent do you read books/novels/magazines/ newspapers/websites? | Gaming and reading *(cf. 2.3.8)* | Reading |
| 14. | To what extent was school boring? | School attendance and boredom *(cf. 2.3.9)* | Boring |
| 15. | To what extent is tax money spent on school education well spent? | South African education budget *(cf. 2.3.10)* | Tax |
| | **SQ3:** How does gaming behaviour of participants (parents) influence parental involvement in schools (educators)? | | |
| 16. | To what extent do educators think about and thus improve what they do in a classroom? | Gaming and educators *(cf. 2.4)* | Improve |
| 17. | To what extent do you accept the authority of a school? | Educators and teaching *(cf. 2.4.1)* | Authority |

*(Table 3.1 continues next page*

**Table 3.1 Question Matrix (continued)**

| No. | Question | Source (Chapter two) | Identifying word(s) used in graphs and tables |
|---|---|---|---|
| 18. | To what extent do you respect gamers? | Educators and learners' emotions *(cf. 2.4.2)* | Do respect |
| 19. | To what extent were you respected at school? | Educators and learners emotions *(cf. 2.4.2)* | Were respect |
| 20. | To what extent are you curious about the world? | Educators and learners' emotions *(cf. 2.4.2)* | Curiosity |
| | **SQ4:** To what extent does gaming behaviour affect general social interaction of participants?<br>**SQ5:** To what extent does gaming behaviour contributes to the psychosocial development of participants? | | |
| 21. | To what extent are you a responsible person? | Parental responsibility *(cf. 2.5.1)* | Responsible citizen |
| 22. | To what extent are you positive about school education? | Parental responsibility *(cf. 2.5.1)* | Positive |
| 23. | How comfortable did you/do you/would you feel involving yourself in your child's schooling? | Parental responsibility *(cf. 2.5.1)* | Comfortable |
| 24. | To what extent did/do/would you work with educators at your child's school? | Parental responsibility *(cf. 2.5.1)* | Educators |
| 25. | To what extent are/were/would you be interested in your child's school? | Parental responsibility *(cf. 2.5.1)* | Interested |
| 26. | How prepared would you be to support an online campaign about an education issue? | Parents and community *(cf. 2.5.3)* | Online |
| 27. | How prepared would you be to join a parents' street protest about an education issue? | Parents and community *(cf. 2.5.3)* | Street |
| 28. | To what extent are you in control of your life? | Reflections on gaming *(cf. 2.6)* | Control |
| 29. | To what extent do you speak or act before you think? | Reflections on gaming *(cf. 2.6)* | Before |
| 30. | To what extent can gamers immediately resume normal, satisfactory human interaction after playing? | Gaming and addiction *(cf. 2.6.1)* | Resume interaction |

*(Table 3.1 continues next page)*

**Table 3.1 Question Matrix (continued)**

| No. | Question | Source (Chapter two) | Identifying word(s) used in graphs and tables |
|---|---|---|---|
| 31. | To what extent did you/do you/would you have time to spend helping your child with their school work? | Time *(cf. 2.5.5.2)* | Time/help |
| 32. | To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parents' evenings and sports fixtures? | Time *(cf. 2.5.5.2)* | Time/attend |
| 33. | To what extent are you interested in creating jobs for other people? | Unemployment *(cf. 2.5.6.1)* | Creating jobs |
| 34. | To what extent do you question the world? | Critical thinking (*cf. 2.5.6.2)* | World |

The questionnaire is presented as Appendix 1. The data was captured in an Excel spread sheet.

Cognisance is taken of Mouton's (2004) concern that the length of a questionnaire has a direct and often negative impact on the quality of the responses. As such, the choice of questions was selective and not exhaustive. The questionnaire employed a numeric rating scale. Respondents to this study were asked to rate their responses from 1 – 7. The responses offered a number, which can be considered a piece of statistical data. Weiers (2008) states that a statistic is a measured characteristic of the sample. Quantitative variables enable researchers to determine how much of something is possessed, not just whether it is possessed, making use of continuous variables. In an ordinal scale, numbers represent greater than or less than measurements, such as preferences or ratings. The study went further than that and used an interval scale which included a greater than and less than relationship, and a unit of measurement that allowed an observer to say how much more or less one object is possessed than another (Weiers, 2008). In an interval scale the unit of measurement is arbitrary. Multiples of measured values are not meaningful. For example, a rating of two is not twice that of a rating of one. Hair, Babin, Money and Samuel (2003) point out that numerical scales have numbers as response options rather than verbal descriptions.

The numbers correspond with categories (response options). Numerical scales are frequently used to measure behavioural intentions, such as the intention to buy, likelihood of seeking additional information or probability of investing. Scales that measure behavioural components of an individual's attitude ask about a respondent's likelihood or intention to perform some future action. This approach is considered acceptable (Hair, Babin, Money & Samuel, 2003). A Likert scale asking respondents to manoeuvre between strongly agree or strongly disagree, or a five-point scale, could have been used (Leedy & Ormrod, 2005; Bryman & Cramer, 2005). However, a 7-point numeric rating was employed in this study so as to record the finer shaves of respondent opinions (Saunders, Lewis & Thornhill, 2009).

The questionnaire made use of a preference, rating scale, as shown in Table 3.2.

**Table 3. 2: Rating scale of each question**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

The intention is that the distance in the preference data scale between each choice from 1 to 7 is equal, meaning that the distance between 1 and 2 is the same as between 4 and 5, for example.

#### 3.7.1.2 Administration of the questionnaire

Steps were taken to balance the anonymity of respondents with the need to keep research records (Mouton, 2004).

The next section investigates the qualitative research approach.

### 3.7.2 Qualitative data

This section discusses how the qualitative data was obtained.

#### 3.7.2.1 Description of the qualitative data collection instrument

Quantitative data was gathered through the questionnaire. The data was then subjected to a factor analysis technique, which revealed the most important questions in the judgement of respondents. The most important questions were recast as questions in an interview to qualitative respondents by email, as shown in Appendix 2. The respondents were selected on the basis of convenience. They were people known to be interested in education and aware of gaming behaviour.

## 3.8 DATA ANALYSIS

### 3.8.1 Analysis of quantitative data

This study uses statistics to reflect upon an education issue, with information reflected as data. Statistical techniques serve as aids in making justifiable decisions on the data obtained (Saunders *et al.,* 2009). Data analysis in the quantitative paradigm does not in itself provide the answer to research questions, as answers are found by way of interpretation of the data and the results. To interpret is to explain and to find meaning through analysis. Analysis means reducing the data to an intelligible and interpretable form so that the relations of research problems can be studied, tested and conclusions drawn (De Vos, Strydom, Fouche & Delport, 2005). The similarity (association) or difference between groups and variables can be tested and inferences pertinent to the research relations can be made. Analysis entails breaking up data into manageable themes, patterns, trends and relationships so as to understand the constitutive elements of the data. The relationships between concepts, constructs or variables thus emerge, as do trends and themes in the data (De Vos, Strydom, Fouche & Delport, 2005; Mouton, 2004; Babbie and Mouton, 2001, Welman & Kruger, 1999).

Statistical data can be presented in two ways, through descriptive statistics and inferential statistics. Descriptive statistics summarise and describe data. Inferential statistics arrive at inferences regarding the phenomenon for which sample data was obtained. Inferential statistics seek to reach conclusions or make predictions regarding the population from which the sample is drawn. Inferential statistics include factor

analysis, correlations and regression analysis (Weiers, 2008; Mouton, 2004). These three inferential techniques were used in this study. The techniques were enacted using Statistical Package for the Social Sciences (SPSS). The statistical tools of correlation and regression were used to both analyse the data and to help shape the recommendations.

The statistical work, therefore, covers four broad fields: descriptive statistics (means, standard deviation), bivariate statistics (correlations), and prediction for numerical outcomes (linear regression) and prediction for identifying groups (factor analysis).

#### 3.8.1.1 Descriptive statistics

The mean score was calculated as it has merits in the context of the study. The mean is a measure of central tendency. The mean is the average score of any group on a test and it is of interest to compare the mean scores of demographic groups within a question. The higher the mean returned, the stronger the sentiment is held by respondents and these sentiments can be compared (Babbie & Mouton, 2001; Kline, 1996).

#### 3.8.1.2 Correlation

Correlation analysis reveals the extent to which two variables are related to each other. The strength of the relationship is expressed as a correlation coefficient, which is a number between -1 and +1. A value of +1 represents a perfect positive correlation (agreement). A value of -1 represents a perfect negative correlation (agreement). A value of 0 means the variables are perfectly independent. The data for some questions was subjected to correlation analysis to indicate the degree of agreement between them. A positive correlation reflects a direct relationship, one in which an increase in one variable corresponds to an increase in the other variable. Two variables which are inversely related will produce a negative correlation, indicating that an increase in one variable is associated with a decrease in the other (Saunders *et al*., 2009; Welman & Kruger, 1999; Kline, 1996).

### 3.8.1.3 Regression

Regression analysis is the process of calculating a regression coefficient and regression equation using one independent variable and one dependent variable (Williams, Sweeney & Anderson, 2012) This is a test to see the extent to which a unit change in one variable gives rise to a change in another variable (Williams, Sweeney & Anderson, 2012). Data from selected questions was subjected to regression analysis. The regression coefficient is a number between 0 and 1 that depicts the strength of the relationship between the numerically dependent variable and the numerically independent variable. The dependent variable is the variable to be predicted. The independent variable is the variable upon which the prediction is based. The closer the regression to one, the more of the dependent variable can be explained by the independent variable.

Regressions shows the proportion of the dependent variable that can be explained statistically by the independent variable. A value of 1 means that all the variation in the dependent variable can be explained statistically by the independent variable. A value of 0 means that none of the variation in the dependent variable can be explained by the independent variable (Saunders *et al*., 2009; Hair, Babin, Money & Samuel, 2003). Regression was a useful analytical tool for this study as the technique revealed the likely, practical results, if any, of steps taken by school leadership and educators to impact the behaviour of gaming respondents.

### 3.8.1.4 Factor Analysis

A factor analysis of data is a parametrical statistical procedure that examines correlations among a number of variables so as to identify clusters of highly interrelated variables that reflect underlying themes or factors within the data (Bryman & Cramer, 2006). Characteristics (aspects) of a study expressed as data are correlated with one another and those characteristics which go together constitute a factor. A factor analysis thus reveals groups of questions that are the most important in driving respondent response. A factor analysis also shows the order of importance of the questions within each group (Bryman & Cramer, 2006). A factor is comprised of

variables with closely aligned scores (loadings; coefficients), so factor analysis is a tool that brings order by determining which variables are related and which variables are not related. Within a factor, the variable with the highest loading is the most important. All variables are analysed together to identify underlying patterns or factors (Weiers, 2008; Bryman & Cramer, 2006; Leedy & Ormond, 2005; Hair, Babin, Money & Samuel, 2003).

Factor analysis simplifies data by indicating what the important variables are, Kline (1996) notes, in what he describes as a linear combination of variables. Kline (1996) says the aim of factor analysis is to simplify a matrix of correlations so that they can be explained in terms of a few underlying factors. A factor analysis generates a first unrotated component or factor matrix that should not be made use of. The matrix has to be rotated and this can be used as evidence of common factors running through the data and can be interpreted (Kline, 1996). The larger the sample the better.

#### 3.8.1.5 Further tests

Additional statistical techniques were used to unpack the data, including testing four constructs of dependent variables. The data was tested for normality, substantiated through Kolmogorov-Smirnov (K-S) tests. The data was subjected to the tests of homoscedasticity, analysis of variance (ANOVA) test, hypothesis making and measures of association.

### 3.8.2 Analysis of qualitative data

Qualitative data was gathered through questions sent to nine selected respondents. The qualitative data was analysed in terms of a variation of thematic coding, termed interpretative phenomenological analysis (Better Evaluation, 2017). Thematic coding is a form of qualitative analysis which involves recording or identifying passages of text or images that are linked by a common theme or idea. One variety of thematic coding is interpretative phenomenological analysis (Better Evaluation, 2017; Smith & Osborn, 2003). French (2010) says thematic coding analysis allows for an exploration of the participants experiences, meanings, perceptions and feelings, allowing for an

in-depth feel and understanding. A thematic analysis focuses on descriptions of people's representations of what is occurring in their world.

More specifically, interpretative phenomenological analysis explores how participants make sense of their personal and social world and articulates the meanings particular experiences, events and states hold for them (Better Evaluation, 2017; Smith & Osborn, 2003). The approach involves an examination of the participant's lifeworld, explores their personal experience and is concerned with their personal perception or account of an object or event. The intention is to get close to the participant's personal world to capture an insider's perspective (Better Evaluation, 2017; Smith & Osborn, 2003). To put the point another way, interpretative phenomenological analysis aims to offer insights into how a person, in a given context, makes sense of a given phenomenon (Better Evaluation, 2017; Smith & Osborn, 2003). Participants are engaged in meaning making. Participants were chosen specifically because they could have telling insight into and experience of the issues highlighted though factor analysis. Data collection was through questions leading to a detailed verbatim transcript (Better Evaluation, 2017; Smith & Osborn, 2003).

Interpretative phenomenological analysis can be used to understand what an experience is like (phenomenology) and how a person makes sense of it (interpretation) (Better Evaluation, 2017; Smith & Osborn, 2003). For the purposes of this study, quantitative data was first gathered through the questionnaire. The quantitative data was subjected to a factor analysis which revealed the most important questions in the judgement of respondents. The most important questions were then recasted as questions that were presented to qualitative respondents. The qualitative participants were asked to interpret and shed understanding on the most important questions as identified by factor analysis.

The data gathered is presented in thematic format (to reflect the research questions) in Table 4.36 *Most important questions* in Chapter 4. The interview questions reflected the hegemonic factor that will emerge through the factor analysis statistical technique. As such the data by definition will meet a requirement of qualitative data analysis which is to identify common themes in respondents' descriptions of their experiences (French, 2010). The data was thus coded as a priori by the hegemonic questions. The

phenomena yielded by the quantitative questions – the experience - were put to qualitative respondents to make sense of (interpretation) (Better Evaluation, 2017; Smith & Osborn, 2003). The meaning of, perceptions of, perspectives of and understanding of gaming and school education provides qualitative insight to triangulate with findings from the quantitative questionnaire (Leedy & Ormrod, 2005).

## 3.9 ETHICAL CONSIDERATIONS

The researcher applied for ethical clearance from the University of Technology, Free State (cf. Appendix 4). For ethical reasons, all respondents were informed about their voluntary participation and that they were free to decline. No respondents were approached as a representative of any organization or state department. Respondents were approached in their capacities as gamers or non-gamers, some of whom may be educators and parents. No use was made of respondents' demographic detail beyond what is needed for statistical purposes for this study. The demographic data of respondents was not shared in a way that can further identify respondents.

## 3.10 MEASURES TO ENSURE VALIDITY AND RELIABILITY

### 3.10.1 Credibility

Research findings need to be credible. For credibility, the possibility of getting the research answers wrong has to be reduced. Using a scientific method helps prevent a researcher from deceiving themselves. Research work needs to follow three rules of scientific evidence.

- Objective evidence: The evidence has to be objective and systematic as opposed to anecdotal, selective and arbitrary. Steps have to be taken to ensure that the evidence is based on good sampling techniques, proper conceptualization and operationalisation, reliable data collection and error-free capturing and editing.
- Appropriate evidence: The evidence has to be relevant to the research problem and address the research problem and research questions head on.

- The weight/support of the evidence: The evidence has to be sufficient or strong enough to support the weight of the conclusions drawn from it (Saunders *et al*., 2009; Mouton, 2004; Babbie & Mouton, 2001).

This study attempts to ensure credibility (Saunders *et al*., 2009) through following the rules of scientific evidence (Mouton, 2004). Data was obtained objectively and systematically, based on good sampling techniques. There is proper conceptualization and operationalisation, reliable data collection and error-free capturing and editing. Data relevant to the problem statement and research questions was obtained. The number of respondents was sufficiently strong to inform analysis and support recommendations. There is in this study a search for truth (Mouton, 2004) in order for the study to be credible. Reducing the possibility of getting the answers wrong raises the issues of reliability and validity.

### 3.10.2 Reliability

A reliability analysis of the data was carried out using the Cronbach Alpha model of internal consistency. The analysis involves correlating the responses to each question with those of other questions to measure the consistency of responses across all the questions. The model calculates the average of all possible split-half reliability coefficients and should be above 0.8. A reading greater than 0.9 is excellent (Saunders *et al*., 2009; Bryman & Cramer, 2006; Hair, Babin, Money & Samuel, 2003).

Saunders, Lewis and Thornhill (2009) posed three tests to assess reliability centred on obtaining the same results, similar observations and transparency. The questions are important for a study such as this.

### 3.10.3 Same results

The test is if the measures would yield the same results on other occasions (Saunders *et al*., 2009). Gamers and non-gamers, as members of society, are constantly engaging in their changing world. So, therefore, the attitudes, opinions, positions and answers respondents forward in response to the questionnaire can change if the questionnaire is done in a few years. The test for reliability, however, is not if duplicated research at a later period, in possibly changed settings, will return the same numerical,

statistical results. The real test for reliability is if the measures being tested will still be relevant a few years hence and the data obtained can be of use to school leadership and educators. To the extent gaming will continue probably unabated, to ask questions a few years hence about the impact of gaming on school education, as this study does, will be relevant and germane, ensuring the test itself and the measures are reliable. The measures will in the future still yield respondents' response to gaming and school education.

### 3.10.4 Similar observations

The test to ensure validity and reliability is if similar observations will be reached by other observers (Saunders et al., 2009). To re-phrase the test, the question is if a second researcher administering the same questionnaire to the same respondents, in the same setting, in the same period, will achieve the same results. The answer is there is no reason why this should not be the case. The number of respondents was large enough to suggest that all possible respondents that are reached could be reached by another researcher covering the same field. The questions emanate from literature open to all scholars and the instrument will not so complicated that it gives rise to different interpretations. So, there is no reason why a second researcher administering the same questionnaire in the same setting, in the same period, should not achieve the same results.

### 3.10.5 Transparency

The test is if there is transparency in how sense is made from the raw data (Saunders *et al*., 2009). The answer is an unequivocal yes in that sense is made of the data through statistical techniques. Transparency can be secured by subjecting the data again and separately to the same statistical techniques used in this study.

### 3.10.6 Threat to reliability

Several threats to reliability are possible, such as participant error. For example, respondents should be approached at a neutral time. With a questionnaire sent out electronically, the question of a respondent's personal neutrality is impossible to control (Saunders *et al*., 2009). There can also be participant bias in that respondents might have felt under pressure to convey sentiment to, or hide sentiments from, a researcher that respondents think will please or irk the researcher (Saunders *et al*., 2009). One way to overcome this is to ensure the anonymity of respondents. If participants are anonymous, and know from the outset they will remain anonymous, they might not feel under pressure to convey or hide sentiments to please or irk a researcher. The e-mail address of most respondents are known as the returns were done by e-mail. No attempt was made to find out more about the respondents beyond their e-mail addresses and beyond the demographic questions that were asked. The anonymity of respondents was honoured in the way the data was captured and records maintained. No person who declined to respond to the questionnaire was asked a second time.

Another threat to research reliability is posed by observer error. The study attempted to ameliorate this by employing statistical tools. Statistical results are always open to differing interpretation, but not error as statistical formulae will always return the same set of figures. There is also the possibility of observer bias. The only defence possible is that this study was a quest for the truth (knowledge). The quest for the truth leaves no place for pre-determined bias on what respondents should furnish (Saunders *et al*., 2009).

### 3.10.7 Validity

The term validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration (Saunders *et al*., 2009). Validity is concerned with whether the findings are really about what they appear to be about and whether the relationship between variables is a causal relationship. Two challenges to validity are germane. These are history, which suggests that the timing

of the research can be a factor, and testing, where the respondents fear that the outcome can be used against them. The timing of the work is of relevance in that it is possibly the first study into the interplay between gaming and school education. As for the fear that respondents might have – there is no way of knowing this. Gamers and non-gamers were approached to be respondents. The issue of whether or not participation in the research and/or the research results can be the harbinger of adverse moves by education authorities is subjective and internal to the respondents. The research has the opposite intention, and that is to test the response of respondents so as to make recommendations to political leadership, curriculum designers, school leadership and educators on how to live with increasing gaming. This is to the advantage of respondents and indeed all stakeholders.

The study, it is contended, does have validity. The assumption has to be made that respondents are aware of their own thoughts when they contemplate their responses and that their responses are based on deliberations. The measures obtained must be taken as adequately reflecting the respondents' real meaning. The recommendations from this study can have a direct impact on informing school leadership and educators about their world, enhance their decision-making capacity and enable them to take steps to respond adequately to rising gaming and the challenges that poses to school education (Saunders *et al*., 2009; Babbie & Mouton, 2001; Welman & Kruger, 1999).

### 3.10.8 Generalisability

Concerns about population validity, which is the degree to which the findings for a sample may be generalised to the total population, are accepted. Respondents are expressing their opinion on gaming and education. While local nuance may have led to slightly different interpretations of the driving forces in gaming and education, it can be contended that the results of the research, and particularly the recommendations, are generalisable to all parents and educators in South Africa. However, this claim is not being made in this study in light of the non-probability sample being used.

In a second usage of the word generalisable, Dhai (2004) says research is a systematic investigation designed to produce generalisable knowledge, generalisable

either to the community that has been researched or to the population at large. To this extent, if the findings of this study are generalisable to the community being researched, they can actually prove a great aid to helping school leadership and educators face up to the challenges of gaming parents. Further, this work does not set out to secure nationally generalisable findings, but to explain just what is going on in a particular research setting (Saunders *et al*., 2009). The setting for this research project is the Lejweleputswa district in the Free State province. This geographical region was chosen as it was the candidate's place of abode and where the Central University of Technology, Free State is situated.

## 3.11 CHAPTER SUMMARY

This chapter explored the theory of research relevant to this work, especially the questions of population and sample. The population of the investigation can be loosely defined as people over 18 who may or may not play games, who have an electronic device and have an interest in school education.

The study can be summed up thus: it used a questionnaire method of data collection triangulated by phenomenological qualitative interviews with questions to qualitative respondents. This falls within a survey research strategy and the research philosophy of realism (Saunders *et al*., 2009).

The data gathered from the field work is presented in Chapter Four.

# CHAPTER 4

# RESULTS AND DISCUSSION OF THE FINDINGS

## 4.1 INTRODUCTION

The study focused on the effect that gaming and gaming parents have on education and educators. The research design was discussed in chapter three. This included the dependent (DVs) and independent variables (IVs), the main research question and the accompanied subsidiary questions, the overall aim and objectives. The chapter also explained the related hypotheses, the data-collection instruments, the methods of data-analysis, and the ethical considerations of the study. Data was gathered through a quantitative research questionnaire and qualitative interviews. The literature review attempted to conceptualise the growing popularity of gaming and its impact on the education environment. The study aimed to reconnoitre the extent to which gaming behaviour of participants impacted on the related DVs acknowledged through literature. Ultimately, the study sought to come up with solutions and support strategies through which relevant stakeholders in education could recognise the limitations created by gaming behaviours and accommodate problems related to specific interest constraints and absence created by gaming parents. Subsequently, the study examined whether statistically significant variances existed between the opinions of participants towards the effectiveness of the education system, parental involvement in schools, social interaction and psychosocial skills of gaming parents. The data analysis, discussions and literature review integration are presented in this chapter. Chapter 4 gives rise to recommendations in Chapter 5.

The questionnaire comprised of 34 questions. Descriptive, univariate values for the 34 variables (questions) are offered in Table 4.13. The questions are depicted by their number and one or two words from the question, termed labels. The words used to identify each question were offered in Table 3.1.

The main research question that guided the study was:

*What impact will the playing of electronic computer games by parents of learners, and young people soon to be parents of learners, have on schools, educators, teaching and learning, social ills (such as unemployment) and critical thinking?*

## 4.2 RESEARCH QUESTIONS AND HYPOTHESES

Based on the main research question, the following specific subsidiary research questions and hypotheses were formulated:

**SQ1:** What are the critical aspects of gaming that impact parents and education?
**SQ2:** How does gaming behaviour influence participants' (parents) view on the effectiveness of the education system in a broad sense?
**SQ3**: How does gaming behaviour of participants influence parental involvement in schools?
**SQ4:** How does gaming behaviour affect general social interaction of participants?
**SQ5:** How does gaming behaviour contributes to the psychosocial development of participants?

Based on the interaction between the most reported dependent and independent variables, hypotheses were stated with the following variables in mind:

- There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of the effectiveness of the education system.

- There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their parental involvement in schools.

- There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their social interaction.

- There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their psychosocial development.

The results and discussions are presented in order to answer the above-mentioned questions and test the hypotheses. The results are based on the data that were collected using a quantitative questionnaire. The biographical data of the participants are provided in the first section of this chapter. Thereafter the results of the quantitative phase of the study are presented. The results from the quantitative data are presented in tables and discussed accordingly. Specific correlation and regression analysis were also conducted and reported. Thereafter the findings from the qualitative phase are discussed. All the above-mentioned findings are finally interpreted and discussed.

## 4.3 VARIABLES

A variable is a characteristic property or attribute of a concept that takes on different values. Such variables have numbers, values or symbols assigned to them, and may either be dependent or independent (Ross, 2005). In research, variables are classified as either independent or dependent.

### 4.3.1 Independent variables (IV)

An independent variable (or variables) is the variable that is manipulated by the researcher. It is thought to influence other variables in a particular study, and predictions can be formulated based on it/them (Tirivangana, 2013).

For the purpose of this study, the following independent variables were identified:

- Age
- Gender
- Economic activity
- Gaming behaviour

### 4.3.2 Dependent variables (DV)

The dependent variable(s) in a study is the reputed effect which varies concomitantly with changes or variation in the independent variable(s) (Bryman & Liao, 2004). Dependent variables are not manipulated by the researcher, and as a result prediction can also be made about them. In this study, the dependent variables presented the effectiveness of the education system, parental involvement, social interaction and psychosocial development.

## 4.4 BIOGRAPHICAL DATA (Demographic section of questionnaire)

There were 248 respondents to this study. The biographical data of the respondents are summarised in Table 4.1 to 4.12 below. In the figures that follow, a graphical representation of each Independent Variable (gender, age, gaming experience and occupation of respondents) together with the other biographical data pertaining to the respondents is offered.

### 4.4.1 Gender composition

Data from both gender groups is offered. The gender distribution of respondents is set out in Table 4.1.

**Table 4. 1: Frequency analysis of gender composition of the sample (N=248)**

| ***Gender of Respondent*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Female | 116 | 46.8 | 46.8 | 46.8 |
| | Male | 132 | 53.2 | 53.2 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

From Table 4.1 it is evident that the population was more composed of male respondents. As illustrated above, from a total of 248 respondents, males comprised 53.2% (N=132) and females made up the rest (N=116; 46.8%).

### 4.4.2 Age composition

Four age groups were delineated in the questionnaire. However, only three age brackets are used for the analysis. These age groups are respondents aged:

- Age 25 and younger;
- Age 26 – 40; and
- Age 41 and older.

The age composition of the sample is set out in Table 4.2.

**Table 4.2: Frequency analysis of age composition of the sample (N=248)**

| ***Age of Respondent*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | 25 years and younger | 108 | 43.5 | 43.5 | 43.5 |
| | Between 26 and 40 years | 46 | 18.5 | 18.5 | 62.1 |
| | Older than 40 years | 94 | 37.9 | 37.9 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

The frequency distribution of the respondents shows that there was a preponderance of respondents from the young and older age groups. Respondents aged 25 years and less (108) made up 43.5 percent of the sample, respondents aged 26 to 40 years (46) comprised 18.5 percent of the sample and respondents aged 41 years and older 37.9 percent of the sample (94) (N=248).

### 4.4.3 Respondents occupation

Respondents were asked their occupation. Their options were

- Educator;
- Other; and
- Student.

The occupation of respondents is shown in Table 4.3.

**Table 4.3: Frequency analysis of occupation of the sample (N=248)**

| ***Occupation*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Educator | 46 | 18.5 | 18.5 | 18.5 |
| | Other | 100 | 40.3 | 40.3 | 58.9 |
| | Student | 102 | 41.1 | 41.1 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

Respondents who classified themselves as students comprised 41.1 percent of the study (102 respondents) and educators 18.5 percent (46). All other occupations were grouped together as other and comprised 40.3 percent of respondents (100 respondents) (N=248).

### 4.4.4 Gaming behaviour

Of the 248 respondents, 144 played games, which was 58,06 percent of respondents. The average age of respondents who played games was 30,92 years. This data was obtained from the information provided by the question “How many hours a week do you play electronic games?” If the respondent was not playing games for any amount of hours during the week, they were classified as non-gamers. See Table 4.4.

**Table 4.4: Frequency analysis of the gaming behaviour of the sample (N=248)**

| *Gamers vs. Non-gamers: Gaming behaviour - hours played per week* | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Non-gamer | 104 | 41.9 | 41.9 | 41.9 |
| | Gamer | 144 | 58.1 | 58.1 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

#### 4.4.4.1 Gaming behaviour: Hours played per week

The number of hour's respondents play electronic games a week was asked and is of importance. This data is reflected in five brackets:

- No games (respondents who do not game during the week);
- Less than 3 hours (gaming three hours and less a week);
- Between 4 and 7 hours (gaming for between four and seven hours a week);
- Between 8 and 10 hours (gaming for between 8 to 10 hours a week); and
- More than 10 hours (gaming for 11 hours and more a week).

According to the means of central tendency calculations, the average amount of hours played per week by the 144 respondents amounted to 7.03 hours as seen in Table 4.5.

**Table 4.5: Gaming behaviour - Average hours played per week**

| *Gaming behaviour – average hours played per week* | | | |
|---|---|---|---|
| | | *Number of gaming respondents* | *Average hours played* |
| Valid | 3 Hours and less | 67 | 1.85 |
| | Between 4 and 7 hours | 33 | 5.21 |
| | Between 8 and 10 hours | 19 | 9.61 |
| | More than 10 hours | 25 | 20.92 |
| | Total | 144 | 7.03 |

The respondents who gamed on average spent seven hours a week gaming. The following table display the frequencies and percentages that gamers played for different amount of hours per week.

**Table 4.6: Frequency analysis of the gaming behaviour of the gamer sample (N=144)**

| ***Gaming behaviour of Gamer Respondent: hours played per week*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | 3 hours and less hours played per week | 67 | 46.5 | 46.5 | 46.5 |
| | Between 4 and 7 hours played per week | 33 | 22.9 | 22.9 | 69.4 |
| | Between 8 and 10 hours played per week | 19 | 13.2 | 13.2 | 82.6 |
| | More than 10 hours played per week | 25 | 17.4 | 17.4 | 100.0 |
| | Total | 144 | 100.0 | 100.0 | |

Almost half of the gamer sample spent 3 hours and less playing games per week (N=67; 46.5%) and 22.9% (N=33) plays between 4 and 7 hours per week. Only 17.4 % of the sample spend more than 10 hours playing games per week. These results concur with the average amount of hours spent on playing games for the different hour allocations as shown in Table 4.6.

The following section describes the respondents who were classified as gamers (N=144) in terms of their age and gender.

The following section explains the average amount of years that gamers played games, as well as the frequency analysis and percentages for the different year groups.

#### 4.4.4.2 Gaming behaviour: Amount of years that gamers played games

The average number of years played by the respondents who have ever gamed, is reflected in Table 4.7.

The number of years for which respondents have played games was asked and is of importance. The number of years' gamers have played is reflected in four brackets:

- No years (to reflect respondents who have never played);
- Less than 5 years (respondents who have played for five years or less);
- Between 6 and 10 years (respondents who have played for between six and 10 years); and
- 11 Years and more (respondents who have played for 11 years and more).

**Table 4.7: Gaming behaviour - Average number of years played**

| ***Gaming behaviour – average amount of years*** | | | |
|---|---|---|---|
| | | *Number of gaming respondents* | *Average years played* |
| Valid | 5 Years and less | 50 | 3.44 |
| | Between 6 and 10 years | 43 | 8.63 |
| | 11 Years and more | 77 | 18.62 |
| | Total | 170 | 11.63 |

The respondents who have ever gamed have on average gamed for 11,63 years.

**Table 4.8: Frequency analysis of Gaming behaviour - Average number of years played**

| *Gaming behaviour: number of years played* | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | 5 years and less gaming experience | 50 | 29.4 | 29.4 | 29.4 |
| | Between 6 and 10 years gaming experience | 43 | 25.3 | 25.3 | 54.7 |
| | More than 11 years gaming experience | 77 | 45.3 | 45.3 | 100.0 |
| | Total | 170 | 100.0 | 100.0 | |

Table 4.8 illustrate that 45.3% of respondents have more than 11 years' experience in gaming behaviour.

The following section explains the parental activity of the sample.

### 4.4.5 Parental responsibility of sample

**Table 4.9: Frequency analysis of the Parental responsibility of the sample (N=248)**

| *Parental Responsibility: How many children cared for* | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | 0 | 140 | 56.5 | 56.5 | 56.5 |
| | 1 | 17 | 6.9 | 6.9 | 63.3 |
| | 2 | 50 | 20.2 | 20.2 | 83.5 |
| | 3 | 30 | 12.1 | 12.1 | 95.6 |
| | 4 | 2 | .8 | .8 | 96.4 |

*(Table 4.9 continues next page)*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | 5 | 6 | 2.4 | 2.4 | 98.8 |
| | 6 | 1 | .4 | .4 | 99.2 |
| | 7 | 1 | .4 | .4 | 99.6 |
| | 10 | 1 | .4 | .4 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

Due to the occupation of the sample which merely consisted out of students, it supports the 140 respondents (56.5%) that do not have any children to care for. The most reported number of children that respondents have to take responsibility for ranges between 2 and 3 children.

## 4.5 DEMOGRAPHICAL DATA FOR EACH QUESTION

This section discusses the data returned for each question by each of the demographic categories delineated in the questionnaire.

**Table 4. 10: Quantitative data**

| *Question (number) labels* | *N (number of respondents who answered)* | *Mean returned by respondents* | *Standard deviation* |
|---|---|---|---|
| 1 Professional gamer | 247 | 1,89 | 1,64 |
| 2 Better outcomes with similar experiences | 246 | 5,53 | 1,16 |
| 3 Know | 238 | 4,74 | 1,56 |
| 4 Confident | 243 | 5,14 | 1,48 |
| 5 Teaching skills | 248 | 3,92 | 1,46 |
| 6 Lifelong | 246 | 5,26 | 1,69 |
| 7 Decisions | 237 | 5,26 | 1,60 |
| 8 Addressing problems | 237 | 5,46 | 1,39 |
| 9 Adult World | 245 | 3,93 | 1,58 |
| 10 Employability | 246 | 4,03 | 1,61 |
| 11 Classroom | 236 | 3,31 | 1,60 |

| *Question (number) labels* | *N (number of respondents who answered)* | *Mean returned by respondents* | *Standard deviation* |
|---|---|---|---|
| 12 Preparedness | 244 | 3,05 | 1,50 |
| 13 Reading | 247 | 5,72 | 1,43 |
| 14 Boring | 247 | 3,79 | 1,69 |
| 15 Tax | 246 | 3,45 | 1,67 |
| 16 Improve | 248 | 4,24 | 1,42 |
| 17 Authority | 247 | 4,86 | 1,53 |
| 18 Do respect | 245 | 3,90 | 1,49 |
| 19 Were respected | 246 | 5,02 | 1,37 |
| 20 Curiosity | 247 | 6,10 | 1,11 |
| 21 Responsible | 247 | 5,92 | 1,01 |
| 22 Positive | 248 | 5,04 | 1,63 |
| 23 Comfortable | 236 | 5,52 | 1,52 |
| 24 Teachers | 236 | 5,08 | 1,56 |
| 25 Interested | 237 | 6,04 | 1,19 |
| 26 Online | 247 | 4,99 | 1,54 |
| 27 Street | 247 | 3,86 | 1,87 |
| 28 Control | 246 | 5,41 | 1,28 |
| 29 Before | 247 | 4,20 | 1,62 |
| 30 Resume interaction | 248 | 4,00 | 1,60 |
| 31 Time help | 236 | 5,46 | 1,46 |
| 32 Time attend | 235 | 5,13 | 1,55 |
| 33 Creating jobs | 246 | 5,17 | 1,48 |
| 34 World | 248 | 5,54 | 1,44 |

The mean for all questions as returned by all demographic categories is 4.1. The means are an important part of the discussion in Chapter five. The chapter entails a comparison of and reflection upon the means as returned by each demographic group for each question. The means for all the questions from all respondents is between 4 and 7. Standard Deviation is an indication of how closely values are clustered around the mean. Approximately 68% of cases lie between one standard deviation below and one standard deviation above the mean. The mean for all questions as returned by all demographic categories is 4.71. The means are an important part of the discussion in Chapter five. Standard Deviation is an indication of how closely values are clustered around the mean. The chapter offers a comparison of and reflection upon the means as returned by selected demographic groups for selected question. The use of the

gender category to reflect the data is taken no further. The following questions are taken no further:  question 1 Professional gamer.

At issue in each question is the response of the various demographic groups. The demographic groups articulated in the questionnaire were age, gender, number of hours played, number of years played, number of children and occupation. The data offered by each demographic group to the questions asked will be compared and contrasted in Chapter five.

### 4.5.1 Demographic categories

The number of hours' respondents play electronic games a week was asked and is of importance. This data is reflected in five brackets, namely no games played during the week to reflect respondents who do not game (no hours), gaming three hours and less a week (hours 3 & less), gaming for between four and seven hours a week (hours 4 – 7), gaming for between 8 to 10 hours a week (hours 8 - 10) and gaming for 11 hours and more a week (hours 11 plus). The number of years for which respondents have played games was asked and is of importance. The number of years' gamers have played is reflected in four brackets, namely no years played (no years) to reflect respondents who have never played, respondents who have played for five years or less (years 5 & less), respondents who have played for between six and 10 years (years 6 – 10) and respondents who have played for 11 years and more (years 11 plus). Respondents were asked how many children they had but this data is not taken further as it is not relevant to this study. Respondents were also asked their occupation. Their options were student, educator and other. The numerical average of the responses returned by respondents in each of these demographics categories is shown for each question. The average of the responses on selected questions are discussed and analysed in Chapter five.

The returns for each question are offered in graph form. The data was analysed and discussed in Chapter five, with recommendations offered.

### 4.5.2 Data from each demographic group

At issue in each question is the response of the various demographic groups. The demographic groups articulated in the questionnaire were age gender, number of hours played, number of years played, number of children and occupation. The data offered by each demographic group to the questions asked were compared and contrasted in Chapter five.

The numerical average of the responses returned by respondents in each of these demographic categories is shown for each question. The demographic categories are the three age brackets, the number of hours played, the number of years play, and the occupation. The average of the responses on selected questions are discussed and analysed in Chapter five.

The returns for each question are offered in graph form. The analysis and discussion of data is done in Chapter 5, with recommendations offered.

#### 4.5.2.1 Professional gamer

The average returned by each demographic category to Question 1 Professional Gamer is indicated in Figure 4.1.

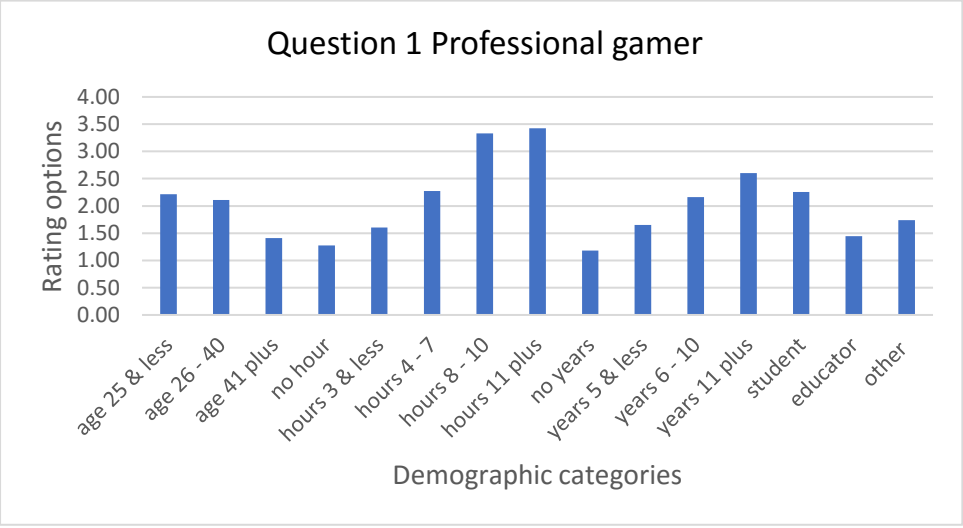


**Figure 4. 1: Professional gamer**

The vertical axis reflects the rating options open to respondents to the question: *To what extent would you like to be a professional international electronic gamer?* The horizontal axis reflects the returns from each demographic group. The more hours a week respondents play games, and the more years they have played games, the more inclined they were to want to be a professional gamer. Younger respondents were also more inclined to be professional gamers.

#### 4.5.2.2 Better outcomes with similar experiences

Figure 4.2 shows the average returned by each demographic category to Question 2 Better outcomes with similar experience

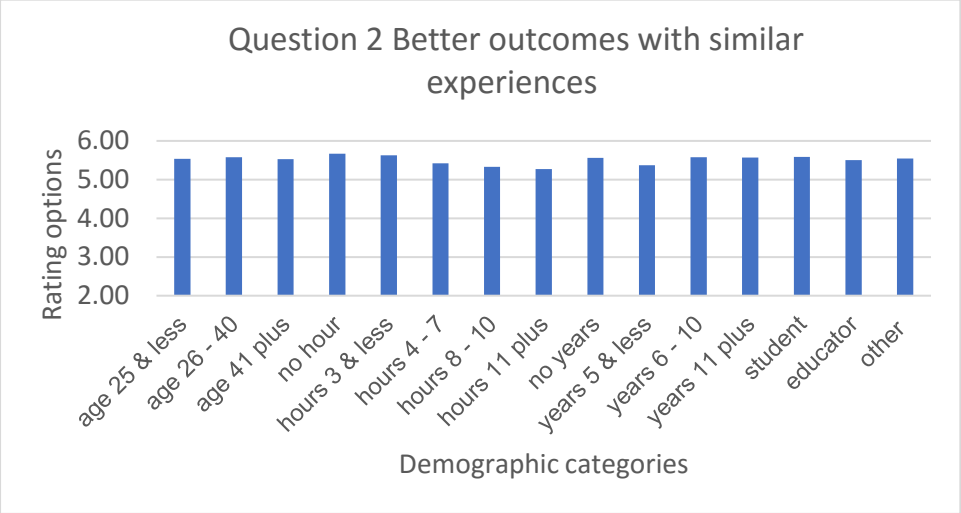


**Figure 4. 2: Better Outcomes with similar experiences**

The vertical axis reflects the rating options open to respondents to the question: *To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* The horizontal axis reflects the returns from each demographic group. The data tested respondents' perception of their maturity. Respondents who did not game during the week judged themselves to be noticeably more mature than respondents who did game during the week. Likewise, respondents who have never gamed rated themselves as more mature than respondents who have gamed.

### 4.5.2.3 Know

Figure 4.3 shows the average returned by each demographic category to Question 3 know.

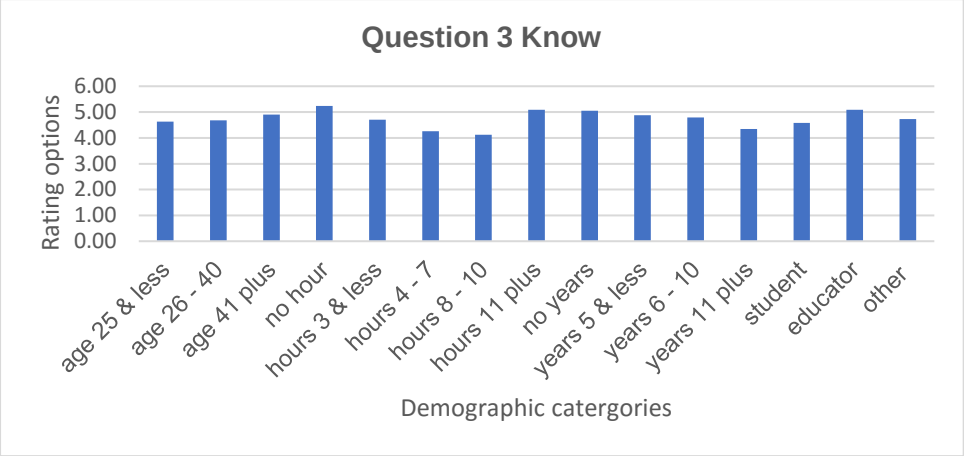


**Figure 4. 3: Know**

The vertical axis reflects the rating options open to respondents to the question: *To what extent did/have you/would you get to know other parents at your child's school?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a week that respondents game, the less they want to get to know other parents at their child's school. Gamers who play for more than 11 hours a week show the most interest in getting to know new parents for their child's school. Similarly, the more years' respondents have spent gaming, the less they want to know other parents at their child's school.

### 4.5.2.4 Confident person

Figure 4.4 shows the average returned by each demographic category to Question 4 confident.

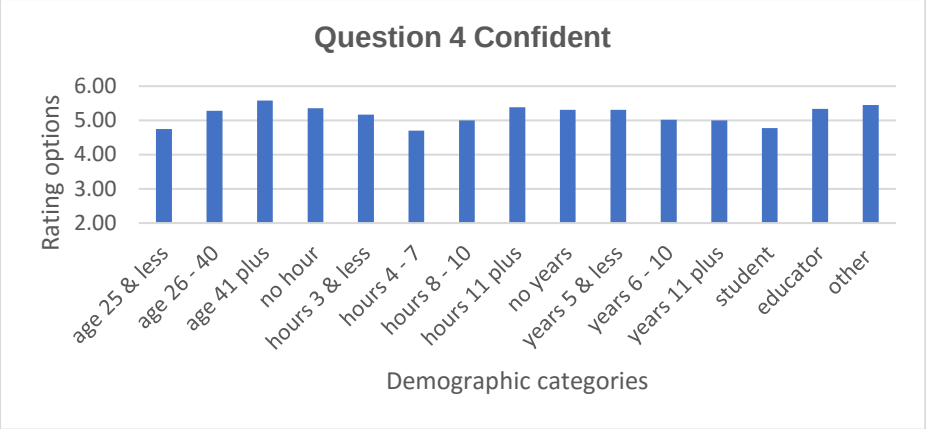


**Figure 4. 4: Confident**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you a confident person*? The horizontal axis reflects the returns from each demographic group. Respondents who did not play games during the week judge themselves to be more confident than respondents who do game. Likewise, respondents who have never gamed see themselves as more confident than respondents who game. Students emerged as having much less confidence in themselves than educators and other respondents.

### 4.5.2.5 Teaching skills

Figure 4.5 shows the average returned by each demographic category to Question 5 Teaching skills.

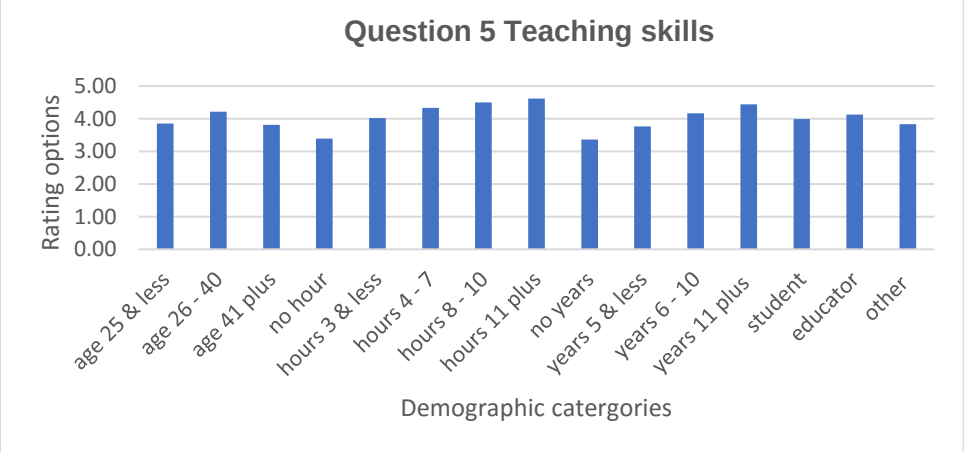


**Figure 4. 5: Teaching skills**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do electronic games teach skills?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a week respondents play games, and the more years they have played, the more inclined they are to believe that gaming imparts skills.

#### 4.5.2.6 Lifelong learner

Figure 4.6 shows the average returned by each demographic category to Question 6 Lifelong learner.

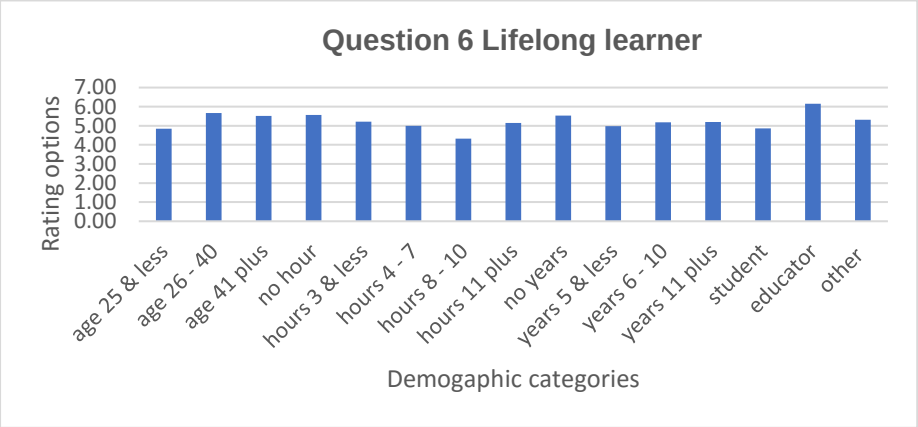


**Figure 4. 6: Lifelong learner**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do you want to be a lifelong learner?* The horizontal axis reflects the returns from each demographic group. The more respondents play games in a week, the less they wanted to be lifelong learners. Similarly, the more years respondents have gamed, the less they wanted to be lifelong learners. Educators emerged as being the demographic group most dedicated to lifelong learning.

#### 4.5.2.7 Decisions

Figure 4.7 shows the average returned by each demographic category to Question 7 Decisions.

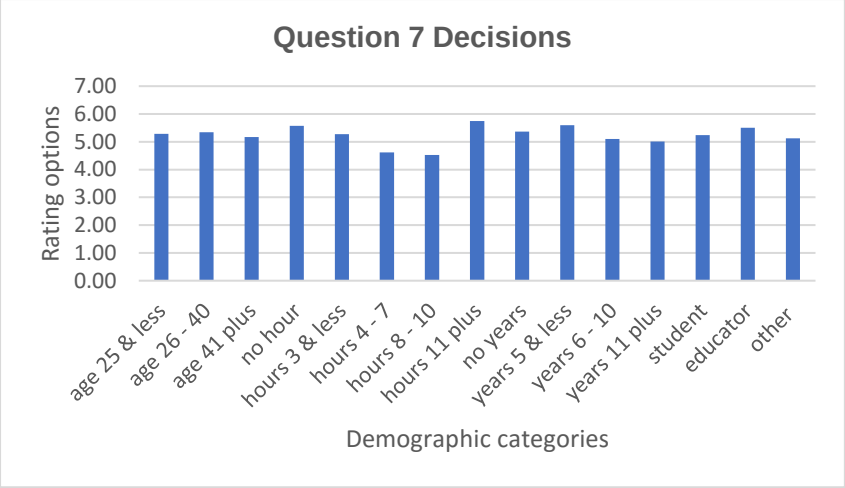


**Figure 4. 7: Decisions**

The vertical axis reflects the rating options open to respondents to the question: To *what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours per week respondents play games, the less they want to be involved in making decisions about the future of the school their child attends. The more gaming years respondents have, the less they want to involve themselves in making decision about the future of their child's school. This data is of significance.

### 4.5.2.8 Addressing problems

Figure 4.8 shows the average returned by each demographic category to Question 8.

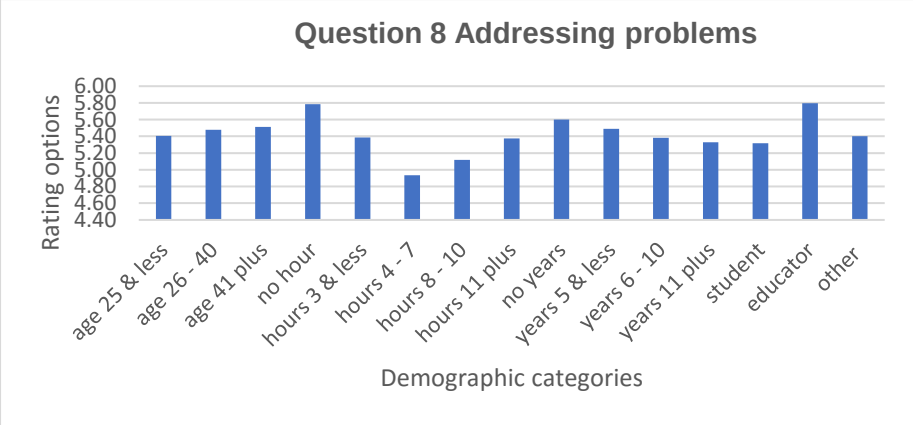


**Figure 4. 8: Addressing problems**

The vertical axis reflects the rating options open to respondents to the question: *To what extent did you/do you/would you be involved in addressing problems at the school your child attended?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours respondents game a week, the less inclined they are to be involved in addressing problems at their child's school. Similarly, and noticeably, the more years respondents have gamed the less inclined they are to involve themselves in addressing problems at their child's school.

#### 4.5.2.9 Preparation for Adult world

Figure 4.9 shows the average returned by each demographic category to Question 9.

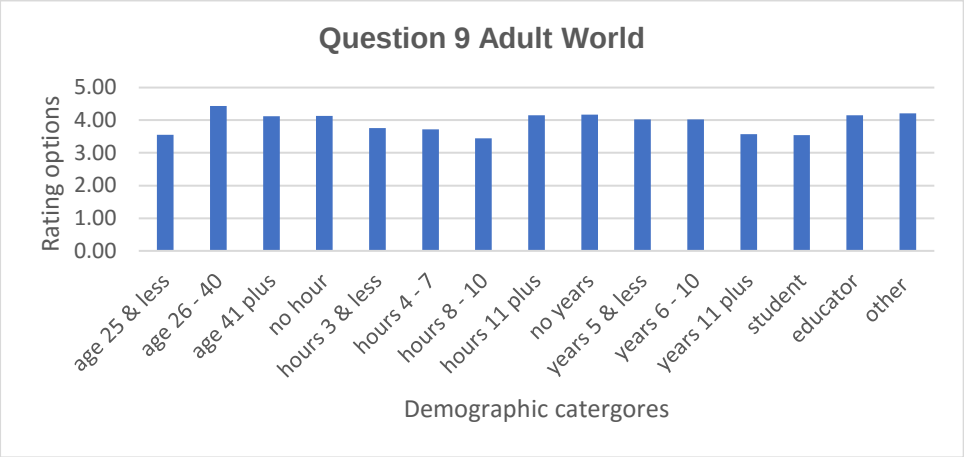


**Figure 4. 9: Adult World**

The vertical axis reflects the rating options open to respondents to the question: To *what extent does school prepare a person to be involved in their society as an adult?* The horizontal axis reflects the returns from each demographic group. The less respondents play games a week, the more inclined they are to think that school does prepare a person to be involved in society as an adult. Similarly, the fewer years gamers have played, the more they are inclined to thinking that school does prepare a person to be involved in society as an adult.

#### 4.5.2.10 Employability

Figure 4.10 shows the average returned by each demographic category to Question 10.

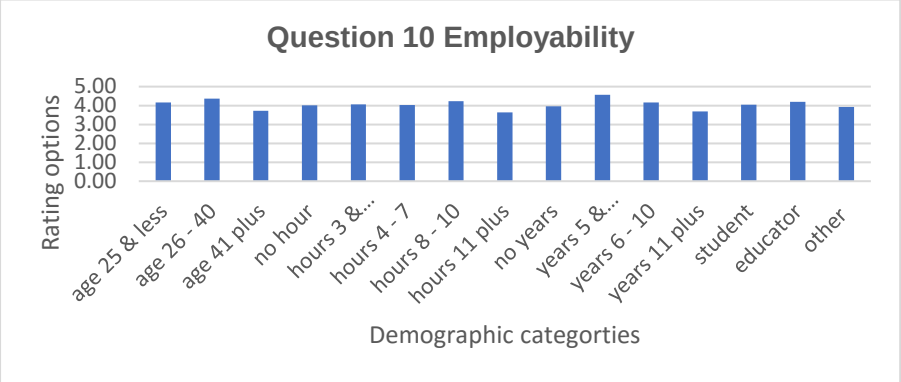


**Figure 4. 10: Employability**

The vertical axis reflects the rating options open to respondents to the question: To *what extent does school prepare a person for employment?* The horizontal axis reflects the returns from each demographic group. Respondents who play games for more than 11 hours a week and have been playing for more than 11 years returned the lowest averages. Educators and students think more strongly than other respondents that school does prepare a person for employment.

#### 4.5.2.11 Classroom

Figure 4.11 shows the average returned by each demographic category to Question 11.

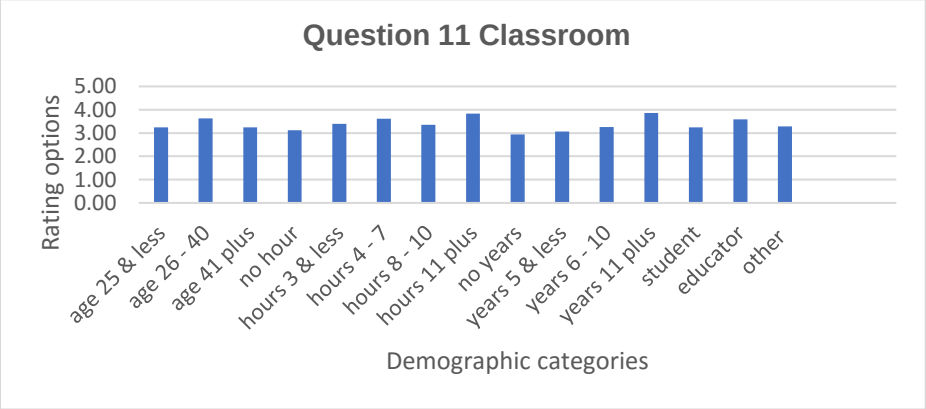


**Figure 4. 11: Classroom**

The vertical axis reflects the rating options open to respondents to the question: To *what extent should electronic games be used in a classroom?* The horizontal axis reflects the returns from each demographic group. The data showed that respondents who game the most during a week and over the years are the most in favour of games being used in a classroom. Educators are more in favour of games being used in a classroom than students.

#### 4.5.2.12 Preparedness

Figure 4.12 shows the average returned by each demographic category to Question 12 Prepare.

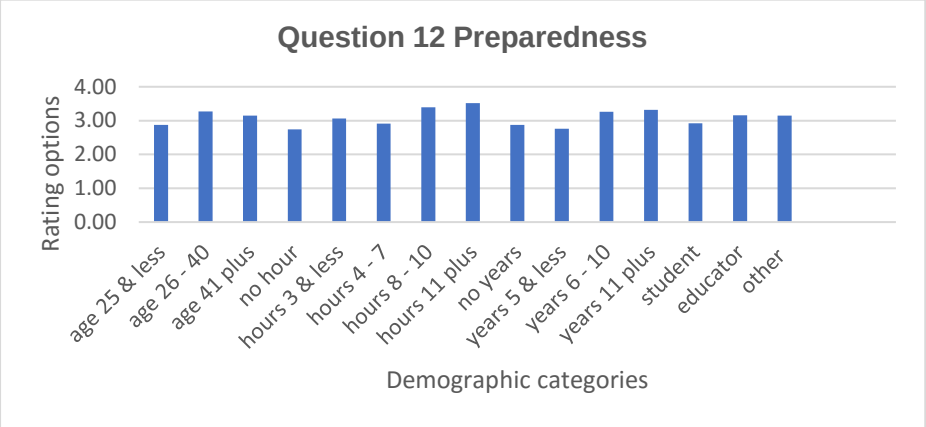


**Figure 4. 12: Preparedness**

The vertical axis reflects the rating options open to respondents to the question: To *what extent does the playing of games prepare gamers for their lives?* The horizontal axis reflects the returns from each demographic group. The more hours respondents play games a week, and the more years respondents have played games, the more they feel that games have prepared them for life, compared to respondents who recorded no hours of play a week and no years of play.

#### 4.5.2.13 Reading

Figure 4.13 on the next page shows the average returned by each demographic category to Question 13 Reading.

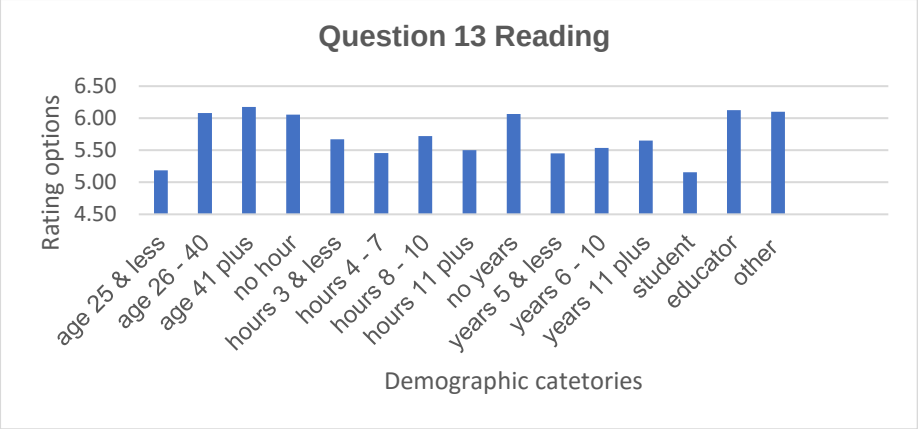


**Figure 4. 13: Reading**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do you read books/novels/magazines/newspapers/websites?* The horizontal axis reflects the returns from each demographic group. Respondents who do not play games during the week, and who have never played games, tended to read more than respondents who do game.

### 4.5.2.14 Boring

The average returned by each demographic category to Question 14 is shown in Figure 4.14.

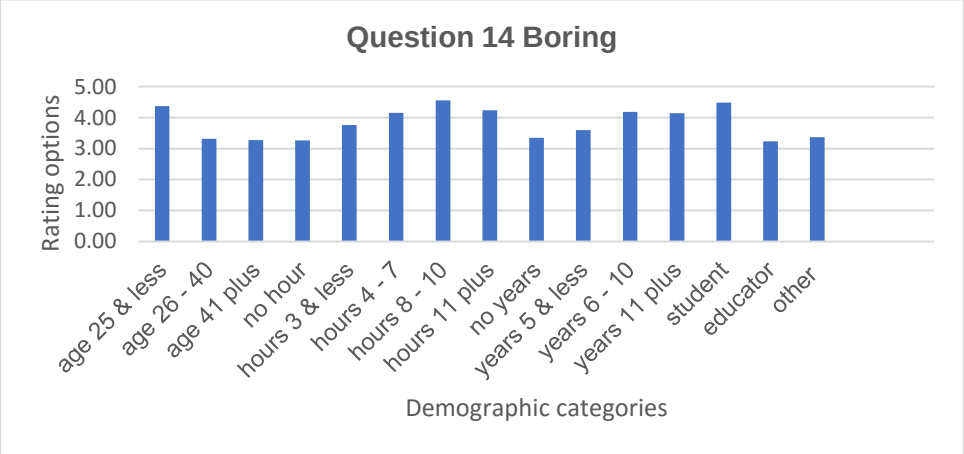


**Figure 4. 14: Boring**

The vertical axis reflects the rating options open to respondents to the question: To

*what extent was school boring?* The horizontal axis reflects the returns from each demographic group. The more respondents game during the week and the more years for which respondents have gamed, the more school was boring for them. Students also registered their boredom with school.

#### 4.5.2.15 Tax

Figure 4.15 shows the average returned by each demographic category to Question 15 Tax.

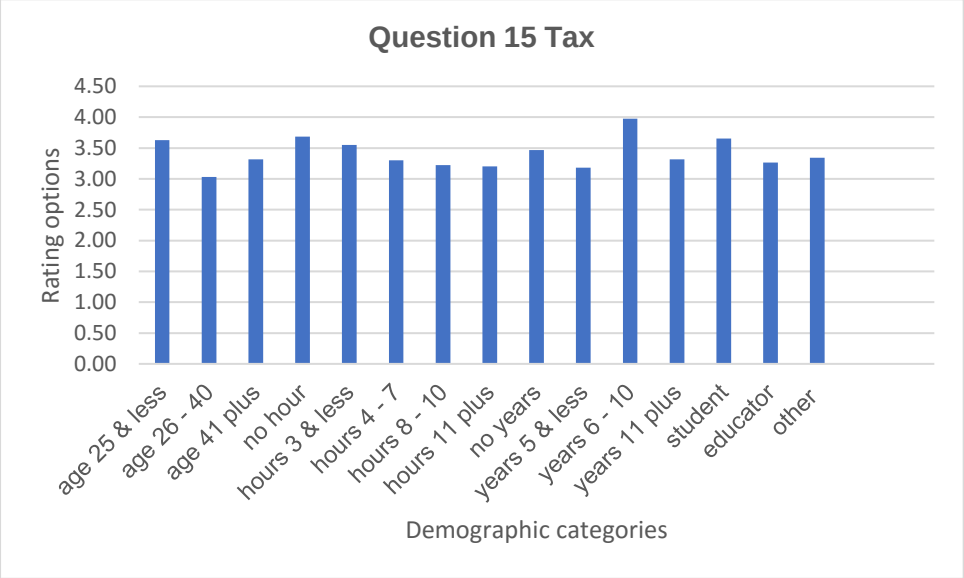


**Figure 4. 15: Tax**

The vertical axis reflects the rating options open to respondents to the question: To *what extent is tax money spent on school education well spent?* The horizontal axis reflects the returns from each demographic group. The fewer hours respondents play games a week, the more inclined they are to consider taxes spent on education well spent. Similarly, respondents who have never played games consider the education spend more highly than respondents who have played games. This result was not anticipated, so the question of why this is so needs to be explored in a future study. Students value the education spend more highly than people not employed in education and educators.

### 4.5.2.16 Improve

Figure 4.16 shows the average returned by each demographic category to Question 16 Improve.

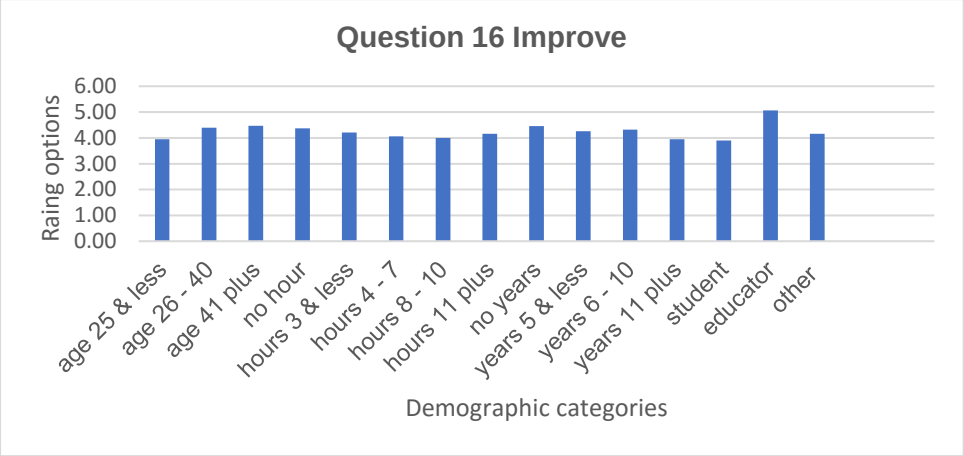


**Figure 4. 16: Improve**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do educators think about and thus improve what they do in a classroom?* The horizontal axis reflects the returns from each demographic group. Respondents who do not play games during the week and who have never played games feel marginally stronger that educators think and thus improve what they do in a classroom.

### 4.5.2.17 Authority

The vertical axis in Figure 4.17 (next page) reflects the rating options open to respondents to the question: To *what extent do you accept the authority of a school?* The horizontal axis reflects the returns from each demographic group.

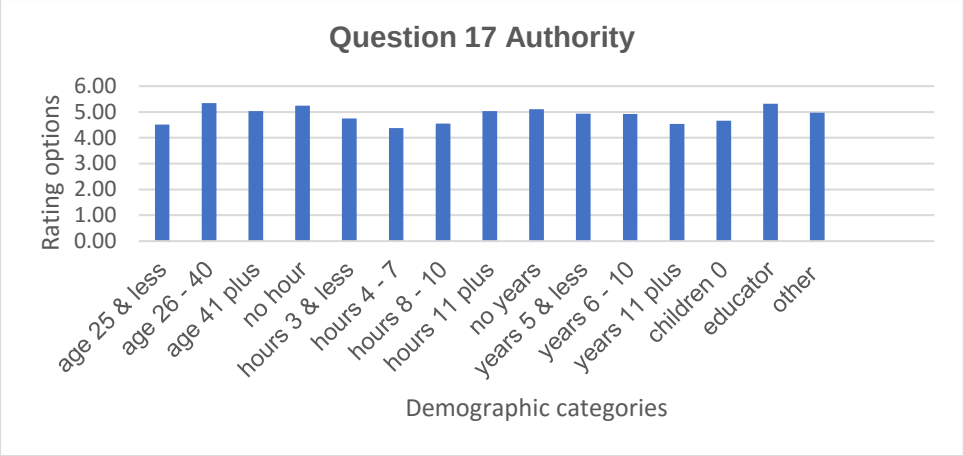


**Figure 4. 17: Authority**

The trend from this data is clear: the more hours a week respondents play games, and for the more years they have played games, the less they accept the authority of the school.

### 4.5.2.18 Do respect

Figure 4.18 shows the average returned by each demographic category to Question 18 Do respect.

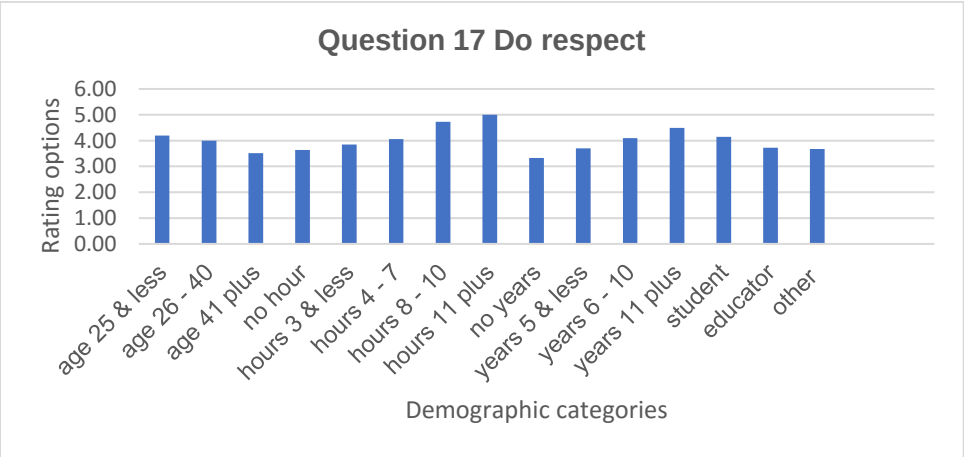


**Figure 4. 18: Do respect**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do you respect gamers?* The horizontal axis reflects the returns from each

demographic group. The more respondents play games and the longer they have played games, the more they respect gamers. The eldest group of respondents, 41 years plus, have little respect for gamers, along with respondents who do not play and educators.

#### 4.5.2.19 Respected at school

Figure 4.19 shows the average returned by each demographic category to Question 18 Were respected.

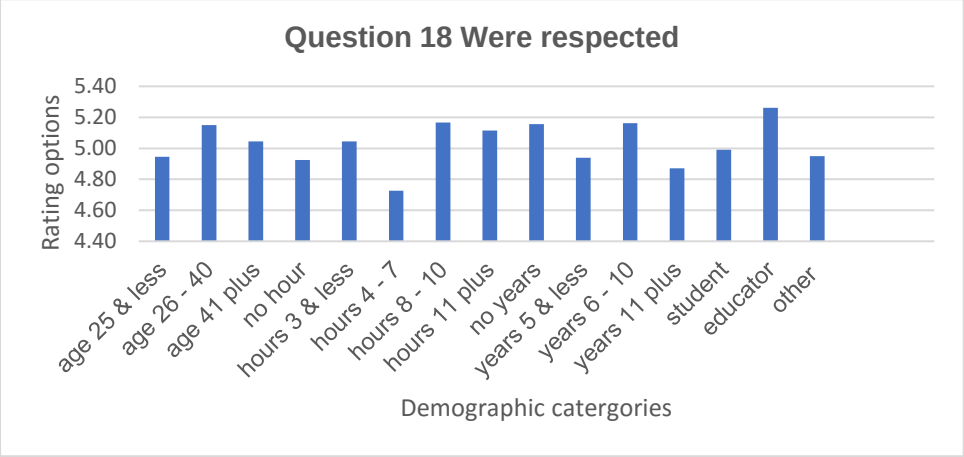


**Figure 4. 19: Were respected**

The vertical axis reflects the rating options open to respondents to the question: To *what extent were you respected at school?* The horizontal axis reflects the returns from each demographic group. Looking back, the more years respondents have played games, the less they recall being respected at school. Educators felt respected at school.

#### 4.5.2.20 Curiosity

Figure 4.20 shows the average returned by each demographic category to Question 20 Curiosity.

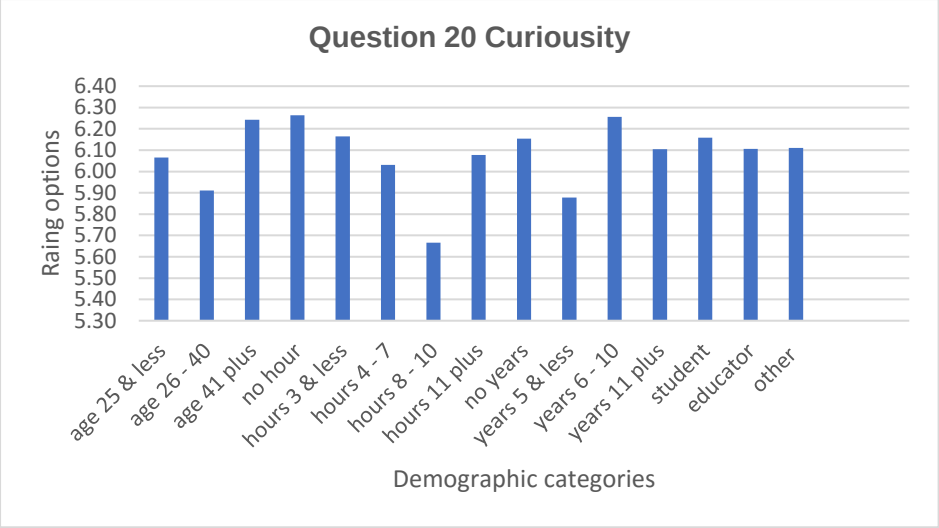


**Figure 4. 20: Curiosity**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you curious about the world?* The horizontal axis reflects the returns from each demographic group. Respondents who do not play games during the week are noticeably more curious about the world than respondents who play games.

### 4.5.2.21 Responsible

Figure 4.21 shows the average returned by each demographic category to Question 21 Responsible.

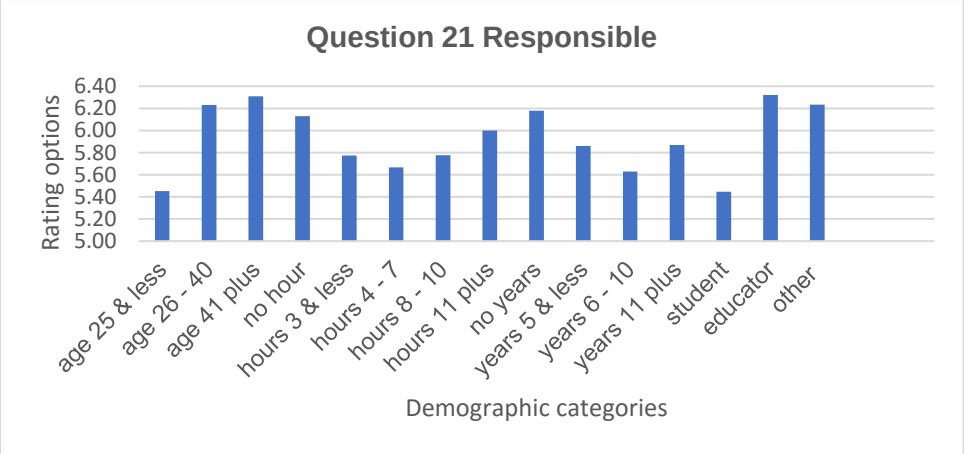


**Figure 4. 21: Responsible**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you a responsible person?* The horizontal axis reflects the returns from each demographic group. The data shows that respondents who did not game in a week consider themselves more responsible than respondents who do. Likewise, respondents who have never gamed consider themselves more responsible than respondents who do.

#### 4.5.2.22 Positive

Figure 4.22 shows the average returned by each demographic category to Question 22 Positive.

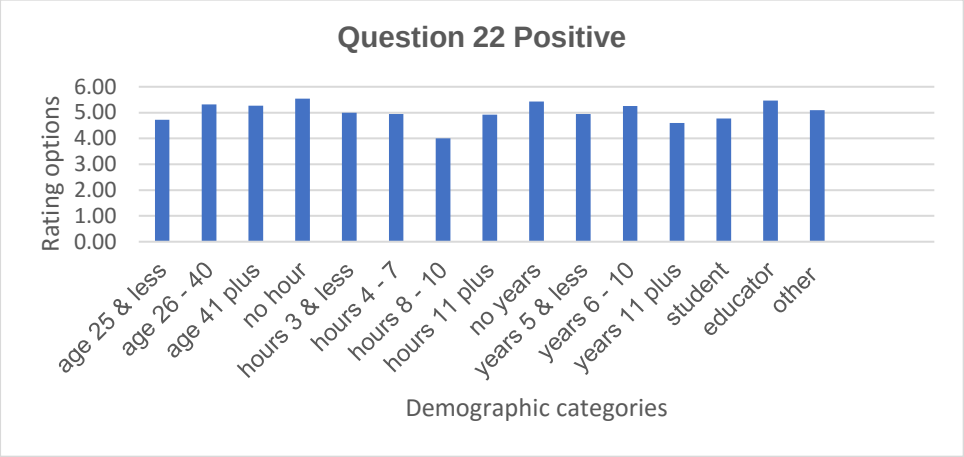


**Figure 4. 22: Positive**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you positive about school education?* The horizontal axis reflects the returns from each demographic group. The data showed that respondents who did not play games during the week, and have never played games, were more positive about school education compared to gamers.

#### 4.5.2.23 Comfortable

Figure 4.23 shows the average returned by each demographic category to Question 23 Comfortable.

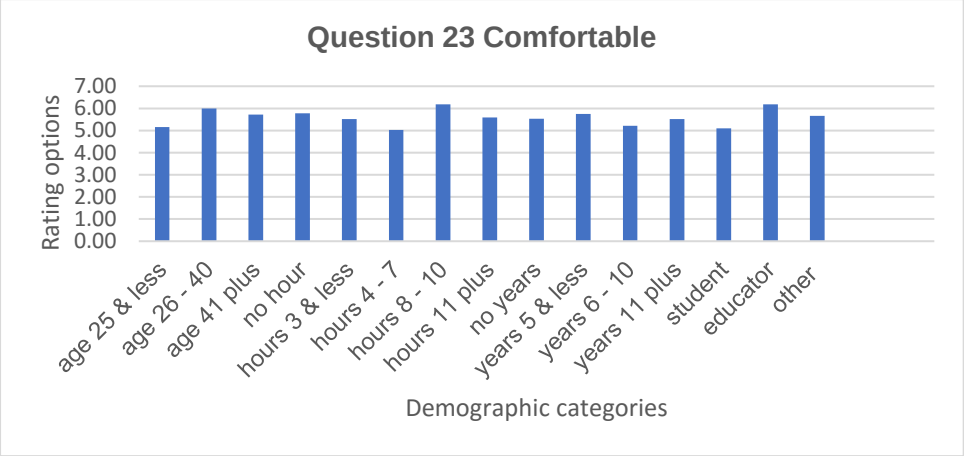


**Figure 4. 23: Comfortable**

The vertical axis reflects the rating options open to respondents to the question *How comfortable did you/do you/would you feel involving yourself in your child's schooling?* The horizontal axis reflects the returns from each demographic group. The data shows that the more respondents play games a week, the less comfortable they are in involving themselves in their child's school. The number of years respondents have played for does have a noticeable effect on the data.

#### 4.5.2.24 Teachers

Figure 4.24 shows the average returned by each demographic category to Question 24 Teachers.

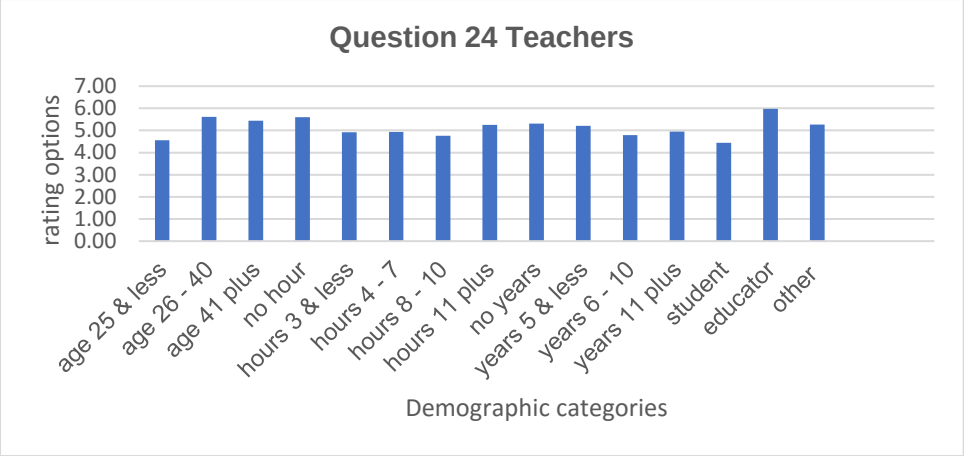


**Figure 4. 24: Teachers**

The vertical axis reflects the rating options open to respondents to the question: To *what extent did/do/would you work with teachers at your child's school?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a week respondents spend playing games, the less they will work with educators at their child's school. Similarly, the more years that respondents have gamed, the less inclined they are to work with educators.

### 4.5.2.25 Interested

Figure 4.25 shows the average returned by each demographic category to Question 25 Interested.

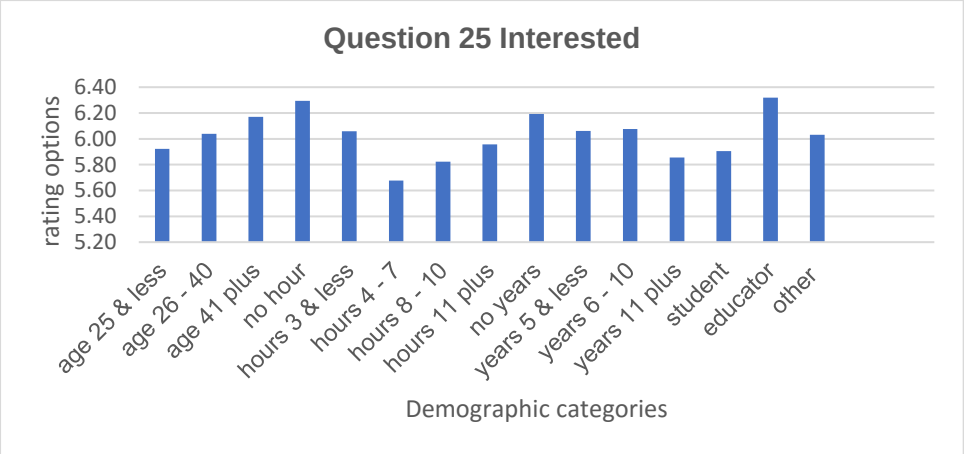


**Figure 4. 25: Interested**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are/were/would you be interested in your child's school?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours respondent game a week, the less interested they are in their child's school. Likewise, the more years respondents have gamed, they less interested they are in their child's school.

### 4.5.2.26 Online

Figure 4.26 shows the average returned by each demographic category to Question 26 Online.

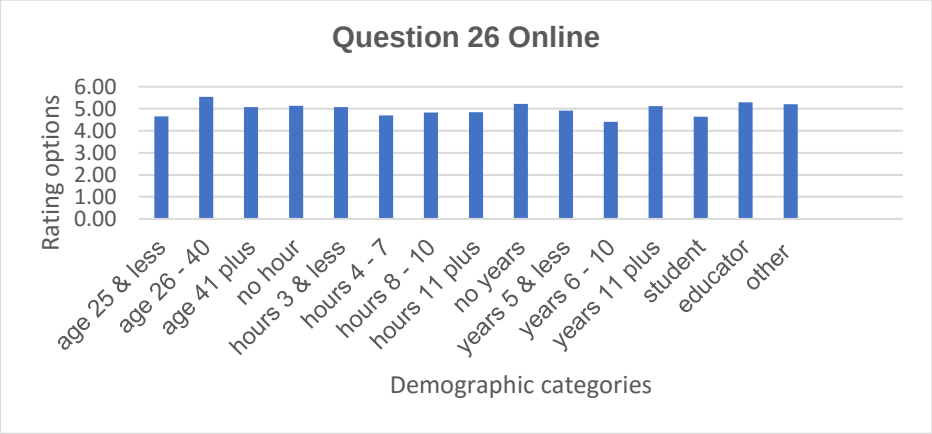


**Figure 4. 26: Online**

The vertical axis reflects the rating options open to respondents to the question *How prepared would you be to support an online campaign about an education issue?* The horizontal axis reflects the returns from each demographic group. The data shows that gamers are not keyboard warriors, ready to take up causes through their keyboards. Respondents who do not play games in a week and have never played games are more inclined to take up causes on their keyboards.

### 4.5.2.27 Street Protests

Figure 4.27 shows the average returned by each demographic category to Question 27 Street.

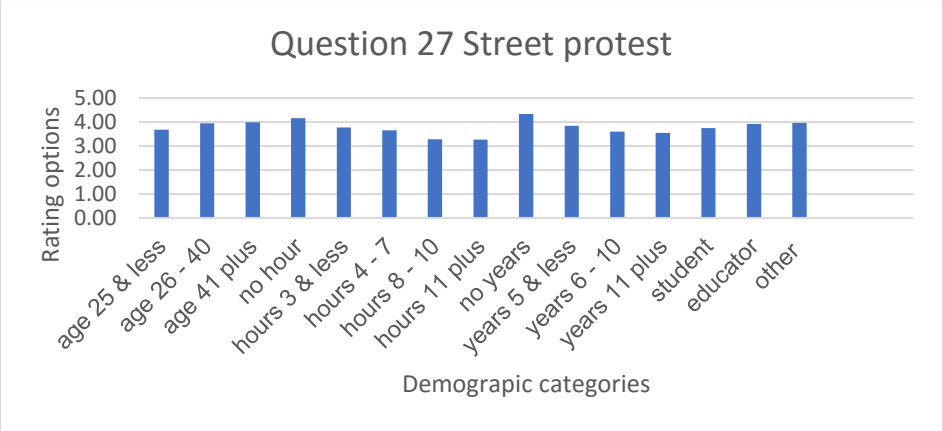


**Figure 4. 27: Street protest**

The vertical axis reflects the rating options open to respondents to the question *How prepared would you be to join a parents' street protest about an education issue?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a respondent game a week, and the more years they have gamed, the less inclined they are to leave their keyboards and take part in a street protest. Educators are more inclined to protest in the street than gamers and students.

### 4.5.2.28 Control

Figure 4.28 shows the average returned by each demographic category to Question 28 Control.

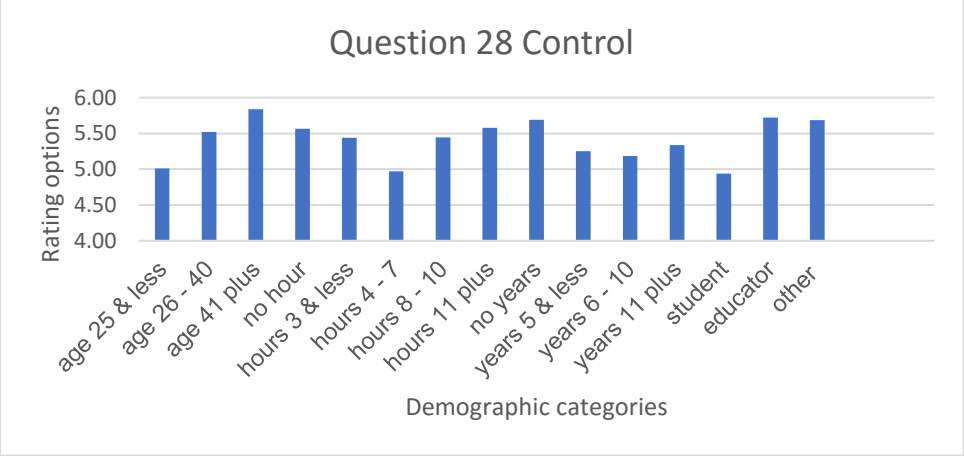


**Figure 4. 28: Control**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you in control of your life?* The horizontal axis reflects the returns from each demographic group. Of significance is that respondents who do not game, either by hours or years, feel more in control of their lives than gamers. This raises the question of if respondents are not in control of their lives, so game, or if gaming renders the respondents to be not in control of their lives.

#### 4.5.2.29 Before

Figure 4.29 shows the average returned by each demographic category to Question 29 Before.

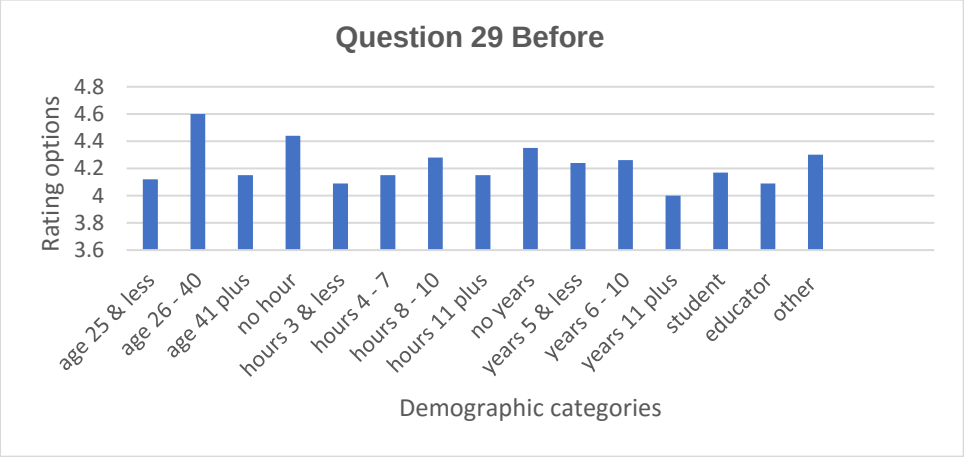


**Figure 4. 29: Before**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do you speak or act before you think?* The horizontal axis reflects the returns from each demographic group. The question tested the respondents' notion of self-control. The data showed that respondents who do not game and have never gamed judge themselves as having slightly more self-control than respondents who do game.

#### 4.5.2.30 Resume Interaction

Figure 4.30 shows the average returned by each demographic category to Question 30 Resume.

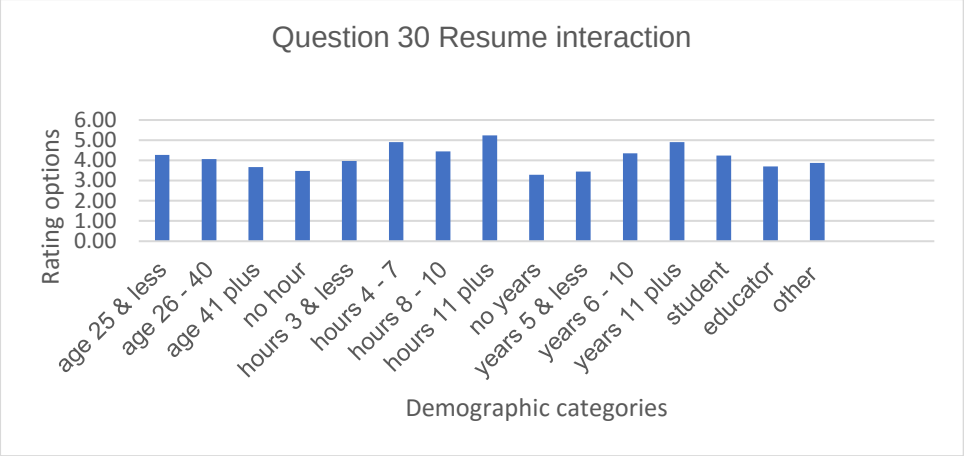


**Figure 4. 30: Resume interaction**

The vertical axis reflects the rating options open to respondents to the question: To *what extent can gamers immediately resume normal, satisfactory human interaction after playing?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours gamers play a week, the more they feel they can resume their normal lives after stepping away from their keyboards. Likewise, the more years gamers have been playing, the more they feel they can resume their normal lives straight from their keyboards.

#### 4.5.2.31 Time help

The average returned by each demographic category to Question 31 is displayed in Figure 4.31.

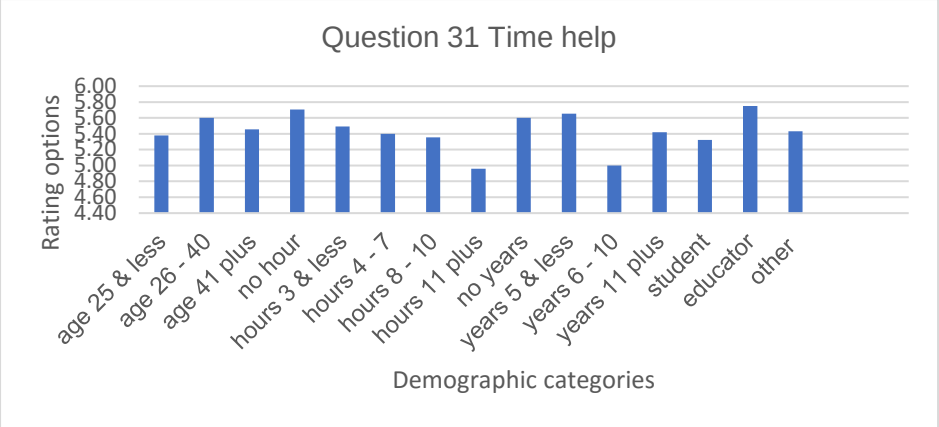


**Figure 4. 31: Time help**

The vertical axis reflects the rating options open to respondents to the question: To *what extent did you/do you/would you have time to spend helping your child with their school work?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a respondent plays games a week, the less inclined they are to help their children with their school work. Similarly, the more years respondents have gamed, the less inclined they are to help their children with their schoolwork.

### 4.5.2.32 Time attend

Figure 4.32 (on the next page) shows the average returned by each demographic category to Question 32 Time attend.

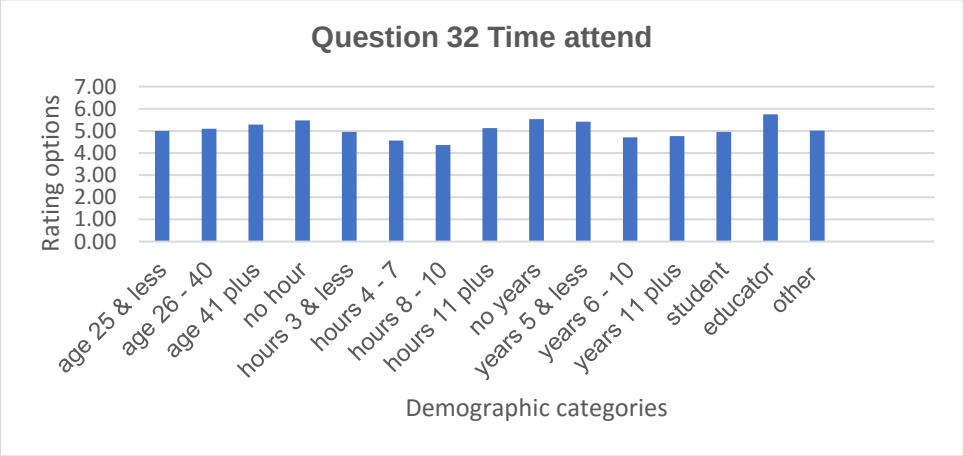


**Figure 4. 32: Time attend**

The vertical axis reflects the rating options open to respondents to the question: To *what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parents' evenings and sports fixtures?* The horizontal axis reflects the returns from each demographic group. The data shows that the more hours a week respondents play games, the less time they have to attend the social aspects of a school; the braais, the parents' evenings and sports fixtures. Similarly, the more year's respondents have been gaming, the less time they have to attend the social aspects.

#### 4.5.2.33 Creating jobs

Figure 4.33 (on the next page) shows the average returned by each demographic category to Question 33 Creating jobs

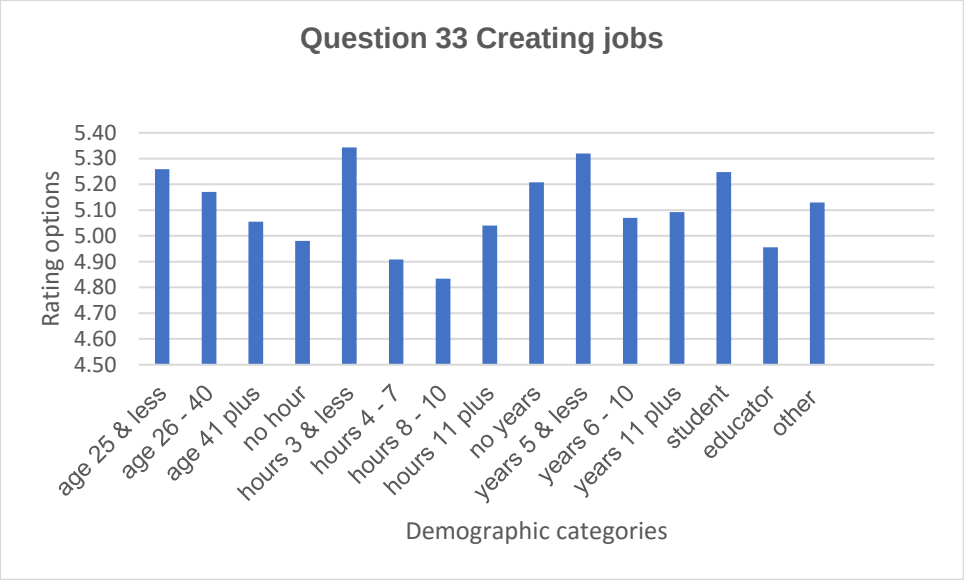


**Figure 4. 33: Creating jobs**

The vertical axis reflects the rating options open to respondents to the question: To *what extent are you interested in creating jobs for other people?* The horizontal axis reflects the returns from each demographic group. Respondents who play games for three hours or less a week, and have played for five years or less, are interested in creating employment. Gamers who have played for 11 years plus are less interested

in creating employment than respondents who have never gamed. Students are interested in creating employment.

#### 4.5.2.34 World

Figure 4.34 shows the average returned by each demographic category to Question 34 World.

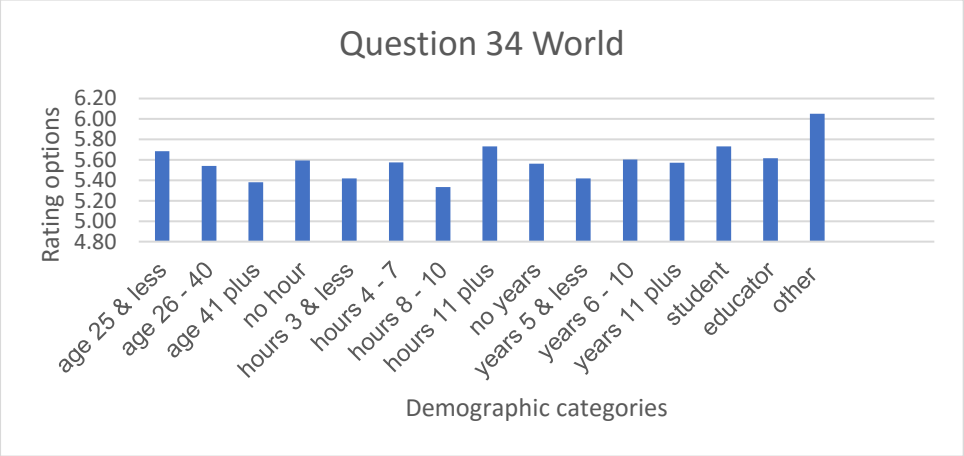


**Figure 4. 34: World**

The vertical axis reflects the rating options open to respondents to the question: To *what extent do you question the world? The* horizontal axis reflects the returns from each demographic group. Gamers who do not play games during the week are more inclined to question the world than respondents who game during the week. Respondents who have never gamed were also more inclined to question the world than respondents who have played for up to five years. Gamers who do not play games during the week are more inclined to question the world than respondents who game during the week. Respondents who have never gamed are also more inclined to question the world than respondents who have played for up to five years.

## 4.6 RESULTS OF THE QUANTITATIVE PHASE: DESCRIPTIVE STATISTICS

*Specific **research questions 2 - 5** are addressed through descriptive statistics in this section. The qualitative component of the study elaborates further on these questions. Questions identified during factor analysis are further subjected to correlation and*

*regression and the results are summarised in Chapter 5.*

### 4.6.1 Gaming as a professional career

The following question were highlighted separately as part of describing the respondents' aspirations to become a professional international electronic gamer.

**Table 4.11: Frequency analysis of the respondents' aspirations to become a professional international electronic gamer (N=248)**

| ***To what extent would you like to be a professional international electronic gamer?*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Not at all | 172 | 69.4 | 69.6 | 69.6 |
| | Seldom | 22 | 8.9 | 8.9 | 78.5 |
| | At times | 12 | 4.8 | 4.9 | 83.4 |
| | I'm neutral | 15 | 6.0 | 6.1 | 89.5 |
| | A lot | 11 | 4.4 | 4.5 | 93.9 |
| | Mostly | 6 | 2.4 | 2.4 | 96.4 |
| | Considerably | 9 | 3.6 | 3.6 | 100.0 |
| | Total | 247 | 99.6 | 100.0 | |
| Missing | System | 1 | .4 | | |
| Total | | 248 | 100.0 | | |

As evident from Table 4.11 and Figure 4.35, 172 respondents (69.4%) do not consider at all to become professional international electronic gamer.

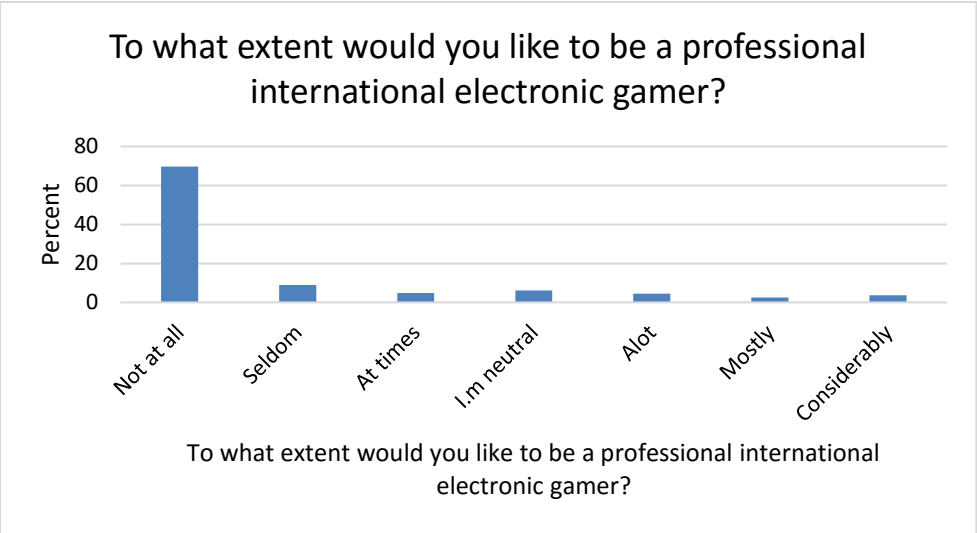


**Figure 4. 35: Respondents' aspirations to become a professional international electronic gamer (N=248)**

The quantitative questionnaire employed 34 questions in total where respondents had to indicate on a Likert type scale their responses to the questions asked. The Likert scale ranged from 1 to 7 where 1= Not at all; 2=Seldom; 3= At times; 4=I'm neutral; 5=A lot; 6=Mostly; and 7=Considerably. The questions were structured to imply that 1 indicate a negative response and 7 a positive response. The questions were subjected to factor analysis which assisted the researcher in identifying certain factors that loaded coherently in order to define the dependent variables (DVs) to the study.

For the purpose of answering research question 2 to 5, 4 DVs were identified:

- Effectiveness of the education system
- Parental involvement
- Social interaction
- Psychosocial development

The relevant questions from the questionnaire pertaining to each DV were grouped together accordingly. Descriptive statistics was applied to answer these questions.

### 4.6.2 Research question 2: DV1 Effectiveness of the Education system

*To what extent does gaming behaviour influence participants' view on the effectiveness of the education system in a broad sense?*

The specific questions that were grouped together for the purpose of evaluating the respondents' view on the effectiveness of the education system are outlined below:

**Table 4.12: Grouping of questions for DV 1: Effectiveness of the Education system**

| ***Question number*** | ***Content of Question*** |
|---|---|
| 9 | To what extent does school prepare a person to be involved in their society as an adult? |
| 10 | To what extent does school prepare a person for employment? |
| 11 | To what extent should electronic games be used in a classroom? |
| 14 | To what extent was school boring? |
| 15 | To what extent is tax money spent on school education well spent? |
| 16 | To what extent do educators think about and thus improve what they do in a classroom? |
| 17 | To what extent do you accept the authority of a school? |
| 22 | To what extent are you positive about school education? |

**Table 4.13: How does gaming behaviour impact respondents' view on the effectiveness of the education system (N=248)**

| ***How does gaming behaviour impact respondents' view on Education?*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Seldom | 4 | 1.6 | 1.6 | 1.6 |
| | At times | 50 | 20.2 | 20.2 | 21.8 |
| | I'm neutral | 107 | 43.1 | 43.1 | 64.9 |
| | A lot | 81 | 32.7 | 32.7 | 97.6 |
| | Mostly | 6 | 2.4 | 2.4 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

From Table 4.13 above it is evident that respondents were mostly neutral with regard

to their view on the effectiveness of the education system (N=107; 43.1%).

### 4.6.3 Research question 3: DV2 Parental involvement

*To what extent does gaming behaviour of participants influence parental involvement in schools?*

The specific questions that were grouped together for assessing their view on parental involvement are outlined below:

**Table 4.14: Grouping of questions for DV 2: Parental involvement**

| ***Question number*** | ***Content of Question*** |
|---|---|
| 3 | To what extent did/have you/would you get to know other parents at your child's school? |
| 7 | To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended? |
| 8 | To what extent did you/do you/would you be involved in addressing problems at the school your child attended? |
| 23 | How comfortable did you/do you/would you feel involving yourself in your child's schooling? |
| 24 | To what extent did/do/would you work with teachers at your child's school? |
| 25 | To what extent are/were/would you be interested in your child's school? |
| 31 | To what extent did you/do you/would you have time to spend helping your child with their school work? |
| 32 | To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parent's evenings and sports fixtures? |

**Table 4.15: How does gaming behaviour impact respondents' view on Parental involvement (N=248)**

| *How does gaming behaviour of participants impact Parental Involvement?* | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | Not at all | 1 | .4 | .4 | .4 |
| | At times | 14 | 5.6 | 5.9 | 6.3 |
| | I'm neutral | 29 | 11.7 | 12.2 | 18.5 |
| | A lot | 73 | 29.4 | 30.7 | 49.2 |
| | Mostly | 91 | 36.7 | 38.2 | 87.4 |
| | Considerably | 30 | 12.1 | 12.6 | 100.0 |
| | Total | 238 | 96.0 | 100.0 | |
| Missing | System | 10 | 4.0 | | |
| Total | | 248 | 100.0 | | |

From Table 4.15 it can be derived that respondents were mostly positive with regard to their view on parental involvement (N=194; 78.2).

### 4.6.4 Research question 4: DV 3 Social interaction

*To what extent does gaming behaviour affect general social interaction of participants?*

The specific questions that were grouped together for assessing their view on social interaction are outlined below:

**Table 4.16: Grouping of questions for DV 3: Social interaction**

| ***Question number*** | ***Content of Question*** |
|---|---|
| 6 | To what extent do you want to be a lifelong learner? |
| 13 | To what extent do you read books/novels/magazines/newspapers/ websites? |

*(Table 4.16 continues on next page)*

**Table 4. 16 continues**

| *Question number* | *Content of Question* |
|---|---|
| 18 | To what extent do you respect gamers? |
| 20 | To what extent are you curious about the world? |
| 26 | How prepared would you be to support an online campaign about an education issue? |
| 27 | How prepared would you be to join a parents' street protest about an education issue? |
| 33 | To what extent are you interested in creating jobs for other people? |
| 34 | To what extent do you question the world? |

**Table 4.17: How does gaming behaviour of participants affect Social Interaction (N=248)**

| *How does gaming behaviour of participants affect Social Interaction?* | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | At times | 11 | 4.4 | 4.4 | 4.4 |
| | I'm neutral | 37 | 14.9 | 14.9 | 19.4 |
| | A lot | 117 | 47.2 | 47.2 | 66.5 |
| | Mostly | 76 | 30.6 | 30.6 | 97.2 |
| | Considerably | 7 | 2.8 | 2.8 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

From Table 4.17 it can be derived that respondents were mostly positive with regard to their view on social interaction (N=200; 80.6

### 4.6.5 Research question 5: DV 4 Psychosocial development

*To what extent does gaming behaviour contributes to the psychosocial development of participants?*

The specific questions that were grouped together for assessing their view on psychosocial development are outlined below:

**Table 4. 18: Grouping of questions for DV 4: Psychosocial development**

| ***Question number*** | ***Content of Question*** |
|---|---|
| 2 | To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience? |
| 4 | To what extent are you a confident person? |
| 5 | To what extent do electronic games teach skills? |
| 12 | To what extent does the playing of games prepare gamers for their lives? |
| 19 | To what extent were you respected at school? |
| 21 | To what extent are you a responsible person? |
| 28 | To what extent are you in control of your life? |
| 29 | To what extent do you speak or act before you think? |
| 30 | To what extent can gamers immediately resume normal, satisfactory human interaction after playing? |

**Table 4. 19: How does gaming behaviour of participants affect Psychosocial development (N=248)**

| ***How does gaming behaviour of participants affect Psychosocial Development?*** | | | | | |
|---|---|---|---|---|---|
| | | *Frequency* | *Percent* | *Valid Percent* | *Cumulative Percent* |
| Valid | At times | 9 | 3.6 | 3.6 | 3.6 |
| | I'm neutral | 88 | 35.5 | 35.5 | 39.1 |
| | A lot | 124 | 50.0 | 50.0 | 89.1 |
| | Mostly | 27 | 10.9 | 10.9 | 100.0 |
| | Total | 248 | 100.0 | 100.0 | |

From Table 4.19 it can be derived that respondents were mostly positive with regard to their view on psychosocial development (N=151; 61.0%).

In summary, respondents were mostly positive regarding the 4 DVs except for being neutral regarding the effectiveness of the education system.

The following section turns the focus to the inferential statistics of this study.

## 4.7 RESULTS FROM THE QUANTITATIVE PHASE: INFERENTIAL STATISTICS

### 4.7.1 Reliability and validity of the measuring instrument

Reports of reliability and validity estimates are necessary to determine the adequacy of the psychometric properties of the scales in a questionnaire. The information gathered for this study was done by using a Likert type scale questionnaire. Since it was attempted to quantify constructs which are not directly measurable, multiple-item scales and summated ratings were utilised to quantify the construct(s) of interest. The Likert scale's invention in 1931 is attributed to Rensis Likert who described this technique for the assessment of attitudes (Gliem & Gliem 2003:82). Cronbach's alpha which measures the internal consistency reliability of the research instrument for this study, was used as the reliability coefficient for the Likert type scales. A Cronbach Alpha coefficient was calculated on each of the constructs to confirm their reliability in the local context. A Cronbach's Alpha reliability coefficient usually ranges between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. Based on the formula _ = rk / [1 + (k -1) r], where *k* is the number of items considered and *r* is the mean of the inter-item correlations, the size of alpha is determined by both the number of items in the scale and the means of the inter-item correlations. George and Mallery (2003:231) provide the following rules of thumb: _ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable.

As shown by Table 4.20, the Cronbach alpha for the questionnaire was 0.888 which indicates a high level (89%) of internal consistency for the Likert type questions.

**Table 4. 20: Cronbach alpha analysis table**

| ***Reliability Statistics*** | | |
|---|---|---|
| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | Number of Items |
| | **0.888** | **34** |

### 4.7.2 Assumptions for statistical analysis

Garson (2013) asserts that all statistical procedures have underlying assumptions. An expected component of quantitative studies is to establish that the data of the study meet these assumptions of the procedure. Similarly, O'Neil (2009) outlines the importance of meeting the conditions of a particular statistical procedure before data analysis is done. Parametric tests are significant tests which assume (1) a certain distribution of the data (usually a normal distribution), (2) the interval level of measurement and (3) the homogeneity of variances when two or more samples are compared. Most common significance tests are parametric (Garson, 2013). However, it has long been established that moderate violations of parametric assumptions have little or no effect on substantive conclusions in most instances (Cohen in Garson, 2013). In this study, the said tests were all conducted before analysing the data to ensure that these conditions were met.

#### 4.7.2.1 Normality

According to O'Neil (2009), it is assumed that the data gathered for statistical analysis is from a normally distributed population. As inferential statistics is done to verify that some or all of the results are applicable to the entire population, it is paramount that the population's distribution should also be normal. However, even if the distribution of the individual observations is not normal, the distribution of the *sample means* will be normal if the sample size is around 30 or larger. This is due to the 'central limit theorem' which posits that even when a population is non-normally distributed, the distribution of the *sample means* will be normal when the sample size is 30 or more. Since the sample size of this study was larger than 30 (N=248), the principle of

normality of distribution was adopted.

Table 4.21 below depicts the statistical calculations for the Kolmogorov-Smirnov (K-S) tests. The histograms are also included to substantiate the test of normality done for the Dependent Variables (see Figure 4.36 to Figure 4.39).

**Table 4.21: Test of Normality for DVs**

| ***Tests of Normality*** | | | | | | |
|---|---|---|---|---|---|---|
| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| How does gaming behaviour impact participants' view on Education? | .221 | 238 | .000 | .870 | 238 | .000 |
| How does gaming behaviour of participants impact Parental Involvement? | .225 | 238 | .000 | .894 | 238 | .000 |
| How does gaming behaviour of participants affect Social Interaction? | .250 | 238 | .000 | .870 | 238 | .000 |
| How does gaming behaviour of participants affect Psychosocial Development? | .279 | 238 | .000 | .835 | 238 | .000 |
| a. Lilliefors Significance Correction | | | | | | |

When considering Shapiro-Wilk as a means of assessing normality, Table 4.19 indicates that the variables appears to be normally distributed since the significant value is less than 0.05. However, if the normality is considered graphically using the histogram with normal distribution curve (Figures 4.36 to 4.39), it shows that the dependent variables appear to be normally distributed.

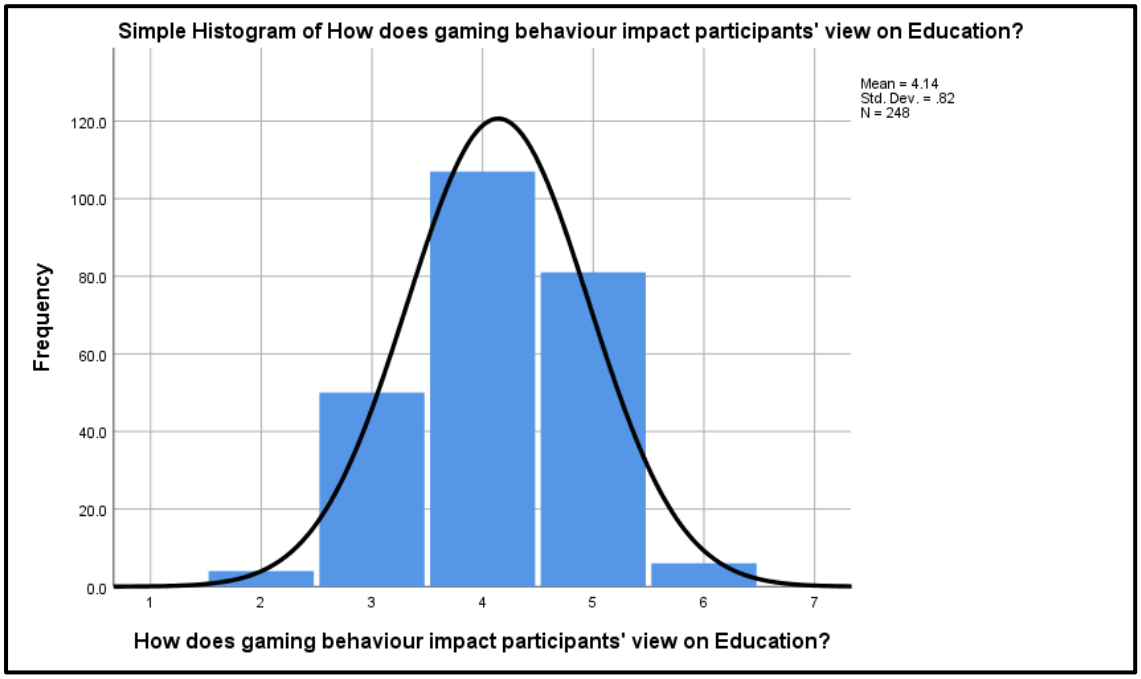


**Figure 4. 36: Histogram for DV1 - Effectiveness of the education system**

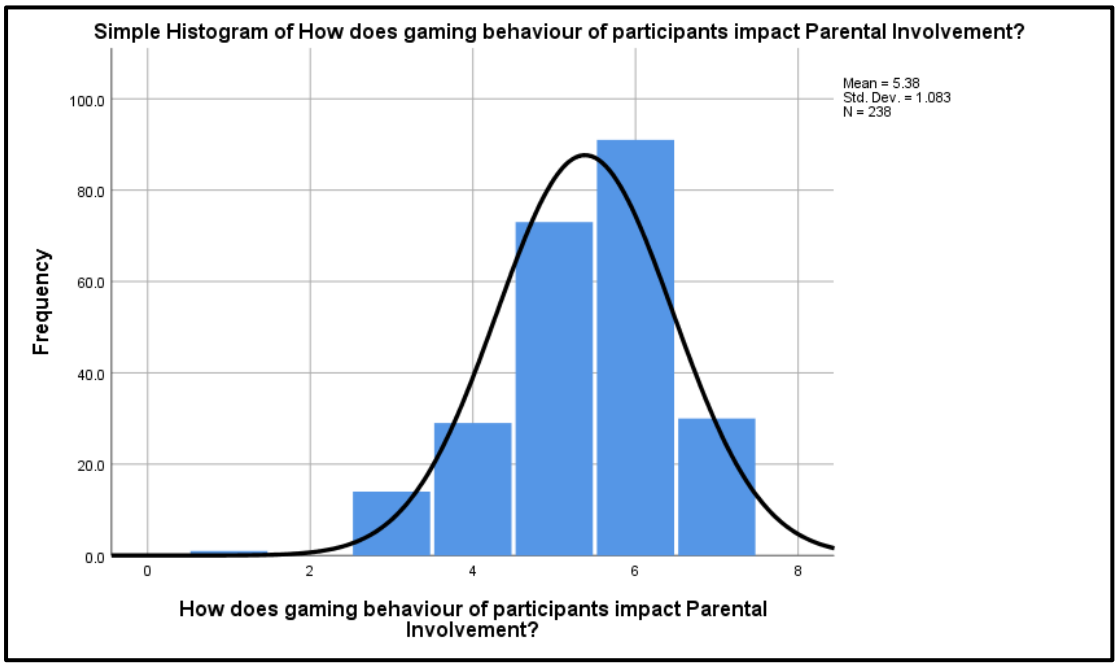


**Figure 4. 37: Histogram for DV2 - Parental involvement**

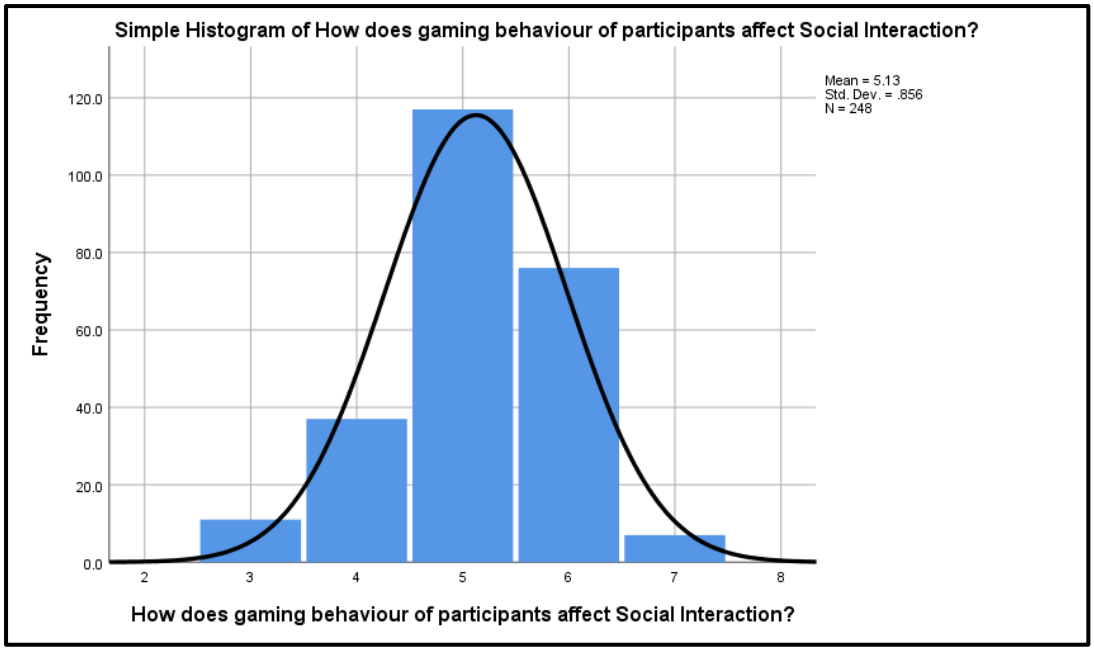


**Figure 4. 38: Histogram for DV3 - Social interaction**

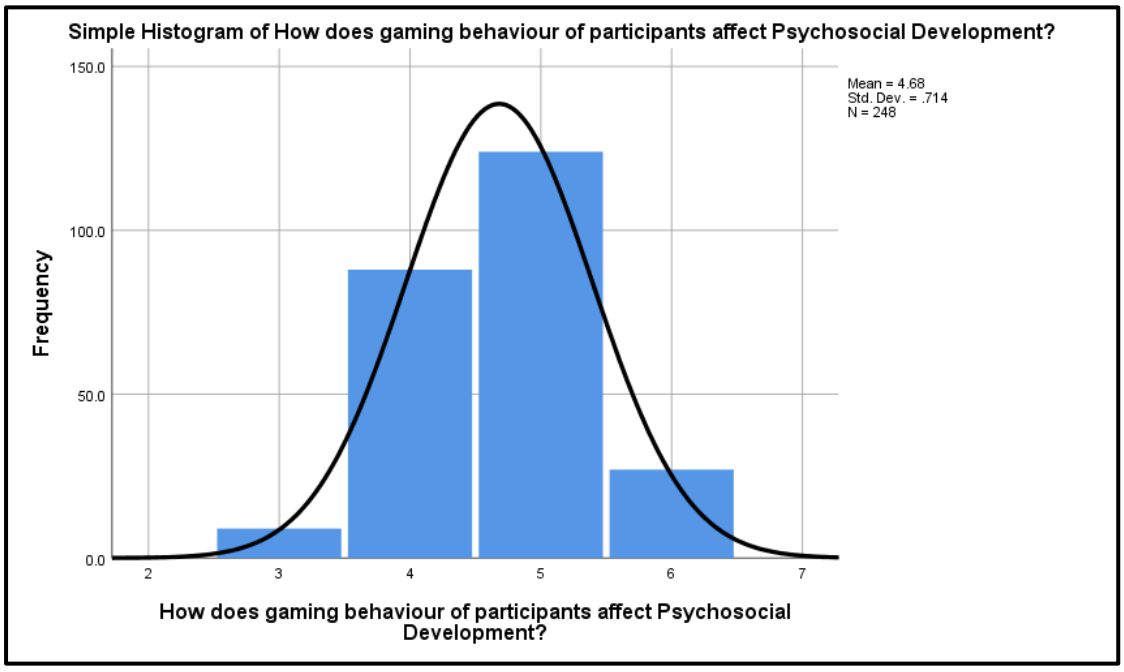


**Figure 4. 39: Histogram for DV4 - Psychosocial development**

### 4.7.2.2 Homoscedasticity

In statistics, Levene's test is an inferential statistic used to assess the equality of

variances for a variable calculated for two or more groups. Some common statistical procedures assume that variances of the populations from which different samples are drawn are equal. Levene's test assesses this assumption. It tests the null hypothesis that the population variances are equal (called homogeneity of variance or homoscedasticity). If the resulting p-value of Levene's test is less than some significance level (typically 0.05), the obtained differences in sample variances are unlikely to have occurred based on random sampling from a population with equal variances. Thus, the null hypothesis of equal variances is rejected and it is concluded that there is a difference between the variances in the population.

Homogeneity of variances (homoscedasticity) thus assumes that the dependent variables exhibit equal levels of variance across the range of predictor variables. Conversely, heteroscedasticity refers to a scenario where the variability of a variable is unequal across the range of values of a second variable that predicts it (Taylor, 2013). Table 4.22 indicates the tests conducted for homoscedasticity.

**Table 4.22: Test of Homogeneity of variances**

| ***Test of Homogeneity of Variances*** | | | | | |
|---|---|---|---|---|---|
| | | *Levene Statistic* | *df1* | *df2* | *Sig.* |
| How does gaming behaviour impact participants' view on Education? | Based on Mean | 1.012 | 2 | 245 | .365 |
| | Based on Median | .587 | 2 | 245 | .557 |
| | Based on Median and with adjusted df | .587 | 2 | 242.321 | .557 |
| | Based on trimmed mean | .851 | 2 | 245 | .428 |
| How does gaming behaviour of participants impact Parental Involvement? | Based on Mean | .300 | 2 | 235 | .741 |
| | Based on Median | .160 | 2 | 235 | .852 |
| | Based on Median and with adjusted df | .160 | 2 | 214.385 | .852 |

*(Table 4.22 continues on next page)*

| | | | | | |
|---|---|---|---|---|---|
| | Based on trimmed mean | .265 | 2 | 235 | .768 |
| How does gaming behaviour of participants affect Social Interaction? | Based on Mean | .638 | 2 | 245 | .529 |
| | Based on Median | 1.791 | 2 | 245 | .169 |
| | Based on Median and with adjusted df | 1.791 | 2 | 242.588 | .169 |
| | Based on trimmed mean | .745 | 2 | 245 | .476 |
| How does gaming behaviour of participants affect Psychosocial Development? | Based on Mean | 1.518 | 2 | 245 | .221 |
| | Based on Median | 1.081 | 2 | 245 | .341 |
| | Based on Median and with adjusted df | 1.081 | 2 | 236.038 | .341 |
| | Based on trimmed mean | 1.363 | 2 | 245 | .258 |

A Levene's test was conducted for each dependent variable. Effectiveness of the Education system, Parental involvement, Social interaction and Psychosocial development were found to be *not statistically significant* (equal variances are assumed), since the p-value was in each case > (greater than) 0.05. Based on the above homogeneity of variances for each of the variables, a parametric test (Independent samples test) was conducted.

## 4.8 RESULTS FOR THE ANOVA TESTS

The level of *statistical significance* is often expressed as the so-called *p-value* (see Table 4.12). Depending on the statistical test one has chosen (in this case the Analysis of Variance (ANOVA) test), a probability calculation (i.e. the *p*-value) is made by observing one's sample results. To ascertain whether a hypothesis statement is statistically *significant*, the p-value has to be less than 0.05. This means that there was a 5% or less chance (5 times in 100 or less) that the difference in the opinions of teachers between different IV (age, gender, gaming behaviour and occupation groups) is statistically significant. Alternatively, if the chance was greater than 5% (5 times in 100 or more), one would accept the hypothesis.

### 4.8.1. Findings with regard to Hypotheses

4.8.1.1 There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of the effectiveness of the education system.

4.8.1.2 There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their parental involvement in schools.

4.8.1.3 There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their social interaction.

4.8.1.4 There is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of their psychosocial development.

**Table 4. 23: Group statistics for IV 'Age'**

| ***Descriptive Statistics*** | | | | | |
|---|---|---|---|---|---|
| Age of Respondent | | *How does gaming behaviour impact participants' view on Education?* | *How does gaming behaviour of participants impact Parental Involvement?* | *How does gaming behaviour of participants affect Social Interaction?* | *How does gaming behaviour of participants affect Psychosocial Development?* |
| 25 years and younger | Mean | 4.06 | 5.24 | 5.00 | 4.52 |
| | N | 108 | 104 | 108 | 108 |
| | Std. Deviation | .789 | 1.038 | .937 | .717 |

*(Table 4.23 continues on next page)*

| | | | | | |
|---|---|---|---|---|---|
| Between 26 and 40 years | Mean | 4.30 | 5.45 | 5.26 | 4.85 |
| | N | 46 | 44 | 46 | 46 |
| | Std. Deviation | .785 | 1.150 | .801 | .666 |
| Older than 40 years | Mean | 4.15 | 5.50 | 5.20 | 4.79 |
| | N | 94 | 90 | 94 | 94 |
| | Std. Deviation | .867 | 1.094 | .770 | .701 |
| Total | Mean | 4.14 | 5.38 | 5.13 | 4.68 |
| | N | 248 | 238 | 248 | 248 |
| | Std. Deviation | .820 | 1.083 | .856 | .714 |

**Table 4.24: ANOVA table for IV 'Age'**

| ***ANOVA results*** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Sum of Squares | df | Mean Square | F | Sig. |
| How does gaming behaviour impact participants' view on Education? * Age of Respondent | Between Groups | (Combined) | 1.860 | 2 | .930 | 1.388 | .252 |
| | Within Groups | | 164.200 | 245 | .670 | | |
| | Total | | 166.060 | 247 | | | |
| How does gaming behaviour of participants impact Parental Involvement? * Age of Respondent | Between Groups | (Combined) | 3.567 | 2 | 1.783 | 1.527 | .219 |
| | Within Groups | | 274.399 | 235 | 1.168 | | |
| | Total | | 277.966 | 237 | | | |

*(Table 4.24 continues on next page)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| How does gaming behaviour of participants affect Social Interaction? * Age of Respondent | Between Groups | (Combined) | 3.096 | 2 | 1.548 | 2.130 | .121 |
| | Within Groups | | 178.029 | 245 | .727 | | |
| | Total | | 181.125 | 247 | | | |
| How does gaming behaviour of participants affect Psychosocial Development? * Age of Respondent | Between Groups | (Combined) | 5.192 | 2 | 2.596 | 5.272 | .006 |
| | Within Groups | | 120.642 | 245 | .492 | | |
| | Total | | 125.835 | 247 | | | |

A one-way ANOVA indicated *no statistically significant differences* in the IV 'Age' across three DVs (effectiveness of the education system, parental involvement and social interaction).

***DV1: Effectiveness of the education system*** [F (247) =1.388, p > .05(.252), eta$^2$ = .011). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the age group between 26 and 40 years (M=4.30, SD=.785), followed by the age group older than 40 years (M=4.15, SD=.867) and lowest satisfaction for the age group 25 years and younger (M=4.06, SD=.789).

***DV2: Parental involvement*** [F (237) =1.527, p > .05(.219), eta$^2$ = .013). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the age group older than 40 years (M=5.50, SD=1.094), followed by the age group between 26 and 40 years (M=5.45, SD=1.150) and lowest satisfaction for the age group 25 years and younger (M=5.24, SD=1.038).

***DV3: Social interaction*** [F (247) =2.130, p > .05(.121), eta$^2$ = .017). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the age group between 26 and 40 years (M=5.26, SD=.801), followed by the age group older than 40 years (M=5.20, SD=.770) and lowest satisfaction for the age group 25 years

and younger (M=5.00, SD=.937).

The ANOVA test indicated *statistically significant differences* in the IV 'Age' for DV4: Psychosocial development [F (247) =5.272, p < .05(.006), eta2 = .041). *Therefore, the hypothesis can be accepted.* The highest level of satisfaction was reported in the age group between 26 and 40 years (M=4.85, SD=.666), followed by the age group older than 40 years (M=4.79, SD=.701) and lowest satisfaction for the age group 25 years and younger (M=4.52, SD=.717).

**Table 4. 25: Measures of Association test for IV 'Age'**

| ***Measures of Association*** | | |
|---|---|---|
| | Eta | Eta Squared |
| How does gaming behaviour impact participants' view on Education? * Age of Respondent | .106 | .011 |
| How does gaming behaviour of participants impact Parental Involvement? * Age of Respondent | .113 | .013 |
| How does gaming behaviour of participants affect Social Interaction? * Age of Respondent | .131 | .017 |
| How does gaming behaviour of participants affect Psychosocial Development? * Age of Respondent | .203 | .041 |

For practical significance, the standardised measure of effect size ($Eta^2$) is also reported. The $Eta^2$ value is an estimate of the difference between the means expressed in standard deviation units which explains the magnitude of the effect size. The effect size measures the strength of the effect. The effect size between different age groups for DV1: Effectiveness of the education system is considered to be low (11.0%); DV2: parental involvement is considered to be low (13.0%); DV3: Social interaction is considered to be low (17.0%); and DV4: Psychosocial development is considered to be moderate (41.0%)

**Table 4. 26: Group statistics for IV 'Gender'**

| ***Descriptive Statistics*** | | | | | |
|---|---|---|---|---|---|
| Gender of Respondent | | *How does gaming behaviour impact participants' view on Education?* | *How does gaming behaviour of participants impact Parental Involvement?* | *How does gaming behaviour of participants affect Social Interaction?* | *How does gaming behaviour of participants affect Psychosocial Development?* |
| Male | Mean | 4.12 | 5.18 | 5.05 | 4.81 |
| | N | 132 | 128 | 132 | 132 |
| | Std. Deviation | .820 | 1.090 | .919 | .722 |
| Female | Mean | 4.16 | 5.61 | 5.21 | 4.53 |
| | N | 116 | 110 | 116 | 116 |
| | Std. Deviation | .823 | 1.032 | .775 | .678 |
| Total | Mean | 4.14 | 5.38 | 5.13 | 4.68 |
| | N | 248 | 238 | 248 | 248 |
| | Std. Deviation | .820 | 1.083 | .856 | .714 |

**Table 4. 27: ANOVA table for IV 'Gender'**

| ANOVA results | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Sum of Squares | df | Mean Square | F | Sig. |
| How does gaming behaviour impact participants' view on Education? * Gender of Respondent | Between Groups | (Combined) | .112 | 1 | .112 | .166 | .684 |
| | Within Groups | | 165.949 | 246 | .675 | | |
| | Total | | 166.060 | 247 | | | |
| How does gaming behaviour of participants impact Parental Involvement? * Gender of Respondent | Between Groups | (Combined) | 10.908 | 1 | 10.908 | 9.640 | .002 |
| | Within Groups | | 267.058 | 236 | 1.132 | | |
| | Total | | 277.966 | 237 | | | |
| How does gaming behaviour of participants affect Social Interaction? * Gender of Respondent | Between Groups | (Combined) | 1.462 | 1 | 1.462 | 2.001 | .158 |
| | Within Groups | | 179.663 | 246 | .730 | | |
| | Total | | 181.125 | 247 | | | |
| How does gaming behaviour of participants affect Psychosocial Development? * Gender of Respondent | Between Groups | (Combined) | 4.707 | 1 | 4.707 | 9.560 | .002 |
| | Within Groups | | 121.127 | 246 | .492 | | |
| | Total | | 125.835 | 247 | | | |

A one-way ANOVA indicated *no statistically significant differences* in the IV 'Gender' across two DVs (effectiveness of the education system and social interaction).

***DV1: Effectiveness of the education system*** [F (247) =.166, p > .05(.684), eta$^2$ = .001). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the gender group female (M=4.16, SD=.823), followed by the gender group male (M=4.12, SD=.820).

***DV3: Social interaction*** [F (247) =2.001, p > .05(.158), eta$^2$ = .008). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the gender group female (M=4.16, SD=.823), followed by the gender group male (M=4.12, SD=.820).

**The ANOVA test indicated *statistically significant differences* in the IV 'Age' for *DV2: Parental involvement*** [F (237) =9.640, p < .05(.002), eta$^2$ = .039). *Therefore, the hypothesis can be accepted.* The highest level of satisfaction was reported in the gender group female (M=5.61, SD=1.032), followed by the gender group male (M=5.18, SD=1.090).

**DV4: Psychosocial development [F (247) =9.560, p < .05(.002), eta2 = .037).** Therefore, the hypothesis can be accepted. The highest level of satisfaction was reported in the gender group male (M=4.81, SD=.722), followed by the gender group female (M=4.53, SD=.678).

**Table 4. 28: Measures of Association test for IV 'Gender'**

| ***Measures of Association*** | | |
|---|---|---|
| | Eta | Eta Squared |
| How does gaming behaviour impact participants' view on Education? * Gender of Respondent | .026 | .001 |
| How does gaming behaviour of participants impact Parental Involvement? * Gender of Respondent | .198 | .039 |
| How does gaming behaviour of participants affect Social Interaction? * Gender of Respondent | .090 | .008 |
| How does gaming behaviour of participants affect Psychosocial Development? * Gender of Respondent | .193 | .037 |

For practical significance, the standardised measure of effect size (Eta$^2$) is also reported. The Eta$^2$ value is an estimate of the difference between the means expressed in standard deviation units which explains the magnitude of the effect size. The effect size measures the strength of the effect. The effect size between different age groups for DV1: Effectiveness of the education system is considered to be low (1.0%); DV2: parental involvement is considered to be moderate (39.0%); DV3: Social interaction is considered to be low (8.0%); and DV4: Psychosocial development is considered to be moderate (37.0%)

**Table 4. 29: Group statistics for IV 'Gaming behaviour'**

| ***Descriptive Statistics*** | | | | | |
|---|---|---|---|---|---|
| Gamers vs. Non-gamers: Gaming behaviour - hours played per week | | *How does gaming behaviour impact participants' view on Education?* | *How does gaming behaviour of participants impact Parental Involvement?* | *How does gaming behaviour of participants affect Social Interaction?* | *How does gaming behaviour of participants affect Psychosocial Development?* |
| Non-gamer | Mean | 4.18 | 5.56 | 5.17 | 4.58 |
| | N | 104 | 99 | 104 | 104 |
| | Std. Deviation | .810 | 1.099 | .756 | .664 |
| Gamer | Mean | 4.11 | 5.25 | 5.09 | 4.76 |
| | N | 144 | 139 | 144 | 144 |
| | Std. Deviation | .829 | 1.057 | .923 | .741 |
| Total | Mean | 4.14 | 5.38 | 5.13 | 4.68 |
| | N | 248 | 238 | 248 | 248 |
| | Std. Deviation | .820 | 1.083 | .856 | .714 |

**Table 4. 30: ANOVA table for IV 'Gaming behaviour'**

| ANOVA results | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Sum of Squares | df | Mean Square | F | Sig. |
| How does gaming behaviour impact participants' view on Education? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | Between Groups | (Combined) | .309 | 1 | .309 | .459 | .499 |
| | Within Groups | | 165.751 | 246 | .674 | | |
| | Total | | 166.060 | 247 | | | |
| How does gaming behaviour of participants impact Parental Involvement? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | Between Groups | (Combined) | 5.335 | 1 | 5.335 | 4.618 | .033 |
| | Within Groups | | 272.631 | 236 | 1.155 | | |
| | Total | | 277.966 | 237 | | | |
| How does gaming behaviour of participants affect Social Interaction? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | Between Groups | (Combined) | .414 | 1 | .414 | .564 | .454 |
| | Within Groups | | 180.711 | 246 | .735 | | |
| | Total | | 181.125 | 247 | | | |

*(Table 4.30 continues on next page)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| How does gaming behaviour of participants affect Psychosocial Development? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | Between Groups | (Combined) | 1.957 | 1 | 1.957 | 3.886 | .050 |
| | Within Groups | | 123.878 | 246 | .504 | | |
| | Total | | 125.835 | 247 | | | |

A one-way ANOVA indicated *no statistically significant differences* in the IV 'Gaming behaviour' across two DVs (effectiveness of the education system and social interaction).

***DV1: Effectiveness of the education system*** [F (247) =.459, p > .05(.499), eta$^2$ = .002). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the gaming behaviour group Non-gamer (M=4.18, SD=.810), followed by the gaming behaviour group gamer (M=4.11, SD=.829).

***DV3: Social interaction*** [F (247) =.564, p > .05(.454), eta$^2$ = .002). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the gaming behaviour group Non-gamer (M=5.17, SD=.756), followed by the gaming behaviour group gamer (M=5.09, SD=.923).

The ANOVA test indicated *statistically significant differences* in the IV 'Gaming behaviour for

***DV2: Parental involvement*** [F (237) =4.618, p < .05(.033), eta$^2$ = .0139). *Therefore, the hypothesis can be accepted.* The highest level of satisfaction was reported in the gaming behaviour group Non-gamer (M=5.56, SD=1.099), followed by the gaming behaviour group gamer (M=5.25, SD=1.057).

**DV4: Psychosocial development** [F (247) =3.886, p < .05(.050), eta2 = .016). *Therefore, the hypothesis can be accepted*. The highest level of satisfaction was reported in the gaming behaviour group gamer (M=4.76, SD=.741), followed by the gaming behaviour group Non-gamer (M=4.589, SD=.664).

**Table 4.31: Measures of Association test for IV 'Gaming behaviour'**

| ***Measures of Association*** | | |
|---|---|---|
| | Eta | Eta Squared |
| How does gaming behaviour impact participants' view on Education? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | .043 | .002 |
| How does gaming behaviour of participants impact Parental Involvement? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | .139 | .019 |
| How does gaming behaviour of participants affect Social Interaction? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | .048 | .002 |
| How does gaming behaviour of participants affect Psychosocial Development? * Gamers vs. Non-gamers: Gaming behaviour - hours played per week | .125 | .016 |

For practical significance, the standardised measure of effect size ($Eta^2$) is also reported. The $Eta^2$ value is an estimate of the difference between the means expressed in standard deviation units which explains the magnitude of the effect size. The effect size measures the strength of the effect. The effect size between different age groups for DV1: Effectiveness of the education system is considered to be low (2.0%); DV2: parental involvement is considered to be low (19.0%); DV3: Social interaction is considered to be low (2.0%); and DV4: Psychosocial development is considered to be low (16.0%)

**Table 4. 32: Group statistics for IV 'Occupation'**

| Descriptive Statistics | | | | | |
|---|---|---|---|---|---|
| Occupation of Respondent | | *How does gaming behaviour impact participants' view on Education?* | *How does gaming behaviour of participants impact Parental Involvement?* | *How does gaming behaviour of participants affect Social Interaction?* | *How does gaming behaviour of participants affect Psychosocial Development?* |
| Educator | Mean | 4.37 | 5.75 | 5.22 | 4.78 |
| | N | 46 | 44 | 46 | 46 |
| | Std. Deviation | .771 | 1.102 | .841 | .696 |
| Other | Mean | 4.11 | 5.38 | 5.19 | 4.75 |
| | N | 100 | 97 | 100 | 100 |
| | Std. Deviation | .852 | 1.094 | .775 | .687 |
| Student | Mean | 4.07 | 5.21 | 5.02 | 4.57 |
| | N | 102 | 97 | 102 | 102 |
| | Std. Deviation | .799 | 1.030 | .933 | .738 |
| Total | Mean | 4.14 | 5.38 | 5.13 | 4.68 |
| | N | 248 | 238 | 248 | 248 |
| | Std. Deviation | .820 | 1.083 | .856 | .714 |

**Table 4. 33: ANOVA table for IV 'Occupation'**

| ANOVA results | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Sum of Squares | df | Mean Square | F | Sig. |
| How does gaming behaviour impact participants' view on Education? * Occupation of Respondent | Between Groups | (Combined) | 3.033 | 2 | 1.517 | 2.279 | .105 |
| | Within Groups | | 163.027 | 245 | .665 | | |
| | Total | | 166.060 | 247 | | | |
| How does gaming behaviour of participants impact Parental Involvement? * Occupation of Respondent | Between Groups | (Combined) | 8.953 | 2 | 4.477 | 3.911 | .021 |
| | Within Groups | | 269.013 | 235 | 1.145 | | |
| | Total | | 277.966 | 237 | | | |
| How does gaming behaviour of participants affect Social Interaction? * Occupation of Respondent | Between Groups | (Combined) | 1.948 | 2 | .974 | 1.332 | .266 |
| | Within Groups | | 179.177 | 245 | .731 | | |
| | Total | | 181.125 | 247 | | | |
| How does gaming behaviour of participants affect Psychosocial Development? * Occupation of Respondent | Between Groups | (Combined) | 2.239 | 2 | 1.119 | 2.219 | .111 |
| | Within Groups | | 123.596 | 245 | .504 | | |
| | Total | | 125.835 | 247 | | | |

A one-way ANOVA indicated *no statistically significant differences* in the IV 'Occupation' across three DVs (effectiveness of the education system, social interaction and psychosocial development).

***DV1: Effectiveness of the education system*** [F (247) =2.279, p > .05(.1052), eta$^2$ = .018). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the Occupation group educator (M=4.37, SD=.771), followed by the occupation group other (M=4.11, SD=.852) and lowest satisfaction for the occupation group student (M=4.07, SD=.799).

***DV3: Social interaction*** [F (247) =1.332, p > .05(.266), eta$^2$ = .011). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the occupation group educator (M=5.22, SD=.841), followed by the occupation group other (M=5.19, SD=.775) and lowest satisfaction for the occupation group student (M=5.02, SD=.933).

**DV4: Psychosocial development** [F (247) =2.219, p > .05(.1116), eta2 = .018). *Therefore, the hypothesis can be rejected.* The highest level of satisfaction was reported in the occupation group educator (M=4.78, SD=.696), followed by the occupation group other (M=4.75, SD=.687) and lowest satisfaction for the occupation group student (M=4.57, SD=.738).

The ANOVA test indicated *statistically significant differences* in the IV 'Economic activity' for

***DV2: Parental involvement*** [F (237) =3.911, p < .05(.021), eta$^2$ = .032). *Therefore, the hypothesis can be accepted.* The highest level of satisfaction was reported in the occupation group educator (M=5.75, SD=1.102), followed by the occupation group other (M=5.38, SD=1.094) and lowest satisfaction for the occupation group student (M=5.21, SD=1.030).

**Table 4. 34: Measures of Association test for IV 'Economic activity'**

| *Measures of Association* | | |
|---|---|---|
| | Eta | Eta Squared |
| How does gaming behaviour impact participants' view on Education? * Economic Activity of Respondent | .135 | .018 |
| How does gaming behaviour of participants impact Parental Involvement? * Economic Activity of Respondent | .179 | .032 |
| How does gaming behaviour of participants affect Social Interaction? * Economic Activity of Respondent | .104 | .011 |
| How does gaming behaviour of participants affect Psychosocial Development? * Economic Activity of Respondent | .133 | .018 |

For practical significance, the standardised measure of effect size ($Eta^2$) is also reported. The $Eta^2$ value is an estimate of the difference between the means expressed in standard deviation units which explains the magnitude of the effect size. The effect size measures the strength of the effect. The effect size between different age groups for DV1: Effectiveness of the education system is considered to be low (18.0%); DV2: parental involvement is considered to be moderate (32.0%); DV3: Social interaction is considered to be low (117.0%); and DV4: Psychosocial development is considered to be low (18.0%)

As can be seen from the analysis above, respondents' opinions differ significantly among the age groups with respect to DV Psychosocial development on the 5% level; among the gender groups with respect to DV Parental involvement and Psychosocial development on the 5% level; among the gaming behaviour groups with respect to DV Parental involvement and Psychosocial development on the 5% level; and among the occupation groups with respect to DV Parental involvement. The hypotheses on the other IV and DV can therefore be rejected.

## 4.9 STATISTICAL ANALYSIS

The data was subjected to three statistical techniques namely factor analysis, correlation and regression.

### 4.9.1 Factor analysis

The data was subjected to a factor analysis technique. The results are depicted in Table 4.35 Rotated component matrix factor analysis.

**Table 4. 35: Rotated component matrix factor analysis**

| Rotated Component Matrix | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Factor | Factor | Factor | Factor | Factor | Factor | Factor |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | Component | Component | Component | Component | Component | Component | Component |
| 32 Time/attend | ,739 | ,067 | ,090 | -,102 | -,183 | -,051 | -,079 |
| 31 Time/help | ,673 | -,036 | -,038 | -,119 | ,191 | ,007 | ,238 |
| 24 Teachers | ,649 | ,192 | ,042 | ,026 | ,184 | ,186 | ,024 |
| 25 Interested | ,643 | ,133 | ,098 | -,226 | ,318 | -,088 | ,042 |
| 8 Addressing problems | ,643 | ,098 | ,183 | ,078 | -,060 | ,041 | -,021 |
| 23 Comfortable | ,639 | -,004 | ,108 | ,068 | ,205 | ,215 | ,060 |
| 7 Decisions | ,622 | ,121 | ,263 | ,077 | -,040 | -,071 | ,039 |
| 3 Know | ,564 | ,214 | ,073 | -,128 | -,118 | ,086 | -,154 |
| 22 Positive | ,101 | ,758 | ,021 | ,013 | ,077 | ,100 | ,045 |
| 17 Authority | ,103 | ,716 | -,077 | -,061 | ,119 | ,164 | ,048 |
| 16 Improve | ,126 | ,708 | ,102 | -,050 | ,034 | -,156 | -,035 |
| 10 Employability | ,125 | ,702 | -,063 | ,055 | -,075 | ,013 | ,312 |
| 9 Adult world | ,093 | ,699 | ,007 | ,018 | ,040 | ,195 | ,081 |
| 34 World | ,059 | -,241 | ,693 | ,174 | ,046 | -,147 | ,066 |

*(Table 4.35 continues next page)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20 Curiosity | ,048 | -,086 | ,672 | -,021 | ,236 | -,172 | ,189 |
| 6 Lifelong | ,073 | ,094 | ,635 | ,018 | ,201 | ,047 | -,157 |
| 33 Creating jobs | ,130 | ,033 | ,612 | ,067 | -,172 | ,089 | ,042 |
| 26 Online | ,183 | ,109 | ,579 | ,053 | -,035 | ,181 | -,062 |
| 5 Teaching skills | -,076 | ,040 | ,080 | ,798 | ,227 | ,012 | -,027 |
| 11 Classroom | ,046 | -,039 | -,009 | ,720 | -,078 | ,031 | ,022 |
| 12 Preparedness | ,003 | ,082 | ,190 | ,678 | ,013 | ,046 | -,064 |
| 18 Do respect | ,009 | -,037 | -,016 | ,633 | -,032 | -,103 | ,377 |
| 1 Professional | -,109 | -,095 | -,023 | ,620 | -,131 | -,074 | -,039 |
| 21 Responsible | ,062 | ,172 | ,083 | -,033 | ,701 | ,007 | -,117 |
| 28 Control | ,073 | ,107 | ,024 | ,056 | ,645 | ,229 | ,030 |
| 19 Were respected | ,119 | ,072 | -,028 | ,083 | ,304 | ,655 | -,039 |
| 29 Before | ,013 | ,096 | -,013 | -,096 | -,055 | ,635 | ,090 |
| 15 Tax | ,076 | ,279 | ,008 | ,078 | -,206 | ,199 | ,651 |
| 2 Better outcomes with similar experiences | ,102 | ,069 | ,350 | -,098 | ,442 | ,049 | ,444 |
| 4 Confident | ,046 | ,174 | ,242 | -,023 | ,329 | ,479 | -,025 |
| 30 Resume interaction | -,214 | -,136 | -,155 | ,435 | ,267 | -,218 | ,426 |
| 13 Read | ,276 | ,018 | ,432 | -,031 | ,261 | ,025 | -,167 |
| 14 Boring | -,070 | -,645 | -,045 | ,067 | -,212 | -,071 | ,192 |
| 27 Street | ,169 | ,087 | ,428 | -,172 | -,155 | ,353 | ,226 |

#### 4.9.1.1 Most important questions

The most important questions asked, according to the factor analysis, are reflected in factor one. The questions, in order of importance, are showed in Table 4.36.

**Table 4. 36: Most important questions**

| | |
|---|---|
| 32 | To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parent's evenings and sports fixtures? |
| 31 | To what extent did you/do you/would you have time to spend helping your child with their school work? |
| 24 | To what extent did/do/would you work with teachers at your child's school? |
| 25 | To what extent are/were/would you be interested in your child's school? |
| 8 | To what extent did you/do you/would you be involved in addressing problems at the school your child attended? |
| 23 | How comfortable did you/do you/would you feel involving yourself in your child's schooling? |
| 7 | To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended? |
| 3 | To what extent did/have you/would you get to know other parents at your child's school? |

The questions above were grouped together to form 4 trends that formed part of the qualitative data that were collected through a questionnaire (cf. Appendix 2).

The questionnaire of 34 questions gave rise to 1 156 possible combinations that can be subjected to both correlation and regression techniques. Correlation and regression techniques are used so as to give rise to recommendations. The questions to be further interrogated are listed below.

### 4.9.2 Correlation

1. *To what extent does school prepare a person to be involved in their society as an adult?* and
   *To what extent do electronic games teach skills?* Table 5.3
2. *To what extent does school prepare a person to be involved in their society as an adult?* and Table 5.4

| | | |
|---|---|---|
| | *To what extent does the playing of games prepare gamers for their lives?* | |
| 3. | *To what extent do electronic games teach skills?* and<br>*To what extent does the playing of games prepare gamers for their lives?* | Table 5.5 |
| 4. | *To what extent should electronic games be used in a classroom?* and<br>*To what extent are/were/would you be interested in your child's school?* | Table 5.6 |
| 5. | *To what extent do you read?* and<br>*To what extent was school boring?* | Table 5.7 |
| 6. | *To what extent is tax money spent on school education well spent?* and<br>*To what extent do you accept the authority of a school?* | Table 5.8 |
| 7. | *To what extent do educators think about and thus improve what they do in a classroom?* and<br>*To what extent does school prepare a person for employment?* | Table 5.9 |
| 8. | *To what extent does the playing of games prepare gamers for their lives?* and<br>*To what extent are you positive about school education?* | Table 5.14 |

### 4.9.3 Regression

| | | |
|---|---|---|
| 1. | *To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* and<br>*To what extent did/have you/would you get to know other parents at your child's school?* | Table 5.1 |
| 2. | *To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* and<br>*To what extent are/were/would you be interested in your child's school?* | Table 5.2 |

| | | |
|---|---|---|
| 3. | *To what extent were you respected at school?* and *To what extent did you/do you/would you have time to spend attending functions at your child's such as braais, parent's evenings and sports fixtures?* | Table 5.10 |
| 4. | *To what extent were you respected at school?* and *To what extent did you/do you/would you have time to spend helping your child with their school work?* | Table 5.11 |
| 5. | *To what extent were you respected at school?* and *How comfortable did you/do you/would you feel involving yourself in your child's schooling?* | Table 5.12 |
| 6. | *To what extent were you respected at school?* and *To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?* | Table 5.13 |
| 7. | *To what extent are you in control of your life?* and *To what extent did/do/would you work with teachers at your child's school?* | Table 5.15 |
| 8. | *To what extent are you in control of your life?* and *To what extent did you/do you/would you be involved in addressing problems at the school your child attended?* | Table 5.16 |
| 9. | *To what extent are you interested in creating jobs for other people* and *To what extent does school prepare a person to be involved in their society as an adult?* | Table 5.17 |

### 4.9.4 Least important questions

The questions that were least important in driving the behaviour of respondents, as revealed by the factor analysis are shown in Table 4.34.

**Table 4. 37: Least important questions**

| |
|---|
| 2 Better |
| 3 Confident |
| 31 Resume interaction |
| 11 Read |
| 12 Boring |

## 4.10 QUALITATIVE DATA

Qualitative data was gathered in two separate time periods. Seven phenomenological interviews were done before the quantitative instrument was devised so as to offer insight into the study and literature review. Salient points from the interviews are reported below.

After the interviews were done, the quantitative questionnaire was carried out and the data captured. As described earlier (cf. 4.10.1.) the data was subjected to a factor analysis. The questions that emerged as the most important questions in Factor 1 (cf. Table 4.32), were then put as qualitative questions to qualitative respondents. The qualitative respondents were selected on the basis of convenience. They were people known to be interested in education and aware of gaming behaviour.

### 4.10.1 Phenomenological interviews

Seven phenomenological interviews were held at the outset of the study. The phenomenological interviews were conducted with education stakeholders who had a knowledge of gaming. They were asked how gaming impacts education. The salient points of the data gathered from the phenomenological interviews is reported below. The reports are extensive because the views of the phenomenological respondents are central to this study.

#### 4.10.1.1 Phenomenological respondent 1

Respondent 1, aged 62, is a female science educator. The respondent says gamers need at least an hour for their brains to return to normal after playing. Any electronic activities affect the sleeping pattern. Therefore, people who play games do not get enough sleep, because their task at hand (next level to be reached) takes priority in their thoughts. That is why their first thought in the morning is to play again. Some parents feel that electronic games take their children away from them. However, if it is not games that take their children away it would be something else.

#### 4.10.1.2 Phenomenological respondent 2

Respondent 2 facilitates, but does not teach, courses online for high school learners who study information technology. The learners sign onto a course website and work through course content. It is a largely self-taught course. Many of the learners complain that there is nobody to teach them. The respondent directs their minds to the computer games that they play, pointing out that there is no person to help them find their way through the games, so actually they are self-taught. Students have to persevere to master a game. The respondent acclaims the qualities of being self-taught and perseverance.

#### 4.10.1.3 Phenomenological respondent 3

Respondent 3 is an information technology course provider and offers courses online for high school learners who study information technology. If education means remembering, then “I suspect that computer games might reduce learner’s remembering in traditional classrooms because, by comparison, remembering dry academic stuff is so very boring compared to the interactive, real-time nature of a computer game.” If education refers to thinking skills, then some strategy games might improve problem-solving skills.

The school system should respond by looking at the elements of successful computer games and see to what extent they are positive to learning and incorporate those into

the school system and where these are negative, design to prevent those from entering the system.

For example, there is a lot of instant feedback in computer games – perhaps this could be incorporated into the school system. The feedback comes as a result of a learner interacting with the subject matter and not because of a formal assessment. This should also be incorporated.

Designing and producing a computer game is done by a small number of incredibly skilled people at significant cost. Designing and producing a computer game would be good to incorporate in the online learning environment. However, in the face-to-face teaching environment educators might really resent having their lesson preparation done by a small group of highly paid individuals, reducing their role to one of crowd controller.

#### 4.10.1.4 Phenomenological respondent 4

Respondent 4 is a high school information technology educator. There are certain subjects where playing computer games helps. A perfect example is information technology. This is a subject where logically thinking is a great asset. There are numerous logic-based games that will help the learner acquire this skill. The biggest hindrance is that gaming takes so much time away from the learners' academic study.

Playing computer games takes hours. There is no set time limit to a game, whereas, with sport and other activities there is usually a set time. You cannot simply stop a computer game and continue later."

In that education is relational, it is important *"that we as educators identify with the children and take an interest in what they are passionate about so that we can use it to help them learn. There should be a games club at each school."*

#### 4.10.1.5 Phenomenological respondent 5

Respondent 5 is aged 23 and is a Master's student in computer science. He says:

*"The only way I imagine that playing games can impede education is through wasting of a student's time. Multi user dragon games, although being a dead genre, are a perfect example of that. They garnered the nick name multi undergraduate destroyer. Massive multiplayer online, and more recently multiplayer online battle arenas (MOBA), have risen to take that role. I know one person who dropped out of Rhodes University because he played a MOBA too often, although it was possibly a symptom rather than the cause; he was severely depressed. Although addiction is not unique to video games, I suppose."*

Educational games obviously help education. They can teach a wide variety of academic skills: maths, science, and reading. Accidental learning occurs. "The sole source of knowledge of classical antiquity and the medieval period for a lot of my age group comes from the Age of Empires video games." Recently a colleague mentioned that Mehmed led the Ottomans against the Byzantine Empire and conquered Constantinople, saying that he had learned that from playing the Age of Empires video games.

Text based or text-based point and click games definitely help reading, although the former is dead and the latter is a dying genre. "*They definitely helped my ability to read. Critical thinking skills are developed by strategy games. I'm interested in technology and science. Playing games definitely got me interested in what I do."*

#### 4.10.1.6 Phenomenological respondent 6

Respondent 6 is an applications developer. He thinks that games have a role to play in education for the following reasons: *"Games are a lot more engaging than educators, so finding ways to teach by play will help motivate learners to learn."*

Taking part in your own learning (constructing your understanding of the subject). This is easily accomplished through games. As an example, to explain the working of the internal combustion engine you can design a simulation in which the player can construct and modify their own engine. Through experimenting they will start to understand what works (or doesn't) and why. Having goals and rewards will motivate

the player to keep trying, refining and innovating, even coming up with new novel solutions to old problems. Making this a multi-player game adds the extra push of competitions and/or advantages of working with a team, learning from each other.

Gaming has some positive effects on the brain such as the improvement of visual ability, motor skills and brain growth. Moderation as with all things in life is important though.

How schools should respond?

*"I think that schools should keep an open mind in regards to gaming. The educators should be more willing to consider the benefits of gaming in class (not just electronic games). Having a game to help teach should not replace the educator or allow them to cop out, but rather be used to help them keep their kids interested and help clarify concepts that are otherwise hard to explain. For instance, what if in a physics class, groups built bridges from a fixed amount of cheap material and then have a competition to see whose bridge can carry the greatest load. This is something that can be easily translated into a computer /cell /tablet game with group/individual /school competitions and different types of challenges. It will help the students gain a deeper understanding of the principles involved and help promote self-study to gain the edge in competition."*

#### 4.10.1.7 Phenomenological respondent 7

Respondent 7 has several decades of school teaching experience and has a son who plays electronic games every second he has. The respondent says selected games have to be brought into the school curricula. She proposes that the name of the subject be gaming studies.

"*A game would be selected each year, much like an English text book would be selected. Lessons would then be based on the game such as aspects of history closest to the content in the game. English teaching can be based on the language used in the game. A game can also lend itself to aspects of science and certainly life orientation. Further, business learning can take place around the research and development of the game, in terms of time and costs and marketing. The development of the game and ownership can also lend itself to lessons on entrepreneurship and job creation. Games are distinctively a cultural statement so can be used as the content for cultural and media studies. Games can be used to help art and design classes and for software programme lessons. Gaming studies would therefore be an eclectic course. Aspects of sociology can be brought in, drawing from the way gamers form themselves into online communities and have probably never seen each other face to*

*face. Gaming studies is made indispensable because gaming is such fun and school is not. Schools have to catch up.*"

The research project is founded on the sentiments the phenomenological respondents express.

## 4.11 QUALITATIVE DATA ANALYSIS

The most important questions emanating from the factor analysis (cf. 4.10.1) were re-cast as six trends. 9 qualitative respondents were asked to respond to the trends (Appendix 2). The data from the questions to qualitative respondents is summarised below and not given verbatim.

The thematic coding is represented as trends. Thematic coding is discussed in 3.8.2 Analysis of qualitative data. The trends are:

**Table 4. 38: Questions for further testing in qualitative data**

| | ***Factor 1 questions*** | ***New questions*** |
|---|---|---|
| **Trend 1** | To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parent's evenings and sports fixtures? | Time to attend social functions and help their children with school work. |
| | To what extent did you/do you/would you have time to spend helping your child with their school work? | |
| **Trend 2** | To what extent did/do/would you work with teachers at your child's school? | Working with teachers at their child's school and being interested in their school. |
| | To what extent are/were/would you be interested in your child's school? | |

*(Table 4.38 continues on next page)*

| | | |
|---|---|---|
| **Trend 3** | To what extent did you/do you/would you be involved in addressing problems at the school your child attended? | Being involved in addressing problems at the school their child attends and feeling comfortable in involving themselves at their child's school. |
| | How comfortable did you/do you/would you feel involving yourself in your child's schooling? | |
| **Trend 4** | To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended? | Being involved in making decisions about the future of the school their child attends and getting to know other parents at their child's school. |
| | To what extent did/have you/would you get to know other parents at your child's school? | |

### 4.11.1 Qualitative respondents

The qualitative respondents that took part in the interviews are described below:

| | |
|---|---|
| ***Respondent 1*** | Educator: Male educator in his 60s.<br>Served as a Jesuit priest before becoming an educator. |
| ***Respondent 2*** | Educator: Grade 12 educator of long standing |
| ***Respondent 3*** | Principal: Secondary School |
| ***Respondent 4*** | Student: A philosophy Honours student, school dux student |
| ***Respondent 5*** | Student: A computer science student and a gamer |
| ***Respondent 6*** | Held a private home school franchise |
| ***Respondent 7*** | Deputy Principal |
| ***Respondent 8*** | Educator: Head of Department |
| ***Respondent 9*** | Educator: Left teaching 19 years ago to marry, has stayed interested in education. |

### 4.11.2 Analysis of data

#### 4.11.2.1 Trend 1 Time, social functions and school work

*Trend 1: Time to attend social functions and help their children with school work.*

The data shows that the more hours a week respondents play games, and the more years respondents have played games, the less time they have to attend the social aspects of a school such as the braais, the parents' evenings and sports fixtures. Similarly, the more hours a respondent plays games a week, and the more years they have gamed, the less inclined they are to help their children with their school work.

***Question: How should a teacher respond to this?***

**Respondent 1** says parents are too busy and face stresses of the changing world environment, ideologies and crises. So often not having time for the child, or helping children, is compensated with a cell phone, games and electronics, thus creating in the children this continuous absence from the other.

**Respondent 2** says the attitudes of parents toward the academic life of children are usually adopted by those children. The respondent expects that many of the children of gaming parents will not take an interest in extra mural activities at school. Homework will be done as quickly as possible without paying much attention to presentation or whether it is correct.

**Respondent 3** says people have a certain amount of time in which they must complete the chores of the everyday life. Whatever time is left over they may devote to any specific interests they have. If this time is taken up by the virtual lives or online personas there would clearly be less time to devote to voluntary school-based activities. However, the need for parental involvement at school or with homework depends on the child's ability to work independently. Teachers are unlikely to know the online habits of the parent body. However, teachers should meet with the parents to establish and maintain a positive home school partnership to support the work and progress of the child. Teachers are able to refer the problem upwards if there is an

academic or pastoral need or child neglect. Register teachers should be a little more alert to the needs of pupils who come from homes where there is little involvement with the school. However, minimal parent involvement with the school does not automatically indicate poor parenting so teachers will have to use their professional judgement.

**Respondent 4** says learners whose parents are disinterested in school will end up as parents who are disinterested in school. Generally, learners who are involved in lots of extra activities have parents who get involved in the parent teachers' association. Teachers need to attract parents to functions. If the parents go their children will go. It is the adults who are the problems so it is the adults who need to be addressed.

**Respondent 5** thinks a sense of community is vital. Community structures are important for the well-being and development of a child. School events are a perfect way to build a sense of community and if parents do not attend them they are isolating themselves from the other parents. This could negatively impact their children as well. Teachers could stage gaming events such as a lan for parents. Schools could hold an old school gaming evening and hire arcade machines. Parents could take their old Nintendos and have tournaments where parents and kids can play against each other and interact. Parents can show their children the games they enjoyed.

**Respondent 6** feels that teachers should try to incorporate gaming into their teaching plan; thus allowing their learners and the parents to satisfy their desire for gaming while ensuring that some form of work gets done.

**Respondent 7** believes there is no reason why parents should attend social functions. It is a school, not a social club. Most teachers would be happy if parents stayed away from the school.

**Respondent 8** points out that as much as it would pain some learners to take part in social functions at school, social functions are an integral aspect of school. Social functions are important for team-building and to get to know people i.e. to socialise. Gaming was perhaps an escape mechanism for people who are naturally introverted

and who would despise attending functions that force them to interact and communicate with people they would not naturally interact with.

The age of the learner is the issue insofar as gaming prevents parents from helping their children with school work. Primary school parents would need to assist their children in mastering the basics, but as a high school teacher, the respondent does not think that parents should assist their children with school work. That would defeat the purpose of teaching them independence, a skill greatly needed for children going into tertiary education.

**Respondent 9** fears the day that technology will surpass human interaction. The world will then have a generation of idiots. As a mother and a teacher, the respondent wants parents to socialize at braais and to know what their children are doing at school. A lot of gamers are introverts and computer gaming actually helps introverts communicate more easily. So, teachers need to research and understand how best to include introverts in school life.

#### 4.11.2.2 Trend 2: Work with teachers, be interested

*Trend 2: Working with teachers at their child's school and being interested in their school*

The data shows that the more hours a week respondents spend playing games, and the more years respondents have gamed, the less inclined are to work with educators. Similarly, the data shows that the more hours a respondent game a week, and the more years they have gamed, they less interested they are in their child's school.

***Question 2: The question to the nine respondents is: How should a teacher respond to this?***

**Respondent 1** says the trend demonstrates that the teacher and schools have become, or are seen as, the parent, and what the learners' families pay for.

**Respondent 2** feels that parents pay school fees and so parents feel it is the job of the teachers to ensure that the children are being educated. Teachers who get no support from parents find it very difficult to motivate children as they have adopted their parents' attitude towards school. Offering positive reinforcement is probably the only option a teacher has under these circumstances.

**Respondent 3** believes education is a 3-way partnership of parent, pupil and teacher. So, having the parent missing from the equation can be a serious matter. Teachers should find a way to involve the parents more in the education of their children. Online parents are probably more likely to respond to online solutions to their absence from school, so emails or skype chats might be possible solutions to attempt before face to face meetings.

**Respondent 4** locates the trend in the attitudes of parents towards teachers. Parents like to shout at the teacher as much as they shout at their children, if not more. There are definitely parents who blame the teachers. Factor that with parents who play games and quite a vicious circle emerges. Teachers need to be transparent and communicate with parents in ways that increase the flow of information between the parties. Techers need to find interesting ways for the parents to want to be involved in the schooling and education of their children.

**Respondent 5** believes that adults who consider themselves serious gamers probably did not learn much when they were at school.

**Respondent 6** says teachers should use their initiative and develop teaching programmes that will spark the interest of their students as well as their parents.

**Respondent 7** feels that the learners should be doing the work themselves. In the respondent's experience, the less parents help their children the better.

**Respondent 8** sees parent teacher communication as vital. Parents who pay extortionate school fees are customers and should have input if something at school is not satisfactory. Parents should be interested in their child/ren's school. Parent who

are not interested in the child's school are probably not interested in their child. It is a bit like shunning responsibility and that is not a trait of a well-balanced, healthy parent.

**Respondent 9** believe that finding ways to change the trend is challenging but teachers need to respond in a positive not negative way. Teachers have to be creative in engaging these parents to show them why it is important to be more involved.

#### 4.11.2.3 Trend 3 Addressing problems, feeling comfortable

*Trend 3: Being involved in addressing problems at the school their child attends and feeling comfortable in involving themselves at their child's school.*

The data shows that the more hours respondents game a week, and the more years respondents have gamed, the less inclined they are to be involved in addressing problems at their child's school. Similarly, the data shows that the more respondents play games a week, and the more years they have played games, the less comfortable they are in involving themselves in their child's school.

***Question 3 The question to the nine qualitative respondents is: How should a teacher respond to this?***

**Respondent 1** advocates a balance in the lives of teachers, learners and people in the community.

**Respondent 2** is sure that if a problem was of a serious nature the gaming parent would make time to see the teacher. The gaming type of parent may expect their children to sort things out for themselves, which is not necessarily a bad thing.

**Respondent 3** did not provide a response.

**Respondent 4** says gamers who were not comfortable at school as learners probably would not have gotten over their uncomfortable feelings as adults. They would have bad memories and supressed trauma in the school environment instead of nostalgic

feelings of people who enjoyed school. The respondent anticipates a correlation between the number of hours played and the worst memories of school. Teachers should help parents understand they do not have to deal with school any more, they only have to help their kids get through it.

**Respondent 5** insists that people who are not prepared to live up to the realities of having a child, such as fighting for what they think is right at their school or addressing their problems, should not have a child. Far too many people have children just because they think it is expected of them. Teachers should offer very extensive sex education so people know what it is like to have children. A lot of people have children because they think it is the next step in their lives.

**Respondent 6** wants teachers to become familiar with gaming trends in order to develop relationships with gaming parents. Gaming parents would be more comfortable with a teacher that is familiar with gaming.

**Respondent 7** anticipates problems if parents do not feel comfortable around the teachers. At times parents and teachers need to speak. However, it is probably good that parents feel a little uncomfortable around teachers, otherwise parents could be tempted to interfere in what teachers do. That is not always good.

**Respondent 8** says teachers need to know the nature of the problems that parents do not want to address. If the problem lies with the child's academic endeavours or behaviour or learning then the parent has a responsibility to see that the child's welfare is addressed.

**Respondent 9** asks teachers to understand that gaming is an addiction. Teachers have to understand how best to relate to an addict. Teachers need to research to understand how a gamer's mind works and how best to include them.

#### 4.11.2.4 Trend 4 Making decisions, know other parents

*Trend 4 Being involved in making decisions about the future of the school their child attends and getting to know other parents at their child's school.*

The data shows that the more hours respondents spend playing games a week, and the more years they have gamed, the less they want to involve themselves in making decisions about the future of their child's school. Similarly, the more hours a week that respondents game, and the more years they have spent gaming, the less they want to get to know other parents at their child's school.

***Question 4 The question to the nine qualitative respondents is: How should a teacher respond to this?***

**Respondent 1** believes it is vital that a school be a community within a community, not just a cash cow.

**Respondent 2** says school involvement is social interaction. Gamers would not feel the need for this type of social interaction with other people. Schools tend to ask much of the parents who are willing to offer their time and talents to the school. This is simply not a worthwhile activity for parents who use gaming to relax and de-stress.

**Respondent 3** says the scope of a teacher's duty does not include responding to a parent's disinterest in making decisions about the school or meeting and befriending other parents. Many parents would not wish to make decisions about the future of the school. Certainly, more business-oriented models of schooling would not welcome this either. Many, and increasingly, schools are operated as for-profit business ventures with owners interested in education in so far as it produces a financial profit. In this kind of arrangement where parents are customers, parents may not wish to have any additional involvement with the business other than being customers of their chemist.

In instances where schools are more community oriented with a deep tradition of parent involvement at parent's association and board level, parents have the discretion

as to whether they involve themselves in this aspect of their child's school. This would not have anything to do with teachers.

**Respondent 4** believes that people who play a lot of games are probably not over social and are not the kinds of people who intentionally go out and make new friends. So, parents at the school are probably just other people that they do not want to go out and meet. They just don't like people. Teachers can try to contact the parents and communicate with them on a regular basis and try to win their trust. There is not much teachers can really do for parents who are completely disinterested. There is as much teachers can do for parents who hate school as there is for learners who hate school.

**Respondent 5** insists that gaming is the opium of the masses. Teachers should teach learners life skills so that they develop into citizens who are more concerned with their communities and the lives of their future children and will not sit in their rooms playing games and hiding from decisions.

**Respondent 6** says teachers should create groups for parents with similar interests, thus allowing them to be a part of an environment where their ideas and interests are shared; which can encourage them to be more involved in the future of the school.

**Respondent 7** points out that parents will complain when things go array with their children, no matter if the parents game or not. Parents will also always complain about decisions taken if they do not agree, but few parents want to be involved in making decisions.

**Respondent 8** says parents who do not want to involve themselves in a school do not necessarily have to be gamers. Many parents choose not to prioritise their children's school for a variety of reasons: they may be very busy with their careers, they may be single parents at their wits' end, or they may view school as a babysitting facility while they get on with their lives. Ultimately, it is a very sad approach to their child and the school s/he attends. A school is a community and the better the communication between all stakeholders, the more the school thrives.

**Respondent 9** feels that teachers need to educate themselves to gain understanding of gamers. Thereafter, teachers should seek the positives in gaming. Teachers may then be able to relate to gaming parents and help them grasp the importance of being actively involved in their children's' school lives and the decisions made.

#### 4.11.2.5 Likely outcome

***Question 5 If the problems listed here, especially the problems of time and interest, are not addressed, what would be the likely outcome?***

**Respondent 1** foresees loneliness and seeking comfort in so many ills of society today, radicalism, egocentric attitudes, not caring for others, drugs, sex and materialism, if the problems are not addressed.

**Respondent 2** says the attitudes of children toward their schooling and toward their teachers would probably be nonchalant. Hard work and passion would be lacking as school would be seen to be a time to get through to move on with real life. This attitude does not train and prepare children for the hardships that life may bring. A lack of enthusiasm and tenacity prevails and instant gratification is what is expected.

**Respondent 3** says learners will be less driven to do well at school as the signal from the uninvolved parent would be that school is not of great importance – certainly not as important as getting to the next level of the online empire building. What needs to be remembered, however, is that children, families, parenting and schools are all different. Some children are capable of more independent work than others. The respondent is not convinced that it is the school's place to insist on a relationship with each parent, unless, there are compelling reasons to do so.

**Respondent 4** Without interested parents it is pretty hard for schools to function. Teachers should address these problems so it just doesn't happen. If teachers work hard and put their minds to it there is nothing they cannot accomplish.

**Respondent 5** anticipates that children will become estranged from their parents and feel like their parents don't understand them.

**Respondent 6** says if parents are largely uninvolved in the education of their children, this will have a ripple effect on the education of future generations.

**Respondent 7** anticipates problems if more and more parents play games and are less and less inclined to attend to matters at their children's schools. Education is meant to be a partnership. But if parents withdraw, the education authorities will have less checks and balance upon them. The respondent does not have a high enough opinion of people who manage education at levels higher than his to believe that they will always make the right decisions. People higher in the hierarchy than him, right up to the Minister of Basic Education, need more checks and balances rather than fewer. The respondent sees no good coming out of this trend.

**Respondent 8** says the choice by parents to not get involved and to not get to know other parents will affect the wellbeing of the child. Such a decision will have a direct impact on the child's confidence and will set an example for them to follow when they have children of their own. It is downward spiral behaviour.
Schools that are not well-supported will not thrive. Without support, especially if gaming is on the increase, schools will struggle to maintain a good reputation and will simply exist to go through the motions of educating the child. If the child is not interested in joining the alumni, tradition is broken and they will not have that pride instilled to one day send their children to their school.

The respondent believes, however, that every child is different and there is not one mould/type of school that will fit all. It will be sad if matriculants do not value their school enough to send their children there. The more parents are involved in their children, and ultimately the place their child attends, the more successful the school will be and the more confident the child will be to face the challenges outside of school.

**Respondent 9** anticipates people becoming little islands, becoming even more self-absorbed and living only for instant gratification. Children could grow up feeling isolated from parents and thinking that education is not that important.

#### 4.11.2.6 Recognise and deal with

***Question 6 To what extent are school leadership and teachers able to recognise and deals with the problems set out in the trends?***

**Respondent 1** believes school leadership and educators need to become

- Caring
- Compassion
- Reaching out to both parents and learners and the community, and,
- Instead of teaching recall, teach memory.

**Respondent 2** says recognising the trend is the easy part. Dealing with it is not so easy. Teachers need to entertain children in the classroom. If their imaginations and interest are not captured by the teacher, the education process is not effective.

**Respondent 3** says if there are impediments to progress and minimal parent involvement, the school should make every effort to build a relationship with the parent. Making any direct links though between pupil performance and parental involvement might prove difficult. Much depends on the training and experience of the teachers and school leadership. The more experienced and better qualified school leaders are; the better equipped they are to deal with any eventuality that might arise. Schools have different required levels of parental participation. Some schools hold the view that as long as school fees are up to date and the pupil is passing everyone is happy.

**Respondent 4** says there is no blanket ability that teachers and schools have. Some schools have absolutely brilliant minds running them and some do not. This problem needs to be dealt with at national decision-making level and not school level.

**Respondent 5** says the management of the school from which they matriculated was completely inept and would not be able to recognise this problem, let alone address it. There are many more female teachers than male teachers and there are many more male gamers than female gamers so often gaming does not even register on teachers'

radars. The respondent does not know of groups of girls who speak about gaming and does not know teachers who know about gaming. The men the respondent knows who are studying to be teachers are either not interested in gaming or are not intelligent enough to think about what they do or why they are doing it. So, they might notice that parents do not attend events but they would not ask why and would not think to ask how to address it. They would just complain about it, the respondent says.

**Respondent 6** says that while school leadership and teachers should be able to recognise and deal with problems, very few actually do. The bureaucracy of the modern education system makes it very difficult and oftentimes extremely unpleasant to affect any real change.

**Respondent 7** anticipates that a few people in senior positions in schools will recognise the trends reported here and will want to respond. But having a school – by – school response will serve almost no purpose. There needs to be a conference called by the Minister of Basic Education to discuss gaming and school education and formulate a response.

**Respondent 8** believes school leadership have a duty to be up to date with new trends in education, including how gaming behaviour is impacting and will impact the school and the wider school community. Teachers cannot compete with games, but should use games alongside more traditional ways of educating learners. The respondent says gaming is a real, undeniable challenge in education.

**Respondent 9** fears that schools are ill prepared, so will not recognise the problems nor be able to deal with them.

## 4.12 CHAPTER SUMMARY

The chapter set out the quantitative and qualitative data. The data is interrogated in the next chapter and integrated with literature review material. Chapter five also offers recommendations.

# CHAPTER 5

# DISCUSSION, RECOMMENDATIONS AND CONCLUSION

## 5.1 INTRODUCTION

The data from selected quantitative questions and the qualitative interviews are interrogated in this chapter and integrated with literature review material. Some of the questions and data gave rise to the recommendations. The conclusion of the study is offered in this chapter.

## 5.2 GAMING

The literature review material on gaming highlights the critical aspects of gaming that impact parents and education. This material contextualises the discussion on gaming and education, gaming and educators and gaming and parents.

### 5.2.1 Gaming as a social activity

Moursund (2007) claims that games help gamers to learn about themselves and interact with other people. That might be so, but gaming respondents to this study judge themselves less able to curb their impulsive behaviour and act maturely compared to non-gaming respondents.

This is depicted in Figure 4.2 in response to ***Question 2*** *To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?*

The data tested respondents' perception of their maturity. Respondents who do not game during the week judge themselves to be noticeable more mature than respondents who do game during the week. Likewise, respondents who have never gamed rate themselves as more mature than respondents who have gamed. Gamers emerge from the data as being less reflective of their actions than non-gamers.

***Question 3*** *asks the question to what extent did/have you/would you get to know other parents at your child's school?* Data in Figure 4.3 shows that the more hours a week that respondents' game, the less they want to get to know other parents at their child's school. Similarly, the more years respondents have spent gaming, the less they want to know other parents at their child's school.

The question: To *what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* is the independent variable in a regression analysis with the question: To *what extent did/have you/would you get to know other parents at your child's school?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.1 below.

**Table 5. 1: Regression between 'Better outcome' and 'Know other parents'**

| ***Regression 'Better Outcome' and 'Know other parents'*** | |
|---|---|
| R Square | 0,005 |
| observations | 142 |

This is a very weak regression, meaning that even if gamers take steps to become more mature people, they will not seek to get to know better other parents at their child's school. Gaming is driving the extent to which gamers want to get to know other parents, not their sense of their own maturity. As University of North Carolina (2011) says, gamers cannot, or will not, engage in real world conversations or be a source of support or encouragement to friends and family. Because their friends speak about other things, gamers begin to feel left out, which in turn causes them to feel irritated or offended. Gamers do not realise that they have chosen to be left out by devoting all their time to gaming (University of North Carolina, 2011).

The response of the nine qualitative respondents to trends 4 is also relevant. Trend 4 Being involved in making decisions about the future of the school their child attends and getting to know other parents at their child's school. The data shows that the more

hours respondents spend playing games a week, and the more years they have gamed, the less they want to involve themselves in making decisions about the future of their child's school. Similarly, the more hours a week that respondents game, and the more years they have spent gaming, the less they wanted to get to know other parents at their child's school. The response of the phenomenological respondents is the interpretative phenomenological analysis that can be used to understand what an experience is like (phenomenology) and how a person makes sense of it (interpretation), according to Better evaluation (2017) and Smith and Osborn (2003). Interpretative phenomenological analysis can be used to understand what an experience is like (phenomenology) and how a person makes sense of it (interpretation) (Better evaluation, 2017; Smith & Osborn, 2003).

Qualitative respondent 1 feels it is vital that a school should be a community within a community, not just a cash cow. Because we are so busy gaming we lose sight of who we are serving. How much do I know about my learner child, his friends, their doing or situations emotionally and financially?

Qualitative respondent 2 sees school involvement as social interaction. Gamers will not feel the need for this type of social interaction with other people. Schools tend to ask much of the parents who are willing to offer their time and talents to the school. This is simply not a worthwhile activity for parents who use gaming to relax and de-stress.

Qualitative respondent 3 is not convinced that this has anything to do with educators. *"I would not think it is within the scope of an educator's duty to respond to a parent's disinterest in making decisions about the school or meeting and befriending other parents,"* the respondent says. *"Many parents would not wish to make decisions about the future of the school. Certainly, more business-oriented models of schooling would not welcome this either."* Many, and increasingly, schools are operated as for-profit business ventures with owners interested in education in so far as it produces a financial profit. In this kind of arrangement where parents are customers, why would a parent wish to have any additional involvement with the business or other customers?

*"I have no wish to befriend other customers at my local grocer or chemist,"* the respondent says.

In instances where schools are more community oriented with a deep tradition of parent involvement at PTA and board level, it is again utterly at the discretion of parents as to whether they wish to involve themselves in this aspect of their child's school. Again, this would not have anything to do with educators.

According to qualitative respondent 4, gamers who play a lot are probably not overly social and are not the kind of people who will intentionally go out and make new friends. So, parents at a school are probably just other people that they do not want to go out and meet. They just don't like people. Educators can contact gaming parents, communicate with them try to win their trust, but there are not much educators can do for parents who are completely disinterested. There are as much educators can do for parents who hate school as there is for children who hate school.

Qualitative respondent 5 feels educators should teach the children life skills so that they become more concerned with their communities and the lives of their own children and will not sit in their rooms playing games and hiding from decisions.

Qualitative respondent 6 suggests educators to create groups for parents with similar interests, thus allowing them to be a part of an environment where their ideas and interests are shared; which can encourage them to be more involved in the future of the school.

Qualitative respondent 7 says parents will complain when things go array with their children, regardless if they are gaming parents or not. Parents will complain about decisions they do not agree with. But few parents want to be involved in making decisions.

Qualitative respondent 8 points out that parents who do not want to involve themselves in the school do not necessarily have to be gamers. Such parents may be busy with their careers or be single parents and see school as a babysitting facility while they

get on with their lives. A school, however, is a community and the better the communication between all stakeholders, the more thriving.

The question: To *what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* (2) is the independent variable in a regression analysis with question 25 *To what extent are/were/would you be interested in your child's school?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.2.

**Table 5. 2: Regression Better outcome and Interested**

| Regression Better outcome and Interested | |
|---|---|
| R Square | 0,004 |
| Observations | 142 |

This is a very weak regression, meaning that even if gamers take steps to become more mature as people, they will not become more interested in what happens at the school their children attend. Gaming is driving the interest gamers have in their child's school, not their sense of their own maturity.

### 5.2.2 Life skills acquired through gaming

Wastiau, Kearney and Van den Berghe (2009) claim that gamers feel more confident at school, whereas Besson, Huber, Mompoint-Gaillard and Rohmann (2015) feel schools leave young people with a lack of confidence. Figure 4.4 reports on the question this gives rise to, question 4 *To what extent are you a confident person?* Respondents who do not play games during the week judge themselves to be more confident than respondents who do game. Likewise, respondents who have never gamed see themselves as more confident than respondents who have gamed. Students emerge as having much less confidence in themselves than educators and other respondents. Gaming respondents in this study do not believe that they are as confident as non-gaming respondents. Educators dealing with parents who game need to know that such parents are not as confident as they might need to be.

### 5.2.3 Making decisions

Video games require players to make real life-like decisions which are important skills that are not easily taught (Wagner, 2016; Matthews & Coyle, 2010; Hong, Cheng, Hwang, Lee & Chang, 2009; Griffiths, 2002). A person adept at addressing problems cultivates the ability to read people, to collaborate and to bring in other knowledge as need be (Wagner, 2016; Moursund, 2007). Question 7 asked *To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?* Figure 4.7 shows that the more hours respondents spend playing games a week, the less they want to be involved in making decisions about the future of the school their child attends. The more years respondents have gamed, the less they want to involve themselves in making decision about the future of their child's school. To the extent that gaming will grow in usage, educators can expect to deal with parents who do not want to be involved in making decisions at the school their child attends. More and more, school leadership and educators will be making decisions by themselves.

Question 8 asks *To what extent did you/do you/would you be involved in addressing problems at the school your child attended?* Data in Figure 4.8 shows that the more hours respondents game a week, the less inclined they are to be involved in addressing problems at their child's school. Similarly, and noticeably, the more years respondents have gamed the less inclined they are to involve themselves in addressing problems at their child's school. Again, to the extent that gaming will become increasingly more popular, educators can expect gaming parents to not want to be involved in addressing problems. This is further evidence that more and more school leadership and educators will be making decisions and addressing problems with less and less input from parents.

The pattern was reinforced by question 25 *To what extent are/were/would you be interested in your child's school?* Figure 4.25 shows that the more hours a respondent games a week, the less interested they are in their child's school. Likewise, the more years respondents have gamed, the less interested they are in their child's school. Taken together, the questions on making decisions, addressing and being interested

reveal that gaming parents are deliberately making themselves impuissant in the future education of their children. Their impuissance makes make more poignant the need for school leadership and educators to be correct in what they do. However, the World Economic Forum ranking of South Africa at 139 out of 143 countries for overall quality of education (Van Wyk, 2016) does not engender great confidence.

To summarise, gaming parents are less reflective of their behaviour, and less confident and are less inclined to make school-based decisions and address school-based problems. Spaull (2013) warns of two public school systems. The smaller, better performing system accommodates the wealthiest 20-25 percent of learners who achieved much higher scores than the larger system which caters for the poorest 75-80 percent of learners. The performance in the larger category was abysmal. These two education systems split learners by wealth, socio-economic status, geographic location and language. The division can be further complicated by a division between gaming parents who render themselves impuissant because they will not involve themselves in their children's schooling and non-gaming parents who might involve themselves in their children's schooling. These findings are inputs into recommendations 5.10.1 and 5.10.2. A discussion on education and gaming follows.

## 5.3 GAMING AND EDUCATION

This section discusses how education is impacted by the gaming behaviour of parents.

### 5.3.1 Transferable skills

The less respondents play games a week, the more inclined they are to think that school did prepare them to be adults (question 9 adult). Similarly, the fewer years gamers have played, the more they are inclined to think that school has prepared them to be adults. This is reflected in Figure 4.9 which shows the means returned by each demographic group to the question 9 *To what extent does school prepare a person to be involved in their society as an adult?* This data shows a growing separation between gaming and one of the purposes of school, namely to prepare a person for adult life.

The data demands that political leadership of schools, school leadership and educators recognise that they are in competition with gaming on the question of usefulness in life, as reflected in recommendations 5.10.1 and 5.10.2. If political leadership, school leadership and educators ignore this drift away from the usefulness of education in the opinion of gamers, then school leadership and educators will be the losers. At the very least their sense of purpose will erode. Political leadership, school leadership and educators must not lose sight of the fact that 58,06 percent of respondents to this study play games. Drawing from Table 2.3 Demographic trends 2014 population estimates, that means at least 17 million people aged 20 years to 64 years play games. The drift away from the usefulness of schools is reinforced by Figure 4.5 that reports on question 5 *To what extent do electronic games teach skills?* The data shows that the more hours a week respondents play games, and for the more years they play, the more inclined they are to believe that gaming imparts skills.

Gaming imparts skills, attitudes, values and knowledge that can be transferred to other aspects of life (Hong, Cheng, Hwang, Lee & Chang, 2009; Wagner, 2016; Kampf & Cuhavear, 2015; Ahmada & Jaafarb, 2012; University of North Carolina 2011; Boyle & Connolly, 2011; Snodgrass & Blunt 2009; Durkin, 1995). The point emerging is that gamers see great advantages to themselves in playing games and additional, more formal learning, is not sought after, as shown by the data in Figure 4.6, which reports on question 6 *To what extent do you want to be a lifelong learner?* The data shows that the more respondents play games in a week, the less they want to be lifelong learners. Similarly, the more years respondents have gamed, the less they want to be lifelong learners. Educators emerge as being the demographic group most dedicated to lifelong learning. The term *lifelong learning* is meant in the questionnaire to convey an arena of formal education, as in acquiring degrees, diplomas and certificates.

This sentiment is underlined by McClarty *et al.,* (2012) who insist education systems have to prepare learners for contemporary life, given the rapid penetration of increasingly sophisticated technologies into every facet of society. The data shows gamers think they are preparing for contemporary life but the route for them is through games and not through formal education. Continuing to provide the same type of education to learners who are children of gaming parents and gamers themselves, as

the world continues to change, will not serve them well (McClarty *et al*., 2012; Connolly, Boyle, MacArthur, Hainey & Boyle, 2012; Randall, 2010; Shapiro, 2014. Billieux, Thorens, Khazaal, Zullino, Achab & Van der Linden, 2015; Ahmada & Jaafarb, 2012; McCauley, 2011; Moursund, 2007; Durkin, 1995). Within the field of understanding of gamers, the data supports claims made in the literature that games support contemporary skills necessary for success in the workplace such as self-regulation, creativity, negotiation, working in teams and coordination, while teaching sequence learning, deductive reasoning and memorizing (Ahmada & Jaafarb, 2012; Connolly, Boyle, MacArthur, Hainey & Boyle, 2012; Boyle & Connolly, 2011; Cortes, Alcalde & Camacho, 2010; Gros, 2003). The endorsement of games, however, comes at the expense of school education, at least in the eyes of gamers.

The questions *To what extent does school prepare a person to be involved in their society as an adult? (9)* and *To what extent do electronic games teach skills?* (5) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.3.

**Table 5. 3: Correlation Adult World and Teaching skills**

| Correlation Adult World and Teaching skills |
|---|
| R = 0,05 |
| n = 243 |
| p = 0,456 |

The value of the correlation, R is 0,05 which can be considered a weak correlation. The p value is 0,456 which means that the correlation is not statistically significant. Adult and Teaching skills are not statistically significantly correlated (r=0,05; p=0,456).

According to phenomenological respondent 3, an information technology course provider, if education refers to thinking skills, then some strategy games might improve problem-solving skills. The school system should respond by looking at the elements of successful computer games and see to what extent they are positive to learning and incorporate those into the current school system.

Phenomenological respondent 4, a high school information technology educator, feels there are subjects where playing computer games helps, such as information technology. This is a subject where logically thinking is a great asset. There are numerous logic-based games that will help the learner acquire this skill. The biggest hindrance in my opinion is that gaming takes so much time. Playing computer games takes hours and there is no set time limit to a game, whereas, with sport and other activities there is usually a set time. You cannot simply stop a computer game and continue later.

In that education is relational, it is important "that we as educators identify with the children and take an interest in what they are passionate about so that we can use it to help them learn," phenomenological respondent 4 suggests. There should be a games club at each school, the respondent suggests. This discussion re-enforced recommendations 5.10.1 and 5.10.2

The questions *To what extent does school prepare a person to be involved in their society as an adult? (9)* and *To what extent does the playing of games prepare gamers for their lives?* (12) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.4 Correlation Adult and Prepare.

**Table 5. 4: Correlation Adult world and Preparedness**

| Correlation Adult world and Preparedness |
|---|
| R = 0,09 |
| n = 247 |
| p = 0,142 |

The value of R is 0,09 which can be considered a weak correlation. The p value is 0,142 which means that the correlation is not statistically significant. So, Adult and Prepare are not statistically significantly correlated (r=0,09; p=0,142). Taking tables 5.1 and 5.2 together, the suggestion is that respondents are not looking back at their schooling and seeing strong links between school and gaming behaviour. The

correlations highlight the need to have followed a realist research philosophy (Saunders *et al*.; 2009) in that there are social forces and processes affecting people, without people necessarily being aware of such influences on themselves. Thus, it is important to understand people's socially-constructed, subjective, reality.

Shapiro (2014) sees little distinction between gaming and other favourable activities in terms of benefits to people.

"*Compared with factors shown to have robust and enduring effects on child well-being such as family functioning, social dynamics at school, and material deprivations, the influences of electronic gaming, for good or ill, are not practically significant,*" Shapiro (2014, p 1).

These sentiments give rise to question 12 *To what extent does the playing of games prepare gamers for their lives?* Figure 4.12 offers the data. The more hours respondents play games a week, and the more years respondents have played games, the more they feel that games prepare them for life, compared to respondents who record no hours of play a week and no years of play. The questions *To what extent does the playing of games prepare gamers for their lives?* (12) and *To what extent do electronic games teach skills?* (5) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.5 below.

**Table 5. 5: Correlation Preparedness and Teaching skills**

| Correlation Preparedness and Teaching skills |
|---|
| R = 0,53 |
| n = 242 |
| p = 0,000 |

The value of R is 0,53 which can be considered a strong correlation. The p value is 0,000 which means that the correlation is statistically significant. Prepare and Teaching skills are statistically significantly correlated at the 1% level (r=0,53; p=0,000). The correlation reading demonstrates that gamers believe the games prepare them for life and teaches them skills, much more than their schooling did. Put

another way, gamers base their existence and success on their engagement with virtual reality. Educators dealing with gaming parents may not share the same reality as gaming parents. They can be living in different worlds.

The debate on the purpose of education in school and other institutions takes place between two extremes. On the one hand, an argument is made that education should produce democratic citizens, learning by themselves and questioning authority (Chomsky, 2013). Alternatively, Besson, Huber, Mompoint-Gaillard and Rohmann (2015) and Peterson (2009) state that the purpose of education is preparation for the labour market. Question 10 asks *To what extent does school prepare a person for employment?* Data in Figure 4.10 shows that respondents who play games for more than 11 hours a week and have been playing for more than 11 years return the lowest averages. These two demographic groups feel least strongly that school has prepared them for employment. However, if a person plays games for 11 hours a week, it is probably difficult to focus on a meaningful occupation. Educators and students think more strongly than other respondents that school prepares a person for employment. This discussion helps shape Recommendation 5.10.7.

### 5.3.2 Gaming in the classroom

At issue, for parents, educators, gamers and non-gamers is if the playing of electronic games should be encouraged in classrooms. There are arguments for and against this. Question 11 asks *To what extent should electronic games be used in a classroom?* Figure 4.11 reveals that respondents who game the most during a week and over the years are the most in favour of games being used in a classroom. Educators are more in favour of games being used in a classroom than students. Games are used by corporations, governments, militaries and political groups to express ideas and teach facts, principles, and world views (Shaffer *et al*., 2005). “Schools and school systems must soon follow suit or risk being swept aside,” Shaffer *et al*. (2005, p 1) say. Political leadership of schools, school leadership and educators would be wise to heed their advice. Certainly, educators are in favour of introducing games into the classroom, as the data shows.

The questions *To what extent should electronic games be used in a classroom?* (11) and *To what extent are/were/would you be interested in your child's school?* (25) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.6 Correlation and Interested.

**Table 5. 6: Correlation Classroom and Interested**

| Correlation Classroom and Interested |
|---|
| R = -0,11 |
| n = 234 |
| p = 0,104 |

The value of R is -0,11 which can be considered a relatively weak correlation. The p value is 0,104 which means that the correlation is not statistically significant. Classroom and Interested are not statistically significantly correlated (r=-0,11; p=0,104). This correlation suggests that support for games in the classroom from gamers emanates from their gaming patterns and not because of their lack of interest in school. The point can be put this way: because of gaming they are not interested in what happens at schools their children attend. Gamers, however, would like to see games used more widely in classrooms. The qualitative respondents reflected upon this point.

Phenomenological respondent 2, an information technology facilitator, points out that many learners complain that there is nobody to teach them in the online information technology course he facilitates. He, however, directs their minds to the computer games that they play. He points out that there is no person to help them find their way through the games, so actually they are self-taught. Further, the students have to persevere in mastering the game. The respondent acclaims the qualities of being self-taught and perseverance. In the information technology lessons, learners sign onto a course website and work through course content. It is a largely self-taught course.

Phenomenological respondent 5, a Master's student in computer science, claims educational games obviously help education. Games can teach a wide variety of academic skills: maths, science and reading. Accidental learning takes place.

Phenomenological respondent 6, an applications developer points out:

*"I think that games have a role to play in education. Games are a lot more engaging than educators, so finding ways to teach by play will help motivate kids to learn. Taking part in your own learning (constructing your understanding of the subject). This is easily accomplished through games."*

The respondent says gaming has some positive effects on the brain such as the improvement of visual ability, motor skills and brain growth. Schools should keep an open mind in regards to gaming. The use of games as a teaching aid will not replace educators, but rather help them keep learners interested and help clarify concepts that are otherwise hard to explain.

Phenomenological respondent 7, a high school educator with a gaming son, believes selected games have to be brought into the school curricula. In a subject called gaming studies, a game will be selected each year, much like an English text book will be selected. Lessons will then be based on the game in the fields of history, English, science, business learning, research, costs, marketing, entrepreneurship, job creation, cultural and media studies, art and design classes and for software programme lessons. Aspects of sociology can be brought in. Gaming studies is made indispensable because gaming is such fun and school is not. Schools have to catch up, the respondent says.

Learning with computer games is consistent with constructivist theories of learning which emphasises learning as an active process in which learners construct new ideas or concepts based upon their current/past knowledge and where learning is individualised according to characteristics of the player (Boyle & Connolly, 2011). School leadership should not lose sight of this point. The quantitative and qualitative data gives rise to Recommendation 5.10.3 to curriculum designers and educators.

### 5.3.3 Gaming and reading

Chomsky (2013) says teaching should inspire students to discover on their own and to challenge if they don't agree. For this to happen, students need to read. Reading is explored in the literature (McCauley, 2011; Lenhart, Kahne, Middaugh, Macgill, Evans & Vitak, 2008). The points raised give rise to question 13 *To what extent do you read books/novels/magazines/newspapers/websites?* Figure 4.13 shows that respondents who do not play games during the week, and who have never played games, tend to read more than respondents who do game.

### 5.3.4 Being bored

The reality of boredom at school has been blamed for many ills of education (Schunk, Pintrich & Meece, 2014; Morin, 2016). Schunk, Pintrich and Meece (2014) say the perception by many students that school learning is meaningless, not important or not connected with their goals and interests and not valuable in their lives, contributes to boredom (Morin, 2016; Paton 2009). Gaming is fun and can help avoid frustration and boredom (McCauley, 2011; Gros, 2003).

Question 14 asks *To what extent was school boring?* Figure 4.14 shows that the more respondents game during the week and the more years for which respondents have gamed, the more school is boring for them. Students also register their boredom with school. Phenomenological respondent 3, who is an information technology course provider for high school learners who studied information technology, says:

> *"If education meant remembering, then I suspect that computer games might reduce learner's remembering in traditional classrooms because, by comparison, remembering dry academic stuff is so very boring compared to the interactive, real-time nature of a computer game."*

The questions *To what extent do you read?* (13) and *To what extent was school boring*? (14) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation. The outcome is shown in Table 5.7 Correlation Read and Boring.

**Table 5. 7: Correlation Reading and Boring**

| Correlations Reading and Boring |
|---|
| R = -0,07 |
| n = 244 |
| p = 0,244 |

The value of R is -0,07 which can be considered a weak correlation. The p value is 0,244 which means that the correlation is not statistically significant. Read and Boring are not statistically significantly correlated (r=-0,07; p=0,244). If the weak interest in reading as shown by gaming parents could have been traced to being bored at school, the problem could have been addressed more easily. However, the data suggests the fact that gamers do not read cannot be attributed to their school years possibly being boring, so must be attributed to their finding playing games more interesting than reading.

### 5.3.5 Money spend on education

The study takes place within the context of South African society and education systems. The issue of taxation is purposely added to the context. This discussion gives rise to question 15 *To what extent is tax money spent on school education well spent?* Data in Figure 4.15 shows that the fewer hours respondents play games a week, the more inclined they are to consider taxes spent on education well spent. Similarly, respondents who have never played games consider the education spend more highly than respondents who have played games. Learners value the education spend more highly the people not employed in education and educators.

The questions *To what extent is tax money spent on school education well spent?* (15) and *To what extent do you accept the authority of a school?* (17) are subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.8 Correlation Authority and Tax.

**Table 5. 8: Correlation Authority and Tax**

| Correlation Authority and Tax |
|---|
| R = 0,19 |
| n = 243 |
| p = 0,003 |

The value of R is 0,19 which can be considered a relatively weak correlation. The p value is 0,003 which means that the correlation is statistically significant. Authority and Tax are statistically significantly correlated at the 1% level (r=0,19; p=0,003).

## 5.4 GAMING AND EDUCATORS

Educators are, and have always been, the single most important element of the education system Spaull (2014) writes. The quality of a country's educators is intimately related with the quality of its education system, learner learning and learner achievement (Spaull, 2014) and perceptions of school. Given that teaching is so complicated, educators cannot merely apply what they have learnt (Rossouw, 2009). Through reflecting on what they do, educators can become more professional, more interested in pedagogical aspects of education and more motivated to integrate their research and teaching interests. The sentiments give rise to question 16 *To what extent do educators think about and thus improve what they do in a classroom?* Data from Figure 4.16 shows that respondents who do not play games during the week and who have never played games feel marginally stronger that educators think about and thus improve what they do in a classroom. The data suggests that gamers will always be less receptive of steps educators take to stay current and good at their calling. The fact that gamers are less receptive must also be remembered when the efficacy of recommendations made in the next chapter is considered. Educators emerge in Figure 4.6 as being the demographic group most dedicated to lifelong learning, which is encouraging.

The questions *To what extent do educators think about and thus improve what they do in a classroom?* (16) and *To what extent does school prepare a person for employment?* (10) are subjected to a Pearson product moment correlation. Only the

data supplied by gaming respondents is used for this computation, shown in Table 5.9 Correlation Improve and Employment.

**Table 5. 9: Correlation Improve and Employability**

| Correlation Improve and Employability |
|---|
| R = 0,35 |
| n = 244 |
| p = 0,000 |

The value of R is 0,35 which can be considered a moderately strong correlation. The p value is 0,000 which means that the correlation is statistically significant. Improve and Employment are statistically significantly correlated at the 1% level (r=0,35; p=0,000). The data suggests that respondents do believe the contribution educators make does have a beneficial outcome on learners' employment prospects; and by extension job creation. This discussion helped shape Recommendation 5.10.7.

### 5.4.1 Education norms

Creating norms and taboos that benefit a social community is the very work of civilization (Shapiro, 2014). Norms are the way we do things around here (Business dictionary, 2016; Shapiro, 2014; Paton, 2009). Norms give a school, and people in charge of a school, authority (Parrish, Smith Frederick & Williams, 1933). This discussion gives rise to question 17 which asks *To what extent do you accept the authority of a school?* Data in Figure 4.17 shows clearly that the more hours a week respondents play games, and for the more years they have played games, the less they accept the authority of the school. Increasingly, gamers hold less and less regard for the authority of a school. This data re-enforces that claim that parents growing up in a digital society expect immediate results and have less tolerance for passive situations, lectures, corporate classrooms and traditional meetings. The digital generation expect an immediate response to their each and every action (Butler, 2015; Rapeepisarn, Wong, Fung & Khine, 2008; Gros, 2003; Ahmada & Jaafarb, 2012; McClarty *et al.,* 2012; McCauley, 2011; Killen, 2011; French, 2010; Hong, Cheng, Hwang, Lee & Chang, 2009; Gros, 2003; Rheeders, 2014). These are the parents that

await educators going forward. Educators should be mindful of these points when dealing with gaming parents. The claim is made that the digital generation learn more outside of school than inside their classrooms (Besson *et al*. 2015; Boyle & Hibberd, 2005; Moursund, 2007; Shaffer *et al*., 2005). Educators will be facing this challenge going forward.

### 5.4.2 Respect

Every student and educator deserve to be treated with respect (Burke Guild, 2001). Learners need to be appreciated and to be acknowledged, which instils in them the feeling of being important and being good enough. Moursund (2007) believes students ask: do I feel respected by the educator in this class? The notion of respect gives rise to two questions. Question 18 asks *To what extent do you respect gamers?* Figure 4.18 shows that the more respondents play games and the longer they have played games for, the more they respect gamers. The eldest group of respondents, 41 years plus, have little respect for gamers, along with respondents who do not play and educators do not display much respect for gamers.

Question 19 asks *To what extent were you respected at school?* Figure 4.19 shows that looking back, the more years respondents have played games, the less they recall being respected at school. Educators felt respected at school. The question: To *what extent were you respected at school?* (19) is subjected to a regression analysis as the independent variable with the question: To *what extent did you/do you/would you have time to spend attending functions at your child's such as braais, parent's evenings and sports fixtures?* (32) as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.10.

**Table 5. 10: Regression - Were respected and Time attend**

| Regression Were respected and Time attend | |
|---|---|
| R Square | 0,0003 |
| Observations | 142 |

The regression is weak and suggests that gamers' non-attendance at social functions cannot be traced back to the degree of respect they enjoyed or did not enjoy at school. Had that been the case, ameliorating the problems could have been easier. Their non-attendance can be attributed only to their playing of games.

The question 19 *To what extent were you respected at school?* is subjected as the independent variable to a regression analysis with question 31 *To what extent did you/do you/would you have time to spend helping your child with their school work?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.11.

**Table 5. 11: Regression - Were respected and Time help**

| Regression Were respected and Time help | |
|---|---|
| R Square | 0,001 |
| Observations | 142 |

This was a very weak regression. The result suggests that any reluctance gaming parents may have towards helping their children with school work does not stem from the way they were treated at school.

The question: To *what extent were you respected at school?* (19) is subjected as the independent variable to a regression analysis with question 23 *How comfortable did you/do you/would you feel involving yourself in your child's schooling?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.12.

**Table 5. 12: Regression Were respected and Comfortable**

| Regression Were respected and comfortable | |
|---|---|
| R Square | 0,002 |
| Observations | 142 |

This is a weak regression. The result suggests that the degree of respect gaming parents enjoyed or did not enjoy at school has minimal bearing on how comfortable they feel involving themselves in their child's schooling.

The question 19 *To what extent were you respected at school*? is subjected to a regression analysis as the independent variable with question 7 *To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation shown in Table 5.13.

**Table 5. 13: Regression Were respected and Decisions**

| Regression Were respected and Decisions | |
|---|---|
| R Square | 0,0002 |
| Observations | 142 |

This is a very weak regression which highlights the fact that gamers do not attribute how they conduct themselves as parents to how they were treated at school.

The low regression scores offered shows that gamers do not point to their school days and a possible lack of respect there to their not having time to attend school functions or help with school work. Gamers also do not blame how they were treated at school for their not being comfortable nor involving themselves in contemporary school decisions. The sentiments and practices relating to time, comfort and involvement in decisions that gamers hold are caused only by the fact that gamers spend so much time gaming. Were the roots to such behaviour located in gamers' own schooling, the matter could have been addressed, going forward. Educators thus face problems with gaming parents that the educators did not have a hand in making.

To function in the digital age, people need a learning space that allows for critical analysis and for learners to approach the changing sources of knowledge and multiple places of information with confidence and curiosity (Besson *et al.* 2015). This gives rise to question 20 *To what extent are you curious about the world?* Figure 4.20 shows

that respondents who do not play games during the week are noticeably more curious about the world than respondents who play games. Initially, respondents who have never played games are noticeably more curious about the world than respondents who have gamed. Children of parents who are not curious about the world can be at a distinct disadvantage in knowledge acquisition. This helps shape recommendations 5.10.5 and 5.10.6.

## 5.5 GAMING AND PARENTS

The study is centred on the gaming behaviour of parents and their interaction with schools.

### 5.5.1 Parental responsibility

Education is a shared responsibility of all role players, be they educators, parents, guardians, education managers, peers, representatives of civil society and learners themselves (Besson *et al*. 2015; Lemmer & Van Wyk, 2015; Carl, 2014). At issue, however, is the attitude of parents. Lemmer and Van Wyk (2015) are of the opinion that learners succeed in school and life, and stay in school longer, when schools work together with families to support learning, and parents are involved in their children's education. Children are influenced by their parents' attitudes and beliefs, so will benefit if their parents have a positive approach towards learning and education (Maughan, 2016). This point gives rise to question 22 *To what extent are you positive about school education?* Figure 4.22 shows that respondents who do not play games during the week, and have never played games, are more positive about school education compared to gamers. The data links the attitude of gamers directly to school education. The lesson for school leadership and educators is that as more and more parents play games, so will parents be less positive towards school education. This is very real challenge facing the future of schools. The questions *to what extent does the playing of games prepare gamers for their lives?* (12) and question 22 *To what extent are you positive about school education?* is subjected to a Pearson product moment correlation. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.14.

**Table 5. 14: Correlation Preparedness and Positive**

| Correlation Preparedness and Positive |
|---|
| R = 0,07 |
| n = 242 |
| p = 0,292 |

The value of R is 0,07 which can be considered a weak correlation. The p value is 0,292 which means that the correlation is not statistically significant. Prepare and Positive are not statistically significantly correlated (r=0,07; p=0,292). The attitude of gaming parents towards games is fuelled by their love for gaming and behaviour and not by their recollections and expectations of school.

Question 23 asks *How comfortable did you/do you/would you feel involving yourself in your child's schooling?* Figure 4.23 shows that the more respondents play games a week, the less comfortable they are in involving themselves in their child's school. The number of years respondents have played for does not have a noticeable effect on the data. The question is important given that parents' sense of inferiority to educators, negative attitudes towards the school, inadequate knowledge and skills, economic status, demographic factors as well as educators' negative actions and attitudes also precludes parents' propensity to be involved in school matters (Okeke, 2014).

The data offered by qualitative respondents to trend 3 is relevant.

Trend 3 Being involved in addressing problems at the school their child attends and feeling comfortable in involving themselves at their child's school.

The data shows that the more hours respondents gamed a week, and the more years respondents have gamed, the less inclined they are to be involved in addressing problems at their child's school. Similarly, the data shows that the more respondents played games a week, and the more years they have played games, the less comfortable they are in involving themselves in their child's school.

According to qualitative respondent 1 the tragedy is the lack of religious teaching. Parents and educators need to practise meditation, living in the here and now so the balance may be restored in their lives, that of their children and their community.

Qualitative respondent 2 believes that if a problem is of a serious nature, gaming parent will make time to see the educator. Gaming parents may expect their children to sort things out for themselves, which is not necessarily a bad thing.

Qualitative respondent 4 feels gamers who were not comfortable at school as children probably will not have gotten over their uncomfortable feelings as adults. “Bad memories. Supressed trauma in the school environment instead of nostalgic feelings of people who enjoyed school. That correlates with the number of hours played and the hardcore gamers are definitely the people with the worse memories of school.” The only option for educators is to help parents understand they do not have to deal with school any more. They only have to help their children get through it.

Qualitative respondent 5 feels that people who are not prepared to live up to the realities of having a child such as fighting for what they think is right at their school or addressing their problems, should not have children.

Qualitative respondent 6 believes educators will need to become familiar with gaming trends in order to develop relationships with gaming parents and encourage them to be more comfortable around educators.

Qualitative respondent 7 predicts problems if parents do not feel comfortable around the educators. There are times when parents and educators need to speak.

According to qualitative respondent 8 educators believe that if school problems lie with a child’s academic endeavours or behaviour, then the parent has a responsibility to see that the child’s welfare is addressed.

Qualitative respondent 9 insists educators have to see gaming is an addiction and need to understand how such mind work.

Question 24 asks *To what extent did/do/would you work with educators at your child's school?* The question upholds the sentiment that parental responsibility includes consistent communication with educators about learner's progress and achievement and collaboration with the school community (Okeke, 2014). Data in Figure 4.24 shows that the more hours a week respondents spend playing games, the less they will work with educators at their child's school. Similarly, the more years that respondents have gamed, the less inclined they are to work with educators.

Question 28 *To what extent are you in control of your life?* is subjected to a regression analysis as the independent variable with the question 24 *To what extent did/do/would you work with educators at your child's school?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.15.

**Table 5. 15: Regression Control and Teachers**

| Regression Control and Teachers | |
|---|---|
| R Square | 0,022 |
| Observations | 142 |

This is a weak regression. Gamers do not see themselves in control of their lives to the extent that other respondents do, but control of their lives has little bearing on their propensity to work with educators. The sentiment of working with educators is driven by gaming behaviour, not feelings of being in control or not of one's life. The response of the qualitative respondents to trend 2 is relevant.

Trend 2 Working with educators at their child's school and being interested in their school.

The data shows that the more hours a week respondents spend playing games, and the more years respondents have gamed, the less inclined they are to work with educators. Similarly, the data shows that the more hours a respondent game a week,

and the more years they have gamed, the less interested they are in their child's school.

Qualitative respondent 1 feels this demonstrates the fact that parents ask educators and schools: what do we pay you for?

Qualitative respondent 2 holds the view that the parents pay school fees and it is the job of the educators to ensure that the children are being educated. Educators who get no support from parents find it very difficult to motivate children as they have adopted their parents' attitude towards school. Offering positive reinforcement is probably the only option an educator has under these circumstances.

According to qualitative respondent 3, education is a 3-way partnership of parent, learner and educator, and to have the parent missing from the equation can be problematic. Educators should nevertheless involve absent parents more in the education of their children. Online parents are probably more likely to respond to online approaches about their absence from school events

Qualitative respondent 4 notes that parents like to shout at educators. Defiant parents blame teachers. Educators should be transparent and communicate with parents more in channels that work for the educator and the parents.

Qualitative respondent 5 imagines that the children of adults who consider themselves serious gamers are probably the children of parents who did not learn all that much when they were at school.

Qualitative respondent 6 feels educators should develop teaching programmes that spark the interest of learners and their parents.

Qualitative respondent 7 claims learners should do the work themselves and the less parents help their children the better.

Qualitative respondent 8 points out that if a parent does not show interest in the child's school it is indicative of a parent not being interested in their child.

Qualitative respondent 9 says educators had to engage absent parents and show them why it is important to be more involved at the school their child attends.

The question (28) *To what extent are you in control of your life?* is subjected to a regression analysis as the independent variable with the question 8 To *what extent did you/do you/would you be involved in addressing problems at the school your child attended?* as the dependent variable. Only the data supplied by gaming respondents is used for this computation, shown in Table 5.16.

**Table 5. 16: Regression Control and Addressing problems**

| Regression Control and Address | |
|---|---|
| R Square | 0,029 |
| observations | 142 |

This is a weak regression. The regression posits that the extent to which gaming parents feel they are in control of their lives, or not in control of their lives, has no bearing on the extent to which they wish to address problems at their child's school. The attitude of gaming parents to addressing, or not addressing, problems stems from their gaming habits, not from the control they may or may not have of their lives. A point made by Ensslin (2012) is apt: video games are neither good nor bad all by themselves and context is paramount. As such, the greatest threat from computer games is not their tendency to arouse aggression but in the lack of mental stimulation they provide (Matthews, 2001).

### 5.5.2 Gaming, democracy and parents

This section reflects upon the impact gaming has on the behaviour of parents and the parents' interaction with schools. The propensity of parents to act as democratic citizens, think critically and engage with social ills is also considered.

#### 5.5.2.1 Responsible citizens

Figure 4.21 reports on the question 21 *To what extent are you a responsible person?* The data shows that respondents who do not game consider themselves more responsible than respondents who do. Likewise, respondents who have never gamed consider themselves more responsible than respondents who do. This has bearing for educators. The statement can be made that parents who game is not as responsible as parents who do not game, and the parents know this about themselves. Further, given that gaming is growing in popularity, and not to mention that parents are encouraged to game with their children, going forward educators can expect to be dealing with more and more parents who are less responsible than the situation before them might call for. As Hurst (2016) notes, as adults interact with children, they show the meanings they attach to objects, events and experiences (Moursund, 2007). Gaming parents are going to lead their children into gaming.

The discussion on stimulating a brain and the production of chemicals gives rise to question 28 Control *To what extent are you in control of your life?* The data is reflected in Figure 4.28. Of significance is that respondents who do not game, either by hours or years, feel more in control of their lives than gamers. This raises the question on if respondents are not in control of their lives, so game, of if gaming renders the respondents to be not in control of their lives. More importantly, the data is an alert to educators to be aware that when they interact with parents who game, the parents may not be in control of their lives as they might need to be when dealing with difficult situations. The question is linked to question 30 *To what extent can gamers immediately resume normal, satisfactory human interaction after playing?* The data in Figure 4.30 shows that the more hours gamers play a week, the more they feel they can resume their normal lives after stepping away from their keyboards. Likewise, the more years gamers have been playing, the more they feel they can resume their normal lives straight from their keyboards. The data suggests that gamers see no problem in their moving from keyboard to normal interaction. Respondents who do not game are not as convinced. Non-gaming respondents endorse cautions by Olivier (2000) and (Boyle & Hibberd, 2005) that emotional frames of mind, violent and otherwise, stay as lingering sentiments within some gamers after they have powered down their keyboards to resume normal life. Phenomenological respondent 1, a

female science educator, insists that gamers need at least an hour for their brains to return to normal after playing. Educators would be advised to know that the parents discussing matters with them can be re-playing their last computer game in their mind.

Democracy requires a learning community of inquirers who develop a caring and reasonable interconnectedness with others and dynamic peer co-operation (Amasa & Mathebula, 2011). Such a community will be social, affective and creative. At the same time, Amasa and Mathebula (2011) caution against an education system that fashions citizens into a flock of sheep offering unquestioning obedience and who are inactive, obedient and passive. Question 26 asks *How prepared would you be to support an online campaign about an education issue?* Data in Figure 4.33 shows that gamers are not keyboard warriors, ready to take up causes through their keyboards. Respondents who do not play games in a week and have never played games are more inclined to take up causes on their keyboards.

Question 27 asks *How prepared would you be to join a parents' street protest about an education issue?* Data in Figure 4.27 shows that the more hours a respondent games a week, and the more years they have gamed, the less inclined they are to leave their keyboards and take part in a street protest. Educators are more inclined to protest in the street than students. Going forward, school leadership and educators need not brace themselves for militant parents. Questions 27 and 28 can be taken as further evidence of the puissant nature of gaming parents. Vital issues can be left unchallenged, simply because the parents are too busy gaming. The unprecedented interconnectedness of citizens brought about by the digital era that is foreseen by Besson, Huber, Mompoint-Gaillard and Rohmann (2015) has not materialised; at least when it comes to citizens standing together to confront an education problem. The notion of massively multiplayer online games where thousands of players work together is not transferred to the school environment.

### 5.5.3 Gaming concerns

The vast amount of the literature material on gaming means that endorsement can be found for all points of view. Matthews and Coyle (2010) and Griffiths (2002) claim that

games raise players' self-esteem and teach gamers about impulse control. Figure 4.29 offers data for question 29 *To what extent do you speak or act before you think?* The data shows that respondents who do not game and have never gamed judge themselves as having slightly more self-control than respondents who do and have gamed. Non-gaming respondents think they thought before they spoke or acted. Educators should know, therefore, that when dealing with gaming parents, they are dealing with parents who speak in an unguarded way. Unguarded communication can be good and not good. This question is linked to a question on maturity. Question 2 asks *To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?* The intention of the question is to show that mature respondents think about their experiences and attempt to secure a better outcome the next time they face a similar situation. Figure 4.2 reflects the data. Respondents who do not game during the week judge themselves to be noticeably more mature than respondents who do game during the week. Likewise, respondents who have never gamed rate themselves as more mature than respondents who have gamed. Again, this is important for educators. When dealing with parents who game, educators are dealing with parents who perceive themselves to be less mature that other parents. Further, gamers might not judge themselves as mature and confident as non-gaming respondents, but they have faith in what they do – gaming – and they believe that gaming prepares them for their lives.

### 5.5.4 Time

Gamers spend a substantial amount of time playing games (Boyle & Connolly, 2011; Moursund, 2007) which can diminish their being responsible adults. Figure 4.31 reports on the question 31 *To what extent did you/do you/would you have time to spend helping your child with their school work?* The question was recognised in the factor analysis calculation as forming part of the hegemonic factor. The data shows that the more hours a respondent plays games a week, the less inclined they are to help their children with their school work. Similarly, the more years respondents have gamed, the less inclined they are to help their children with their schoolwork. Given the rising popularly of gaming, this trend is perilous for school leadership and educators. Left unchecked, more and more learners in school will have parents who

simply do not have the time to help them with their schoolwork because they are too busy gaming. The problem can be worsened if Crawford's (2012) note is always true; namely that people who spend a large amount of time playing video games often have low self-esteem, consume alcohol and ignore their family, which is anti-social activity. Phenomenological respondent 5 says the only way gaming can impede education is through wasting of a student's time.

Question 32 asked *To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parents' evenings and sports fixtures?* The factor analysis calculation reveals that this is the hegemonic question of the study. Figure 4.32 shows that the more hours week respondents play games, the less time they have to attend the social aspects of a school; the braais, the parents' evenings and sports fixtures. Similarly, the more years respondents have been gaming, the less time they have to attend the social aspects. Parental participation is a combination of supporting student academic achievement and participating in school-initiated functions (Okeke, 2014). School-initiated functions can be seen as a gathering for the purpose of promoting fellowship (Vocabuary.com, 2017). The data show that gamers are not honouring the sentiments offered by Okeke (2014) and Vocabuary.com (2017).

The sentiments around the questions are addressed by the qualitative respondents in their response to Trend 1 Time to attend social functions and help their children with school work. The data shows that the more hours week respondents play games, and the more years respondents have played games, the less time they have to attend the social aspects of a school such as the braais, the parents' evenings and sports fixtures. Similarly, the more hours a respondent play games a week, and the more years they have gamed, the less inclined they are to help their children with their school work.

Qualitative respondent 1 says parents are just too busy and are caught up in the stresses of the changing world environment, ideologies and crisis. So often not having time for the child, or helping their children, is compensated with a cell phone, games or electronics, thus creating in the children this continuous absence from the other.

Qualitative respondent 2 points out that the attitudes of parents toward the academic life of children are usually adopted by those children. Many of the children of gaming parents will not take an interest in extra mural activities at the school. Homework is done as quickly as possible without paying much attention to presentation or whether it is correct.

Qualitative respondent 3 points out that people have a certain amount of time in which to complete the chores of life. If time is taken up by their virtual lives, they will have less time for voluntary school-based activities. Educators should be alert to possible parental neglect. However, minimal parent involvement with the school does not automatically indicate poor parenting.

Qualitative respondent 4 Children whose parents are disinterested in school in general will end up as parents who are disinterested in school in general. Generally, learners who are involved in extra activities have parents who get involved in school activities.

Qualitative respondent 5 sees a school community as vital. Parents do not attend school events isolate themselves from other parents and this will negatively impact their children.

Qualitative respondent 6 says educators should to incorporate gaming into their teaching plan; thus, allowing their students as well as their parents, to satisfy their desire for gaming as well as ensuring that some form of work gets done.

Qualitative respondent 7 stated that there are so many reasons why parents do not attend social functions, but actually there is no reason why parents should attend. It is a school, not a social club.

Qualitative respondent 8 says some learners would be pained to take part in social functions, but such everts are important for team-building and to get to know people. Gaming is an escape mechanism for parents who are naturally introverted and despise attending functions that force them to interact and communicate with people they would not naturally interact with. Insofar as gaming prevents parents from helping their

children with school work, it depends on the age of the school child. Primary school parents could need to assist their children in mastering the basics, but I do not think parents should assist their children with high school work. That defeats the purpose of teaching them independence, a skill greatly needed for children going into tertiary education.

Qualitative respondent 9 wants parents to socialize at braais and to know what their children are doing at school. Educators should grasp the concept that a lot of gamers are generally introverts and that computer gaming actually helps introverts communicate. Educators need to understand how to include introverts in school life.

### 5.5.5 Social ills (unemployement)

One of the sentiments informing this study is that education should develop a person's social consciousness and social critique. Social consciousness can be expressed in the desire to address the social ill of unemployment. Social critique can be expressed as the desire to engage in critical thinking. The literature explores the links between improving technology and job losses (Miller, 2016; Iwasaki, 2013; Washington, 2011). Playing computer games on technologically advanced platforms manifests the interplay between technology and job losses. Gaming has to be read in the context of improving technology and job losses. The discussion gives rise to question 33 *To what extent are you interested in creating jobs for other people?* Figure 4.33 shows that respondents who play games for three hours or less a week, and have played for five years or less, are interested in creating employment. Gamers who have played for 11 years plus are less interested in creating jobs than respondents who have never gamed. Students are interested in creating employment.

The data suggests what can now be considered obvious: people who play games over a long period of time are not entrepreneurial. However, the very input into job losses – technology - is what sustains them every day. This is something of a dialectical dependency.

Question 33 *To what extent are you interested in creating jobs for other people* is subject to a regression analysis as the independent variable with Question 9 *To what extent does school prepare a person to be involved in their society as an adult?* as the dependent variable. The data from all respondents is included in this computation, not just data from gaming respondents, shown in Table 5.17 Regression Creating and Adult.

**Table 5. 17: Regression Creating jobs and Adult world**

| Regression Creating jobs and Adult world | |
|---|---|
| R Square | 0,003 |
| Observations | 248 |

This is a weak regression. Respondents do not link their propensity to create jobs to the degree or otherwise that they deem school prepared them for their lives. The significance of this is that the lack of entrepreneurial interest displayed by gamers and non-gamers lies more in their outside school experiences, including gaming, than school.

### 5.5.6 Critical thinking

To change the trend of job loss and to address other social ills, a measure of critical thinking in required. The National Curriculum Statement (2011) directs that schools should encourage an active and critical approach to learning, rather than rote and uncritical learning of given truths (Foundation for Critical Thinking, 2013). The discussion gives rise to question 34 *To what extent do you question the world?* Data in Figure 4.34 shows that respondents who do not play games during the week are more inclined to question the world than respondents who game during the week. Respondents who have never gamed are also more inclined to question the world than respondents who have played for up to five years. To put the point another way, playing electronic games dulls respondents' propensity to question the world. This is a crucial finding. Gaming respondents as parents are not likely to make great intellectual demands of educators and will not instil in their children a great desire to

question the world. A reduced focus on the world by gaming parents and their children is not good, when judged against any yardstick.

## 5.6 FURTHER PROBLEMS

The hegemonic questions emanating from factor analysis gives rise to two questions put to qualitative respondents. The questions are discussed here.

### 5.6.1 Likely outcome

The question put to qualitative respondents, Question 5 (cf. Appendix 2) is: If the problems listed here, especially the problems of time and interest, are not addressed, what would be the likely outcome?

**Qualitative respondent 1** anticipates that the outcome will be loneliness and seeking comfort in the ills of radicalism, egocentric attitudes, not caring for others, drugs, sex and materialism.

**Qualitative respondent 2** believes the attitudes of children towards their schooling and towards their educators will probably be nonchalant. Hard work and passion will be lacking as school will be seen to be a time to get through to move on with real life. This attitude does not train and prepare children for the hardships that life may bring. A lack of enthusiasm and tenacity prevails and instant gratification is what is expected.

**Qualitative respondent 3** feels the obvious answer is that the child will be less driven to do well at school as the signal from the uninvolved parent will be that school is not of great importance – certainly not as important as getting to the next level of the online empire building. What needs to be remembered, however, is that children are different, families are different and parenting is different. Schools are also different. Some children are capable of more independent work than others.

*"I am not convinced that it is the school's place to insist on a relationship with each parent, unless, there are compelling reasons to do so."*

**Qualitative respondent 4** anticipates the problems will worsen because of less interested parents. Without interested parents it is difficult for schools to function.

**Qualitative respondent 5** feels a lack of action will mean children will become estranged from their parents and feel like their parents don't understand them.

**Qualitative respondent 6:**

*"Parents would be largely uninvolved in the education of their children, which would then have a ripple effect on the education of future generations."*

**Qualitative respondent 7** anticipates problems if more and more parents play games and are less and less inclined to attend to matters at their children's schools. Education is meant to be a partnership. But if parents withdraw the education authorities will have less checks and balance upon them.

*"Frankly, I do not have a high enough opinion of people who manage education at levels higher than mine to believe that they will always make the right decisions. I think people higher than me in the hierarchy, right up to the Minister of Basic Education, need more checks and balances rather than fewer. This trend does worry me. I see no good coming out it."*

**Qualitative respondent 8** claims that parents choosing not to get involved and not to get to know other parents is a choice that will affect the wellbeing of the child. It will have a direct impact on the child's confidence and will set an example for them to follow when they have children of their own. It is downward spiral behaviour. If schools are not well supported, they will not thrive. Without support, especially if gaming is on the increase, they will struggle to maintain a good reputation and will simply exist to go through the motions of educating the child.

*"On the other hand, I am a firm believer that every child is different and there is not one mould/type of school that will fit all."*

The more parents are involved in their children, and ultimately the school their child attends, the more successful the school will be and the more confident the child will be to face the challenges outside of school.

**Qualitative respondent 9:**

*"We would all become little islands and become even more self-absorbed and only living for instant gratification. Children would possibly grow up feeling isolated from parents and think that education isn't that important."*

The data offered by the nine qualitative respondents help shape recommendations 5.10.1 and 5.10.2.

### 5.6.2 Recognise and deal with

Question 6 (cf. Appendix 2) asks respondents: To what extent are school leadership and educators able to recognise and deal with the problems set out in the trends?

According to qualitative respondent 2, recognising the trend is the easy part. Dealing with the trend is not so easy. Educators need to entertain children in the classroom. If their imaginations and interest are not captured by the educator, the education process is not effective.

Qualitative respondent 3 feels if there are clear impediments to progress and there is also minimal parent involvement, the school should make every effort to build a relationship with the parent. Making direct links though between learner performance and parental involvement might prove difficult when moving from generalities to specific children. Much depends on the training and experience of the educators and school leadership. The more experienced and better qualified school leaders are, the better equipped they are to deal with any eventuality that might arise. Much depends on if the school wishes to encourage increased levels of parental participation. Schools have different requirements in this regard and it may not be a one size fits all kind of situation. As long as school fees are up to date and the learner is passing everyone is happy.

Qualitative respondent 4 feels there is no blanket ability that educators and schools have. Some schools have absolutely brilliant minds running them and some do not. This problem needs to be dealt with at national decision-making level and not school level.

Qualitative respondent 5 feels that the management of the school she attended was completely inept and would not have even been able to recognise this problem, let alone address it. There are more female educators than male educators and there are

more male gamers than female gamers so often gaming does not register on educators' radars.

"*If I think of the men I know who are studying to be educators; they are either not interested in gaming or are not intelligent enough to think about what they do or why they are doing it. So, they might notice that parents do not attend events but they would not ask why and would not think to ask how to address it. They would just complain about it.*"

Qualitative respondent 6 suggests that while school leadership and educators should be able to recognise and deal with problems, very few actually do. The bureaucracy of the modern education system makes it very difficult and often times extremely unpleasant to effect any real change.

Qualitative respondent 7 feels that few people in senior positions in schools will recognise the trends and will want to respond. However, a school – by – school response will serve almost no purpose. There needs to be a conference called by the Minister of Basic Education to discuss gaming and school education. "But right now, I do not see that happening. What is reported here will be described as yet another problem facing South African educators."

Qualitative respondent 8 thinks that to a large extent the onus is on the school's leadership. They have a duty to be up to date with new trends in education, but also on how gaming behaviour is impacting and will impact the school and the wider school community. Educators face real challenges with regards to competing with games.

*"Perhaps competing is too generous a word. I don't think we can compete with games, but I do think we can use it alongside more traditional ways of educating to stimulate that need. Gaming is a real, undeniable challenge to education."*

Qualitative respondent 9 feels that schools are ill prepaid, will not recognise the problems nor be able to deal with them.

The data offered by the nine qualitative respondents helps shape recommendations 5.10.1 and 5.10.2.

## 5.7 FURTHER DISCUSSION ON FINDINGS

The discussion on the findings is informed by Table 4.5. The table shows that the average number of hours played a week by the 144 respondents who gamed was to 7.03 hours. The amount of hours spent gaming should be seen in terms of opportunity cost – which means what could the respondents do with these hours a week if they did not spend them gaming? For the 20 respondents who on average played games for 20.92 hours a week, there was not much of the week left over for other pursuits. However, there was little interest among respondents in becoming profession gamers, as shown in Table 4.11. Gaming has to be seen therefore as a form of entertainment firstly and then also a response to other stimuli. The importance of assessing the data of the gaming respondents separately is highlighted by the returns when the data of all respondents was considered in terms of the four DVs that were put forward:

- Effectiveness of the education system
- Parental involvement
- Social interaction
- Psychosocial development

Table 4.13 showed that the respondents were mostly neutral with regard to their view on the effectiveness of the education system (N=107; 43.1%).

Table 4.15 shows that respondents were mostly positive with regard to their view on parental involvement (N=194; 78.2%).

Table 4.17 shows that respondents were mostly positive with regard to view on social interaction (N=200; 80.6%).

Table 4.19 shows that respondents were mostly positive with regard to their view on psychosocial development (N=151; 61.0%). In summary, respondents were mostly positive regarding the 4 DVs except for being neutral regarding the effectiveness of the education system.

The results for the ANOVA tests with regards to the hypotheses put forward show that there is no statistically significant difference regarding participants' opinions with different genders, age groups, gaming behaviour and occupation in terms of the effectiveness of the education system, their parental involvement in schools, their occupation and in terms of their social interaction.

## 5.8 IN SUMMARY AND FINDINGS

The chapter so far interrogated the quantitative and qualitative data and integrated it with literature review material. The main findings can be reported as gamers have less time to spend attending functions at their child's school and less time to their child with school work? Gamers are less inclined to work with educators at their child's school and would be less interested in the school than non-gamers. Gamers will be less involved in addressing problems at their child's school and would feel less comfortable involving themselves in the schooling, than non-gamers. Gamers will be less involved in making decisions about the future of the school their child attends and less inclined to get to know other parents at the school? Further, and crucially, playing electronic games dulls respondents' propensity to question the world. Hence, gaming parents will be less inclined to question the school than non-gaming parents. Stakeholders who have an interest in the findings of this study, to whom recommendations will now be made, are parents who play electronic games, educators, school management, designers of school curricula and the political leadership of school education.

## 5.9 FURTHER DISCUSSION AND RECOMMENDATIONS

This section offers further discussions on research questions and offers recommendations to stakeholders.

### 5.9.1 Gaming

More and more, parents and their children will be gaming in future; and will be encouraged to play electronic games together. This gives rise to Recommendation 5.10.1 to school leadership to bring the attention of problems posed by gaming to the

attention of political leadership, and Recommendation 5.10.2 to political leadership of schools.

### 5.9.2 Gaming and education

Educators have long used various approaches including contemporary media and art to increase engagement and motivation in the classroom (McClarty *et al*., 2012). However, the digital generation learns more outside of school than inside their classrooms (Besson, Huber, Mompoint-Gaillard & Rohmann, 2015). Boyle and Hibberd (2005) point out that governments encourage the development of a creative/knowledge economy that places digital culture at its centre. Governments have attempted to improve their higher education systems (Wildavsky 2010) in a quest to build knowledge-based economies. At issue, however, is how political leadership gets mobilised. The suggestion here is that school leadership and educators, on recognising the problems posed by gaming parents, encourage political leadership of education to acknowledge and address the issues of the digital cultural landscape (Boyle & Hibberd, 2005). These points helped shape recommendations 5.10.1 and 5.10.2 School leadership needs to address the reality that they are in competition with gaming on the core issue of usefulness in people's lives. Political leadership of school education must acknowledge, respond to and thus offer a strategic way forward for school education to respond positively to the increasingly widespread playing of electronic games by parents.

Shaffer *et al*. (2005) are adamant: education has to use electronic games and meaningful activity in virtual worlds as preparation for meaningful activity in the post-industrial, technology-rich, real world. Education systems have to prepare students for contemporary life, given the rapid penetration of increasingly sophisticated technologies into every facet of society (McClarty *et al*., 2012). Schools might not impart adequate preparation for success in life (McClarty *et al*., 2012) so need to correct what they do. Each new type of mass media from books, films, radio, recorded music, television, electronic games and the Internet was praised for its potential benefits and criticised for its potential harms to society and education (Cortes, Alcalde & Camacho, 2010: Moursund, 2007). There has been consistent interest in harnessing

the power of technology to add contemporary relevance and improve instruction, teaching and learning (McClarty *et al.,* 2012; DiPietro *et al*., Black, 2007).

Given the global attraction of electronic games, school leadership and teachers will be wise to begin to, or continue, ways of integrating electronic games into classrooms and learning. Education has always made use of improved technology and so should explore the possibilities opened up by gaming and always improving technology. There are arguments for and against the increased use of games in a classroom. Shaffer *et al*. (2005) point out that video games are not going to replace schools, even in an information age, nor educators and classrooms, but might replace textbooks and laboratories. Games can supplement traditional learning but not replace it (McClarty *et al*., 2012; Wastiau, Kearney & Van den Berghe, 2009). Gaming will not replace educators, but educators can use gaming to their advantage and explore ways to modernise the teaching of some subjects. The closeness between learning, fun and play cannot be challenged (Wagner, 2016; Rapeepisarn, Wong, Fung & Khine, 2008; Connolly, Boyle, MacArthur, Hainey & Boyle, 2012). This gives rise to the extent to which games should be used in a classroom. Given that parents are increasingly gaming, and seeing benefits in doing so, educators will be wise to make use of electronic games in class. Educators will not be replaced by electronic games but can use them to their advantage (Butler, 2015). Success in schools calls for continual re-examination of educators' assumptions, expectations, and biases (Burke Guild, 2001; Jonck, 2016). This discussion gives rise to Recommendation 5.10.3. The point made by Durkin (1995) is relevant: the issue is not to make the games less addictive but how to make other learning experiences, particularly school, more addictive. If gaming parents could feel strongly about one point in the future, it could be that games be introduced in classroom – even if only to making gaming parents feel better about their all-consuming gaming behaviour.

The discussion on the purpose of education gives rise to question 10 *To what extent does school prepare a person for employment?* Data in Figure 4.10 shows that respondents who play games for more than 11 hours a week and have been playing for more than 11 years feel the least strongly that school prepares a person for employment. The data has to be read with the data for question 17 *To what extent do*

*you accept the authority of a school?* Data in Figure 4.17 shows that the more hours a week respondents play games, and the more years they have played games, the less they accept the authority of the school. These are problems confronting educators and school education and reinforce the wariness of gaming parents towards school. The problems could be ameliorated by Recommendation 5.10.3 to educators to make more and better use of electronic games in a classroom, in schools and other forms of education. After all, research should not focus on whether games can be used for learning. Instead research should prioritize how games can best be used for learning (McClarty *et al*., 2012; Bright Media, 2012). Such a step can stimulate the curiosity (question 20) of people who are learning and can help ward off the danger before schools of being swept aside (Shaffer *et al*., 2005). School cannot afford to be seen as irrelevant by some parents and learners (Shaffer *et al.,* 2005) in the ever-changing digital environment (Gros, 2003). Learners grow up with laptops, tablets and cell phones and expect to use such technology in their learning (McClarty *et al*., 2012). A failure to accept this can cast schools as old fashioned and something from the era of grandparents, not even gaming parents. Data from Figure 4.16 shows that educators are more in favour of games being used in a classroom than students, which is encouraging in light of recommendation 5.10.3. Qualitative respondent 9 cautions against children thinking that education is not that important. These are issues that curriculum designers must face up to, as is reflected in Recommendation 5.10.3 School leadership and educators have to recognise that they are in competition in many ways with gaming, especially the core issue of usefulness in people's lives.

The discussion covered the importance of reading, the issue of transferable skills and the very real problem of boredom at school. The problems raised here influenced, and can be ameliorated by, Recommendation 5.10.4 to educators, that they must strive to constantly improve what happens in the classroom, which is discussed next.

### 5.9.3 Gaming and educators

Educators must strive to constantly improve what happens in the classroom, even if they are increasingly alone in seeing value in that. Educators are, and have always been, the single most important element of the education system (Spaull, 2014). The

quality of a country's educators is intimately related with the quality of its education system, learner learning and learner achievement (Spaull, 2014). So, what educators do does matter. There is pressure on educators to improve what they do in a classroom by (Schön, 2009; Rossouw, 2009; Norms and standards for educators, 1998). Hence, Recommendation 5.10.4.

The questions on respect (questions 18 and 19) have great significance. Data in Figure 4.19 shows that looking back, the more years respondents have played games, the less they recall being respected at school. To suggest a recommendation here that educators should respect all people at school is redundant. All people should respect all other people. Every student and educator deserve to be treated with respect (Burke Guild, 2001).

### 5.9.4 Gaming and parents

The literature sets out arguments for and against gaming (University of North Carolina, 2011). Like most technologies before them, computer games can have both positive and negative impacts, Connolly, Boyle, MacArthur, Hainey and Boyle (2012) note (Billieux *et al*., 2015). Lenhart *et al.,* (2008) insist that video games are neither good nor bad all by themselves, they neither lead to violence or peace. They can be and do one thing in one family, social, or cultural context, quite another in other such contexts. So, just as some argument can be used to enhance gaming, so can some argument be used to decry gaming. This leaves parents in the position where they need to display discretion and offer direction to their children, as Amory notes: "It is not the thing, but what you do with it that matters," (Bright Media, 2012, p 1). Addicted gamers spend so much time playing that their personal relationships are neglected and sometimes disappear altogether (University of North Carolina, 2011). Given the cautions raised in the literature, the discussion gives rise to Recommendation 5.10.5 to parents to think about their gaming behaviour, and how their behaviour influences their children and people in their lives. In encouraging parents to play electronic games with their children, Shapiro (2013, p 2) tells parents: "If you're trying to get your kids to give you more than monosyllabic answers and grumpy shrugs, try talking to them about the games they love."

What must be noted is that the Internet allows people to live their online fantasies (French, 2010). Gaming enables gamers to explore, experiment with and take on different identifies, and explore their emotions (McCauley, 2011; Shaffer *et al.,* 2005). Brought together, the material suggests that gaming parents live out their fantasies on line by adopting temporary identities. This point has to be read with question 30 *To what extent can gamers immediately resume normal, satisfactory human interaction after playing?* Data in Figure 4.30 shows that the more hours gamers play a week, the more they feel they can resume their normal lives after stepping away from their keyboards. Likewise, the more years gamers have been playing, the more they feel they can resume their normal lives straight from their keyboards. Educators, however, are not so sure. Educators are left in the position where the gaming parent they are engaging with can be still living a fantasy and pretending to be someone they are not. Again, this makes more vital Recommendation 5.10.4 to educators, that they must strive to constantly improve what happens in the classroom, even if that involves understanding parents better. There are beneficial social aspects to playing games. However, that is social interaction based on a virtual reality. Just because one can be sociable when armed with a delete button does not mean one can deal with people when delete and repeat may not be viable options.

#### 5.9.4.1 Time

Concerns about the amount of time spent playing games, regulating the time and social isolation are raised by Connolly, Boyle, MacArthur, Hainey and Boyle (2012) and Boyle and Connolly (2011). The correlation between game time and poor quality of relationships with peers and parents is raised by Crawford (2012). Question 31 *To what extent did you/do you/would you have time to spend helping your child with their school work?* is a crucial question. The data gives rise to Recommendation 5.10.4 to gaming parents that they must find time to help their children with school work, for the sake of their children and their children's education, even if only to uphold their Constitutional obligations. The recommendation is backed by data for questions 7 *To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?* and question 8 *To what extent did you/do you/would*

*you be involved in addressing problems at the school your child attended?* and question 25 *To what extent are/were/would you be interested in your child's school?*

Education is a shared responsibility of all people active in the facilitation of learning and development, be they educators, parents, guardians, education managers' peers, representatives of civil society and learners themselves (Besson *et al*. 2015; Lemmer & Van Wyk, 2015; Carl, 2014; South African Schools Act, 2009). Lemmer and Van Wyk (2015) are of the opinion that learners succeed in school and life, and stay in school longer, when schools work together with families to support learning, and parents are involved in their children's education. To make a resolution that parents should get to know other parents (question 3), be more positive about school education (question 22) or be more comfortable around educators (question 23) or work with educators (question 24) will simply be wishful thinking. The point is made, however, that parents can instil a love of learning in children (Reed, 2015; Child Development Institute, 2015). What parents do and do not do is instrumental in how their children see school (Okeke, 2014). School-initiated functions can be seen as a gathering for the purpose of promoting fellowship (Vocabuary.com, 2017). Question 32 *To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parents' evenings and sports fixtures?* emerged through factor analysis as the most telling question in the questionnaire. The data in Figure 4.32 reinforces Recommendation 5.10.5 to gaming parents that they must find time to help their children with school work, for the sake of their children and their children's education, even if only to uphold their Constitutional obligations. The caution raised by qualitative respondent 3 has bearing: increasingly schools are operated as for-profit business ventures with owners interested in education in so far as it produces a financial profit. Parents are thus customers. The move towards education for profit is already the reality for 1 098 independent and private schools (Spaull, 2013).

Education has many goals, Moursund (2007) points out, and each person has their own ideas as to what education should mean. This study is founded on the acceptance that education should develop a person's social consciousness and social critique. Social consciousness can be expressed as the desire to address the social ill of unemployment. Social critique can be expressed as the desire to engage in critical

thinking. The social ill of technology-induced unemployment is focussed on. Data in Figure 4.33, in response to question 33 *To what extent are you interested in creating jobs for other people?* shows that prolonged gaming in hours and years dulls any desire to create jobs. This is not unexpected or massively significant. But it does reinforce a downward spiral of life because of technology-induced job loss and the false lure of gaming. There is likewise a downward spiral of life offered by data in Figure 4.34 in response to question 34 *To what extent do you question the world?* The data shows that prolonged gaming in hours and years dulls any desire to question the world. This is not unexpected but could be massively significant. However, given that gaming is becoming increasingly widespread, the two questions combined do present a problem. Going forward, more and more people, especially gaming parents, are going to be less and less interested in creating jobs as entrepreneurs and questioning the world. Both inputs are vital for a better and improving world. This makes the role of educators in a class room significant. Recommendation 5.10.7 to political leadership, school management and educators is that they must never lose sight of the need to encourage entrepreneurship and critical thinking among people in their classes, both at school and other forms of education. The fancifulness and unlikely fruition of this recommendation is accepted. Amasa and Mathebula (2011) caution against an education system that fashions people into a flock of sheep offering unquestioning obedience and who are inactive, obedient and passive. A democratic citizen needs to be active, informed and a critical individual. Gaming parents may not be helping this cause.

Amasa and Mathebula (2011) caution that an education system's inability to develop a person's ability and inclination to act for themselves gives rise to slavish obedience to the state. Talk is fundamental to democratic citizenship. The data in Figure 4.27 Online in answer to question 27 *How prepared would you be to support an online campaign about an education issue?* shows that gamers are not keyboard warriors, ready to take up causes through their keyboards. Data in Figure 4.27 for question 27 *How prepared would you be to join a parents' street protest about an education issue?* shows that gamers are even less likely to leave their keyboards and take part in a street protest. Gaming parents are passive and will probably become increasingly so. This puts educators in the position where increasingly they will be dealing with gaming

parents who do not wish to know each other, and do not wish to involve themselves in any decisive way with education. Educators will be left to be the best they can in such circumstances.

The discussion above gives rise to seven recommendations.

## 5.10 RECOMMENDATIONS

***Recommendation 5.10.1 to school leadership and educators:***

School leadership and educators need to make use of their prevailing channels of communication to bring to the attention of political leadership of education the problems and challenges posed by parents playing electronic games, so that the issue of gaming parents can be address in an integrated, coherent way.

***Recommendation 5.10.2 to political leadership:***

Political leadership of school education must acknowledge, respond to and thus offer a strategic way forward for school education to respond positively to the increasingly widespread playing of electronic games by parents.

***Recommendation 5.10.3 to curriculum designers and educators***:

Curriculum designers and educators must make more and better use of electronic games in a classroom, in school and other forms of education.

***Recommendation 5.10.4 to educators:***

Educators must strive to constantly improve what happens in the classroom and sustain the curiosity of people in the class.

***Recommendation 5.10.5 to gaming parents***

Gaming parents need to think about their gaming behaviour and how their behaviour influences their children and people in their lives, because the example they set may not be edifying.

***Recommendation 5.10.6 to gaming parents***

Gaming parents must take time to attend social functions at their children's school and help with their school work to at least honour their Constitutional obligations towards their children.

***Recommendation 5.10.7 to political leadership, school management and educators***

Educators must never lose sight of the need to encourage entrepreneurship and critical thinking among people in their classes, both at school and other forms of education.

## 5.11 A DEDUCTIVE THEORY

Drawing from the data and the literature material, a deductive theory can be posited, entitled *Towards an accommodation with E-sports.* This theory holds that:

More and more parents of school going children are going to play electronic games as the games become more fun to play. Gaming parents do not have the time to involve themselves in school, nor are interested in their children's schooling to the extent that is necessary to make a positive contribution. Thus, schools will increasingly operate without meaningful input from gaming parents. Political leadership, school leadership and educators thus need to constantly reflect on what they do, and improve what they do, to ensure that schools function in a way that is beyond reproach and continue to contribute to contemporary life and a digital environment. Political leadership, school

leadership and educators will increasingly work alone as gaming parents have less and less time and interest in schooling.

*Towards an accommodation with E-sports* is presented as a substantive theory in that it is restricted to a particular time, research setting, group, population and problem (Saunders *et al.,* 2009).

## 5.12 LIMITATIONS OF STUDY

Durkin (1995) stressed that research findings have to be interpreted with the limitations in mind. The main limitation is that this study could well have been the first study into the interplay between gaming parents and school education. There is thus no previous research lessons on this question to draw from. Also, little, if anything, has been written about gaming parents and schools. Respondents thus had little reading to guide their thoughts before contemplating the questionnaire and responding to qualitative questions.

## 5.13 FURTHER RESEARCH

Further research now needs to be done to test all aspects of the deductive theory *Towards an accommodation with E-sports.* The research can give rise to a theory that will hopefully have more status than the substantive theory that emanates from this study and is restricted to a particular time, research setting, group, population and problem (Saunders *et al.,* 2009).

## 5.14 CHAPTER SUMMARY

The chapter opens with further discussion on the data gathered and literature review material. The discussion gives rise to recommendations. A deductive theory based on the data is then offered. Limitations of research and further research are discussed. The research questions are addressed through this research work (Saunders *et al*., 2009). The dissertation is set against a theoretical canvass (Saunders *et al*., 2009) so

as to provide context. The chapter concludes with the assertion that the study explores its main research question and supplementary research questions.

The study explores the interplay between gaming respondents and school education. The exploration gives rise to seven recommendations and further research. The dissertation hopefully has clearly defined research questions and objectives (Saunders *et al.*, 2009) backed up by an awareness of relevant literature. If this dictum is achieved, the project has yielded data which reveals fresh insights into the impact gaming can have on school education, educators and parents.

It is submitted that the study has explored the main research question and supplementary research questions. The study is thus the next step, or contribution, in the academic debate around gaming, education, educators and parents.

## REFERENCES

Adams, R. 2015. Mobile phone bans improve school exam results, research shows. Available http://www.theguardian.com/education/2015/may/15/mobile-phone-bans-improve-school-exam-results-research-shows [Accessed 16 May 2016].

Adams, R. 2016. Students who use digital devices in class 'perform worse in exams. Available http://www.theguardian.com/education/2016/may/11/students-who-use-digital-devices-in-class-perform-worse-in-examsclose. [Accessed 16 May 2016].

Ahmada, I. & Jaafarb, A. 2012. Computer games: implementation into teaching and learning. Procedia - Social and Behavioural Sciences 59 (2012) pp 515 – 519 1877-0428.

Alfreds, D. 2016. Telkom launches R1m prize for SA gamers. Available http://www.fin24.com/Tech/News/telkom-launches-r1m-prize-for-sa-gamers-20160122 [Accessed 6 October 2016].

Alkafaji, Y. 2010. Liberal education can prepare students for life. Sharjah: (Letter)The National. 24 October 2010. Associate professor of accounting, American University of Sharjah.

Amasa, N. & Mathebula, M. 2011. Philosophy for children in South African schools: its role for citizens-in-waiting. South African Journal of Childhood Education | 2011 1(2): 127-142 | ISSN: 2223-7674 |© UJ. SAJCE– September 2011 Available http://www.sajce.co.za/index.php/sajce/article/viewFile/89/35 [Accessed 29 October 2016].

Babbie, E. & Mouton, J. 2001. The practice of social research. South African Edition. Oxford: Oxford University.

Besson, B., Huber, J., Mompoint-Gaillard, P. & Rohmann, S. 2015. Education for change. Teacher manifesto for the 21st century. The Professional Image and Ethos of Teachers. Council of Europe, Strasbourg.

Better evaluation. 2017. Thematic coding available http://www.betterevaluation.org/en/evaluation-options/thematiccoding [accessed 10 October 2017].

Betting on the future. 2012. South African gaming outlook: 2012-2016. PricewaterhouseCoopers. Available https://www.pwc.co.za/en/assets/pdf/gaming-outlook-2012-south-africa.pdf [Accessed 3 June 2017].

Billieux, J., Thorens, G., Khazaal, Y., Zullino, D., Achab, S. & Van der Linden, M. 2015. Problematic involvement in online games: A cluster analytic approach. Computers in Human Behaviour. 43 (2015) pp 242 – 250.

Blewett, C. & Adam, E. 2016. Kids have lower attention spans than goldfish - games can help in education. Available http://www.timeslive.co.za/scitech/2016/03/24/Kids-have-lower-attention-spans-than-goldfish---games-can-help-in-education. [Accessed 16 May 2016].

Booyse, J.J., le Roux, C.S., Seroto, J. & Wolhuter, C.C. 2015. A history of schooling in South Africa. Pretoria: Van Schaik.

Boyle, E. & Connolly, T.M. 2011. The role of psychology in understanding the impact of computer games. Entertainment Computing 2 (2011) pp 69 – 74.

Boyle, J. 2013. Gaming Education: Are Parents, Teachers, and Schools Ready to Embrace Gaming as a Learning Tool? Available http://www.emergingedtech.com/2013/12/ gaming-education-are-parents-teachers-and-schools-ready-to-embrace-gaming-as-a-learning-tool/ [Accessed 30 October 2016].

Boyle, R. & Hibberd, M. 2005. Review of research on the impact of violent computer games on young people. Stirling Media Research Institute.

Bright Media. 2012. Games and Learning in South Africa. Available http://www.brightmedia.co.za/index.php/research/children/48-games-and-learning-in-south-africa.htmlhttp://www.brightmedia.co.za/index.php/research/children/48-games-and-learning-in-south-africa.html [Accessed 3 June 2016].

Bryman, A. & Cramer, D. 2005. Quantitative data analysis with SPSS 12 and 13. London: Routledge.

Bryman. A, & Liao, T.F. 2004. The Sage Encyclopaedia of Social Science Research Methods. London: SAGE Publishers Inc.

Burke Guild. P. 2001. Diversity, Learning Style and Culture. New Horizons for Learning. John Hopkins University. Available http://education.jhu.edu/PD/newhorizons/strategies/topics/Learning%20Styles/diversity.html [Accessed 18 September 2016].

Business dictionary. 2016. Available http://www.businessdictionary.com/definition/norm.html [Accessed 11 September 2016].

Business Tech. 2015. The biggest entertainment markets in the world. Available http://businesstech.co.za/news/lifestyle/88472/the-biggest-entertainment-markets-in-the-world/ [Accessed 3 June 2016].

BusinessTech, 2017. Spending on mobile devices in South Africa seen declining 4.6% in 2017. Available: Spending on mobile devices in South Africa seen declining 4.6% in 2017 [Accessed 16 July 2017].

Butler, Y. G. 2015. The use of computer games as foreign language learning tasks for digital natives. System 54 (2015) 91e102. Available http://dx.doi.org/10.1016/j.system.2014.10.010 [Accessed 19 September 2016].

Byron, S., Curran, S. & McCarthy, D. 2006. Game on. From pong to oblivion. The 50 greatest video games of all time. London: Headline Publishing Group.

Byung-yeul, B. 2016. E-sports head aiming to secure Olympic status. Available http://www.koreatimes.co.kr/www/news/nation/2016/11/663_217155.html [Accessed 4 November 2016].

Carl, A.E. 2014. Teacher empowerment through curriculum development. Cape Town: Juta.

Cellan-Jones, R. 2014. Game on - e-sports takes off in the UK. Available http://www.bbc.com/news/technology-29659275. Technology correspondent. October 17 2014 [Accessed 25 April 2016].

Cheok, A.D. 2004. Connecting the Real World and Virtual World through Gaming. In: Jacquart R. (eds) Building the Information Society. IFIP International Federation for Information Processing, Vol 156. Springer, Boston.

Child development institute. 2015. Erik Erikson's stages of social-emotional development. Available at http://childdevelopmentinfo.com/child-development/Erickson/ [Accessed 8 may 2016].

Child development institute. 1999. Playing with your child. Available https://childdevelopmentinfo.com/child-development/play-work-of-children/pl5/#.wp0afy9oliu [Accessed 23 April 2017].

Chomsky, N. 2013. The Purpose of Education. Video. Learning without Frontiers Conference. London. Available http://www.thedailyriff.com/articles/noam-chomsky-the-purpose-of-education-869.php [Accessed 17 September 2016].

Connolly, T.M., Boyle, E.A., MacArthur, E., Hainey, T. & Boyle, J.M. 2012. A systematic literature review of empirical evidence on computer games and serious games. Computers and education. 59 pp 661 – 686.

Cortes, M. D.S., Alcalde, J. V. & Camacho, J.V. 2010. Effects of Computer Gaming on High School Students' Performance in Los Baños, Laguna, Philippines. Osaka University Knowledge Archive.

Country report. 2015. Euromonitor International Toys and Games in South Africa. Available http://www.euromonitor.com/toys-and-games-in-south-africa/report [Accessed 3 June 2016].

Crawford, G. 2012. Video gamers. London: Routledge.

Department of Basic Education. 2011. National Curriculum Statements grades R – 12. 2011. Pretoria: Government Printing.

Department of Basic Education. 1998. Norms and standards for educators. 1998. Pretoria: Government Printing.

Development Indicators. 2014. The Presidency; Minister for Planning, Monitoring and Evaluation.

De Vos, A.S., Strydom, H., Fouche, C.B. & Delport, C.S.L. 2005. Research at grass roots. For the social sciences and human service professions. Third Edition. Pretoria: Van Schaik. [Accessed 29 March 2018].

Dewar, G. 2012. The social effects of video games: Games that promote helpfulness. Available https://www.parentingscience.com/effects-of-video-games-prosocial.html. [Accessed 29 March 2018].

Dhai, A. 2004. Address on research. Durban: University of KwaZulu-Natal.

DiPietro, M., Ferdig, R.E. Boyer, J. & Black. E. W. 2007. Towards a Framework for Understanding Electronic Educational Gaming. Journal of Educational Multimedia and Hypermedia Volume 16, Number 3, July. Available http://www.editlib.org/p/24390/ [Accessed 4 May 2016].

Dominguez, J.D 2012. New statistics reveal the face of Australian gaming. Sydney Morning Herald. Fairfax Media. Available http://www.smh.com.au/digital-life/games/blog/screenplay/new-statistics-reveal-the-face-of-australian-gaming-20120801-23g49.html [Accessed 3 September 2016].

Dowling, N, Smith, D & Thomas, T. 2004. Electronic gaming machines: are they the 'crack-cocaine' of gambling? Wiley Online Library. Available http://onlinelibrary.wiley.com/doi/10.1111/j.13600443.2005.00962.x/abstract;jsessionid=6A824232F1DAAF7EA558FE4F4EAB8BBF.f01t02?deniedAccessCustomisedMessage=&userIsAuthenticated=false. [Accessed 4 May 2016].

Durkin, K. 1995. Computer Games: their effects on young people. Sydney: Office of Film and Literature Classification.

Encyclopaedia of Children's Health. 2016. Available http://www.healthofchildren.com/C/Cognitive-Development.html [Accessed 4 May 2016].

Ensslin, A. 2012. The language of gaming. London: Palgrave MacMillan.

Equal Education. 2013. School infrastructure. Available https://equaleducation.org.za/campaigns/school-infrastructure/ [Accessed 12 September 2016].

Essential facts. 2015. Essential facts about the computer and video game industry. Entertainment software association. Available http://www.theesa.com/wp-content/uploads/2015/04/ESA-Essential-Facts-2015.pdf [Accessed 23 April 2017].

Evans, S. 2014. League of Legends gaming final fills Seoul stadium. Available http://www.bbc.com/news/business-29684635. [Accessed 25 April 2016].

Fin24Tech, 2016. Gaming may boost teens' school results, says study. [Online] Available https://www.fin24.com/Tech/News/gaming-may-boost-teens-school-results-says-study-20160809 [Accessed 3 June 2016].

Foundation for Critical Thinking. 2013. Defining Critical Thinking. Available http://www.criticalthinking.org/pages/defining-critical-thinking/766 [Accessed 6 May 2016].

Freemantle, S. 2016. Analysis: South Africa's Trump moment is brewing. Available https://www.dailymaverick.co.za/article/2016-12-16-analysis-south-africas-trump-moment-is-brewing/#.WFYCto9OJYd [Accessed 18 December 2016].

French, C. 2010. Life in the game: Identity in the age of online computer games. Masters Dissertation. Faculty of Humanities, Development and Social Sciences. Durban: University of KwaZulu-Natal.

Gambrel , B., 2014. Gaming Development Fundamentals, USA: John Wiley & Sons.

Garson, G.D. 2013. Testing Statistical Assumptions. North Carolina State University. School of Public and International Affairs. London: Statistical Associates Publishers.

Giddy, P. 2012. Philosophy for Children in Africa: developing a framework. South African Journal of Education. vol.32, n.1, pp.15-25. Available www.scielo.org.za/scielo.php?script=sci_abstract&pid=S0256010020120001000002&lng=en&nrm=abn&tlng=en [Accessed 6 December 2016].

Gliem, J.A. & Gliem, R.R. 2003. Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. (In 2003 Midwest Research to Practice Conference in Adult, Continuing, and Community Education: Papers read at the Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education, The Ohio State University, Columbus, OH, October 8-10, 2003.

Goldhill, O. 2013. Average video game fan is 35 years old. The Telegraph. Available http://www.telegraph.co.uk/technology/news/10159917/Average-video-game-fan-is-35-years-old.html. [Accessed 3 September 2016].

Gordhan, P. 2017. Budget speech, joint sitting, Houses of Parliament.

Gouws, E.G., Kruger, N. & Burger, S. 2000. The Adolescent. Sandown: Heinemann Publishers.

Granic, I., Lobel, A. & Engels, R. C. M. E. 2014. The Benefits of Playing Video Games. American Psychological Association. Vol. 69, No. 1 pp 66–78. January. Available https://www.apa.org/pubs/journals/releases/amp-a0034857.pdf [Accessed 17 February 2017].

Griseri, P. 2002. Management knowledge. A critical view. Basingstoke: Palgrave.

Griffiths, M. 2002. The Educational Benefit of Videogames. Education and health. Vol. 20 No.3, 2002 pp 47 – 52.

Gros, B. 2003. The impact of digital games in education. First Monday, volume 8, number 7 (July). Available http://firstmonday.org/issues/issue8_7/gros/index.html [Accessed 19 November 2016].

Hair, J.F., Babin. B., Money, A.H. & Samuel. P. 2003. Essentials of business research methods. New Jersey: Wiley & Sons.

Hamari, J., Koivisto, J. & Sarsa, H. 2014 Does gamification Work? — A Literature Review of Empirical Studies on Gamification. Forth Hawaiian International Conference of System Science. Available http://people.uta.fi/~kljuham/2014-hamari_et_al-does_gamification_work.pdf pp 3025 - 3035 [Accessed 4 November 2016].

Hartmann, T., Krakowiak, K. M. & Tsay-Vogel, M. 2014. How Violent Video Games Communicate Violence: A Literature Review and Content Analysis of Moral

Disengagement Factors. Communication Monographs 81(3) July. Available https://www.researchgate.net/publication/264088800 How Violent Video Games Communicate Violence A Literature Review and Content Analysis of Moral Disengagement Factors [Accessed 17 February 2016].

Henley, J. 2009. Blurred boundaries for teachers. Education. The Guardian.

Hong, J.C., Cheng, C.L. Hwang, M.Y., Lee, C K, & Chang, H.Y. 2009. Assessing The Educational Values Of Digital Games. Journal of Computer Assisted Learning. 25 Pp 423–437 Available http://Onlinelibrary.Wiley.Com/Doi/10.1111/J.1365-2729.2009.00319.X/Full [Accessed 30 October 2016].

Hendricks, F. 2003. Issues in methodology – a personal experience. Journal of Management and Administration Vol 2 No 1. March.

Huckle, J. 2010. Further thoughts towards a theory of development education. Available www.google.ae/search?hl=en&biw=1100&bih=416&q=list+of+education+theorists&as_q=globalisation&btnG=Search%C2%A0within%C2%A0results [Accessed 2 October 2016].

Hurst, M. 2016. Lev Vygotsky's Theory of Cognitive Development. Video. Available http://study.com/academy/lesson/lev-vygotskys-theory-of-cognitive-development.html\ [Accessed 19 June 2016].

Independent Education Board. 2016. One research task option. Independent Examination Board. Johannesburg.

Ivory, J. D. 2006. Still a Man's Game: Gender Representation in Online Reviews of Video Games. Mass Communication and Society, Vol:9(1):103-114, DOI: 10.1207/s15327825mcs0901_6.

Iwasaki, R. G. 2013. Technology and Unemployment. Stanford Daily. Available

http://www.stanforddaily.com/2013/11/15/technology-and-unemployment/ [Accessed 17 October 2016].

Jenkin, C. 2013. Parenting in the digital age. Available http://www.parent24.com/Child_7-12/Development/health_safety/Parenting-in-the-digital-age-20131218Parenting in the digital age [Accessed 1 December 2016].

Jonck, J. 2016. Top 20 School Rugby 1st XV Rankings. Available http://www.rugby15.co.za/school-rankings/http://www.rugby15.co.za/school-rankings/. [Accessed 24 September 2016].

Jordaan, N. 2016. More than half of Grade 4 pupils don't understand what they read. Rand Daily Mail. Available http://www.rdm.co.za/lifestyle/2016/05/25/more-than-half-of-grade-4-pupils-don-t-understand-what-they-read [Accessed 17 July 2016].

Kardaras, N. 2016. It's 'digital heroin': How screens turn kids into psychotic junkies. New York Post. Available http://nypost.com/2016/08/27/its-digital-heroin-how-screens-turn-kids-into-psychotic-junkies/ [Accessed 9 September 2016].

Kampf, R. & Cuhavear, E. 2015. Do computer games enhance learning about conflicts? A cross-national inquiry into proximate and distant scenarios in Global Conflicts. Computers in Human Behaviour 52 (2015) 541 – 549.

Kemp, C. 2013. How 'free' games are destroying your mind (and your wallet). The Citizen. Available http://www.citizen.co.za/77034/free-games-destroying-mind-wallet [Accessed 1 October 2016].

Killen, R. 2011. Teaching strategies for quality teaching and learning. Cape Town: Juta.

Kirkland, D. & O'Riordan, F. 2010. Games as an Engaging Teaching and LearningTechnique: Learning or playing? Available www.icep.ie/wp-content/uploads/2010/01/Kirkland_et_al.pdf [Accessed 12 November 2016].

Kirriemuir, J. & McFarlane. A. 2003. Use of Computer and Video Games in the Classroom. Available www.digra.org/dl/db/05150.28025.pdf [Accessed 11 November 2016].

Kline, P. 1996. An easy guide to factor analysis. London: Routledge.

Landsberg, E. (Editor) 2016. Addressing barriers to learning. A South African Perspective. Pretoria: Van Schaik.

Leedy. P. D. & Ormrod. J. E. 2005 Practical Research. Planning and Design. 8 th Edition. New Jersey: International Edition Pearson Merrill Prentice Hall.

Lemmer, E. & Van Wyk, N. (Editors) 2015. Themes in South African Education. Cape Town: Pearson.

Lenhart, A., Kahne, J., Middaugh, E., Macgill, A.R., Evans, C. & Vitak, J. 2008. Teens, Video Games, and Civics. Pew Internet & American Life Project, Washington, D.C.

Livingstone, S. 2016. A day in the digital life of teenagers. Independent Education. Publication of the Independent Schools Association of South Africa. Winter edition

Lofgren, K. 2015. Video Game Statistics & Trends Who's Playing What & Why? Big Fish games. Available http://www.bigfishgames.com/blog/2015-global-video-game-stats-whos-playing-what-and-why/ [Accessed 4 October 2016].

Lola, 2015. Carte Blanche investigates South African game development. Available at: http://www.mweb.co.za/games/view/tabid/4210/Article/20667/Carte-Blanche-investigates-South-African-game-development.aspx [Accessed 18 October 2016].

Lowood, H.E. 2014. Electronic game. Encyclopaedia Britannica. Available http://www.britannica.com/EBchecked/topic/183800/electronic-game/233732/Networked-games-and-virtual-worlds [Accessed 4 May 2016].

Mantshantsha, S. 2016. How did SA get the job of creating the future so terribly wrong? Financial Mail. 29 April 2016.

Mathebula, P. T. 2009. Citizenship education in South Africa: A critique of post-apartheid citizenship education policy. Available http://wiredspace.wits.ac.za/xmlui/bitstream/handle/10539/7607/Mathebula%20T.%20P.%20(PhD%20Thesis).pdf?sequence=2&isAllowed=y [Accessed 29 October 2016].

Matthews, A. 2001. Computer games make children anti-social. Telegraph. London. August 20 2001. Available http://www.telegraph.co.uk/news/uknews/1337971/computer-games-make-children-anti-social.html [Accessed 26 May 2016].

Matthews, M. & Coyle, D. 2010. Therapeutic Computer Games. In the Use of Technology in Mental Health: Applications, Ethics and Practice. Anthony, K., Nagel, D.M. & Goss, S. pp 134 - 142.

Maughan, S. 2016. The Best Parental Attitude to Make Kids Appreciate Education. Available http://oureverydaylife.com/parental-attitude-make-kids-appreciate-education-4651.html [Accessed 2 December 2016].

McCall, J. 2011. Gaming the past. London: Routledge.

McCauley, K. 2011. Gaming impacts student learning. Department of Educational Leadership and Human Development. Kansas City: University of Central Missouri.

McClarty, K.L., Orr, A., Frey, P.M., Dolan. R. P., Vassileva, V. & McVay, A. 2012. A Literature Review of Gaming in Education. Research Report. Available http://images.pearsonassessments.com/Images/tmrs/Lit_Review_of_Gaming_in_Education.pdf [Accessed 29 October 2016].

McGonigal, J. 2011. Reality Is Broken: Why Games Make Us Better and How They Can Change the World. New York: Penguin Press.

Mcilhone, M. 2015. The Growth of Mobile Gaming in South Africa. African Brains. Available http://africanbrains.net/2015/02/25/the-growth-of-mobile-gaming-in-south-africa/ [Accessed 3 June 2016].

McMillan, J. & Schumacher, S. 2014. Research in education. Evidence-based inquiry. Seventh edition. London: Pearson New International Edition.

Medical dictionary. 2016. Available http://medical-dictionary.thefreedictionary.com/cognitive+development. [Accessed 4 May 2016].

Merten, M. 2016. The great reversal: Stats SA claims black youth are less skilled than their parents. Daily Maverick. South Africa.

Miller, C.C. 2016. The Long-Term Jobs Killer Is Not China. It's Automation. New York Times. Available http://www.anytimes.com/2016/12/21/upshot/the-long-term-jobs-killer-is-not-china-its-automation.html?_r=0 [Accessed 8 February 2017].

Mind Sports South Africa. 2016. Available http://www.mindsportsa.co.za/# [Accessed 30 October 2016].

Mitchell, G. 2017. A digital era – the South African statistics. Available http://www.news24.com/PartnerContent/a-digital-era-the-south-african-statistics-20170425 [Accessed 26 April 2017].

Morin, A. 2016. 4 Reasons Kids Are Bored at School. Available https://www.verywell.com/reasons-kids-are-bored-at-school-620804 [Accessed 23 November 2016].

Moursund, D. 2007. Introduction to Using Games in Education: A Guide for Teachers and Parents. Available https://www.google.co.za/webhp?sourceid=chrome-instant&rlz=1C1CHWA_enZA627ZA627&ion=1&espv=2&ie=UTF-8#q=Introduction+to+Using+Games+in+Education%3A+A+Guide+for+Teachers+and+Parents [Accessed 13 November 2016].

Mouton, J. 2004. How to succeed in your master's & doctoral studies. A South African guide and resource book. Pretoria: Van Schaik Publishers.

Msolo, S. 2015. Campus home to SA's Serious Games Institute. Available http://www.nwu.ac.za/content/vaal-triangle-campus-news-campus-home-sa%E2%80%99s-serious-games-institute [Accessed 2 June 2016].

Muller, S. 2016. Revealed: Scary truths about maths marks at SA schools – insider expert. Available http://www.fin24.com/BizNews/revealed-scary-truths-about-maths-marks-at-sa-schools-insider-expert-20161215 [Accessed 16 December 2016].

Needleman, S.E. 2015. Should Parents Play Videogames With Their Children? Wall Street Journal. Available https://www.wsj.com/articles/should-parents-play-videogames-with-their-children-1441899567 [Accessed 5 April 2018].

Ngcaba, A. 2016. The Really Awesome Gaming Expo (rAge) 2016. Available http://andile.co.za/index.php/2016/10/12/the-really-awesome-gaming-expo-rage-2016/ [Accessed 15 October 2016].

Ngoepe, K. 2016. SA pupils among lowest 5 in the world in maths, science. Available http://www.news24.com/SouthAfrica/News/sa-pupils-among-lowest-5-in-the-world-in-maths-science-20161129 [Accessed 29 November 2016].

Novikov, A.M. & Novikov, D.A. 2013. Research Methodology: From Philosophy of Science to Research Design. Florida, CRC Press.

Olivier, K. 2000. The Effect of Violent Internet Games on Children and Juveniles Institute for Criminological Sciences. Pretoria: University of South Africa.

Osman, P. 2015. Private vs public schools in SA: not a simple numbers game. The Conversation. June 6.

O'Neil, S. 2009. Basic Statistics for the Utterly Confused. Faculty of Economic & Management Science. University of Pretoria. Pretoria.

Parrish, J.M., Smith Frederick, T. and Williams, A.M. 1933. The King's English Dictionary. London: British Books Limited.

Paton, G. 2009. School is boring and irrelevant, say teenagers. The Telegraph. Available http://www.telegraph.co.uk/education/secondaryeducation/4297452/School-is-boring-and-irrelevant-say-teenagers. [Accessed 1 October 2016].

Peterson, M. 2009. The purpose of schools. Available http://www.wholeschooling.net/WS/WSPrincples/WS%200%20purpose%20schls.hml [Accessed 11 September 2016].

Okeke, C. I. 2014. Effective home-school partnership: Some strategies to help strengthen parental involvement. South African Journal of Education. Vol.34 N.3 Pretoria Mar. 2014.
Available http://www.scielo.org.za/scielo.php?script=sci_arttext&pid=S0256-01002014000300004&lng=en&nrm=abn&tlng=en [Accessed 2 December 2016].

Quick, J.M & Atkinson, R.K. 2011. A data-driven taxonomy of undergraduate student videogame enjoyment. GLS'11 Proceedings of the 7th international conference on Games + Learning + Society Conference ACM Digital Library. Available http://dl.acm.org/citation.cfm?id=2206399 [Accessed 4 May 2016].

Randall, M. 2010. A university education is not just about getting a job. The National. Available www.thenational.ae/the-national-conversation/comment/a-university-education-is-not-just-about-getting-a-job?pageCount=1 [Accessed 8 November 2016].

Rapeepisarn, K., Wong, K.W., Fung, C.C. and Khine, M.S. 2008. The relationship between game genres, learning techniques and learning styles in educational computer games. In: Z. Pan, X. Zhang, A. El Rhalibi, W. Woo and Y. Li (eds)

Technologies for E-Learning and Digital Entertainment, Lecture Notes in Computer Science, 2008, Volume 5093/2008, pp 497 - 508. Available http://researchrepository.murdoch.edu.au/637/1/relationship_between_game_genres.pdf [Accessed 30 October 2016].

RDM News Wire, 2015. Video games industry to generate over R1 trillion this year. [Online]Available https://www.timeslive.co.za/news/sci-tech/2015-10-06-video-games-industry-to-generate-over-r1-trillion-this-year/ [Accessed 3 June 2016].

Reed, L.W. 2015. Home Education Inspires a Love of Learning. Foundation for economic education. Available https://fee.org/articles/home-education-inspires-a-love-of-learning/ [Accessed 16 September 2016].

Research methods knowledge base. 2017. Available http://www.socialresearchmethods.net/kb/sampnon.php [Accessed 10 October 2017].

Rheeders, F. 2014. Future if gaming looks bright. Available www.rectron.co.za/media-centre/news/future-of-gaming-looks-bright-for-sa/ [Accessed 3 February 2016].

Riding, P., Fowell, S. and Levy, P. 1995. An action research approach to curriculum development. UK Information Research, Vol. 1 No. 1, April. Available http://informationr.net/ir/1-1/paper2.html [Accessed 21 May 2010].

Rogers, D. 2016. The fourth revolution hits Kyalami schools. Independent Education. Publication of the Independent Schools Association of South Africa. Winter edition

Ross, K.N. 2005. Quantitative research methods in educational planning. UNESCO International Institute for Educational Planning.

Rossouw, D. 2009. Educators as action researchers: some key considerations. South African Journal of Education. Vol.29 No.Available http://www.scielo.org.za/scielo.php?pid=S0256-01002009000100001&script=sci_arttext [Accessed 31 October 2016].

Rumsey, D. 2003. Statistics for dummies. New Jersey: Wiley Publishing Inc.

Saunders, M., Lewis, P. and Thornhill, A. 2009. Research methods for business students. Fifth edition. Harlow: Pearson Education

Saunders, M., Lewis, P. and Thornhill, A. 2003. Research methods for business students. Third edition. Harlow: Prentice Hall Financial Times.

Schön, D. 2009. Reflective Practitioner. Available //ivythesis.typepad.com/term_paper_topics/2009/07/reflective-practitioner.html [Accessed 4 November 2016].

Schools 4 South Africa. 2012. South African Comprehensive Schools Resource Directory. Available http://www.schools4sa.co.za/ [Accessed 12 September 2016].

Schunk, D.H., Pintrich, P.R. and Meece, J. 2014. Why Are So Many Students Bored in School? Pearson Allyn Bacon Prentice Hall. Available http://www.education.com/reference/article/why-so-many-students-bored-school/ [Accessed 3 November 2016].

North West University (NWU), 2015. SGI-SA: More than a game. Available www.nwu.ac.za/content/sgi-sa-more-game [Accessed 3 June 2016].

Shaffer, D.W., Squire, K.R., Halverson, R. and Gee, J.P. 2005. Video Games and the Future of Learning. Available http://website.education.wisc.edu/kdsquire/tenure-files/23-pdk-VideoGamesAndFutureOfLearning.pdf [Accessed 19 November 2016].

Shapiro, J. 2014. A Surprising New Study on How Video Games Impact Children. Available http://www.forbes.com/sites/jordanshapiro/2014/08/27/a-surprising-new-study-on-how-video-games-impact-children/#38a801fd49f9 [Accessed 29 October 2016].

Shapiro, J. 2013. Research says parents and kids should play video games together. Available https://www.forbes.com/sites/jordanshapiro/2013/12/04/research-says-parents-and-kids-should-play-video-games-together/#5ab2cecb4892 [Accessed 23 April 2017].

Siitonen, M. 2007. How Does Online Gaming Affect Social Interactions? PhD thesis University of Jyväskylä Available https://www.sciencedaily.com/releases/2007/09/070915110957.htmYour source for the latest research news [Accessed 26 March 2018].

Smith, J.A. & Osborn, M. 2003. Interpretative phenomenological analysis. In J.A. Smith (Ed.), Qualitative Psychology: A Practical Guide to Research Methods. London: Sage.

Smith Squire, A. 2010. Happy ever avatar: Couple marry after falling in love in online game before they'd even met. Available www.dailymail.co.uk/news/article-1329250/Couple-marry-falling-love-online-game-theyd-met.html [Accessed 8 June 2016].

Snodgrass, L & Blunt, R. 2009. The value of play for conflict management: a case study. South African Journal of Education. Vol.29 N.1 Pretoria Feb. Available http://www.ajol.info/index.php/saje/article/view/25181 [Accessed 6 December 2016].

South Africa Concise Oxford Dictionary. 2009. Cape Town: Oxford University Press.

South African Council for Educators, 2016. The Code of Professional Ethics (As Amended). Available https://www.sace.org.za/pages/the-code-of-professional-ethics [Accessed 12 October 2016].

South African Social Media Landscape. 2015. Facebook bridges SA gender divide. Available http://worldwideworx.com/wp-content/uploads/2014/11/Exec-Summary-Social-Media-2015.pdf [Accessed 3 September 2016].

Social Media Stats. 2014. The State of Social Media in South Africa. 2012. Blue Magnet. Available http://www.bluemagnet.co.za/the-current-state-of-social-media-in-south-africa/ [Accessed 4 October 2016].

Spaull, N. 2013. South Africa's Education Crisis: The quality of education in South Africa 1994-2011. Report commissioned by Centre for Development and Enterprise. October 2013. Available http://section27.org.za/wp-content/uploads/2013/10/Spaull-2013-CDE-report-South-Africas-Education-Crisis.pdf [Accessed 1 September 2016].

Stanford Encyclopaedia of Philosophy. 2008. Philosophy of Education. Online. Available http://plato.stanford.edu/entries/education-philosophy/ [Accessed 1 October 2016].

Statpac. 2017. Survey sampling methods. Available www.statpac.com/surveys/sampling.htm [Accessed 21 June 2017].

Stein, D. 1999. Teaching Critical Reflection. Available www.inspiredliving.com/business/reflection.htm [Accessed 29 June 2016].

Taylor, S. 2013. How Does Socio-Economic Status Impact on Educational Outcomes in South Africa? Education matters. News and Events. University of South Africa.

Terre Blanche, M., Durrheim, K. and Painter, D. 2008. Research in practice. Applied methods for the social sciences. Cape Town: UCT Press.

Tirivangana, A.M. 2013. Preparing your Dissertation at a Distance: A Research Guide. Vancouver: Virtual University for Small States of the Commonwealth.

Turgut, Y and Irgin, P. 2009. Young learners' language learning via computer games. Procedia Social and Behavioral Sciences 1 (2009) pp 760 – 764. World Conference on Educational Sciences.

University of North Carolina. 2011. Social consequences of online gaming addiction. 2011. Available http://onlinegamingaddiction.web.unc.edu/ [Accessed 18 February 2017].

Van Allen, E. 2015. The League of Legends 2015 World Championship: A Primer. Available www.pastemagazine.com/articles/2015/09/league-of-legends-worlds-primer.html. September 30 2015. [Accessed 4 May 2017].

Van Wyk. C.E. 2016. Fixing SA's education: Entrepreneurs look to Finland. Available www.dailymaverick.co.za/article/2016-10-23-fixing-sas-education/#.WBXEMrKqqkq [Accessed 30 October 2016].

Venktess, K. 2016. (A) Pro gamers fast becoming 'sports superstars' – commentator. Available http://www.fin24.com/Tech/News/pro-gamers-fast-becoming-sports-superstars-commentator- [Accessed 6 October 2016].

Venktess, K., 2016. SA needs more ICT skills to solve economic woes - expert. Available at: https://www.fin24.com/Tech/News/sa-needs-more-ict-skills-to-solve-economic-woes-expert-20160902 [Accessed 2 September 2016].

Vocabulary. Com. 2017. Available https://www.vocabulary.com/dictionary/social%20gathering [Accessed 19 June 2017].

Von Kotze, A. 2005. Putting ourselves into practice: popular education at/and universities. (2005). Journal of Education, No. 37. Available http://www.ukzn.ac.za/joe/JoEPDFs/joe%2037%20von%20kotze.pdf [Accessed 19 May 2016].

Wagner, J. 2016. Parents' Guide to Video Games. Available http://familyInternet.about.com/od/software/fl/Parents-Guide-to-Video-Games.htm [Accessed 30 October 2016].

Ward, V. 2013. Child therapist: iPads are as bad as heroin. London: Sunday Telegraph. 21 April 2013.

Washington, R. A., 2011. Technological unemployment. Race against the Machine. Available at: https://www.economist.com/free-exchange/2011/11/09/race-against-the-machine [Accessed 23 October 2016].

Wastiau, P., Kearney, C. and Van den Berghe, W. 2009. How are digital games used in schools? European Schoolnet. Available http://games.eun.org/upload/gis-full_report_en.pdf [Accessed 21 November 2016].

Webb, B. 2014. What is Education? Available http://motivation-tools.com/youth/what_is_education.htm [Accessed 17 September 2016].

Webster, C. 2016. South Africa now ranked 14th in the world for eSports. Available http://www.news24.com/MyNews24/south-africa-now-ranked-14th-in-the-world-for-esports-20161018 [Accessed 18 October 2016].

Weiers, R.M. 2012. Introduction to Business statistics. Seventh edition. International student edition. Mason City: Thompson.

Welman, J.C. and Kruger, S.J. 1999. Research methodology for the business and administrative science. Oxford: Oxford University Press.

Wildavsky, B. 2010. The Great Brain Race How global universities are reshaping the world. Princeton: Princeton University Press.

Williams, T.A. Sweeney, D.J. and Anderson, D.R. 2012. Contemporary business statistics. International edition. Melbourne: South-Western Cengage Learning.

Wood, Van R. 2010. Globalisation and Higher Education: eight common perceptions from university leaders. Available www.iienetwork.org/page/84658/ [Accessed 2 October 2010].

Woolfolk, A. 2014. Educational psychology. Unisa customary edition. Pretoria: Pearson.

Young, K. 2009. Understand Online Gaming addiction and Treatment issues for adolescents. The American Journal of Family Therapy. 37 pp 355 - 372, 2009.

# APPENDIX 1: QUANTITATIVE QUESTIONNAIRE

I am Robin Martin Challenor. I am a Master of Education student in the Department of Mathematics, Science and Technology at the Central University of Technology, Welkom campus. I am carrying out research into gaming and education. The title of my study is

***Playing games pedagogy in the 21st century***

Please help me by answering the questions that follow. Your participation conveys your consent to be part of the research project. If you have queries please contact my supervisor
Dr Luzaan Schlebusch on email lschlebu@cut.ac.za
Thank you.

**Demographic questions**

Age: _____

Gender: male/female

How many hours a week do you play electronic games? _____
For how many years have you played electronic games? _____
Number of children you care for/have cared for as a parent or guardian: _____
Your present economic/studying activity: _____

**Research questions**

Please circle, mark, tick or in any other way highlight the number that is closest to your feelings on the question.

1 To what extent would you like to be a professional international electronic gamer?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

2 To what extent do you think about your actions and ensure you have a better outcome next time you have a similar experience?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

3 To what extent did/have you/would you get to know other parents at your child's school?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

4 To what extent are you a confident person?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

5 To what extent do electronic games teach skills?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

6 To what extent do you want to be a lifelong learner?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

7 To what extent did you/do you/would you be involved in making decisions about the future of the school your child attended?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

8 To what extent did you/do you/would you be involved in addressing problems at the school your child attended?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

9 To what extent does school prepare a person to be involved in their society as an adult?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

10 To what extent does school prepare a person for employment?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

11 To what extent should electronic games be used in a classroom?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

12 To what extent does the playing of games prepare gamers for their lives?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

13 To what extent do you read books/novels/magazines/newspapers/websites?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

14 To what extent was school boring?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

15 To what extent is tax money spent on school education well spent?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

16 To what extent do educators think about and thus improve what they do in a classroom?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

17 To what extent do you accept the authority of a school?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

18 To what extent do you respect gamers?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

19 To what extent were you respected at school?

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

20 To what extent are you curious about the world?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

21 To what extent are you a responsible person?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

22 To what extent are you positive about school education?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

23 How comfortable did you/do you/would you feel involving yourself in your child's schooling?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

24 To what extent did/do/would you work with teachers at your child's school?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

25 To what extent are/were/would you be interested in your child's school?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

26 How prepared would you be to support an online campaign about an education issue?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

27 How prepared would you be to join a parents' street protest about an education issue?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

28 To what extent are you in control of your life?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

29 To what extent do you speak or act before you think?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

30 To what extent can gamers immediately resume normal, satisfactory human interaction after playing?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

31 To what extent did you/do you/would you have time to spend helping your child with their school work?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

32 To what extent did you/do you/would you have time to spend attending functions at your child's school such as braais, parents' evenings and sports fixtures?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

33 To what extent are you interested in creating jobs for other people?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

34 To what extent do you question the world?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Not at all | Seldom | At times | I'm neutral | A lot | Mostly | Considerably |

Thank you for helping me. Dr Martin Challenor, umbilo4@gmail.com 0820 47 48 47

# APPENDIX 2: LETTER TO QUALITATIVE RESPONDENTS

From Dr Robin Martin Challenor.

I am a Master of Education student in the Department of Mathematics, Science and Technology at the Central University of Technology, Welkom campus. I am carrying out research into gaming and education.

The title of my study is

*Playing games pedagogy in the 21st century*

I have completed the first part of my study. I gathered data from 246 respondents. Four trends emerged from the data. Please help me by reading about the trends and then answering in words the questions that follow. Your participation conveys your consent to be part of the research project.

| | |
|---|---|
| Trend 1 | Time to attend social functions and help their children with school work. |
| | *The data showed that the more hour's week respondents played games, and the more year's respondents have played games, the less time they have to attend the social aspects of a school such as the braais, the parent's evenings and sports fixture. Similarly, the more hours a respondent played games a week, and the more years they have gamed, the less inclined they were to help their children with their school work.* |
| Question 1 | Please write out your response to this trend. How should an educator respond to this? |
| Response | |
| Trend 2 | Working with educators at their child's school and being interested in their school. |
| | *The data shows that the more hours a week respondents spent playing games, and the more year's respondents have gamed, the less inclined they were to work with educators. Similarly, the data shows that the more hours a respondent gamed a week, and the more years they have gamed, they less interested they were in their child's school.* |

| | |
|---|---|
| Question 2 | Please write out your response to this trend. How should an educator respond to this? |

| | |
|---|---|
| Response | |
| Trend 3 | Being involved in addressing problems at the school their child attends and feeling comfortable in involving themselves at their child's school |
| | |
| Question 3 | Please write out your response to this trend. How should an educator respond to this? |
| Response | |
| Trend 4 | Being involved in making decisions about the future of the school their child attends and getting to know other parents at their child's school. |
| | |
| Question 4 | Please write out your response to this trend. How should an educator respond to this? |
| Response | |
| Trend 5 | If the problems listed above, especially the problems of time and interest, are not addressed, what would be the likely outcome? |
| Response | |
| Question 6 | To what extent are school leadership and educators able to recognise and deals with the problems set out in the trends? |
| Response | |

| | |
|---|---|
| | |

Feel free to be as expansive as you wish to be in your answers.

Going forward, the influence of gaming on education will not fade as the games become increasingly attractive, more and more fun to play, and popular. Game developers strive to make the games more attractive and parents are urged to play electronic games with their children, in the name of good parenting.

You might be interested to know that 142 of the 246 respondents played electronic games. The average age of the gamers was 31,04 years. On average, the gaming respondents spent 6,99 hours a week playing games. A further 25 respondents said they have gamed in the past but were not gaming at the time they responded to the questionnaire. The 167 respondents who gamed at some point in their lives have on average played for 11,62 years.

Thank you for helping me.

If you have queries please contact my supervisor Dr Luzaan Schlebusch on email lschlebu@cut.ac.za

Thank you.

Dr Martin Challenor
umbilo4@gmail.com
0820 47 48 47

# APPENDIX 3: REPORT FROM ENGLISH EDITORS

**Trine University**
1 University Avenue
Angola, Indiana, USA, 46703

**Worth Weller**
MA, English, Indiana University
MBA, Trine University
wellerw@trine.edu

10 July 2018

To the readers of Dr. Robin Martin Challenor's comprehensive study entitled "Playing games pedagogy in the 21st century":

I have reviewed his project and find that it thoroughly meets all the criteria of Standard English and higher education academic writing. I have made a few suggestions as to conciseness and word choice plus recommended the more modern usage of commas, which calls for fewer wherever possible to ensure speedier readability.

As an educator of teenagers, I found his study thorough and illuminating.

Worth Weller
Instructor
Trine University Global Partnership
Melaka Malaysia and Ningbo China

## APPENDIX 3: REPORT FROM ENGLISH EDITORS

DECLARATION

I, PATRICK RICHARD SALVAGE, hereby declare that I have read Robin Martin Challenor's dissertation, entitled *Playing games Pedagogy in the 21st Century*, in fulfilment of a Master of Education degree.

Having suggested several changes to the content of the dissertation I have found that it is of a standard that meets the expectations of a Masters level study.

Patrick Richard Salvage BA (hons), HDE, MEd (Education Management) (Natal)
ID Number:
patricksalvage@gmail.com or salvagep@newtonschools.sch.qa
Mobile:

July 19 2018

Doha,

Qatar

**FACULTY RESEARCH AND INNOVATION COMMITTEE – Faculty of Humanities RESEARCH ETHICS APPROVAL LETTER**

**Date: 18 February 2019**

This is to confirm that ethical clearance has been provided by the Faculty Research and Innovation Committee in view of the CUT Research Ethics and Integrity Framework, 2016 with reference number **[D FRIC 11/17/3].**

| | |
|---|---|
| Applicant's Name | ***RM Challenor*** |
| Student Number | |
| Supervisor's Name for Student Project | ***Dr CL Schlebusch*** |
| Level of Qualification for Student's Project | ***M Ed*** |
| Title of research project | ***PLAYING GAMES PEDAGOGY IN THE 21st CENTURY.*** |

The following special conditions were set:

| | |
|---|---|
| x | Adherence to all ethical measures as stipulated and approved in the LS262a form |

We wish you success with your research project.

Regards

Prof JW Badenhorst

(Ethics committee representative: Humanities)