Graduate School of BUSINESS UNIVERSITY OF CAPE TOWN | MPhil

An exploration of gamification as a teaching method for entrepreneurship education amongst black youth entrepreneurs in townships and peri-urban areas

By

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Abstract

Due to the increase in youth unemployment, one of the suggestions has been a move to encourage young people to pursue entrepreneurship. But entrepreneurship requires certain skills and knowledge that some individuals might not possess.

This sequential embedded mixed method research investigated the purposeful sampling of entrepreneurs, ED practitioners and serious game founders and developers, in an effort to discover whether gamification can be used as a teaching method for entrepreneurship education amongst black youth in the township and peri-urban areas. This was done through qualitative methods, which were individual interviews and focused groups and quantitative method, which was in the form of a serious game prototype.

The primary question was whether gamification could become a teaching method for entrepreneurship education among black youth entrepreneurs in townships and peri-urban areas. The three secondary questions were:

- How do ED programmes address youth unemployment? And what are the expectations of these programmes?
- How do youth entrepreneurs in the township and peri-urban areas find and learn new information?
- What does gamification data reveal about learning and development for youth entrepreneurs in the township and peri-urban areas?

The research findings from the study were that the pre-gamification phase revealed the lack of skills and experience, inadequate big-picture thinking and achievement mindset, lack of openness to be taught, new entrants' issues into the space, and being stretched beyond the comfort zone were some of the factors that are contributing towards the challenges that are faced by the youth entrepreneur. This implies that any intervention, such as the focus of this study, which is gamification, should be looked at through the lenses of these challenges and needs of the young entrepreneurs. What was also evident from the findings was that the young entrepreneurs had expectations of inclusive and continual development, skills development and mentorship but at the same time had business-specific expectations such as assistance with

access to funding, market access, networking with their peers and industry players, despite the fact that several gaps were highlighted in the ED programme by both the young entrepreneurs and ED practitioners. These were unintended disempowerment, lack of follow-through and incompleteness, inadequate breakthrough with new solutions and multiple ineffective ED programmes. These entrepreneurs indicated that they learn by experience, use internet searches and online learning, and prefer creative and fun learning as well as group learning with family, which are good attributes for gamification as a learning tool.

The findings for the second research question indicated that there were multiple groups; some only had theoretical knowledge of gaming, though they did not have practical knowledge. They were more positive towards their use as a learning tool than were other groups of entrepreneurs who had experience in gamification as well as ED practitioners. Some were still using the game for recreation, but it helps to de-stress and refocus, and for others, it helps to improve their propensity to use the technology. Despite recreation, de-stress, refocus and improving technology use behaviour are not the core of gamification; these are critical for building a young entrepreneur for success.

The findings for the third question revealed that the gamification results were inconclusive on whether the application was an effective learning vehicle in this instance, given the average outcomes of quizzes. Although the quizzes produced middling results, these materials were still interesting for all audiences. Despite this, the post-gamification interviews based on their experience confirm that gamification has become a teaching method for black youth entrepreneurs in townships and peri-urban areas.

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I completed this journey because of people like all of you that I've mentioned. May you never tire of supporting those around you that undertake this journey. Academia is not the most inclusive space; therefore, we need to research and publish papers about ourselves and our communities. We need it. Our communities need it. We have to cross the finish line for everyone who thinks it's not possible!

I'm exhausted, but all of you poured into my cup to continue.

I love you all abundantly.

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Abbreviations, Acronyms & Definitions

Black Broad-Based Economic Empowerment (BBBEE) – Economic empowerment of all black people, including women, workers, youth, people with disabilities and people living in rural areas through diverse but integrated socio-economic strategies (DTI, 2018)

Black People – Generic term that means Africans, Coloureds and Indians in South Africa:

(a) who are citizens of the Republic of South Africa by birth or descent; or

(b) who became citizens of the Republic of South Africa by naturalisation –

(i) before 27 April 1994;

(ii) on or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalisation prior to that date (DTI, 2018)

Corona Virus Disease (COVID – 19)

Department for Women, Youth and Persons with Disabilities (DWYPD)

Department of Social Development (DSD)

Design Science (DS)

Economically Active Population (EAP) – Consists of both those who are employed and those who are unemployed. Determined and published by Stats SA.

Enterprise and Supplier Development (ESD) – ED & SD

Enterprise Development (ED) – Monetary or non-monetary contributions carried out for the defined beneficiaries, with the objective of contributing to the development, sustainability and financial and operational independence of those beneficiaries.

Entrepreneur – A person who starts and/or operates a business which includes identifying opportunities in the market and taking risks with a view of being rewarded with profits.

Entrepreneurship – The creation of new businesses in conditions of risk and uncertainty in order to make a profit. Entrepreneurship can be described as the result of a systematic and disciplined process of applying innovation and creativity to opportunities and needs in the market.

Entrepreneurship Education (EE)

Gamification – The intentional use of game elements in both non-game tasks and contexts.

Information Systems (IS)

Millennials – Defined by the year in which they were born (between 1980 and 1995) and have specific characteristics due to the economic, political, and cultural in which they grew up.

National Development Plan (NDP) – A plan that aims to eliminate poverty and reduce inequality by 2030. These goals can be realised by drawing on the energies of its people, growing an inclusive economy, building capabilities, enhancing the capacity of the state, and promoting leadership and partnerships throughout society.

National Youth Development Agency (NYDA)

Not in Employment, Education or Training (NEET)

Peri-Urban Areas (semi-urban) – Not part of a legally proclaimed urban area, but adjoins it. Informal settlements are examples of these types of areas.

Serious Games – Computer-based learning simulations that engage players in realistic activities that are meant to increase knowledge, improve skills, and enable positive learning outcomes.

Simulations – These are not always ‘‘games’’ per se; the main focus is the use of a digital game-based learning environment to support ‘‘serious’’ outcomes. Despite having an

entertainment component, these simulations are designed to promote learning, primarily by leveraging a narrative or story centred in an entrepreneurial setting.

Small & Medium-Sized Enterprises (SMEs) or Small, Medium & Micro Enterprises (SMMEs) – The size classification of small enterprises is defined using two proxies, i.e., total full-time equivalent (FTE) of paid employees and total annual turnover. The proxies are used to define the size, depending on the sector or sub-sector the enterprise falls within.

(a) Micro – Total FTE: 10 or fewer paid employees & Annual Turnover: Maximum threshold between R5 and R20 million (depending on the sector);
(b) Small – Total FTE: 11 to 50 paid employees & Annual Turnover: Maximum threshold between R15 million and R80 million (depending on the sector);
(c) Medium – Total FTE: 51 to 250 paid employees & Annual Turnover: Maximum threshold between R40 million and R220 million (depending on the sector).

Spaza Shop (Tuck Shop) – An informal convenience shop business in SA, usually run from home.

Supplier Development (SD) – Monetary or non-monetary contributions carried out for the benefit of value-adding suppliers to the Measured Entity, with the objective of contributing to the development, sustainability and financial and operational independence of those beneficiaries.

Township – Areas that were designated under apartheid legislation for exclusive occupation by people classified as blacks, coloureds, and Indians.

Unemployed – Those people within the economically active population who:

(a) did not work during the seven days prior to the interview;
(b) want to work and are available to start work within a week of the interview; and
(c) have taken active steps to look for work or to start some form of self-employment in the four weeks prior to the interview.

Youth – In South Africa, it is persons between the ages of 14 and 35. The United Nations defines it as persons between the ages of 15 and 24. The researcher will specify which definition is being used in the research.

CHAPTER 1 – INTRODUCTION

1.1 Purpose of the Study

The International Labour Organization (ILO) (2020a) reported that the COVID-19 pandemic had turned the world we know on its head, not only affecting the world of work but the subsequent livelihoods of workers and global enterprises (ILO, 2020a). What was discovered in the United States of America (USA) was that in the short term, COVID-19 increased the unemployment rate and decreased hours of work and labour participation (Fana, Torrejón Pérez & Fernández-Macías, 2020). The long-term effects are likely to adversely affect any attempts to reduce poverty and inequality (ILO, 2020a).

By the first quarter of 2020, The Organisation for Economic Co-operation and Development (OECD) countries had implemented restrictions to curb the spread of the virus, which meant restricting economic activity (OECD, 2020). This resulted in millions of people not being able to go to work and a decrease in the number of hours people worked (OECD, 2020).

Fana et al. (2020) emphasised that the medium-long term effects of COVID-19 on labour markets will be determined by each individual country's economic specialisation, social protection and labour market regulations; thus, regardless if a country implemented an economic lock-down, the effects will still be felt.

South Africa entered the COVID-19 pandemic with already low economic growth. This is reflected in South Africa's ranking as 5th in the world in the Misery Index (Business Tech, 2021c). The index is the sum of a country's rate of unemployment and inflation, which is a clear indicator that formal labour markets are dysfunctional (Business Tech, 2021c). By the second half of the year, over 2 million job losses had been reported due to the COVID-19 lockdown restrictions, including formal and informal employment (Business Tech, 2020).

Unemployment among young people in South Africa continues to be one of the most significant impediments to the country's economic progress (Pijoos, 2019). Even though South

Africa has a population of 40 million people who are of working age, youth make up 51.6% of the total population (15-34 years old), and the youth unemployment rate continues to restrict opportunities (Stats SA, 2022b).

Although there has been a downward tendency in the rate of graduate unemployment from year to year, there has been an overall increasing trend in the rate of youth unemployment (Soni, 2022). According to the results of the Quarterly Labour Force Survey (QLFS), the unemployment rate in the first quarter was 32.6%, while the percentage of unemployment among young people was 46.3% (Stats SA, 2022a). It is regrettable that graduates accounted for 9.3% of that percentage because this indicates that nearly 10% of the young people who are unemployed have qualifications. It is apparent that over the course of the years, employability in South Africa has advanced to the point where graduates require more than a basic degree to find work.

The South African youth NEET (not in education, employment, or training) rate has continuously exceeded 30 percent and has worsened over the previous decade (Stats SA, 2022b). Young NEETs are a heterogeneous population that is mostly female, black, slightly older youth (20-24), resides in urban areas, lives in income poverty, and has less than or simply a matriculation or matriculation equivalent (Stats SA, 2022b). The majority of young NEETs are unemployed (43.9% are searching for employment, and 24.4% are discouraged job seekers), and slightly less than a third (31.7%) are inactive (i.e., "disengaged" from the labour market) (Mudiriza & de Lannoy, 2022). The majority of the unemployed NEETs are recent entrants to the labour market, and many of them have been unsuccessfully seeking employment for extended durations. Across the world, NEETs continue to endure the greatest rates of poverty among all unemployed youngsters and are increasingly exposed to non-standard, informal, and less secure types of employment (ILO, 2020).

There is a need for location-based, targeted interventions to assist diverse young unemployed people in successfully re-entering the workforce or re-engaging in education and training activities. Prof. Randall Carolissen emphasised this dynamic at an Entrepreneurship Day session presented by the Johannesburg Business School’s Centre for Entrepreneurship's Small Business Enrichment Programme (SBEP) (IOL, 2022). In light of South Africa's unemployment issue, he discussed the significance of entrepreneurship and how it may aid the

unemployed. He acknowledged widespread unemployment and sky-high youth unemployment. However, he seemed to emphasise the chance for young people at home to pursue entrepreneurship. He emphasised the significance of providing spaces, opportunities, and platforms for these young people to express their creativity and dynamism in the area of entrepreneurship.

But this is a problem that affects more than just South Africa. Within the span of just 20 years, the number of young people around the world who are between the ages of 14 and 24 has increased by more than 30 percent, reaching 1.2 billion (ILO, 2022). During the same time period, their participation in the labour market decreased by 12%, and it is anticipated that this trend will continue to worsen over the course of time. The World Economic Forum recommends that young people who are already participating in the labour market acquire additional skills or relearn old ones (ILO, 2022). For those who have not yet entered the workforce, the educational curriculum needs to be subjected to intense inspection so that it can be adapted to meet the ever-evolving demands of the labour market (Du Toit & Kempen, 2018; 2020).

At The Gathering, on a panel moderated by The Daily Maverick, a leading South African online news hub, that focused on issues concerning the business environment and the economy, a diverse group of South African business leaders reached the consensus that the country's youth unemployment rate and the gap between labour market skills and available jobs constituted a "ticking time bomb" (Moodley, 2022). They emphasised how important it was to be rid of the old scripts and begin from scratch.

The emergence of gamification as a strategy for enriching instructional content in educational settings is one example of a contemporary approach to an age-old problem spurred on by the COVID pandemic (Bai, Hew & Huang, 2020). As an educational strategy, gamification can promote learning by fostering motivation and engagement, enhancing learner participation and course interactivity, and stimulating students in such a way that their knowledge expands (Saleem, Noori & Ozdamli, 2022). In the setting of a classroom, serious games can be utilised to foster the traits of creative entrepreneurship (Almeida, 2017). Serious games are the optimal model for matching content in a variety of ways and including problem-solving and reasoning

stimulation, resulting in the acquisition of key competencies (Adam, Blewett & Quilling, 2022).

Young people can develop their knowledge about entrepreneurship, as well as their abilities, qualities, and mindsets, through entrepreneurship education (Wangi, Rochman, Saifillah, Yuliani & Hariyadi, 2020). According to research that was done in the past, entrepreneurship education is taught in South African schools rarely and is just a part of a few different topic areas (Bellotti et al., 2014; Du Toit & Kempen, 2018). Learners putting their business education to use to solve South Africa's economic and social problems might set off a positive chain reaction that would be beneficial to the country as a whole (Du Toit & Kempen, 2020).

The purpose of this study is to address both the crisis caused by COVID-19 and the underlying structural unemployment of youth in South Africa through entrepreneurship and investigate how support through entrepreneurship education tools can assist black youth entrepreneurs in the township and peri-urban areas.

1.2 Context of the Researcher

The researcher was born and raised in the Eastern Cape, which is one of nine provinces in South Africa. The Eastern Cape is the second-largest province by land mass and the third most populated in the country (ECPG, 2022).

The last Statistics SA Community Survey conducted in 2016 indicated that the Eastern Cape is the poorest province in SA, accounting for 12.7% of the country's unemployment rate (Alexander, 2021). Figure 1.1 shows the percentage of households living in poverty according to the four matrices identified.

With almost three decades of democracy in South Africa, the Eastern Cape remains in a structural poverty trap; it is estimated that an average of twenty to sixty percent of the population (depending on the specific geography) is living in poverty (Ngumbela, 2021). From a lived experience by the researcher, some of these failures can be attributed to the leadership (or lack thereof) in the province; leadership that is riddled with corruption.

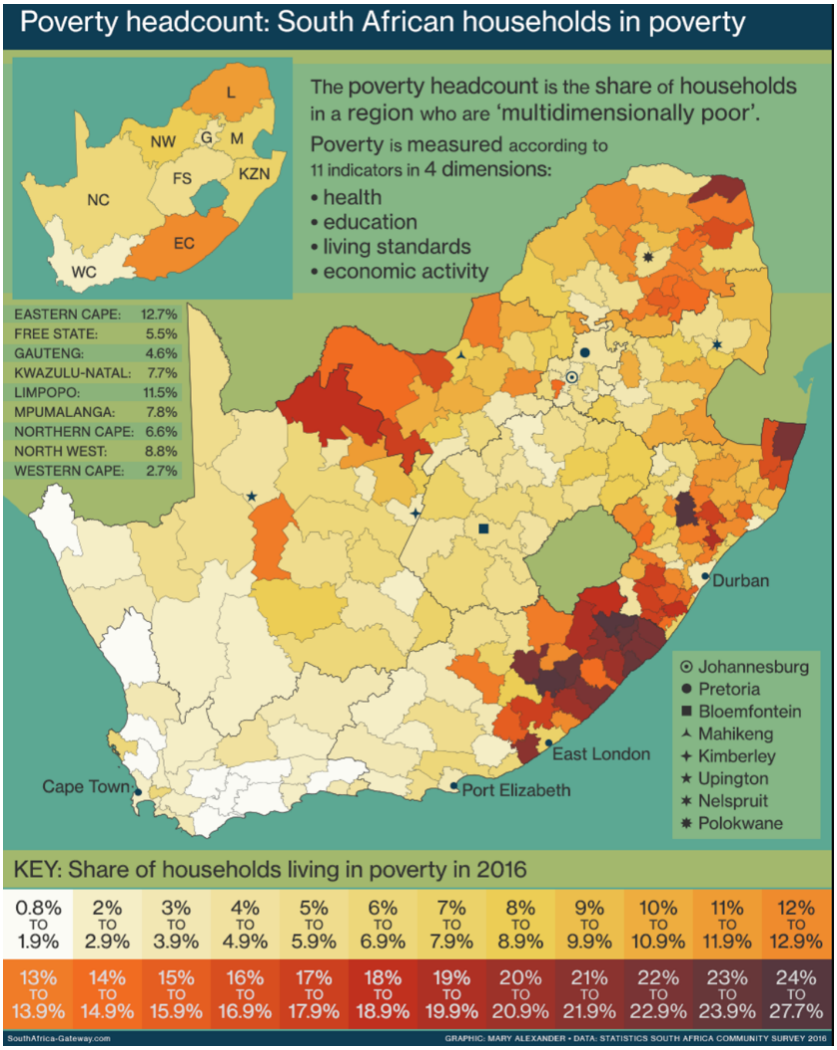

Figure 1.1: Poverty headcount: South African households in poverty

Source: (Stats SA, 2018).

The Eastern Cape is governed by the African National Congress (ANC), the current national ruling party in SA, with the Democratic Alliance (DA) having the second most votes and the Economic Freedom Fighters (EFF) in the third position (Eastern Cape Legislature, n.d.) The province is not only governed by the political party, but different regions (villages) have chiefs and kings that rule over their tribes. This then introduces another layer of leadership in the province, not only with the official political structures in power but with the nuances of tribal chieftaincy.

The researcher hails from the Amampondo tribe, which is ruled by the Mpondo Kingdom of AmaMpondo people of SA. Her village is eMagusheni in the Alfred Nzo municipality in the Eastern Cape. Unemployment and poverty have crippled the village she was born and raised

in. From observation, the people in her village have lost faith and trust in the leadership structures.

On average, approximately 80% - 85% (self-reported) of the population within her village is unemployed, and those that are employed are working in cities and urban areas. Most individuals have not even completed their matric (grade 12) education level; they are satisfied with having a level where they are able to read and write. That way, they can go apply for casual labour that allows them to provide income for their families. These casual jobs consist of work such as security guards, taxi operators, and store cashiers, to name a few. These rarely provide enough to feed one's family.

Due to the lack of education and access to information, individuals from the village rarely consider entrepreneurship as they aren't aware that there should be support structures provided by the government. At times when community members seek such information, they sometimes experience a language barrier. The Eastern Cape is predominantly a Xhosa (one of South Africa's eleven official languages) speaking province, and most of the necessary information is provided in English. And the few individuals that approach government structures for resources such as funding are met with corrupt government officials. These officials, in most cases, demand bribes before they can assist members of the community.

Recently there were grants by the Alfred Nzo municipality put aside for youth within the community looking at starting or scaling their businesses. The programme was to assist in helping young entrepreneurs create business plans and then provide funding of up to three million rands. Very few applications were received from the community, and some individuals said that they didn't have the confidence in themselves to apply for such a large amount. They didn't know if they could handle the responsibility that came with having that kind of capital in their business.

This becomes a great challenge to overcome because even the local chiefs are uneducated and don't have the necessary information about resources that can assist their community members.

One of the positive elements of the community is the vast availability of land, which all community members have access to upon the request of the chief. This land has allowed

community members to live off their land through farming. Individuals farm for their and their family's sustenance. Very few individuals consider farming for commercial purposes. If anything, most individuals don't see farming as an attractive career or business opportunity. Most people want to leave rural areas to go to the cities and urban areas to pursue opportunities there, not understanding that cities and urban areas are also struggling with high unemployment, lack of housing and general infrastructure. They also fail to realise that there are food shortages across the globe, and farming is one of the biggest opportunities to pursue currently. Instead, those that seek entrepreneurship focus on owning spaza shops and taxis and becoming a tender entrepreneur.

With this background, the researcher has embarked on creating a social enterprise that has worked with youth entrepreneurs in marginalised areas for the past six years. Together, she has worked in the Enterprise Development (ED) space for just over nine years. She believes that research such as this will highlight the harsh disparities faced by youth in marginalised areas compared to those in cities and urban areas, and can explore whether inclusive innovation can create tools that bridge some of those gaps.

1.3 Context of the Study

1.3.1 Unemployment

Pre-COVID-19, global economic growth slowed down in the last three quarters of 2018, with manufacturing being the hardest-hit industry, leading to lower investor confidence (ILO, 2020c). In 2019 the IMF stated some recommendations for a global recovery which were reliant on both public and private sectors through the use of fiscal policies (ILO, 2020c). The slowdown in economic activity and the introduction of technology lead to greater fears of rising unemployment (ILO, 2020c).

Borchowsky (2019) makes use of the term 'technological unemployment', which he described as automation removing the human factor in the supply chain. These were some of the challenges that countries were grappling with before the pandemic concerning unemployment.

The pandemic gradually hit the African continent in 2020, and the effects of overseas trading partners closing their economies had a ripple effect (AU, 2020a). To contain the virus, countries put in place lockdown measures. During the lockdown, some governments provided economic relief measures to support the formal economy, but not much thought was put in place for the informal employment sector. It is important to differentiate between informal employment and employment in the informal sector. Informal employment is defined as any employment that does not provide an individual with social protection, such as medical and pension benefits (Rogan & Skinner, 2017). The informal employment sector in Africa provides almost 75% of the labour force, and the informal economy is one of the largest in the world (AU, 2020a).

South Africa, already coming from a high unemployment base, reached the highest unemployment numbers in 12 years with the strict lockdown regulations, including curfews and travel restrictions. This further limited people's ability to look for employment (Faku, 2020). Analysis has revealed that in the long term, unemployed people will become unemployable; currently, 75.3% of unemployed individuals have been out of work for over a year, and 60% of unemployed people have been out of work for more than five years (Business Tech, 2021b). Therefore, the likelihood is that those who are currently unemployed will remain unemployed even in the long run.

1.3.2 Youth Unemployment

Prior to the pandemic, youth unemployment was a cause for concern globally; the rates of unemployment for young people were almost three times as high as those of adults (ILO, 2020a). Some of the reasons attributed to these statistics are structural barriers that prevent young people from entering the labour market and their limited work experience (ILO, 2020a). In Africa, where young people are already vulnerable and insecure, a study indicated that flexible labour market regulations were one of the causes of the increase in youth unemployment (Awad, 2019). In this context, flexible market regulations include non-standard, informal and less secure forms of employment, which means that young people aren't protected.

Observations have led to the belief that Millennials entering the labour market have different expectations of work than the older generation (Pyöriä, Ojala, Saari & Järvinen, 2017). Millennials tend to be loyal to individuals that are invested in their career development, rather than institutions. Hence they change jobs more frequently than the older generations (Wood, 2019). Although there's a notion that Millennials display a sense of entitlement and laziness in the workplace, research data suggests this is not necessarily true; Millennials value meaningful work that caters to work-life balance (Wood, 2019).

The latest data showed that at the peak of the pandemic young people were being disproportionally affected by the effects of the pandemic (ILO, 2020a). Young people fall within the same category as women, self-employed people, temporary workers, and low-paid employees, as being the most vulnerable during this crisis (OECD, 2020).

The gaping gaps exposed by this crisis in the labour markets require swift interventions by countries to recover (OECD, 2020). Dooms (2020) states that in South Africa, leadership and not only money will solve the youth unemployment crisis. This statement was made after the finance Minister announced billions to be provided to youth programmes during the 2020 supplementary budget speech (Dooms, 2020).

Before the pandemic, South Africa was already sitting at a youth unemployment of 58% between the ages of 15 – 24 years old (StatsSA, 2020). This has currently increased to more than 60%, creating a long-term problem for the South African Revenue Services (SARS), as it threatens to erode the country's tax base (Business Tech, 2021a).

1.3.3 Entrepreneurship

Entrepreneurship has been identified as part of the solution for ending social inequality and poverty, creating employment and promoting economic growth (Bosma et al., 2020).
This is due to the fact that Small and Medium Enterprises (SMEs) contribute approximately 60% of employment in the OECD regions and account for 99% of all businesses (OECD, 2019).

Understanding the importance of entrepreneurship has led governments to start working on improving policies that affect entrepreneurial performance (OECD, 2019). Therefore, the political governance in Africa has a direct correlation with regard to the quality and depth of the entrepreneurship ecosystem. Regulatory institutions must be effective in order to support entrepreneurial growth (Atiase, Mahmood, Wang & Botchie, 2018).

Atiase et al. (2018) explain that for production purposes, one of the inputs that entrepreneurs must be able to access is efficient, reliable and cost-effective electricity, among other production inputs. Unfortunately, this is not the case in South Africa, as the national energy supplier has implemented rolling blackouts (also referred to as load shedding) since 2008 (Mbomvu, Hlongwane, Nxazonke, Qayi & Bruwer, 2021). These rolling electricity blackouts are a measure implemented by the energy supplier to cut the supply of electricity when there's an overdemand on the electricity grid (Mbomvu et al., 2021). This, amongst other factors such as limited access to markets and finance, has had detrimental effects on South African entrepreneurs (Mbomvu et al., 2021).

In the OECD SME and Entrepreneurship Outlook (2019), a conceptual framework consisting of six pillars is identified for improving entrepreneurial performance by addressing the business environment and strategic resources; one of the pillars under strategic resources is 'access to skills', which includes education and training.

In South Africa, there are structural mismatches when it comes to skills, with under-qualification in relation to the available opportunities in the market (DHET, 2019).
Zungu (2020) suggests that part of having an effective entrepreneurship system requires introducing entrepreneurship education in schools at the basic education level, and the continuation of this education into tertiary education could see a reduction in the failure rate of start-ups

Although entrepreneurship is encouraged for economic growth and employment opportunities, there are accidental entrepreneurs; individuals who start businesses for the wrong reasons, such as desperation due to a lack of employment opportunities (Zungu, 2020).

1.3.4 Entrepreneurship Education & Entrepreneurial Intention

The old-age debate of whether entrepreneurship can be taught has brought about different views from different schools of thought. Cremades (2018) states that, like any skill or field of study, entrepreneurship can be taught, but it must be through doing because it presents many challenges, especially because business decisions are made under conditions of uncertainty and entrepreneurs require practical skills.

Cremades (2018) further elaborates that one doesn't necessarily learn about entrepreneurship in the classroom; one can learn from mentors, competitors, books, videos and many other tools available.

An important outcome of entrepreneurship education that has been emphasised is the change in behaviour and modified attitudes of the participants (Swarupa & Goyal, 2020).
The terms used in describing these behaviours and attitudes are sometimes referred to as entrepreneurial mindsets and skills (Pauna & Frank, 2017). Therefore entrepreneurship education facilitators should focus on both the design and implementation of the programmes to ensure the necessary outcomes are met (Samuel & Rahman, 2018).

Does entrepreneurship education lead to entrepreneurial intention? Jena (2020) states that there is a lack of rigorous studies thus far to determine a direct correlation between entrepreneurship education and entrepreneurial outcomes. However, a case study conducted amongst business management students showed that there was a positive impact of attitude towards entrepreneurship education on entrepreneurial intention (Jena, 2020). The intention seems to be difficult to prove because it seems to be a complex and personal decision (Swarupa & Goyal, 2020).

1.3.5 The Digital Divide

The reality of the global pandemic further revealed the growing societal fragmentation, especially the persistent risk of a widening digital divide; some of the current imminent threats

include employment crisis, youth disillusionment, digital inequality and economic stagnation (World Economic Forum [WEF], 2021).

With the lockdown disruptions and more people working from home, there's an opportunity to create programmes that assist individuals online. In Australia, a free programme by the Department of Social Services has been developed to improve participants' digital skills and confidence online (Raising Children, 2022).

The expansion of digitalisation will transform societies long after the pandemic; the shift towards remote work, online education and e-commerce promise huge benefits (WEF, 2021). There is growing evidence that young people in the African continent are generating new pathways to secure their livelihoods through the use of mobile phones, both within and beyond Africa (Porter et al., 2018). It is noted that there's still very little understanding of the correlation between mobile phones and socio-economic development processes amongst youth in urban areas. Young people have adopted the use of mobile phones but are still disadvantaged in accessing employment and income (Porter et al., 2018).

In Africa, in response to the pandemic, UNICEF reported that schools were closed in 52 member states, and the teachers and learners had to adapt to new education delivery mechanisms, such as homeschooling and Open Distance and eLearning (ODeL) (AU, 2020b). Digital inequality has meant that these responses have excluded those learners and teachers that are in rural and disadvantaged urban areas (AU, 2020b).

The African Union Commission is currently working on the implementation of its Digital Transformation Strategy, which will improve access, inclusion, quality and relevance of education and learning (Kokutse, 2021).

South African colleges and universities have also moved classes online; this has brought about new challenges for students and lecturers who struggle with access to hardware and internet connection (Bangani, 2020). Remote learning has subsequently also revealed the challenges aren't only about the learning aspect but the importance of the environment for learning to take place (Bangani, 2020).

1.3.6 Simulations and Serious Games

In January 2022, Microsoft acquired a gaming company for almost $70 billion dollars. This highlights that gaming has become one of the biggest forms of entertainment in the world (Microsft New Center, 2022). This further illustrates where the world is moving, not only in terms of game development and entertainment content publishing but as a platform to reach individuals from anywhere.

Fox, Pittaway and Uzuegbunam (2018) define serious games (in the entrepreneurship education context) as computer-based learning simulations that engage players in realistic activities that are meant to increase knowledge, improve skills, and enable positive learning outcomes. The use of serious games is increasing as it allows for an authentic experience of the complexity and uncertainty of entrepreneurship (Newbery, Lean & Moizer, 2016). The focus of serious games is to promote learning and focus on problem-solving but still provide an entertainment element (Fox et al., 2018). Researchers indicate that the use of innovative methods such as games, video clips and simulations are valuable teaching methods (Samuel & Rahman, 2018). With the improved internet connectivity, online gaming has grown rapidly in Africa in the past couple of years (Diallo, 2020).

In 2020 in South Africa, a 3D virtual school was launched as part of remote learning, allowing teachers and students to interact and engage; even though this virtual school was prompted by the pandemic, the founders have noted the growing need for students to take ownership of their learning (Business Insider, 2020).

The challenges faced in the introduction of simulations and serious games have been the time it takes for the adoption and persuasion of stakeholders to convince them of the benefits and rewards (Samuel et al., 2018). In a report conducted to understand the local game development ecosystem where South Africa was compared to a developed country, developing country and two African countries, the African countries ranked poorly (Tshimologong, 2021). Eight different key indicators were identified as key matrices; the poor ranking revealed that there's significant work that needs to be done in short to long term to improve the ecosystem.

1.4 Research Problem

The literature has revealed numerous studies around the world on the role of serious games in tackling social issues, especially entrepreneurship education. Unfortunately, there are few cases in South Africa that are documented, but those that are documented are not about entrepreneurship. Consequently, there are none that address the needs of black youth in townships and peri-urban areas in South Africa. Therefore it is not clear whether gamification could be used as a method to teach entrepreneurship education. There are gaps in the current literature, as previous studies have neglected these geographical areas and demographic groups (Wentzel, 2018).

Consequently, the research problem that will be addressed in this dissertation is whether gamification can become a teaching method for black youth entrepreneurs in townships and peri-urban areas in South Africa.

1.5 Research Objectives

The aim of this study is to determine whether gamification could become a teaching method for black youth entrepreneurs in townships and peri-urban areas.

The aim will be accomplished by determining the following research objectives:

- Identifying factors contributing to challenges faced by youth entrepreneurs;
- Exploring the gaps that exist within ED programmes offered to youth entrepreneurs and their expectations;
- Investigating how this demographic learns new information, especially that pertains to their businesses;
- Exploring whether gamification is a viable option for introducing new and sometimes challenging concepts.

1.6 Research Questions

1.6.1 Primary Question

How can the development and deployment of serious games enable the key skills of entrepreneurship to be learned and applied to create support in the sustainability of enterprises for economically marginalised youth in South Africa?

1.6.2 Secondary Questions

- How do ED programmes address youth unemployment? And what are the expectations of these programmes?
- How do youth entrepreneurs in the township and peri-urban areas find and learn new information?
- What does gamification data reveal about learning and development for youth entrepreneurs in the township and peri-urban areas?

1.7 Significance of the Study

There is a vast body of research on entrepreneurship education and gamification as two separate studies. But there are not enough scholarly studies that address gamification as a tool to teach, especially in marginalised areas in South Africa. The exploration of the literature on entrepreneurship education is mostly based on academic programmes rather than on practitioners of entrepreneurship (entrepreneurs themselves), or on the link or monitoring and evaluation of entrepreneurship education and the teaching methods utilised by institutions. Therefore exploring whether an approach such as gamification is a viable option for entrepreneurship education in marginalised areas is a relatively new dimension.

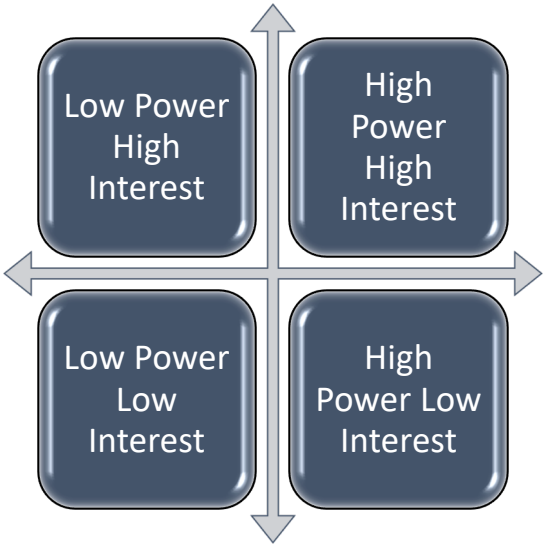

Figure 1.2: Identifying your audience

Source: (Wentzel, 2018).

Figure 1.2 is provided by Wentzel (2018) as a means to identify your audience so that one is able to focus the research. Noting where stakeholders are in the different quadrants is an important indicator of which stakeholders will be interested in the research problem. There might be other stakeholders affected by the problem, but few have the capacity to action change.

The audience for this study is as follows:

- Youth entrepreneurs (potential and existing) – as they transition from unemployment or employment to employment creators and move from being survivalists to participating in formal business through training and support
- Government
- Business (corporate)
- Training and Education Institutions

1.8 Scope of the Study

The research is a mixed-methods study to understand how the chosen demographic learns and acquires new skills and topics that they struggle with in their entrepreneurial journey. The

research then proceeds to test whether a serious game prototype could be a tool that engages and improves entrepreneurship concepts. The theoretical basis of the study will be a transformative design.

The research will focus on youth based in townships and peri-urban areas of Gauteng. Their age group ranges from 18 – 35 years old. The participants are all black entrepreneurs who currently reside or operate a business in a township or peri-urban area.

These entrepreneurs have registered businesses and have participated in an Entrepreurship Development (ED) programme within 24 months of the interview. Due to the challenge of administering individuals for the focus group interviews, the research was conducted with alumni of ED incubators around Gauteng. The focus group interviews also included ED practitioners; these are individuals whose backgrounds vary between academia, corporate, policy advocates and ED programme facilitators. These participants have worked closely with entrepreneurs from diverse industries, age groups and business acumen.

Individual interviews were also conducted with two entrepreneurs who were unable to participate in the focus groups. They fulfilled the required criteria and added to the original research sample.

An entrepreneur from India who designed a game in Hong Kong was interviewed to gain a global perspective on serious games. Locally the founder of a serious game-developing business based in Cape Town was consulted to shed some light on the gaming landscape. The local game developer was able to allow us to test a game developed for one of the top four financial institutions before it was launched, to get an idea of the serious games market.

1.8.1 Research Participants

Purposive sampling was conducted. Participants were approached through the researcher's networks within the entrepreneurship hubs or incubators in Gauteng. This was the most logical choice, as these incubators have the required participants in their databases.

1.8.1.1 Focus Groups

1. Entrepreneurs (Multichoice Development Programme)
2. Entrepreneurs (eKasi Entrepreneurs) (1)
3. Entrepreneurs (eKasi Entrepreneurs) (2)
4. Entrepreneurs (The Hive Network JHB)
5. ED Practitioners (Academia, Corporate & ED entrepreneurs) (1)
6. ED Practitioners (Academia, Corporate & ED entrepreneurs) (2)

1.8.1.2 Individual Interviews

1. Entrepreneur (Tshimologong Precinct)
2. Entrepreneur (Alexandra)
3. Founder – Serious Game Developer (South Africa) - Unstructured
4. Founder – Serious Game (India) – Unstructured
5. 10 Game Participants (Players)

Though there are multiple different research methodologies available, this study has adopted the mixed-methods approach. According to Creswell and Plano Clark (2011), a mixed-methodologies research design is a research design that contains its own philosophical assumptions and methods of enquiry. It is a methodology that draws on philosophical assumptions to provide instructions for the collection and examination of data drawn from a variety of sources within a single investigation.

A mixed-methods design offers a number of benefits when approaching complex research issues because it integrates the philosophical frameworks of both post-positivism and interpretivism (Fetters, 2016). It also interweaves qualitative and quantitative data in such a way that research issues are meaningfully explained. These are all reasons why a mixed-methods design is advantageous. In addition to this, it provides a logical foundation, methodological versatility, and an in-depth comprehension of individual circumstances (Maxwell, 2016). In other words, the use of mixed methods enables researchers to answer research questions with sufficient depth and breadth (Enosh, Tzafrir, & Stolovy, 2014).

Additionally, the use of mixed methods assists in the process of generalising the findings and implications of the researched issues to the entire population. For instance, the quantitative methodology makes it easier for researchers to collect data from a large number of participants, which in turn increases the likelihood that the findings can be generalised to a more extensive population. The qualitative method, on the other hand, allows for a more in-depth comprehension of the matter that is being researched by giving the opinions of those who are taking part due consideration. To put it another way, although quantitative data contribute breadth to the study, qualitative data contribute depth.

In addition, qualitative discoveries and quantitative findings can be used to create a triangulated picture of the data. To achieve a broad understanding of the research problem or to assess validity through the consolidation of information from multiple sources, triangulation is a qualitative research strategy that involves the use of multiple methods or data sources. Triangulation is also known as methodological triangulation (Carter, Bryant-Lukosius, DiCenso, Blythe & Neville, 2014). Therefore, a mixed-methods design provides the best opportunity to address research questions since it combines two distinct sets of strengths while at the same time correcting for the deficiencies that are inherent to each method (Johnson & Onwuegbuzie, 2004). As a direct result of this, the use of mixed-method research designs is becoming increasingly important for the purpose of answering impact study questions (Dawadi, Shrestha & Giri, 2021).

This study will employ a sequential embedded mixed-method design. Creswell and Clark (2010, p.90-93) define embedded mixed method designs as those in which the researcher integrates the collection and analysis of quantitative and qualitative data into a more conventional quantitative research design or qualitative research design. It is possible for the gathering and examination of the secondary data set to take place either before, in the middle of, or after the execution of the data collection and examination processes that are customarily connected to the bigger design. In this study, the sequence of data collection and analysis will be QUAL → quant → QUAL.

The qualitative data will be analysed using a computer aid programme, Atlas ti 8.0, to analyse the interviews and focus groups. The serious game prototype will have back-end analytics to

measure quantitative variables while the entrepreneur is playing. And individuals who have played the game will then be interviewed to extract further qualitative data.

Grounded Theory will be used for the qualitative method; this entails going through iterative waves of data from the study until there are no revisions to the theory or new data (Willis, 2007). This theory is ideal for the proposed study because there's little or no academic literature on entrepreneurship education teaching methods for the chosen target group. There are no documented accounts of what has been successful or unsuccessful. The case studies presented in the literature have vague stipulations for the methodology used.

1.9 Assumptions in the Study

The key assumptions which required testing going into the research phase of this study included but were not limited to the following:

- Participants understood gamification as a concept (although we did provide a broad overview);
- Participants would give open and honest feedback during the interviews, even though some of the entrepreneur focus groups were conducted in the incubators from which they were alumni. We assumed that they wouldn't hold back in their responses to questions posed regarding their experiences;
- Some participants responded to the interview questions in Sotho, Tswana or Zulu. Therefore the assumption is that the translation from these three languages to English would give as accurate a description as the original language spoken during the interview without having certain phrases being lost in translation;
- The game had a survey component, and players were incentivised to complete the survey by allocating more virtual coins to the survey. The purpose of the survey was to assist in identifying the test group. The survey requires participants to enter their demographic data whilst still remaining anonymous. The assumption is that participants who played the game were honest in their responses to the survey;
- The last ten individual interviews were held via Zoom due to the after-effects of the pandemic. Some participants were more comfortable doing online interviews than face-

to-face. Our last assumption was that individual interviews conducted via Zoom produced the same results as face-to-face interviews.

1.10 Chapter Outline

According to Oosthuizen, Smit, Roos, Rossouw, Van der Bijl & Oosthuizen (2020), it is necessary to plan multiple chapters in order to adequately address all aspects of the investigation. The structure of the study is outlined in the following paragraphs.

1.10.1 Chapter 1: Introduction and problem statement

This chapter covers the introduction and background of the research, including the aims, problem statement, design, and techniques of the study. To achieve the study's goal, four research objectives have been identified. It also discusses the background of the research. In addition, discussions regarding the study's significance, scope and assumptions were included.

1.10.2 Chapter 2: Literature Review

The pertinent research on the subject will be examined, as well as discussed, in this chapter. The research problem is multifaceted. To use tools like serious games, one must comprehend the global and local challenges. To understand research participants and their communities, this chapter examines the transformative paradigm. It then discusses youth unemployment in the South African context. Gamification is then unpacked in terms of motivation, success, game elements and gamification as an instructional method.

1.10.3 Chapter 3: Research methodology

This chapter is an in-depth analysis of the different research methods is presented that were used in this study. In addition to this, it provides an overview as well as a description of the research methodology, research questions and objectives, and data collection methods. A reliable research approach lends credibility to the investigation and yields scientifically valid

results. In addition, it provides a thorough plan that assists the researcher in staying on track, so making the process more efficient, effective, and manageable.

1.10.4 Chapter 4: Data analysis and discussion of finding

This chapter describes the study's findings, beginning with an overview of the sample's several phases. This summary describes the participants' demographics and the importance of the empirical findings. Following this is a series of topics developed from the codes and the group of codes (sub-themes). The perspectives of both young entrepreneurs and enterprise development practitioners were offered as a result of analysing these subthemes. Consequently, the gamification outcome and post-gamification discoveries are a natural conclusion. At the end of the chapter, a summary of the investigation's results and a response to the study's questions are provided.

1.10.5 Chapter 5: Praxis Model

One of the requirements to be fulfilled within UCTs GSB Masters in Philosophy in Inclusive Innovation, is a praxis model.

In this chapter, we examine the construction and testing procedure of the serious prototype game which was the researcher's praxis model. Two of the five themes that emerged from initial qualitative research were the acquisition of new information and the usage of gamification as a learning approach. These two concepts form the foundation of the design process for the prototype of the serious game.

The researcher partnered with a game development company in Cape Town, called Sea Monster. The partnership developed due to their commitment to solving social issues through gamification, especially the problem of youth unemployment. The serious game prototype was developed on the Lighthouse Platform. The game was initially called 'EntrepreneurBooster SA', then after some user feedback was amended to 'BusinessBoost SA'

The game was developed using the agile methodology, which involved an iterative approach that incorporated feedback into the game's design. Using the qualitative findings and

implementing the product vision, project description, and project milestones, the idea development was created. The prototype centered on three entrepreneurial learning topics: business registration, market research, and customer approach.

1.10.6 Chapter 6 Conclusion, Recommendations, and Limitations

The investigation is brought to a close with the presentation of a summary of its findings in this chapter. This chapter also includes recommendations based on the literature reviewed for the study as well as the findings of the empirical research. It is crucial for the paper to have a conclusion since it allows the reader to come to terms with what they have read while also bringing to mind the significance of the information presented in the paper. This is achieved by taking a step back from the particulars in order to examine the document as a whole from a more holistic perspective.

1.11 Conclusion

The world has been faced with unemployment for the past decade, but recently the youth unemployment problem has become massive in many parts of the world. In 2019 when the COVID pandemic hit, this exacerbated the problem. In South Africa, youth unemployment is another pandemic. With economic and social issues also escalating, one of the suggestions to tackle these issues is through entrepreneurship. Entrepreneurship has the potential to empower young people and provide the employment opportunities needed in the country.

Unfortunately, entrepreneurship also has many challenges, and without adequate support, young people are bound to fail. Therefore, how does one provide this demographic with sufficient skills and knowledge to navigate the world of entrepreneurship? As there are many solutions out there, the one posed in this study is whether serious games could become one of the options for teaching entrepreneurship education amongst youth entrepreneurs in marginalised areas. In the following chapter, we will navigate what the literature reveals about this research topic.

CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction

In Chapter 1, the researcher laid out the context to determine whether gamification could become a teaching method for black youth entrepreneurs in townships and peri-urban areas.

In 2020, the global community began to feel the effects COVID-19 pandemic. The pandemic has not only been a health crisis but has had adverse effects on employment (UN, 2020). The increase in unemployment has had a trickle-down effect on youth unemployment, with young people becoming even more vulnerable (OECD, 2020).

The Global Entrepreneurship Monitor 2019/2020 – Global Report (2020) reported that entrepreneurship is a viable solution for creating employment. This has led to the drive to support potential and actual entrepreneurs through entrepreneurship education programmes (Samuel & Rahman, 2018). The recent global pandemic has highlighted the gaps experienced in the digital era, with social distancing requirements discouraging the use of any face-to-face training methods (WEF, 2021).

Education on entrepreneurship has been a major priority on policy agendas all around the world as a tool to foster economic growth, combat unemployment, and build social capital. An essential tenet of entrepreneurship education is the notion that developing an entrepreneurial mindset, a set of skills, and a set of competencies that can be taught to students which can lead to the creation of new businesses and business ventures. Because of the significance of entrepreneurship, it is necessary to provide effective educational frameworks and training opportunities for entrepreneurs.

Research has revealed that games and simulations are becoming important teaching methods, with lack of buy-in from stakeholders being one of the hindrances experienced (Samuel et al., 2018). The introduction of these methods is not without its challenges, as inequality in access needs to be noted so that inclusion is a priority (Kokutse, 2021).

This chapter will focus on the following:

- The Theoretical Basis of the Study
- Youth Unemployment
- Inequality and the South African Government's Transformative Objectives
- Entrepreneurship & Entrepreneurship Education
    - Challenges in Entrepreneurship Education
- Gamification & Simulations
    - Motivation
    - Success of Gamification
    - Gamification as an instructional method
    - Game Design
    - Game elements
    - Criticism
- Gamification in Entrepreneurship Education
    - Implementing Gamification

2.2 Theoretical Basis of the Study

This study is based on a transformative design (Table 2.1). This theoretical model gives primacy to value-based, action-oriented research, such as participatory action research and empowerment approaches (Creswell, 2009).

The transformative paradigm is at the intersection of mixed methods research and social justice; it provides a framework for addressing inequality and injustice in society using culturally competent mixed methods strategies (Mertens, 2007:212). In transformative mixed methodologies, the qualitative aspect gathers the community perspectives, and the quantitative can provide credible outcomes for the community (Mertens, 2007). The assumption is that members of these marginalised communities experience some sort of discrimination and oppression (Cram & Mertens, 2016).

In this type of study, the researcher would typically engage with the community prior to the research commencing to gain insights into what the focus of the research should be (Mertens, 2007). A study that engages in transformative design has the potential to address the issues of

power in research; there are real lives at stake, and their fate is usually determined by those in power (Mertens, 2007).

Table 2.1: Basic Principles of the Transformative Paradigm

Ontology: There are multiple realities that are socially constructed, but it is necessary to be explicit about the social, political, cultural, economic, ethnic, racial, gender, age, and disability values that define realities. Different realities can emerge because different levels of unearned privilege are associated with characteristics of participants and researchers. Transformative researchers need to be aware of societal values and privileges in determining the reality that holds potential for social transformation and increased social justice.
Epistemology: To know realities, it is necessary to have an interactive link between the researcher and the participants in a study. Knowledge is socially and historically located within a complex cultural context. Respect for culture and awareness of power relations is critical.
Methodology: A researcher can choose quantitative or qualitative or mixed methods, but there should be an interactive link between the researcher and the participants in the definition of the problem, methods should be adjusted to accommodate cultural complexity, power issues should be explicitly addressed, and issues of discrimination and oppression should be recognized.
Axiology: Three basic principles underlie regulatory ethics in research: respect, beneficence, and justice. The transformative axiological assumption pushes these principles on several fronts. Respect is critically examined in terms of the cultural norms of interaction within a community and across communities. Beneficence is defined in terms of the promotion of human rights and an increase in social justice. An explicit connection is made between the process and outcomes of research and furtherance of a social justice agenda.

Source: (Mertens, 2007:216)

2.2.1 Transformative Epistemological Assumption

This assumption asserts that those who are in positions of power in society will tend to assert the legitimacy and validity of their own knowledge and displace and marginalise the knowledge of those who are powerless (Cram & Mertens, 2016:174). Therefore the researcher must be aware of the power dynamics that exist when they enter communities so as to conduct research that brings in the voices of all concerned (Mertens, 2007). Research focuses on the transformative epistemological assumption as this highlights the need for a relationship between the participants and the researcher, so as to understand the culture and build trust (Mertens, 2007).

The researcher in question has also been a practitioner of the Entrepreneurship Development (ED) space for the past nine years. And in the last six years, she has worked with black youth entrepreneurs in the township and peri-urban areas. Trust is an important commodity in these areas, as individuals may feel that their information is being solicited without any feedback as

to why. Even though the researcher did not know most of the participants individually, she had to form relationships with community members, business hubs and incubators to form the research groups. Not only did the forming of relationships build trust, but it also created an understanding of the power differences for the researcher (Mertens, 2007).

Figure 2.1 illustrates the cyclical model of the transformative paradigm's epistemological assumption. It reflects the critical nature of mixed methods research and that community members' participation is required at the beginning, during and after the research (Fetters, 2016; Mertens, 2007; Maxwell, 2016). This not only builds ongoing trust but contributes to sustainable change in the community (Mertens, 2007), even though the researcher's primary goal is not necessarily to ensure social justice within the community. The intention is that the research outcomes will assist the community with the knowledge that could be helpful for participants going forward.

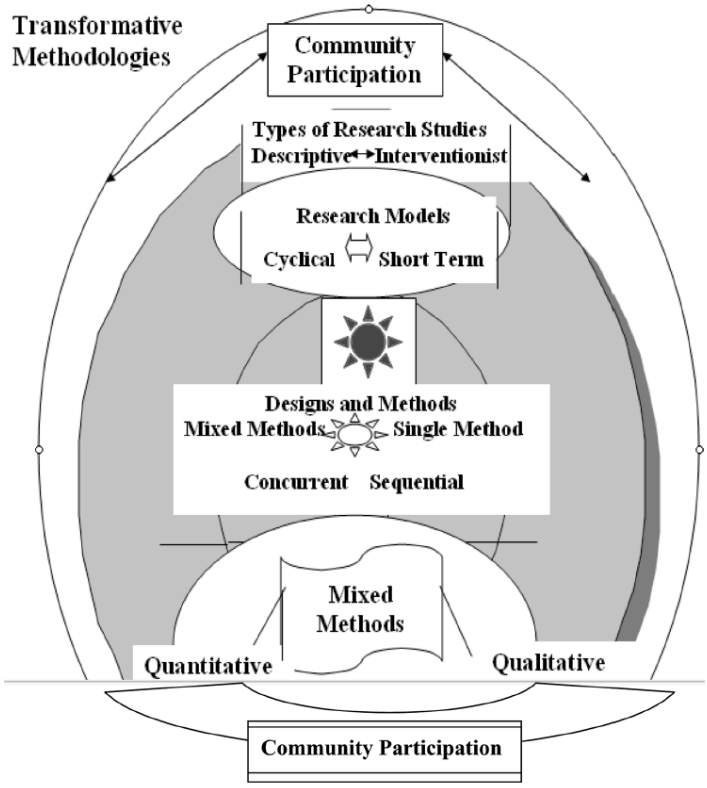

Figure 2.1: Cyclical Model for Transformative Research

Source: (Mertens, 2007:219)

A transformative paradigm, partnered with a mixed methods study, has the potential for a deeper understanding of the realities of the communities and provides richer dialogue (Johnson & Onwuegbuzie, 2004). "The transformative paradigm is applicable to people who experience

discrimination and oppression on whatever basis, including (but not limited to) race/ethnicity, disability, immigrant status, political conflicts, sexual orientation, poverty, gender, age, or the multitude of other characteristics that are associated with less access to social justice" (Mertens, 2009:4). This paradigm is relevant and appropriate for this research project because participants have been specifically drawn from the marginalised areas of townships and peri-urban areas.

2.3 Youth Unemployment

In the two decades between 1999 – 2019, global youth unemployment rates have increased, with young people facing higher rates of poverty, especially in Sub-Saharan Africa (ILO, 2020). In 2019 global statistics indicated that the youth unemployment rate was 13.6% for 15 – 24 years old (ILO, 2020), whilst South Africa recorded 59% youth unemployment in the first quarter of 2020 in a similar age group (StatsSA, 2020). South Africa has been established as having the highest youth unemployment rate in the world. This is becoming a global crisis as emerging young people are struggling to find viable prospects of employment, leading to a ripple effect of societal issues and exclusion from participating in the economy (ILO – Global Employment Trends for Youth 2020, 2020). The economic consequences of these societal issues include lost output, diminished government revenue in taxes, and increased public spending on social services, justice and policing systems (Graham, De Lannoy, Rosa & Breakey, 2019).

In different parts of the world, the age group for youth varies; some will define it as 15 – 24 years old, while in this study, we will use a broader definition of 18 – 35 years old. This broader definition will be used as it is extracted from the South African Broad-Based Black Economic Empowerment (BBBEE) Act of 2003.

According to O'Higgins (1997:1), the International Labour Organisation (ILO) defines unemployment as comprising those people who have not worked more than one hour during the reference period but who are available for, and actively seeking, work. In 1998, StatsSA released a report that revised the official definition of unemployed to: "those people within the economically active population who; did not work during the seven days prior to the interview; want to work and are available to start work within a week of the interview; and have taken

active steps to look for work or to start some form of self-employment in the four weeks prior to the interview" (StatsSA, 1998:1).

In 2019, approximately 87% of youth who were not in education, training or employment (NEET) in South Africa were black, and 59% were living in urban areas (Graham et al., 2019). This is significant because of the implications of interventions for this group in terms of cost, design, and execution (Graham et al., 2019). Youth in marginalised communities are shaped by the experiences of their environments, which has an effect on their development and life choices (Baldry, Graham & De Lannoy, 2019).

In understanding the issue of youth unemployment, one has to have a grasp on what its determinants are. O'Higgins (1997) proposed that aggregate demand, youth wages and the size of the youth labour force are the top three determinants. Aggregate demand refers to the market's demand for labour. Therefore a fall in this demand would increase the level of unemployment. Further challenges such as family structures, access to education, health and safety, information and connection, transport and mobility, and belonging and networks have been described as some of the complexities faced by young people (Baldry et al., 2019). Young people are especially vulnerable during the transition from adolescence to adulthood, with many not completing high school and therefore entering the labour market without adequate credentials and skills (Graham et al., 2019).

At the end of the first quarter of 2022, the youth unemployment rate in South Africa was standing at 63.9% for age groups 15 - 24 years old and 42.1% for age groups 25 - 34 years old (Stats SA, 2022c). These unemployment statistics greatly surpassed the overall national rate of unemployment, which was 34.5% (Stats SA, 2022c).

2.4 Inequality and South African Government Transformative Objectives

Globally, income and wealth inequality has seen a rise since the 1980s; some countries have experienced this rise more drastically than others (Chancel, Piketty, Saez & Zucman, 2022). "The richest 10% of the global population currently takes 52% of global income, whereas the poorest half of the population earns 8.5% of it" – these statistics seem to mirror what is happening in some countries, and South Africa is no different (Chancel et al., 2022).

Through decades of colonisation and apartheid, South Africa has a well-documented history of economic exclusion of the majority of the population of black people (Tshishonga, 2019). Apartheid came to an end in South Africa after the democratic elections in 1994 (Özler, 2007). In 1995 the Gini coefficient of inequality was 0.56 (Özler, 2007), and today it is sitting at 0.63, making South Africa the most unequal country in the world (StatsSA, 2018). Inequality is evident in sectors such as education, health and basic infrastructure, with it being the highest amongst black South Africans (Leibbrandt, Finn & Woolard, 2012).

In 2003 the South African government enacted the BBBEE Act as a means to drive and accelerate economic transformation (DTI, 2018). The BBBEE Act of 2003 had the objective of achieving "the economic empowerment of all black people, including women, workers, youth, people with disabilities and people living in rural areas through diverse but integrated socioeconomic strategies" (DTI, 2018).

In 2013 the Presidency released the BBBEE Amendment Act with a number of revisions (DTI, 2018). One of the significant amendments of the revised BBBEE codes was the emphasis on Enterprise and Supplier Development (ESD) (The Presidency, 2013). ESD is currently the highest element (with 40 points) in the new codes.

Since the establishment of the BBBEE codes, there have been many differing opinions on whether the Act has achieved its mandate or if it is another policy that is failing when it comes to the implementation of social transformation.

Isaacs et al. (2007), cited by Patel and Graham (2012), make the observation as to why there have been some difficulties in the implementation of the codes. These centre on the challenge of getting the private sector operating in a neoliberal economic context to contribute to the state's social transformation agenda. Before the amendment of the BBBEE codes in 2013, the argument was that the codes, as originally implemented, benefited elite and well-connected individuals (Patel & Graham, 2012). Although analysis of the trends of the BBBEE deals concluded between 2004 – 2009 showed that there was still a small black elite benefitting from the deals, the base of the BBBEE beneficiaries was changing slowly (Patel & Graham, 2012).

Following from these transformative initiatives by the government in South Africa, entrepreneurship has been encouraged, especially for marginalised groups from townships and peri-urban areas (NDP 2030, 2012). These initiatives, however, have left some unanswered questions. How will nascent entrepreneurs be supported in this environment, especially those that may not possess the skills, leadership and motivators for entrepreneurship? How will the effectiveness, or lack thereof, of these initiatives be measured?

In 2012, The South African National Planning Commission released the National Development Plan 2030 (NDP 2030), which was a proposal for eradicating poverty and inequality by the year 2030 (NDP 2030, 2012). This has led to the government encouraging young people to seek self-employment and entrepreneurship as a way of not only participating in the economy but of growing it. The NDP 2030 (2012) states that 90% of new jobs in the country must be created by Small, Medium and Micro-Sized Enterprises (SMMEs). Currently, SMMEs contribute approximately 60% to the GDP and 80% of the jobs in South Africa (StatsSA, 2018).

Besides the NDP 2030, there are four other national strategy documents that seek to promote entrepreneurship as the tool that will eradicate youth unemployment (Yiannakaris, 2019). They are as follows:

- The Youth Enterprise Development Strategy 2013 – 2023
- The Youth Employment Accord
- The National Youth Policy 2015 – 2020 (NYP 2020)
- The NYDA Integrated Youth Development Strategy (IYDS) 2020

Besides strategy documents, initiatives and programmes aimed at the youth, there are departments in government mandated to support the youth. These departments have cross-cutting mandates, and they are the National Youth Development Agency (NYDA), the Department for Women, Youth and Persons with Disabilities (DWYPD) in the Presidency, and the Department for Social Development (DSD) (Graham et al., 2019).

In 2020 the Minister of Finance announced a ZAR19 billion expenditure to fight youth unemployment for a newly formed programme known as the Presidential Youth Employment Initiative (Dooms, 2020). This was ZAR2 billion more than was committed between 2016 –

2017 for youth employment programmes, excluding Treasury's Jobs Fund 'Yes4Youth' programme (Dooms, 2020). This means that there has been a significant investment by the government, private sector (through BBBEE) and social enterprise programmes for creating youth employment. The financial resources exist, but the question is; are they being directed towards measurable impact?

2.5 Entrepreneurship And Entrepreneurship Education

A key focus around the world in the effort to achieve sustainable development has been on promoting quality education. This is stressed in Sustainable Development Goal (SDG) 4, which strives to ensure that all people have access to education regardless of their background or circumstances. In this context, it is important to highlight the introduction and explosion of information and communication technologies (ICT), which have been ingrained in the development of society (Maldonado, García & Sampedro-Requena, 2019). Both the education of teachers (Li, Yamaguchi, Sukhbaatar & Takadaand, 2019) and the education of students (Garrote, Arenas & Jiménez-Fernández, 2018) will benefit from the incorporation of these new technologies into education.

A key objective is making information and communication technologies accessible to each and every member of the school community and this has been at the forefront of the evolution of teaching that has taken place in educational institutions over the past few years (Pereira, Fillol & Moura, 2019). Following from this, the quality of teaching has improved, which has led to an increase in values such as motivation (Álvarez-Rodríguez, Bellido-Márquez & Atencia-Barrero, 2019). Students' interest in in educational activities has been seen to increase when information and communication technologies are available and their usage is prompted, which leads in turn to improvements in access to training and training materials using these technologies (Khine, Ali & Afari, 2017). It is clear that that information and communications technologies play a crucial role in the evolution of education at the present time (Nikolopoulou, Akriotou & Gialamas, 2019), particularly in teaching and learning procedures that aim to achieve social and economic transformation (Leite, Hoji & Júnior, 2018). In turn, changes in learning environments results in the emergence of novel learning experiences (Pozo Sánchez, López Belmonte, Fuentes Cabrera & López Núñez, 2020). The overall purpose of these

innovations is improvement in the quality of learning, which can be seen as the adaptation of education to the digital era (Cuevas, Feliciano, Alarcón, Catalán & Alonso, 2019).

Given today's youth are so interested in these new technologies, it is essential that educational and instructional materials continue to evolve to keep pace with their enthusiasm. Research that has already been conducted on gamification demonstrates that it has positive effects on students' engagement, learning acquisition, skill development, and resilience (Saggah, 2020).

These developments raise again the question of whether a person has to be born with entrepreneurial savvy or whether some aspects of entrepreneurship can be taught successfully (Malebana 2016). Does the theoretical approach through which the subject is delivered in universities have any value or relevance when entrepreneurship by nature requires action (Jack and Anderson 1999)?

In this context, Honig (2004) introduces us to Piaget's theory of learning. This states that "our intellect develops as we attempt to achieve a balance between ourselves and the environment, with unique situations bridged by changing mental structures to reflect these new experiences" (Honig, 2004:5). Learning takes place in evolutionary stages, which results in cognitive changes through adult life. Therefore one's learning is not static, but is moved to disequilibrium by challenges and failures that are faced, and the imbalance encourages one to learn and evoke new concepts (Honig, 2004). Honig states that this theory is appropriate for developing potential entrepreneurs as the entrepreneurial need for identifying opportunities and unique solutions develops innate epistemological enquiry (Honig, 2004). This speaks to the entrepreneurial curiosity to solve complex problems. Figure 2.2 supports this argument by showing that an experiential approach towards the teaching of entrepreneurship can enhance the individual's understanding and engagement with the content. Pedagogical tools that promote hands-on activities create outcomes such as self-confidence, risk tolerance and leadership (Honig, 2004).

Another teaching model that has been used in training students about the entrepreneurial process is the camp method (Kai, 2010). The camp method changes the learning environment; students are taken to a different location for a number of days, where they get to meet students from different disciplines and backgrounds (Kai, 2010). They are immersed in activities about

entrepreneurship and surrounded by business leaders and experts. The change in environment stimulates creativity, develops their personal attributes and gives the students the 'feeling' of being entrepreneurial (Kai, 2010).

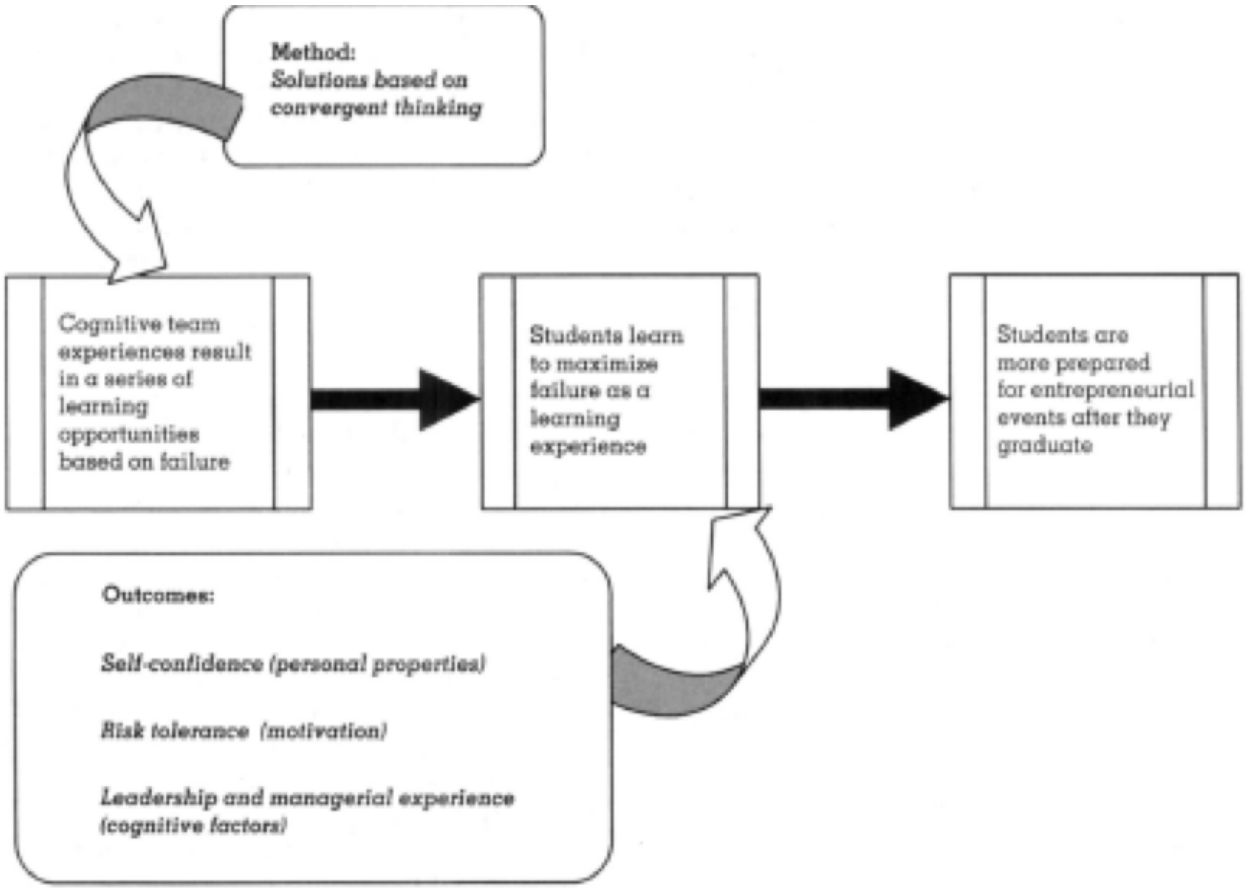

Figure 2.2: An Experiential Model of Entrepreneurship Education

Source: (Honig, 2004).

It may seem as though the focus is only on the individual receiving the knowledge, but there is a vital agent in this ecosystem, and that is the facilitator (trainer or educator). Only when facilitators have a good grasp and understanding of the learning process can they provide the necessary training interventions (Henry, Hill & Leitch, 2005).

2.5.1 Challenges in Entrepreneurship Education

The challenge in providing entrepreneurship education is not only the methods of delivery, but also the practitioner's understanding that there are two main areas of focus. Depending on who the audience is, the method chosen differs (Laukkanen, 2000). Laukkanen (2000) distinguishes these two areas:

- Education about entrepreneurship: this explores knowledge about the field, which contains theoretical micro and macro elements of the field as a social phenomenon.
- Education for entrepreneurship: this aims to develop competencies, skills, experience and values of the entrepreneurial process and follows a more practical approach to the study, such as writing business plans, computer simulations, role-playing games and videos, working with entrepreneurs and joining entrepreneurial clubs (Co & Mitchell, 2006).

In South Africa, even with all the government and private sector initiatives to empower the youth in townships, peri-urban and rural areas, youth entrepreneurship development is still unsatisfactory (Gwija, Eresia-Eke & Iwu, 2014). Gwija et al. (2014) conducted a study in Khayelitsha, Western Cape, to assess the impact of support structures and initiatives for youth entrepreneurship development. What is interesting to note from this study is that all the participants seemed to be unaware of what structures or initiatives existed except for activities driven by local organisations. Therefore part of the issue is not that some of these structures do not exist but the failure to communicate with potential youth entrepreneurs (Gwija et al., 2014).

The issue of these initiatives being seen to create impact is important because, in disadvantaged socioeconomic circumstances, most children and young people do not get the opportunity of observing entrepreneurship role models, which means that their social circumstances cause them to have a limited vision of productive employment (Kourilsky & Esfandiari, 1997).

Nieuwenhuizen and Groenewald (2008) suggest that, when designing entrepreneurship education programmes, one should focus on the process rather than the content, emphasising the "how to" more than the "know what". Gouws (2002) agrees that traditional methods cannot be used when training entrepreneurs. The example made is that earlier reading-intensive

approaches are not conducive to those that might possess lower levels of reading and writing proficiency (Gouws, 2002).

A case study conducted by the New Youth Entrepreneur programme also sought to understand the effects of entrepreneurship education amongst black youth in lower socioeconomic communities. Students were divided into two groups; a treatment group - which was exposed to one period a day for the semester, and a control group – exposed to basic entrepreneurship concepts as part of another course (Kourilsky & Esfandiari, 1997). The educational approach was experience-based and "hands-on", and the findings revealed that the treatment group significantly outperformed the control group on all dimensions of entrepreneurship tested (Kourilsky & Esfandiari, 1997).

In another study, Malebana (2016) looked at interventions that can be utilised to stimulate entrepreneurial intention among rural communities. His findings were that when entrepreneurs experienced entrepreneurship education over a long-term rather than short-term exposure, they were more likely to develop positive entrepreneurial intentions (Malebana, 2016). Malebana concluded that offering appropriate interventions over enough time drive the development of entrepreneurial competencies (Malebana, 2016).

Both studies lead to the question of whether black youth from lower socioeconomic backgrounds have the capabilities of grasping complex entrepreneurial concepts under appropriately designed programmes and with longer-term interventions. However it is still difficult to find specific research on the scope of entrepreneurship education as an impact initiative for youth in the township and peri-urban areas. There has definitely been exposure to entrepreneurship hubs in areas such as Khayelitsha, Philippi, Soweto, and Alexandra (Global Entrepreneurship Monitor 2019/2020 – Global Report, 2020). But the challenge remains that the teaching methodology utilised is not well documented. Therefore, one cannot compare or contrast with similar initiatives.

2.6 Gamification and Simulations

Gamification combines the realms of work and play so that people can enjoy themselves while simultaneously producing high-quality output (Majuri, Koivisto & Hamari, 2018).

Gamification is the process of adding game elements and theories into non-game contexts in order to affect user behaviour, boost fidelity, or engage and encourage users. It is a potent instrument based on the present technological advancements in our culture and the growing popularity of gaming (Ruiz et al., 2022). Consequently, we are better able to appreciate the meaning of "pleasure to individuals." The situation at hand can be resolved by employing the "possibly magical power of games" (Sridharan, Hrishikesh & Raj, 2020). Gamification begins with a comprehension of what a game is. There are numerous types of game elements, including rules, mechanics, dynamics, principles, and control systems (Sridharan et al., 2020).

According to Frith (2013), a combination of incentives, feedback, and rewards can modify behaviour with a reasonably predictable result. This combination of elements includes features such as points, tiers, badges, achievements (such as completing a level), progress bars, challenges, competitions, negative or positive feedback, and leader boards, amongst other things (Al-Rayes et al., 2022). A game element by itself is not considered to be "gameful," but when combined with other game elements, together they have the potential to drive behaviour changes by tapping into the whole range of human emotions and igniting users' motivation (Cotton & Patel, 2019).

Elements of video games are frequently mixed, with the goal of making the gameplay more enjoyable (Ruiz et al., 2022). This is sometimes referred to as the "game dynamics" of the situation. As a direct consequence of the compelling and motivating nature of the experience brought about by the components of the game, “wants” and “reasons” are generated (Majuri et al., 2022). Examples of game dynamics include making progress, expressing oneself, and helping others. Applications for social networking sites and mobile devices are frequently employed in order to incorporate all of these elements into the overall gamified experience (Al-Rayes et al., 2022). This serves to both improve the experience's efficiency and make it more easily available to users (Frith, 2013).

One school of thought contends that, with proper use of gamification, enjoyment may be channelled to both engage the user and increase their level of productivity (Pereira, Fillol & Moura, 2019). It has been demonstrated via a large number of successful applications of gamification in business as well as in a wide variety of other sectors that gamification, when

carried out in the appropriate manner, is capable of producing very positive results (Bai et al., 2022; Saggah, 2020).

It should also be noted that gamified applications are not games and should not be confused with full-fledged video games (Cotton & Patel, 2019). Gamification, as a process, has a more understated effect than a game. While a game is designed and produced from the ground up, the process of gamification borrows concepts and components from a wide range of sources (Frith, 2013; Gourountis, 2022).

In addition, gamification has the potential to accomplish a wide variety of goals (Al-Rayes et al., 2022). In the event that these impacts take place, users may be more engaged, more driven, and more willing to contribute to the achievement of a goal. The "motivational force of games" can be exploited when gamification is applied to solve problems in a variety of settings, including the classroom, the workplace, and personal life (e.g., personal health or tasks) (Maldonado Berea, Garcia Gonzalez & Sampedro-Requena, 2019). In certain instances, gamification succeeds in persuading individuals to participate in activities that would otherwise be boring or uninteresting, and in other scenarios, the level of involvement is so great that the participants lose track of the passage of time (Li, Yamaguchi, Sukhbaatar & Takada, 2019). Because of the beneficial effects that gamification has on users' incentives, motivated users are more likely to participate in tasks that may not be required of them. This is because motivated users are more likely to find the tasks enjoyable (Khine, Ali & Afari, 2017).

2.6.1 Motivation

Gamification incorporates concepts from a variety of domains, including psychology, computer science, the video game industry, and even marketing, in order to achieve results that can be trusted (Gourountis, 2022). When it comes to formulating an efficient gamified approach, having a solid understanding of human psychology and the ways in which it may be influenced is essential (García-Iruela, Hijón-Neira & Connolly, 2022). Any environment can benefit from the application of psychology as a tool to assist players in bringing their best game to the table (Pereira, Fillol & Moura, 2019). A gamified application can be designed to engage users by addressing their basic human impulses for achievement, admiration, reciprocity, and

a sense of control over a little piece of their existence (Frith, 2013). This can be accomplished by utilising psychological elements to develop the application.

The most significant influence on gamification comes from the branch of psychology known as motivational psychology. The ideas of both intrinsic and extrinsic motivation can be applied to the gamification of an application in order to give rewards that will drive behaviour (Zichermann & Cunningham, 2011). People who are motivated by their intrinsic interests choose to engage in activities that "come from within" them rather than those that are chosen for them. On the other hand, intrinsic motivation originates from the individual themselves and does not call for the receipt of an extraneous incentive. In order for users to participate in the gamification of an application, they need to be offered an incentive to make contributions to the platform (Sailer, Hense, Mayr & Mandl, 2017).

Social psychology is another field that has an impact on gamification (Luo, 2022). The discipline of social psychology seeks to discover hypotheses that predict how users might be induced to participate in communal systems in order for them to benefit themselves. This is the end objective of social psychology. Recent research has shown that people have a strong need for social contact, which is why they participate in activities that are similar to games (Rosenthal & Ratan, 2022).

In addition, collecting and analysing data is a crucial instrument for attaining the intended goal in gamified strategies, allowing adaptation to individual interests and motivations (Vargas-Morúa, 2022). It is possible for users of gamified solutions to be motivated to improve their performance or enhance their engagement if the solutions allow the users to visualise and interpret their performance (Luo, 2022). Based on data that is collected in the gamification process, users are able to monitor their own development, obtain comments in real time, and evaluate their accomplishments in relation to those of others in the community (Pozo Sánchez et al., 2020). This results in increased competition, output, and participation from those involved (Barr, 2018).

2.6.2 Success of Gamification

2.6.2.1 Social Psychology

It is common practice to employ social psychology as a non-financial incentive strategy in an effort to raise levels of collaboration and involvement. When thinking about gamification, everyone should be mindful of social facilitation and "social loafing" (Gourountis, 2022). People have a tendency to perform better on simple tasks when they are aware that another person is watching them, as compared to when they are completing the job alone or with a group of other people. On the other hand, the phenomenon known as "social loafing" describes behaviour in which individuals put in less effort to achieve a goal when they are working in a group as opposed to when they are working alone because they have the perception that their efforts do not count, are not evaluated, or are not recognised (Zainuddin, Chu, Shujahat & Perera, 2020).

It is a common observation that members of a group that collaborate on a project produce fewer results than would be achieved by each individual member working independently (García-Iruela, Hijón-Neira, & Connolly, 2022). The purpose of gamification is to improve parts of social facilitation that are beneficial while mitigating the negative effects of social loafing (Pereira, Fillol & Moura, 2019). Individuals' efforts may be prominently exhibited if feedback, competition, and prizes are used in conjunction with other game aspects (Vargas-Morúa, 2022). This makes it evident that individuals' contributions have unique value and that they may be judged by peers or superiors, all of which are conceivable outcomes.

2.6.2.2 Sign of the times

The popularity of gamification can be ascribed to a number of different factors, including the increasing prevalence of mobile devices, the accessibility of the internet, and the influence of video games. People are now able to interact online whenever they want and from wherever they are because of the proliferation of mobile devices and social media. According to the opinions of several experts, the dramatic shift in the way that people engage with one another on a daily basis and in the workplace has been brought about in part by 'hyper connection,' 'virtualization,' and 'the ubiquity of games' (Gourountis, 2022). These include games like video and internet gaming, as well as more informal forms of gaming like online and casual

gaming. Therefore, gamification is an ideal implementation of these new ideas since it combines the elements of social interaction and competitive play (Luo, 2022).

Last but not least, some industry professionals assert that the rise of gamification can be attributed to a change in generations as well as the widespread availability of online connectivity (Chang & Wei, 2016). However, other industry professionals believe that the success of gamification can be attributed to the fact that these factors satisfy the inherent human goals and aspirations that people have for reward, recognition, accomplishment, competitiveness, self-expression, and even altruism (Gourountis, 2022). These sentiments and goals are applicable to almost everyone since everyone is motivated by a unique combination of those factors (Dichev, Dicheva & Irwin, 2020). The term 'virtual revolution' was developed by industry professionals to define this transformation, which will have an impact on each and every sector (Gourountis, 2022). There is little doubt that gamification will quickly become an essential engagement element for today's hyper-connected, social, and technologically sophisticated generation (Saleem, Noori & Ozdamli, 2022).

2.6.3 Gamification as an instructional method

Learning that is traditionally centred on the teacher is coming up against an increasing appreciation of the importance of learning that is centred on the learner (Khine, Ali & Afari, 2017). E-learning is often promoted as a solution to learning issues that are prevalent in teacher-centred learning because it allows students greater influence over the learning process (Bolat & Taş, 2022). In addition to this, the academic world is becoming increasingly competitive for the attention of students and is having difficulty motivating students (Dichev, Dicheva & Irwin, 2018). However, when students are presented with the wide variety of games and social media platforms available, they gladly commit to spending many hours at a time hooked to their screens for the purposes of gaming, socialising, and engaging in other online activities (Vargas-Morúa, 2022).

It is generally agreed that gamification is an innovative and cutting-edge instructional method (Skalka & Drlik, 2018). According to Toda et al. (2019), it is believed that combining traditional learning methods with those that are aided by technology will result in an improved educational experience. Sánchez et al. (2020) conducted a comprehensive study with a total of

sixty participants to evaluate the efficacy of gamification as a component of the learning experience. According to the findings of their study, incorporating elements of gaming into the educational process both stimulated pupils and led to improved knowledge retention.

The existing body of research has placed a strong emphasis on the beneficial effects that gamification can have on the level of engagement shown by students, as well as their capacity to absorb new information and improve their existing abilities (Adam, Blewett & Quilling, 2022). As a direct result of gamification, participants in Adam's (2017) study on a gamified course felt more motivated to participate, contribute, and engage in the activities of the gamified course. Specifically, the elements of relatedness, competence, interest/enjoyment, and value/usefulness all had a favourable influence on participants' levels of motivation. On the other hand, Adam (2017) found that aspects such as autonomy, pressure or tension, and effort or investment entailed varying degrees of unpredictability. At the beginning of the course, a few of the participants expressed scepticism regarding gamification; however, towards the end of the programme, they shared their positive experiences regarding the impact of gamification on e-learning (Adam, 2017). This highlighted the apparent conflict that exists between the propensity of students to participate in gaming and their reluctance to participate in e-learning classes.

There is much for students to benefit from the incorporation of gamification into e-learning. These include encouraging students to engage with an academic subject, recognising students among their classmates, inspiring students to put in more effort, improving students' understanding of the material, and fostering the development of skills and the ability to conduct research (Zainuddin, Chu, Shujahat, & Perera, 2020). In addition, gamification can boost participation, collaboration, and relevance in engagement, while simultaneously motivating students to reflect on their learning strategies and fostering self-directed learning (Sanchez, Langer & Kaur, 2020). Over the course of a longer period of time, gamification prompts participants to consider the ways in which their education is preparing them for their future careers (Barr, 2018).

Further, the global COVID-19 epidemic caused governments across the world to adopt exceptional measures, including the shutdown of schools, creating hurdles for the education of students. The temporary halt in the practice of conventional teaching has presented an excellent

chance to adopt a fresh perspective towards the use of gamification platforms to facilitate the development of innovative instructional strategies (Hyams-Ssekasi & Taheri, 2022).

2.6.4 Game Design Science

In a recent study, a working definition for gamification was proposed: "gamification is the use of game-like information technology (IT) design artefacts and system processes to strengthen motivations and encourage specific behavioural changes in users for specific instrumental goals" (Silic & Lowry, 2020:131).

To create successful artefacts, it is important to conduct design science research within the paradigm of Information Systems (Peffers, Tuunanen, Rothenberger & Chatterjee, 2007). Design Science is defined as a rigorous process that designs artefacts that aim to solve observable problems, make research contributions, evaluate designs and contribute the results to the appropriate audience (Peffers et al., 2007). Using a Design Science approach to create gamified systems ensures the focus on meaningful engagement to produce meaningful results (Silic & Lowry, 2020).

Gamification has seen a staggering increase in participation over the years among young people. In America, it's reported that 61.9 million people in 2011 participated in online social games; and 40% of the participants were between the ages of 20 – 34 years old (Johnson, Adams & Cummins, 2012). One of the reasons for this phenomenon is that this age group has grown up in the digital age; therefore, games are an important part of their lives (Johnson et al., 2012). These numbers have significantly increased, especially during the pandemic. In 2022 the US mobile gaming statistics were estimated at 162.9 million people playing (Insider Intelligence, 2023).

Game developers are not always in agreement about what makes certain games have more engagement and impact over others. In an effort to get users to visualise urban environments in 3D at an educational and social level, a game called Game4City 3.0 was created (Villegas et al., 2021). This specific game aimed to assess the qualitative measure between motivators and game mechanics. Motivators can be different for each player, so at the initial design phase, potential players were encouraged to provide information that could be used in the

development of the game so as to understand the different types of motivators (Villegas et al., 2021). This led to Villegas et al. (2021) creating the Representation of Core Engagement Loop Model (Figure 2.3). This project highlights the merits of co-creating with users, showing that there may be fewer iterations as the players' motivators are identified upfront.

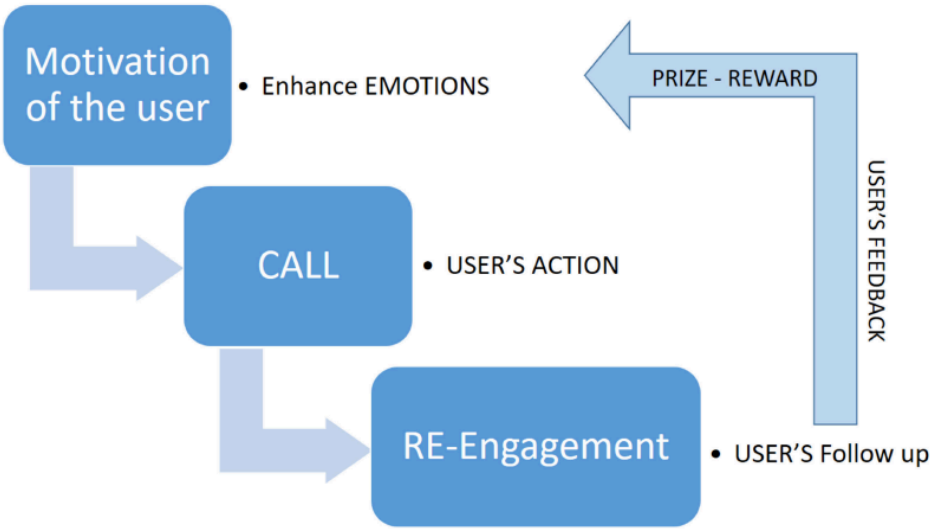

Figure 2.3: Representation of core engagement loop model

Source: (Villegas et al., 2021).

Gaming is no longer just a recreational activity; a serious game is a category of gamification that is specifically designed for educational purposes to improve a specific learning process (Almeida, 2017). Researchers in this field have reported mixed results, with some finding benefits in the use of gamification, while others report damaging results (Gallego-Durán et al., 2019).

Even though serious games have gained traction as learning mediums, it is important to remember that the game is an enabler, a vehicle for delivering learning. Therefore the content still needs to take into account the end user, which is what some researchers tend to forget (Almeida, 2017). In Gallego-Durán et al. (2019), a game-design rubric is introduced as a way to assist researchers and novice gamification practitioners with game-design aspects that provide a way to analyse and measure their work against other successful designs (Table 2.2). The rubric contains ten characteristics measured a scale of 0-20 points; the higher the score,

the better. This rubric is meant to provide guidance so as to lower the difficulty and frustrations experienced by first-time game designers.

It is also worth noting that even though serious games have been recognised as having great potential, their usage in higher education curricula is still low (Almeida, 2017). This is surprising considering the massive increase in gaming sales and culture globally (Gallego-Durán et al., 2019).

Antonaci et al. (2015) state that serious games have concrete relevance to subjects such as entrepreneurship education, which may be complex to explain in words, because games tend to create an immersive experience. There are many examples of uses of simulations and serious games in other industries. Simulators are used for the training of ultrasound radiologists, simulated patients for emergencies and general medical training, and aeroplane simulations for training pilots (Honig, 2004). Simulators are a form of game-based learning that is designed to replicate a real-world situation as accurately as possible to allow players to learn and practice skills without putting themselves, others, or expensive equipment at risk (Hall et al., 2017:2).

The downside of utilising games is that they tap into human extrinsic motivations, the desire for rewards and recognition to keep the players engaged (Hall et al., 2017), which means that some players might find a shortcut to get the reward as quickly as possible.

In 2016, the 'Serious About Games' initiative was launched by the Cape Innovation and Technology Initiative (CiTi) with various partners in Cape Town, South Africa. This initiative aimed to tackle the various social issues faced, especially by the youth in poor communities, through game development competitions and knowledge-sharing events. This was a success as winners of the competition received funding to create their serious games, and this put a spotlight on this growing industry. The serious games market is still very niche in South Africa, as most game development studios are still using their resources for games as entertainment (Hall et al., 2017). In the past couple of years, though, the South African game development ecosystem has been slowly attracting interest from different stakeholders who have the desire to see this industry grow (Tshimologong, 2021).

Table 2.2: Ten-characteristic game-design-based gamification rubric

Characteristic	0	1	2
Open Decision Space	Not open No real decisions to take Only Correct/Incorrect	Decision-tree like Designed decision space With options but limited	Completely open Multiple/Infinite options Continuous decision spaces
Challenge	Single difficulty/activity No activity-ability match Punishments prevent beneficial attempts	Incremental difficulty Speculative Design Subjective matching Subjective measures	Sinusoidal difficulty progression Designed activity-ability match Measured, balanced, tested
Learning by Trial and Error	Failure punished Max.Marks only achievable without failure	Failure permitted Max.Marks achievable with some failures	Failure encouraged for learning Max.Marks achievable independent of failures
Progress Assessment	No progress measures No feedback on progress	Some progress measures defined Some feedback on status/progress Lack of precision	All progress defined All progress measured Detailed feedback on status/progress Next steps are clear
Feedback	None/minimal feedback response to actions Cause-effect learning is difficult/impossible	Some feedback response Some actions w/feedback Feedback not immediate Some cause-effect learning is possible	All actions produce cause-effect feedback Feedback immediate or timely adequate Cause-effect learning
Randomness	Everything is predictable No randomness involved No surprises	Some unpredictability Some random events or parts of activities Speculative/casual design of random parts	Measured unpredictable content and random parts of activities Purposively designed Surprises included, designed and balanced
Discovery	No new content No discovery No unlocking Content is fixed	Activities presents new content on progress Some unlockable content New content does not deliver surprises	New content is presented at a measured pace Discoverable content rewards user interest Surprises on discovery
Emotional Entailment	No design that targets emotions No characters, stories or aesthetics Focus on factual content	Some form of design to target emotions Use of template stories characters or aesthetics Imaginary experiences	Specifically-designed characters, stories and/or aesthetics Design focuses on creating an emotional experience
Playfulness Enabled	Concrete goals Specific procedures No room to experiment No curiosity generated	Selectable goals and/or procedures Room for development of personal creations Optional activities with creative component	Selectable/generable goals Creative procedures Users may play with goals, content and procedures in non-predesigned ways Curiosity rewarded
Automation	No automation Manual intervention All or most of the rules are manually enforced Slow feedback response time	Some level of automation Optimized manual intervention Rules are partly enforced on an automatic way Improved feedback response time	Everything automated None or minimal manual intervention required Rules are/can be enforced automatically Immediate or fastest feedback response time

Source: Gallego-Durán et al. (2019).

2.6.5 Game Elements

It is unrealistic to believe that simply incorporating aspects of a game into a learning session will make the participant more motivated and lead to better outcomes. Understanding the larger environment in which gamification is implemented, including both the learning activities and the learners, is necessary in order to achieve the intended results and is a prerequisite for doing so (Dicheva, Dichev, Cassel, Guy & Irwin, 2021). A strategic step towards such an understanding is determining the factors that are motivating and demotivating with regard to the activities that will be gamified and categorising the learners who will be participating in the activities according to significant motivation kinds (Chang & Wei, 2016).

Learners who participate in gamified activities have varying levels of ability, motivation, and desired outcomes. It is naive to think that by adding a game element to a learning experience, students can be pushed to accomplish something they are not interested in doing or make them feel capable of doing something they do not believe they are capable of doing (Adam, 2017). Dichev, Dicheva and Irwin (2020) propose a context-specific typology as a step toward a learner-centred gamification design. This typology is transitioning towards a gamification design inspired by motivating theories of learning. The essential tenet of this concept is that learners' intrinsic and extrinsic motivational drives, as well as their ability-related motivating experiences, should serve as the criteria for selecting the motivational affordances that will be used in the gamification of learning activities (Dichev, Dicheva & Irwin, 2020).

The incorporation of gaming into educational settings is a developing trend. There have been no comprehensive studies conducted to evaluate its effectiveness in a variety of educational settings (Dicheva, Irwin & Dichev, 2018a). However, there are positive experiences in response to game aspects such as badges, leader boards, and points, all of which seem to provide greater control to the player (Adam, 2017). Despite this, there isn’t universal enjoyment of gamification. Studies done in the past all around literature have shown that different people have different experiences with different game aspects (Dichev et al., 2020)

Although these findings were given in evaluations of previously published work, there is a growing trend in the industry to investigate the experiences of different game features in their own individual studies (Adam, 2017). While Dicheva, Irwin and Dichev (2018b) discovered that players had a range of experiences with different game features, the majority of those

experiences were good. Chang and Wei (2016) found that some game aspects led to improved levels of engagement and experiences for players. These included peer grading, peer emoticon feedback (which is comparable to likes), skill points, virtual products, redeemable points, team leaderboards (which are worth exploring to create collaborative competitiveness), trophies and badges, and skill points (Dicheva et al., 2021).

Another factor that came to light was the fact that there is a benefit in incorporating a variety of different features into gamified learning since it gives students points of reference to understand their progression throughout the course (Dicheva, Irwin & Dichev, 2019). This links in with Adam's (2017) belief that gamification shortens and makes clear the existing pathway that is widespread in higher education, which entails completing tasks (courses), making progress through levels (years), and obtaining a badge of honour (degree).

This finding was corroborated by a study on gamification and education which reviewed 32 published papers from 2011 (Ofosu-Ampong, 2020). Points, leader boards, and badges are the most prevalent game features (Figure 2.4).

Game elements	Content gamified	Related theory	Result of impact	Study
Points and rewards	mHealth App—measuring blood glucose level	NA	Positive	Cafazzo et al. (2012)
Points, rewards and badges	Electrical course	NA	Positive	Todor & Pitica (2013)
Badges	NA	Intrinsic motivation	Positive	Gibson et al. (2015)
Points, badges and status	Social interaction forum	Intrinsic and extrinsic motivation	Negative[a]	Thom et al. (2012)
Levels and graphical rewards	Teaching physical activity	NA	Positive	Consolvo et al. (2008)
Leaderboards and points	Computer environmental course	NA	Positive	Gnauk et al. (2012)
Progress bars and rewards	Teaching e-learning software	Behaviorism/learning theory	Positive	Raymer (2011)
Graphical rewards, feedback and points	Course in health and sustainable behaviors	NA	Negative	Y. Liu et al. (2011)
Leaderboards, points, and levels	Computer software course	Motivational theory	Negative	Berkling & Thomas (2013)
Points and leaderboards	Electronic media course	Situated motivational affordance	Mixed	Leaning (2015)
Levels, badges and points	Teaching software engineering and programming	NA	Positive	Kumar & Khurana (2012)
Progress bars, points, leaderboards, charts and timers	Gamified quiz	Mediators from Technology acceptance	Positive	Filippou et al. (2014)
Badges and leaderboards	Teaching college modules	NA	Positive	Hanus & Fox (2015)
Leaderboards, ranks, points, real-world rewards	Virtual 3D avatars development course	NA	Positive[b]	Featherstone & Habgood (2018)
Challenges, levels, points leaderboards, badges	Teaching a computer engineering course	NA	Positive	Barata et al. (2013)

Note. NA = not applicable.
[a]Participants' motivation declined significantly with the removal of game elements.
[b]Participants cheat when there is lack of motivation since they want to progress in the line of duty meaningfully.

Figure 2.4:Review of Game Elements & resultant impact

Source: (Ofosu-Ampong, 2020, p.135).

2.6.6 Criticisms

In their study, Hyrynsalmi and Kimppa (2017) investigated the negative implications of gamification and explored what is known about the "dark side" of gamification. According to their review of the relevant literature, which included 22 secondary studies and a few primary investigations, Hyrynsalmi and Kimppa (2017) found that the answer was quite straightforward: not much. Kim and Werbach (2016) have presented the most comprehensive study of the negative aspects of gamification. Their analysis suggests that practitioners and designers should exercise caution regarding situations in which gamification: (1) takes unfair advantage of users; (2) infringes users' autonomy; (3) intentionally or unintentionally harms users' and other involved parties; or (4) has a negative effect on the moral character of involved parties (Kim & Werbach, 2016).In addition, some researchers are aware of the potentially detrimental effects as well as their collateral consequences (Kwon & Özpolat, 2021). However, there have only been a few studies that have concretised the ethics of gamification, and there are still many obvious ethical and practical problems that have not been answered (Hyrynsalmi & Kimppa, 2017).

To begin, one can make the reasonable assumption that, in settings where gamification is used, there are also issues that are analogous to those that have been experienced elsewhere (Andrade, Mizoguchi & Isotani, 2016). Consequently, concerns of dishonesty are present in all single-player, multiplayer, and online multiplayer games; these concerns are also prevalent in gamified solutions (Toda, Valle & Isotani, 2018).

Second, if games have the ability to take advantage of their players, then gamified solutions may likewise take this approach (Trang & Weiger, 2019). However, if gamification solutions adhere to the laws of games, then researchers could follow the recommendations for exploitation in games that were established by Søraker (2016), for instance. He has proposed the idea that the people who play the games should be educated on the incentives that are offered by the systems so that they are aware of any potential issues on their own.

Third, one of the most intriguing questions that arose was whether or not gamified solutions may be utilised with those who have a history of, or a predisposition toward, addiction to gaming or gambling (Hyrynsalmi & Kimppa, 2017). Also, how ethically justifiable is it to

deploy gamified solutions in systems and services that are offered for use by children (Toda, Valle, Isotani, 2018)?

Fourth, what kinds of things can and cannot be turned into games (Luo, 2022)? For example, incorporating gamification into the job of first responders, such as paramedics or firemen, may not be a smart idea because the addition of needless stages into their work might result in negative consequences (Sailer & Homner, 2020). Where, however, is the line drawn between effective gamification and the addition of game design features into jobs that have the potential to result in risks, significant losses, or that raise ethical concerns (Silva, Rodrigues & Rodrigues, 2020)?

Both practitioners and marketers are paying attention to the growing use of gamification in the digital service landscape (Nyström, 2021). This is because of the attention that it has garnered. It is of concern that the majority of the empirical research has proven the positive side effects of using gamified services but has neglected to investigate the possibility of negative side effects (Yang & Li, 2021). For example, as users spend more time interacting with gamified apps, they run the risk of becoming so immersed in the experience that they are more likely to disclose private information with companies, so endangering the privacy of their own personal information (Trang & Weiger, 2019).

Furthermore, is it possible for gamification to cause potentially dangerous situations, and if so, what would be a morally justifiable approach to dealing with these issues (Hyrynsalmi & Kimppa, 2017)? An example is the young woman who drove into a lake because she put unquestioning faith in the information provided by her GPS navigation; an illustration of blind confidence in technology (Jacobo, 2016).

Surprisingly little attention has been paid to these questions in the published research. Gamification is complex for three primary reasons (Hamari, 2015a; 2015b):

a. Gamifications are complex, multifaceted, and therefore difficult to transfer holistically to other environments;
b. gamification involves motivational information system design, which requires an understanding of (motivational) psychology; and

c. The goal of gamification is frequently to influence behaviour, which adds a further layer to the scope of gamification design.

In addition, gamification design caters to a variety of audiences and activities, as well as a variety of motivating demands that individuals may have in different gamified situations. Deterding (2015) underlines the tendency of gamification guidelines and frameworks to encourage the notion that a particular design pattern results in a particular outcome. According to Deterding (2015), the motivational influence of any given event is the outcome of 'situated, active interpretation' from a psychological standpoint. In other words, an individual's perception of gamification is largely reliant on the nature of the activity, the contextual variables associated with it, and the precise situation in which the system is being utilised, in addition to the individual's personal and demographic attributes.

2.7 Gamification in Entrepreneurship Education

There has been a significant increase in the use of gamification in a variety of fields, including but not limited to marketing, sustainability, healthcare, business, and education (Nyström, 2021; Trang & Weiger, 2019). The use of gamification in education is particularly noteworthy due to the fact that a growing number of educators are turning to gamification not just to reform pedagogy but also, and perhaps more crucially, to improve learner motivation and engagement (Koivisto & Hamari, 2019). It is assumed that children will expect to be involved in activities when they are in settings where they are viewed as being proficient with technology (Sailer & Homner, 2020).

The educational sector is experiencing a surge in the production of gamification books in general (Majuri et al., 2018). The expanding interest in incorporating gamified design aspects into educational apps has fuelled the academic field of gamification publishing and prompted further study to maximise learning results (Luo, 2022). Research on gamification solutions in education uses a variety of research approaches, including both quantitative and qualitative procedures (Ofosu-Ampong, 2020). As a result of these approaches that investigated a variety of results culminating from different situations, design frameworks, and study contexts, one of the research gaps in educational gamification was discovered; the impact that gamification has on the process of learning (Metwally, Nacke, Chang, Wang & Yousef, 2021).

Recent reviews have provided summaries of the state of research into educational gamification, indicating that the field is still in its formative stages (Silva, Rodrigues & Rodrigues, 2020; Antonaci, Klemke & Specht, 2019; Collantes Inga, Arias-Chávez, Luy-Montejo & Uribe-Hernández, 2022; Koivisto & Hamari, 2019). On the other hand, the actual application of educational gamification has outpaced academics' comprehension of the methods and techniques involved in the practice (Rosenthal & Ratan, 2022).

Educators in the field of entrepreneurship have been employing a variety of computer and game-based teaching approaches in order to build students' knowledge and skills in the field of entrepreneurship (Bellotti, Berta, De Gloria, Lavagnino, Antonaci, Dagnino, Ott, Romero, Usart & Mayer, 2014). However, our understanding of the learning effects of such methods for students, and more specifically, the gamification of teaching strategies, is fragmented and immature at this time. Bagheri, Alinezhad, and Sajadi (2020) conducted a comprehensive analysis of 80 empirical papers that were assessed by peers and focused on gamification and the entrepreneurship learning outcomes of students. Despite the fact that limited research has been done on the subject, their study discovered a link between gamification and the entrepreneurial learning outcomes of students, indicating that there is a positive connection between gamification and the entrepreneurship learning outcomes. This finding was echoed in studies by Gourountis (2022), Vargas-Morúa (2022), Ofosu-Ampong (2020) and Oliveira, Pastushenko, Rodrigues, Toda, Palomino, Hamari and Isotani (2021).

2.7.1 Implementing Gamification

2.7.1.1 Integrate gamification in stages

A gamification project may require a significant amount of resources, which may not be available (Goi, 2022). Consequently, it is suggested that gamification be approached in a staged fashion rather than all at once (Adam, 2017). On the basis of the data and observations made by several researchers, it has been determined that it is preferable to begin with a single game element that can motivate participants and increase the take-up rate (Dicheva et al., 2018a; 2018b; 2019; 2020). After that, perhap, some new components can be added. A strategy of this kind would not necessarily involve a significant expenditure, and it would also allow the option to investigate other aspects, should this be desired. In addition, if a factor does not produce the

results that game designers are looking for, they can quickly switch to a different factor (Adam, Blewett & Quilling, 2022).

An additional piece of advice is to utilise gamification in bursts rather than continuously (Sanchez, Langer & Kaur, 2020). This finding was echoed by participants in Adam's (2017) study, who reported feeling some level of anxiety as a result of the combination of what they believed to be an increased amount of work and outside responsibilities. In particular, they found that gamification was to blame for increased workload, and they discovered that this had an effect on both their interaction with the gamified course and their interaction with the other courses in the programme. In addition, the majority of participants reported feeling exhausted, which led to a decline in their level of motivation (Zainuddin, Shujahat, Haruna & Chu, 2020). The suggestion was thus to use gamification at the level of individual learning activities, sections, topics, or assessments (Adams, 2017). This approach has the added benefit that academics will also have the possibility to analyse and modify gamification efforts thanks to this technique, should this become necessary (García-Iruela, Hijón-Neira & Connolly, 2022).

2.7.1.2 Understand students' motivational drivers and adapt

Gamification is not a one-size-fits-all strategy that ensures all participants will be motivated (Smiderle, Rigo, Marques, de Miranda Coelho & Jaques, 2020). It is reasonable to anticipate that the results, which relate to the motivation of the group as a whole, will differ among another set of students due to the fact that they may be motivated in a different way. As a result, it is vital to create gamification depending on what motivates the specific group of learners (Sanchez et al., 2020). It is important to give thought to the platforms, game components, and sorts of prizes available before making a decision.

The level of familiarity and comfort that students bring to the table when it comes to technology will be a major factor in determining which platforms will be used for the game, and the preferences of the group's gamers will determine which components of the game will be featured (Saleem, Noori & Ozdamli, 2022). It is important to choose the different kinds of incentives depending on the aspects of the game that are most likely to encourage players while also taking into account how feasible it is to offer tangible prizes with an actual monetary value (García-Iruela et al., 2022). There is no requirement that rewards be of a monetary nature; an example of this would be recommendation letters (Adam, 2017).

When it comes to detailed design requirements, it is recommended that a student survey be conducted prior to the implementation of gamification as a vital tool when gamifying learning (Adam, 2017). Even though a gamification endeavour might already be designed before a learning intervention begins, any design should ideally incorporate a degree of elasticity so that it can accommodate students' unexpected expectations or requests (Adam et al., 2022; Zainuddin et al., 2020).

2.7.1.3 Align gamification with objectives

While an understanding of the participants is essential, it is of equal importance to build gamification in such a way that it serves to naturally drive learners to the greatest extent feasible (Zainuddin, Chu, Shujahat & Perera, 2020). It has been hypothesised that randomly granting points and badges will not be sufficient to maintain an individual's motivation over time (Saleem et al., 2022). As a consequence of this, the proposal is that the design of gamification should take into consideration both learning objectives and motivating purposes.

Gamification inspires people to participate in a variety of ways. For instance, a sense of autonomy, relatedness, and competence all play a role in participants' levels of motivation, albeit to various degrees (Sanchez et al., 2020). In addition, individuals' perceptions of abstract concepts such as interest and enjoyment, worth and utility, effort and investment, and strain and pressure can be varied to differing degrees (Adam et al., 2022). When education is gamified, there may be a need to motivate participants to develop certain abilities linked to the constructs being learned. For instance, in Adam's (2017) research, which explored a variety of various dimensions, it was discovered that gamification enhanced the participants' self-esteem and confidence, as well as their ability to research and write, as well as other skills. In light of this, the recommendation is that, in order to design effective gamification, motivating goals and related components need to be taken into consideration (Smiderle et al., 2020).

2.7.1.4 Encourage cooperative competition

Research has shown that having a sense of community is one of the most effective ways to increase motivation (Dichev et al., 2020; García-Iruela et al., 2022; Zainuddin et al., 2020). Despite the fact that participants are driven by rewards, there is a clear preference for individual

recognition rather than competitive recognition versus other participants (Adam, 2017). In addition, players may get anxious about their fellow competitors' progress in the game and whether or not they are earning prizes for themselves (Adam et al., 2020). This was supported by Adam (2017), who found that those who were successful in earning rewards served as a standard against which others might be judged, while those who were unsuccessful in earning awards while making an attempt were a source of anxiety for some of the participants.

Since this sense of community worked to motivate participants, Adam (2017) suggests that a spirit of cooperative competition be developed among students. This could take the form of selfless work or actions carried out as a group that result in the accumulation of group rewards. In addition, although the introduction of a sense of competitiveness is one of the purported benefits of gamification, there is still a pressing need for cooperation in educational settings and social cohesion in general (Adam et al., 2022; Saleem et al., 2022). Therefore, it is essential that people participate in activities that instil a sense of cooperative competitiveness (Goi, 2022).

2.8 Conclusion

The problem being explored in this research has many layers, as the literature indicates. To begin to explore tools such as serious games, one must understand the global and local context of how the issues arise.

This chapter interrogated the transformative paradigm as a theoretical basis of the study to better understand research participants and the communities they reside in.

The review of youth unemployment has shown that it is not only a South African problem but a global issue that other countries are also grappling with. What is unique to South Africa is how enormous inequality is. This has led to devastating effects on the economy, making it more difficult to create employment opportunities for young people. This opens up an opportunity to get young people to be employment creators in the form of entrepreneurship. The question then is, does South Africa have an enabling environment for youth to succeed in these entrepreneurial ventures?

Serious games have the ability to enhance learning processes by providing attractive, motivating, and efficient tools that can help foster positive relationships between students and teachers (Goi, 2022). Serious games are the optimal paradigm for incorporating problem-solving and reasoning stimulation, resulting in the development of key competencies (Almeida, 2017). These qualities are especially important in the field of entrepreneurship, which requires transdisciplinary abilities, and creative, inquisitive, and argumentative modes of thought.

In general, the findings of the review of the literature that has been reported in this chapter (a) suggest that gamification may be a workable alternative for short-term projects, (b) highlight issues of a novelty impact that may recommend teachers not to apply the same gamification method permanently, and (c) show that there are circumstances in which gamification may not be appropriate.

The literature review on the characteristics of gamification and the nature of gamified learning in education revealed that ineffective game features or mechanics result in the failure of educational objectives, whereas effective game mechanics, such as virtual goods, trophies, and redeemable points, can increase engagement and performance (Barr, 2018; Ofosu-Ampong; 2020). The view is that knowledge transmission could benefit from serious games through an iterative design process, prompt feedback, user expectations, and the potential users' continued usage of the target system during game creation (Luo, 2022). In addition, it was discovered that reward systems promote student participation and attendance in a gamified setting (Kwon & Özpolat, 2021).

Research into the unintended negative implications of behavioural interventions is becoming an increasingly relevant topic of study. In the field of study on persuasion and gamification, the negative impacts are frequently referred to as ‘the dark side’ (Hyrynsalmi & Kimppa, 2017). However, ethical concerns with gamification are rarely investigated. The findings of previous studies on the adverse impacts of gamification warrant additional investigation (Yang & Li, 2021). A possible definition of the term ‘dark gamification design’ is the process of consciously creating ‘games’ that do not take into consideration the safety and satisfaction of the players (Søraker, 2016). Negative factors that are extremely important to take into account include elements like motivation, addiction, competition and collaboration, manipulation, data integrity, surveillance and privacy, and ethics and exploitation (Nyström, 2021).

Assessing the learners and the learning environment is crucial advice for educational institutions wanting to embrace gamification. In addition, rather than supposing an underlying notion, it is necessary to examine individual game features for use (Bolat & Taş, 2022). Therefore, it is a recipe for gamification failure to generalise game components for learners without considering the context of educational institutions or user backgrounds (Rosenthal & Ratan, 2022).

The next chapter will focus on what methods were undertaken during the research as well as the type of strategy, approach and design used to collect and analyse the data.

CHAPTER 3 – RESEARCH METHODOLOGY

3.1 Introduction

"Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation" (Kothari, 2004:1).

Research design is a blueprint for collecting, measuring and analysing data (Blumberg, Cooper & Schindler, 2008). The research methodology is chosen by the researcher based on the problem and its setting in order to make the research practicable, credible and legitimate (Creswell, 2015: 14). This study aims to explore whether gamification can be used as a tool to teach entrepreneurship education amongst black youth entrepreneurs in the township and peri-urban areas. To achieve the aim of the study, the following research objectives have been identified:

- Identify factors contributing to challenges faced by youth entrepreneurs;
- Explore the gaps that exist within ED programmes offered to youth entrepreneurs;
- Investigate how this demographic learns new information, especially that pertains to their businesses;
- Explore whether gamification is a viable option for introducing new and sometimes challenging concepts.

The chapter will outline the research methodology and process undertaken through a sequential embedded mixed-method research design.

3.2 Research Strategy & Approach

There are three methodological approaches in research; qualitative, quantitative and mixed methods (Creswell, 2009). The mixed methods approach has been used in this study. Mixed methods is currently the third most popular research paradigm, and it is gaining more and more support from the community of academics that conducts research (Almeida, 2018; Carter et al., 2014; Dawadi et al., 2021). When doing research using mixed methods, researchers blend several types of knowledge - theoretical and practical, quantitative and qualitative - in order to accomplish the objectives of the study while also taking into account a variety of views (Fetters, 2016; Johnson & Onwuegbuzie, 2004; Rowley, 2002). Studies that use mixed methods research processes look for a convergence of findings that are complementary to one another because the findings from one research technique are accountable for informing the findings of the other methodologies (Almeida, 2018; Creswell & Plano Clark, 2011; Enosh et al., 2014; Maxwell, 2016).

3.2.1 Motivation for Mixed Methods

Combining qualitative and quantitative data in a research project has a number of advantages. The first justification for utilising a mixed-method research strategy is broadening the investigation's scope. A mixed-method research strategy enables researchers to broaden the scope of their investigation while maintaining adequate depth and breadth. For example, when a researcher wants to generalise the findings to a population and develop a detailed view of the meaning of a phenomenon or concept for individuals, the advantages of collecting both closed-ended quantitative data and open-ended qualitative data support the resolution of a research problem. This is because both types of data provide different perspectives on the meaning of a phenomenon or concept for individuals (Creswell, 2009).

In addition, qualitative data, such as interviews and focus groups, can provide depth to the research enquiry by allowing the researcher to understand the phenomenon better through the use of narratives. This is one of the benefits of using qualitative data. Then a quantitative method of data collection can provide breadth to the study by assisting the researcher in amassing data on various elements of a phenomenon from a variety of individuals.

The concept that both types of study have value and that they are complementary is one of the primary motivating factors behind merging the two approaches. This results in an increase in the total value obtained from the study. The researcher employs two sets of data to answer the same study question, which can produce a conclusion with greater certainty and a wider range of implications (Maxwell, 2016). In other words, combining two methods helps produce a complete picture and affords the opportunity for a greater assortment of divergent or complementary views. These views are valuable because they not only deepen our comprehension of a phenomenon but also pave the way for new lines of inquiry in the future (Enosh et al., 2014). In addition, the findings of research conducted using mixed methods provide a comprehensive picture of a phenomenon and additional insights into the various aspects of a phenomenon, which can be helpful in the development of substantive hypotheses (Fetters, 2016).

Further, utilising a mixed-method research strategy helps to overcome the epistemological discrepancies between quantitative and qualitative perspectives, resulting in more valuable knowledge (Dawadi et al., 2021). Combining the two approaches in accordance with established principles helps researchers achieve a more thorough and in-depth comprehension of a research topic (Byrne, 2017). For instance, while using a quantitative method, concepts can be operationalized in terms of well-defined indicators, tracing trends and relationships, making comparisons, and using large and perhaps representative samples (Rowley, 2002). On the other hand, while a qualitative method has the strengths of sensitivity to multiple meanings, logical grounding, methodological flexibility, and in-depth understanding of smaller samples which helps to study the process and change, a quantitative method has the advantages of tracing trends and relationships, making comparisons and using large samples (Creswell & Creswell, 2018; Leedy & Ormrod, 2016).

A mixed method research approach aids in reaching more rigorous conclusions by employing two different methods such that the advantages of the qualitative methods offset the flaws of the quantitative methods and vice versa; the strengths of the qualitative methods compensate for the weaknesses of the quantitative methods (Mtotywa, 2019). This suggests that a quantitative method can be effective in regions where a qualitative method is ineffective and vice versa. To put it another way, one method is more appropriate for responding to a certain kind of inquiry, whilst another method is more appropriate for responding to a different kind

of question (Fetters, 2016). Combining the two approaches, as a result, provides the opportunity to capitalise on both sets of benefits while at the same time mitigating the drawbacks associated with each approach individually. Therefore, the combination of qualitative and quantitative methods is frequently recommended because a researcher may make use of the two approaches' respective strengths and generate a more accurate conclusion by avoiding the respective shortcomings of the two methodologies (Dawadi et al., 2021).

The triangulation component of a mixed-method research technique is another advantage of using this method. Triangulation of data is a mechanism for confirming the results gained using individual research methodologies that are commonly acknowledged as part of a mixed-methods research study (Carter et al., 2014). A researcher, for example, seeks to obtain a more valid picture of a research subject by directly comparing the insights drawn from one method (qualitative or quantitative) to those gained from another method (quantitative or qualitative) for convergence and/or divergence. This is done in order to determine whether or not there is a relationship between the two sets of findings (Leedy & Ormrod, 2016). In other words, the collection of several sorts of data offers broader insights into a phenomenon than the approaches alone can offer. As a result, it generates more valid and stronger judgments than just a single method can (Creswell & Creswell, 2016). The utilisation of data triangulation results in a thoroughly validated conclusion and boosts the trustworthiness of conclusions drawn from a single method (Byrne, 2017).

Finally, producing more effective and refined conclusions by using the results from one approach (qualitative or quantitative) to guide or influence the usage of another method (qualitative or quantitative) is also an argument for combining the two methods (Dawadi et al., 2021). For instance, researchers who want to understand the possible factors that cause anxiety in children might argue for the need to quantitatively assess significant predictors. After that, they might use the quantitative results to develop qualitative follow-up exploration (possibly through interviews, observation, and focus groups) to explore why some factors were significant (Creswell & Plano Clark, 2011).

3.2.2 Sequential Embedded Design

Any situation in which one method is given priority and another is employed to augment it is considered an example of an embedded mixed-methods design (Creswell, 2009). Embedded designs can be done sequentially, despite the fact that they are typically done in parallel (qual+QUAN or QUAL+quan), and the procedures of data gathering and analysis are separate from one another and are used to answer various questions (Figure 3.1). Qualitative research methods were undertaken prior to creating the praxis model (serious game prototype) intervention, as per the subjects' responses. The praxis model in this research also served as the quantitative approach. And once users had played the serious game prototype, they were subject to individual interviews, which served as the 'after intervention' qualitative research method. In this particular study, the researcher has employed a sequential embedded design where QUAL is given priority over QUANT simply due to the fact that it is utilised in the process of answering the primary research question. On the other hand, QUANT is utilised in answering the secondary research questions; however, the situation could be reversed depending on the research objective.

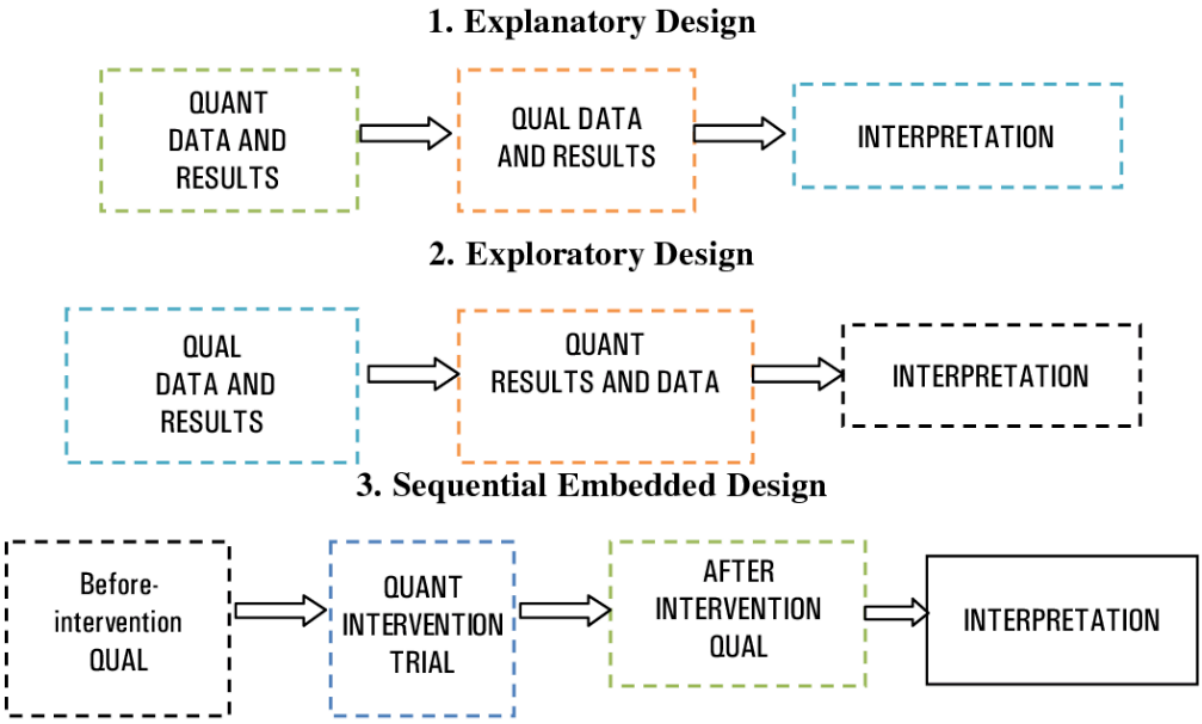

Figure 3.1: Mixed Method Designs

Source: (Chapin, 1991, Figure 5.1).

3.2.3 Qualitative Intervention

Qualitative research is concerned with qualitative phenomena. For instance, motivation research investigating the reasons for human behaviour - why people think or do certain things – may use in-depth interviews for the purpose (Kothari, 2004). Associated techniques of such research are word association tests, sentence completion tests, story completion tests, and similar projective techniques. Another example is attitude or opinion research, i.e., research designed to find out how people feel or think about a particular subject or institution (Kothari, 2004).

Grounded Theory will be used to implement the qualitative methodology; this entails going through iterative waves of data from the study until there are no revisions to the theory or new data (Willis, 2007). Primary data will be derived from focus groups and from individual interviews.

Chapter 2 touched on Mertens's Cyclical Model for Transformative Research; this reflected the requirement of community members' participation in the beginning, during and after the research (Mertens, 2007). Consequently, members of communities (including ED hubs and incubators) were invited to participate in the game prototype testing.

3.2.4 Quantitative Intervention

Quantitative research is based on the measurement of quantity or amount and is applicable to phenomena that can be expressed in terms of quantity (Kothari, 2004). For this study, primary quantitative data will be collected using the design science methodology in information systems. Design science is a rigorous process of designing artefacts that aim to solve observable problems, make research contributions, evaluate designs and contribute the results to the appropriate audience (Peffers, Tuunanen, Rothenberger & Chatterjee, 2007:49). Figure 3.2 illustrates the process that will be undertaken in the design of the prototype of the serious game.

From the findings of the qualitative study (focus group interviews), a prototype in the form of a serious game was developed. A sample of players tested the prototype with a link to the game platform. There was a quick survey that the participants could complete regarding their

demographics. The prototype was designed with a back-end function that monitors and evaluates the progress of the test subject. The information was analysed, and the results were reported using standard usability testing. Once the participants had played the game, a select sample was chosen to partake in individual interviews (qualitative) to understand how their experience of playing the game.

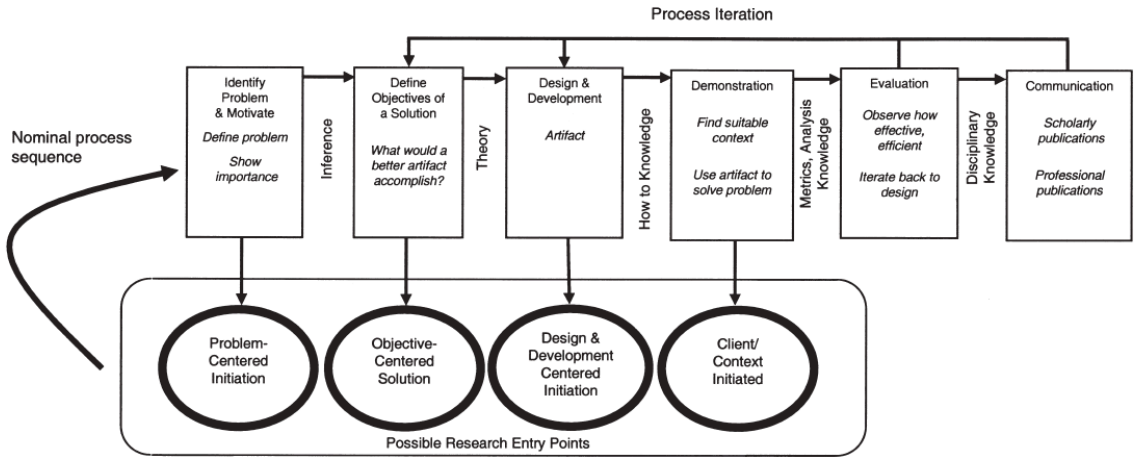

Figure 3.2: DSRM Model

Source: (Peffers et al., 2007:54).

3.3 Research Design, Data Collection Methods & Research Instruments

3.3.1 Research Design

The case study that was used as a guide in this research is titled "Assessing the effectiveness of gamification in reducing domestic energy consumption: lessons learned from the EnerGAware project". This study developed a serious game to promote reduced energy consumption and carbon emissions by changing social housing tenants' energy efficiency behaviour in Europe (Casals et al., 2020:1).

Casals et al. (2020) found that most existing campaigns for fostering energy conservation behaviours were typically designed as information-intensive, and they seemed to not contain enough motivation. Despite growing interest in the space and some initial attempts, serious games' potential to engage consumers in energy efficiency behaviours had not been researched

extensively (Casals et al., 2020). This research problem is similar to the challenge of understanding how to use gamification to promote entrepreneurship among youth in marginalised areas, and was therefore an appropriate exemplar to help guide the development of an appropriate research methodology:

"The game was designed to achieve significant energy consumption and emissions reduction in a social housing pilot project by increasing social tenants' understanding and engagement in energy efficiency. By playing the game, users should learn about potential energy savings that can be made by installing energy-efficiency measures and changing their behaviour whilst maintaining comfort at home. The game should function either without an internet connection or with a link to the actual energy consumption (smart meter data) in the game user's home using a specific energy metering system or within the context of smart metering roll-out. To maximise user acceptance and thus the impact on energy reduction, Living Lab methodology was used, and social tenants were engaged in the design of the serious game from the outset" (Casals et al., 2020:2).

In the case study, the users of the EnerGAware project could play the game whilst offline. The players of the BusinessBoostSA game required an internet connection to play. Although the internet usage needed to play the game was minimal (approximately 40 MB for a full session). BusinessBoostSA was the serious game praxis model designed and implemented by the researcher to explore the posed research questions.

In the EnerGAware project, the following steps were followed:

- Definition of user, building and game requirements;
- Game development; and
- Game validation.

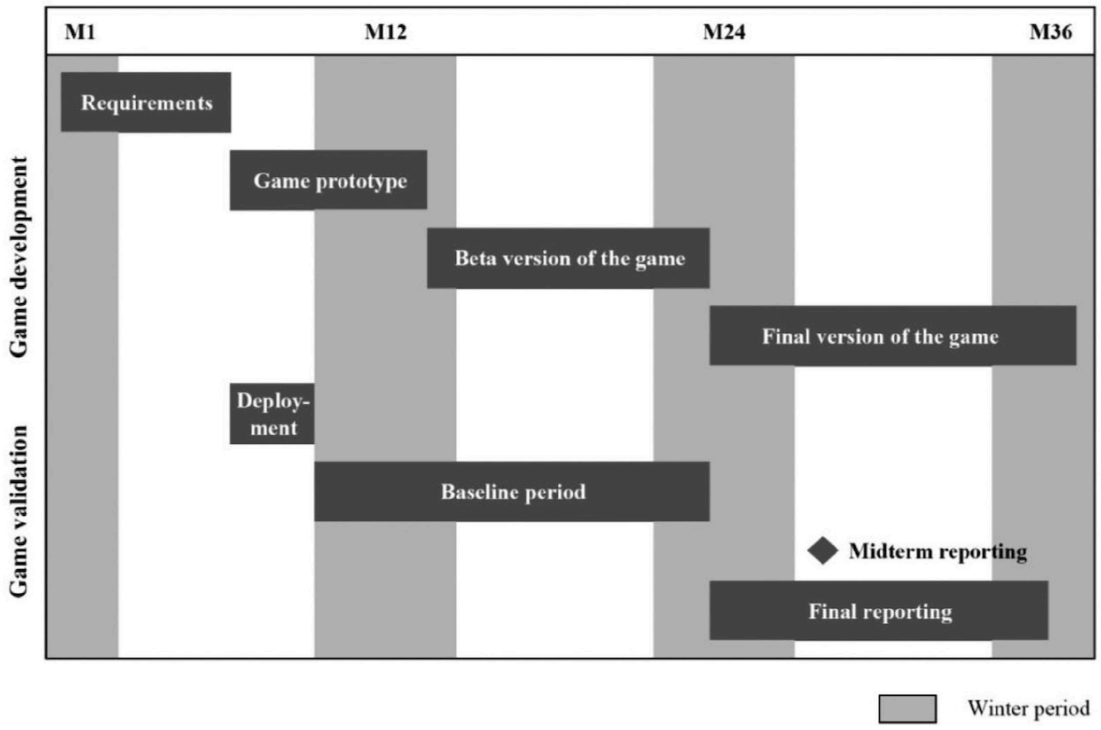

Figure 3.3: Serious Game Work Plan

Source: Casals et al. (2020).

Figure 3.3 illustrates the implementation plan of the serious game over a 36-month period.

In the first six months, the game requirements were determined using a set of datasets and methods, which were as follows (Casals et al., 2020):

- Literature review: a detailed review of previous projects, publications and reports related to the design and use of IT in social housing was undertaken and used as starting point for the definition of requirements.
- Socio-economic characteristics, energy consumption motivations, behaviour and perceptions, game experiences and IT literacy: collected during a large-scale, city-wide survey administered in Plymouth (United Kingdom) to 2772 social houses (social housing survey).
- Game experiences and game feature preferences: collected during three focus groups with social housing tenants in Plymouth (gameplay scenario focus groups).
- Building characteristics of social housing stock in Plymouth: information contained in the social housing provider database (building stock condition database) was used.

This led to the initial design of the serious game, in which, in month twelve, the prototype was released. The initial prototype was refined and validated through an iterative testing process with the research sample. The beta version of the serious game was released in month 24; besides minor bugs to be fixed, the game's final version was released. The last 12 months of the testing period focused on making the game available to the general public, and it was translated into four different languages; English, French, Portuguese and Spanish.

In the BusinessBoostSA game prototype used in the study reported here, the datasets used prior to the building of the game were as follows:

- Literature review: In the discovery of the literature, topics that contributed to the research were;
    - the understanding of the theoretical basis of this study
    - youth unemployment
    - inequality and SA government transformative objectives
    - entrepreneurship and entrepreneurship education and its challenges
    - gamification and simulations
- Focus groups and individual interviews: these were conducted with entrepreneurs, serious game founders and developers, and entrepreneurship development practitioners that have worked with youth entrepreneurs before.
- Socio-economic characteristics, phase of entrepreneur, learning and development methods and familiarity with gameplay.

These data sets allowed the researcher to create a prototype, and a beta version was released to a select number of people who had tested the technical function of the game and reviewed the content. Once the feedback was collated and incorporated, a final live version was released. A link was available, and individuals who fit the criteria were targeted. They were targeted through networks (business hubs and incubators), social media marketing and word of mouth.

The sequential embedded method was used in order to answer the secondary questions posed, which are:

- How do ED programmes address youth unemployment? And what are the expectations of these programmes?

- How do youth entrepreneurs in the township and peri-urban areas find and learn new information?
- What does gamification data reveal about learning and development for youth entrepreneurs in the township and peri-urban areas?

There were four stages in this process:

STAGE: 1 Collection of Qualitative Data >>> Focus Groups and Individual Interviews

Analysis of Qualitative Data >>> Coding

Interpretation of Research Results

STAGE: 2 Development of a Serious Game Prototype

STAGE: 3 Collection of Quantitative Data >>> Design Science Approach

Introduction to Game Play
Analysis of Quantitative Data >>> Standard Usability Testing

Interpretation of Research Results

STAGE: 4 Collection of Qualitative Data >>> Individual Interviews

A consistency matrix was applied during the qualitative stage to ensure the golden thread is apparent in understanding the objectives and the questions asked to achieve them (Table 3.1).

Table 3.1: Consistency Matrix

Sub-Objective	Literature Review	Research Participants	Research Question	Source of Data	Type of Data	Interview Questions
1) Identify factors contributing to challenges faced by youth entrepreneurs	2.3 Youth Unemployment 2.4 Inequality & SA Government Transformative Objectives 2.5.1 Challenges in Entrepreneurship Education	Entrepreneurs ED Practitioners	Which ED programme module(s) did you struggle with? What skills gap(s) is identified with this demographic of entrepreneurs?	Focus Groups Individual Interviews	Translated text Transcribed text	FC (E1) – Q6 FC (E2&3) – Q6 FC (E4&5) – Q6 IE (E1&2) – Q6 FC (EDP1&2) – Q4
2) Explore the gaps that exist within ED programmes offered to youth entrepreneurs and their expectations	2.5 Entrepreneurship & Entrepreneurship Education	Entrepreneurs ED Practitioners	What were the ED programme expectations? Were they met? Which ED programme modules did entrepreneurs struggle with the most?	Focus Groups Individual Interviews	Translated text Transcribed text	FC (E1) – Q3 & Q4 FC (E2&3) – Q3 & Q4 FC (E4&5) – Q3 & Q4 IE (E1&2) – Q3 & Q4 FC (EDP1&2) – Q7
3) Investigate how this demographic learns new information especially that pertains to their businesses		Entrepreneurs	How best do you learn new information, especially for your business?	Focus Groups	Translated text Transcribed text	FC (E1) – Q8, Q9 & Q10 FC (E2&3) – Q8, Q9 & Q10
			What type of information do you search for?	Individual Interviews		FC (E4&5) – Q8, Q9 & Q10 IE (E1&2) – Q8, Q9 & Q10
4) Explore whether gamification is a viable option for introducing new and sometimes challenging concepts	2.6 Gamification & Simulations	Entrepreneurs	Would learning new information be easier if presented in a less conventional and 'fun' way? What type of medium/platform would be best for a gaming tool?	Focus Groups Individual Interviews	Translated text Transcribed text	FC (E1) – Q15 & Q16 FC (E2&3) – Q15 & Q16 FC (E4&5) – Q15 & Q16 IE (E1&2) – Q15 & Q16

Source: Author's own

3.3.2 Data Collection Methods

3.3.2.1 Focus Groups

One definition of a focus group is a planned discussion led by a moderator who guides a small group of participants through a set of carefully sequenced (focused) questions in a permissive and non-threatening conversation (Krueger & Casey, 2015:506). Alternatively, Franz, Childers and Sanderlin (2012) describe focus groups as bringing together a group of people to discuss a particular topic or range of issues, which determine their perceptions, feelings and thoughts. In this definition, there is no stipulation of the focus group questions being sequenced. Krueger and Casey (2015) suggest that for an interesting outcome in the discussions, one must interview

three of four focus group. Hence the research was conducted with a total of six focus groups for an in-depth understanding of the research questions.

3.3.2.2 Semi-structured Interviews

These types of interviews utilise both closed and open-ended questions, gaining advantages from both the structured and unstructured methods of interviews (Blumberg et al., 2008).The semi-structured approach allowed the participants in the interviews and focus groups to elaborate further, leading to deeper understanding.

3.3.2.3 Observation

Observations encompass the full range of monitoring behavioural activities and conditions, which is useful in collecting information on tacit behaviour (Blumberg et al., 2008). There are generally two types of observation; direct observation and participant observation (Blumberg et al., 2008). This study utilised direct observation of the participants in the study.

3.3.3 Research Instruments – Qualitative Study

3.3.3.1 Focus Groups

The focus groups consisted of between 5 – 7 participants, although 6 – 8 individuals per group are recommended to elicit views and opinions from participants that they might not have thought about on their own (Creswell, 2009).

Following from the research design, participants were selected who were:

- Black
- Youth
- Live or run a business in a township or peri-urban area in Gauteng
- Have a registered businesses
- Have participated in an ED Programme

Participants were approached through the researcher's networks of entrepreneurship hubs and incubators in Gauteng. This was the most logical choice as these incubators have the required participants in their databases that fit the criteria.

- Entrepreneurs (Multichoice Development Programme)
- Entrepreneurs (eKasi Entrepreneurs) (1)
- Entrepreneurs (eKasi Entrepreneurs) (2)
- Entrepreneurs (The Hive Network JHB)
- ED Practitioners (Academia, Corporate & ED entrepreneurs) (1)
- ED Practitioners (Academia, Corporate & ED entrepreneurs) (2)

3.3.3.2 Individual Interviews (Semi-structured)

- Entrepreneur (Tshimologong Precinct)
- Entrepreneur (Alexandra)
- Founder – Serious Game Developer (South Africa) – Unstructured
- Founder – Serious Game (India) – Unstructured

3.3.3.3 Individual Interviews (Structured)

Ten individuals were interviewed post-playing the game to gauge their experience further to what the game analytics measured.

3.4 Sampling Procedure

3.4.1 Qualitative Study

A purposeful selection was made during the study to ensure that these participants were the best positioned to assist in understanding the problem and research question (Creswell, 2009). This took into account the conditions of homogeneity that sampling might present and identified any barriers that might have excluded other groups (Mertens, 2007).

During the interviews, the purpose of the focus group and individual interviews was explained. Participants were encouraged to share their views but also respect the views of others. This was

reiterated by requesting that the participants give each other a chance to speak and listen. Participants were informed that the interviews were recorded as stated in their consent forms.

3.4.1.1 Entrepreneurs

These participants could provide more accurate findings of the primary question, and Gauteng has a higher concentration of incubators and entrepreneurship hubs than any other province. As the economic hub of South Africa, Gauteng has more government and non-government funding for entrepreneurship programmes.

The advantages:

- Convenient location. Interviews were conducted at the business hubs or incubators where the entrepreneurs were based. Alternatively, a location of the entrepreneurs' convenience was chosen.
- Multilingual participants. The entrepreneurs felt comfortable and at ease once advised that they could express themselves in other languages besides English. The interviews were translated by a professional linguist.

The disadvantages:

- Diverse languages are spoken. Some knowledge or expressions might be lost in translation.
- Availability of entrepreneurs during working hours. Most entrepreneurs have limited resources, and it was difficult for them to commit that amount of time during a work week to participate in the interview.
- Some entrepreneurs could not complete the interviews as they had to get back to business.

3.4.1.2 ED Practitioners

The practitioners included professionals who operated in academia, consultants, the private sector (training departments) and SMMEs that provide ED services to entrepreneurs in all sectors and stages. The practitioners provided additional insights into the findings from entrepreneurs and explored what in their experience has worked and not worked with this specific demographic.

The advantages:

- Vast knowledge and experience. The practitioners have decades of combined experience, and they are specialists.

The disadvantages:

- Coordinating interview dates. The busy schedules of the participants were difficult to navigate.

3.4.2 Quantitative Study

Once the qualitative data was analysed, the serious game prototype was developed. Semi-purposeful sampling was used to encourage individuals to play the game. The game could be accessed through a hyperlink that anyone who had it could play. A targeted marketing initiative was developed to drive awareness of the game amongst the research group. The marketing used mediums such as social media (Facebook, Instagram, Twitter and WhatsApp), social networks and word of mouth.

The game had a survey that players were encouraged to complete, as this provided participants' demographic information, which made the analysis much easier.

3.5 Data Analysis Methods

The research was conducted in accordance with general recommendations for improving the transparency and replicability of qualitative research (Aguinis et al., 2018). Edmondson and McManus (2007) provide evidence that thematic content analysis coding is the approach of data analysis that should be utilised to locate patterns. After that, the analysis is interpreted in accordance with the earlier research, which ultimately results in a suggestive hypothesis regarding the problems found throughout the analysis (Byrne, 2017; Edmondson & McManus, 2007).

A method known as thematic content analysis is one that locates, investigates, classifies, and reports on recurring themes and codes within a body of data (Braun & Clarke, 2006). The

process of coding is broken down into four stages, which are as follows (Braun & Clarke, 2006; Byrne, 2017):

- A transcription of the recorded interviews was completed.
- The interview notes and transcripts were reviewed attentively and then reread as part of a process that involves generating initial ideas and coding noteworthy features across all of the data sets in an iterative manner.
- The codes were compiled into possible themes, which were then discussed, defined, and given names.
- The overarching story that the analysis is trying to convey is uncovered, and patterns that make sense of the essential topics are hunted for and recorded in a note-taking system.

Data analysis is an ongoing process of iterations of the data, continuous questioning and writing (Creswell, 2009). It involves gathering, grouping and interpreting the data to inform a decision (Creswell, 2009).

The qualitative data from the pre-gamification that was obtained from interviews conducted, was analysed using content analysis with the assistance of Atlas ti 8.0. This resulted in the development of seven themes from 35 categories or subthemes. The seven themes are the factors contributing to challenges faced by young entrepreneurs, the expectations and gaps in entrepreneurship development programmes, finding and learning new information, gamification as a learning method, entrepreneurs' appetite for gamification and success**,** the **e**xperience of the gamification process and system and **c**ontent and usefulness of the game for learning.

And the qualitative data from the post-gamification was analysed through transcripts from the ten interviews, which were analysed and a comprehensive wordlist was developed. The most dominant words being game, information, entrepreneurship, play and time. This verified that the outcomes of the interviews were relevant to the objective of understanding the effectiveness of gamification.

The quantitative analysis utilised Standard Usability Testing within the Lighthouse platform's performance dashboard. The Lighthouse platform analytics provided meaningful data and insights with regard to the players.

3.6 Data Quality

Validity is defined by Noble and Smith (2015) as the integrity and applicability of the procedures used, in addition to the precision with which the findings portray the data. On the other hand, reliability refers to the degree to which the analytical methods used are consistent with one another. To improve the validity and reliability of a study, qualitative researchers utilise a wide variety of methods (Leedy & Ormrod, 2018; Sousa, 2014).

Among these methods are the following:

- Taking into account any personal biases that may have influenced the findings.
- Recognising sample biases and engaging in ongoing critical reflection of procedures in order to ensure sufficient breadth and relevance of data gathering and analysis.
- Meticulous record keeping, the demonstration of a clear decision trail, and the assurance of consistent and transparent data interpretations are all required.
- Creating a comparison case and detecting similarities and differences between different storylines in order to guarantee that different points of view are taken into account.
- Including in-depth, verbatim explanations of participant experiences to back up any findings drawn from the research.
- Having clear thought processes while conducting data analysis and delivering later interpretations of those analyses.
- Working together with other researchers to eliminate or reduce sources of bias in the research
- The utilisation of data triangulation is the process of producing a more comprehensive collection of findings by utilising many ways and points of view.

During both the research design and research implementation phases, it is necessary to use techniques that will increase the study's credibility (Noble & Smith, 2015). Although there is no universally accepted terminology or criterion for evaluating qualitative research, the

following section outlines techniques that helped increase study results' trustworthiness. (Lester, Cho & Lochmiller, 2020).

3.7 Trustworthiness

The most important result of any research design is to accurately demarcate, gather, and examine the data in some manner. Results, recommendations, and conclusions based on reliable data not only help with decision-making but also provide study design outputs that can be replicated (Byrne, 2017). The four factors implanted in this study to support trustworthiness are transferability, credibility, dependability, and confirmability (Lincoln & Guba, 1986).

3.7.1 Transferability

Transferability in qualitative research design is comparable to reliability in quantitative research design. It is obtained when readers feel that the story being relayed coincides with their own experiences, and it is comparable to how reliability is produced in quantitative research design (Tracy, 2010). This is accomplished by collecting first-hand accounts of events (and displaying pertinent snippets from transcripts in the analysis chapter) in addition to providing detailed, in-depth descriptions of those events (Morse, 2015; Tracy, 2010).

3.7.2 Credibility

According to Tracy (2010), credibility can be defined as research that is not only reasonable but also convincing. This research will try to improve trustworthiness by utilising some of the strategies advocated by Tracy (2010), specifically:

- The inclusion of comprehensive concrete detail and taking care to show rather than tell,
- The use of data triangulation, which means that the credibility of the discovery is strengthened if it can be shown that more than one source of data supports the same hypothesis,
- Multivocality of participants, which can be defined as the inclusion of multiple and diverse voices in the report and analysis;

- Sharing transcripts and findings with participants to test whether participants recognise them as true – both as member reflections (Tracy, 2010) and
- For the purpose of data auditing, share transcripts and findings with participants to test whether participants recognise them as true (Morse, 2015).

3.7.3 Dependability

The reliability of a study is evaluated based on the chance of achieving identical findings from a replication study, which requires comparable participants in comparable settings (Leedy & Ormrod, 2012). This study's dependability is increased by publicly commenting on the biases and preferences of the researchers, as well as by being clear about the methodology and the difficulties that were experienced (Tracy, 2010).

3.7.4 Confirmability

Confirmability is increased by making sure that all views from the entire data set, and the literature that was read are taken into account and suitably weighted in the context in which they belong (Braun & Clarke, 2006; McCracken, 1988; Morse, 2015). This is done with the knowledge that, despite making every attempt to open up the analysis to the complexity of the phenomenon, the understanding will only ever be a partial comprehension of the problem (Tracy, 2010).

3.6 Limitations

The generalisability of the findings is restricted due to the nature of the study, which was a sequential embedded design research study. The following are some additional constraints imposed on this exploratory investigation due to its design and scope:

- Data collection and analysis in mixed method research design is time-consuming and more expensive in terms of cost. As this study was constrained by both time and cost, obvious limitations arose around designing the research to stay within the estimated time and budget.

- There is sparse literature on how best to integrate qualitative and quantitative data or data from different sources (Dawadi et al., 2021). As such, this research was constrained in terms of guidance regarding when to stop the analysis and comparison of the data.
- Embedded designs are valuable for enriching results with different data, just like triangulation is. However, because one method is deprioritized in embedded designs, the secondary research strategy (in this case, quant) may be somewhat trivialised or not as rigorously answered as it could be (Creswell & Plano-Clark, 2011).
- Due to the subjective nature of qualitative research, it is susceptible to biases such as interviewer and interviewee bias (Creswell & Creswell, 2018), which has the potential to influence both the data and the interpretation of those findings. The inability of researchers to maintain their independence from the data collection process can have an effect on the reliability of the data, as well as the interviewing skills of researchers, who may or may not have received training in the past on how to conduct interviews for the purposes of research, can have an effect on the quality of the data (Creswell & Creswell, 2018).
- The exploratory study took place within a single organisation that is active in Sub-Saharan Africa and used a single study setting. Even though the benefits of using a homogenous sample were acquired, it is possible that other people had participated in the study may have provided different responses to the research questions. However, one could argue that the population's make-up was typical of the individuals who had something to contribute to the topic being discussed. As a result, this limitation is considered to have some degree of mitigation.
- The selection and usage of a non-probability sample technique for the purpose of this study adds selection bias because it is based on the researchers' network and prior knowledge of the organisation. This contributes to the fact that the findings cannot be generalised to a wider population. The researcher overcame this bias by employing stringent selection criteria for the population that was the subject of the investigation. Consequently, this is not considered to be a significant limitation at all.
- The participants were aware that they were being recorded, and they might have altered their behaviour, and some of them might have previously interacted with the researcher. Because of this, there is a possibility that the outcomes will be affected.

- The questions for the interview were designed based on the research that was done. Therefore, the content and shape of what they were most likely a constraint. On the other hand, this is not considered to be a primary constraint.

3.6.1 Qualitative Study

- Geography (Gauteng) – Incubators and hubs were a distance, and the researcher tried to get representation from different parts of neighbourhoods. But business hubs and incubators with ease of access and location were ultimately chosen. These included those in the central areas such as Alexander township and Johannesburg CBD.
- Language – A professional linguist was appointed to translate the interviews. Some of the responses were in slang which could have been lost with a direct translation. The interpretations are as close to accurate as possible.
- Focus groups – Getting enough numbers for focus groups proved challenging due to last-minute cancellations. Some focus group interviews had to be moved, and two entrepreneurs had individual interviews.
- Role of a Researcher – Ensuring participants knew I was interviewing as a researcher, not as a practitioner. A few entrepreneurs made a note that they had seen some of the work our social enterprise had done in the space. Therefore it was important to highlight my role in the study.

3.6.2 Quantitative Study

- To play the game, one needed a hyperlink that directed them to the landing page. Therefore anyone who came across the hyperlink could access the game, which meant that some players weren't the targeted research group.
- Before the game went live, a marketing campaign was implemented to drive engagement. The campaign focused on easily accessible mediums because of budget constraints. Mediums such as social media, close networks and word of mouth. With a minimal budget, it was challenging to reach the target group.
- The game presented the players with an opportunity to win prizes: airtime, a hard copy entrepreneurship book, a downloadable book, and the opportunity to be mentored by

an expert. Some players did not engage in the game to gain new knowledge and skills but rather for extrinsic motivators in the form of prizes.

3.7 Ethical Considerations

In the transformative paradigm that is the theoretical basis of this study, consideration of the community's history, values, beliefs, culture, norms and practices is required (Cram & Mertens, 2016). In Africa, the concept of 'Ubuntu' means 'humanity' or humanness, that reflects the ethical consideration of connectedness amongst living and non-living things (Cram & Mertens, 2016).

Creswell (2009) highlights the importance of not putting participants at risk and respecting vulnerable populations. During the first part of the qualitative study, the focus groups and interviews were conducted at the entrepreneurship hubs or incubators at which the participants were located or frequented. And the second part of the qualitative study, the individual interviews were conducted via Zoom. In both instances, participants were advised regarding the study and had the option of participating or not. Those that chose to participate were asked to sign a consent form (which was explained). The consent form stipulated the following (Creswell, 2009):

- Identity of the researcher;
- Identity of the institution that the research is conducted with;
- Identity of the purpose of the research;
- Guarantee of confidentiality of the participant;
- The indication that a recording device was utilised;
- Assurance that the participant can withdraw at any time;
- Provision of names of persons to contact if questions arise.

During the focus group and interviews, the participants were assured that any additional information shared would only be used for the purpose of the study. With the semi-structured questions, some responses revealed personal information that a participant might not want to be revealed in the study; this was noted.

3.8 Conclusion

The sequential embedded mixed method design was adopted and examined according to a case study done in Europe that also developed a serious game and used game theory to promote the reduction of energy consumption and carbon emissions by changing the participants' behaviour. The researcher modelled some elements from the sequential embedded mixed method design for this research such as;

- taking into account what the literature says,
- the use of focus groups and individual interviews,
- socio-economic characteristics of the target group,
- the learning and development methods, and
- how familiar the target group is with gameplay.

During the game development, elements to be included in the prototype were;

- the releasing of a beta version that selected individuals tested,
- using the agile process and making suggested changes from the feedback at the beta testing stage, and
- conducting a baseline survey of players as they participate in the game and using that information to collate a final report.

The next chapter delves into the findings of the study; the analysis of the focus groups and individual interviews, and how those led to the building of the serious game prototype.

CHAPTER 4 – FINDINGS OF THE STUDY

4.1 Introduction

This research aims to establish whether or not the use of gamification as a teaching tool for aspiring black business owners living in townships and peri-urban areas is feasible. This is extremely important given the situation in South Africa and the difficulties young business owners experience. A sequential embedded mixed method design has been utilised since it is a method of research that contributes to the development of an all-encompassing, multifaceted understanding of a complicated topic in the context of its application in the real world (Crowe, Cresswell, Robertson, Huby, Avery & Sheikh, 2011; Mtotywa, 2019). This tried-and-true research method has found widespread use across a variety of disciplines, most notably in business studies and social sciences (Yin, 2012).

In order to achieve the goals of the study, it was essential to conduct research on the phenomena in the environments in which they occurred naturally. The utilisation of a range of sources of data, which in this investigation consisted of individual interviews and focus groups, game assessment reports, and post-gamification semi-structured interviews, is a fundamental principle that underlies this methodology (Baxter & Jack, 2008).

The findings of the study are described in this chapter, beginning with an overview of the various phases of assembling this data. This covers the profile of the participants as well as the significance of the empirical data. This is followed with a series of themes derived from the coding and the group of codes – the sub-themes. These subthemes are analysed, and the perspectives of both young entrepreneurs and enterprise development practitioners are constructed from these sib-themes. The gamification outcome, followed by the post-gamification findings, is a natural consequence of this process. At the end of the chapter, a summary of the investigation findings and responses to the study's research questions are presented.

4.2 Overview

4.2.1 Pre-gamification data

The summary of the sample is an important factor in determining the relevance of the sample, which is critical to the sample's overall credibility (Guetterman 2015). The sample for the study was representative of the population of interest because it included both young business people who had participated in an enterprise development programme and professionals working in the field of enterprise development.

During the pre-gamification phase of the research project, five different types of interviews and focus groups were conducted: two individual interviews, four focus groups with numerous entrepreneurs, and one focus group with entrepreneurship development practitioners. This process established that the sample was relevant to the research question.

4.2.2 Gamification

Game developers carried out this part of the research guided by an accelerated proposal process that took place over the course of several months. The serious game live testing campaign lasted for eighteen days and targeted participants through various networks. During this phase of the live testing, a survey card was attached to the serious game with high prominence and coin value. This was enough to earn some of the rewards immediately, which encouraged users to give the survey priority while logged into the game. There were only two instances of users quitting the survey after they had begun it.

A total of 325 individuals successfully completed the survey, out of the total of 427 users who had registered on the Lighthouse serious game platform. The survey consisted of five questions (1623 questions in total were answered). 53% of those who completed the survey were based in Gauteng, 54% lived in townships and peri-urban regions, and 94% of these users self-identified as being black, coloured, or Indian. Of these users, 66% were entrepreneurs, and 74% were in the age category of 18 to 35 years old.

4.2.3 Post-gamification data

The purpose of the post-gamification interviews was to gain an understanding of the efficacy of gamification as a teaching method for young black entrepreneurs living in townships and peri-urban areas, as well as gain an understanding of what the gamification data reveals about their learning and development. During this stage of the research project, ten interviews were carried out, the results of which were used to develop the study's model for gamification.

The game was developed for entrepreneurs who self-identified as being between the ages of 18 and 35, were located in Gauteng at the time of the study, were residents of townships or peri-urban areas, and self-identified as being black, coloured, or Indian. These individuals were recruited to take part in the game through the use of the social media platforms, such as WhatsApp and Twitter, as well as the mailing list of a third party that specialises in entrepreneurship. Others were recruited through entrepreneurs' networks:

> I saw it through social media. First, I saw it on your stories, and then I had to click to go to them; I forgot the name of the page. But it referred me to another page PAT5

> On Twitter, actually. I was browsing through Twitter. I'm not sure if someone re-shared it or something, but that's how I bumped into it. I was like - oh, this is interesting; let me jump on. PAT6

Transcripts from the ten interviews were analysed and a comprehensive wordlist was developed, with the most dominant words being game, information, entrepreneurship, play and time (Figure 4.1). This verified that the outcomes of the interviews were relevant to the objective of understanding the effectiveness of gamification.

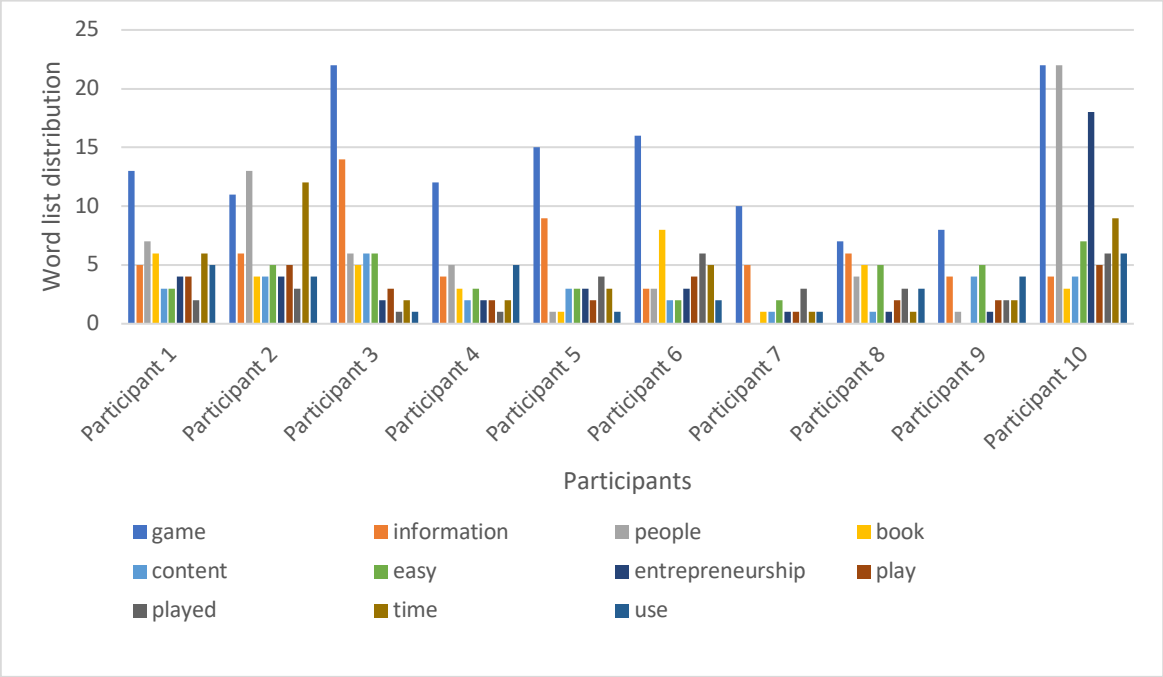

Figure 4.1: Empirical data word list across the participants

Source: Data Analysis.

Using this empirical data, four themes were identified: 'participation in the serious game for learning', 'the content of the game', 'concerns navigating the game platform', and 'the usefulness of learning information in game format'.

4.3 Development of the themes of study

The empirical data that was obtained from these interviews was analysed using content analysis with the assistance of Atlas ti 8.0. This resulted in the development of seven themes from 35 categories or subthemes (Table 4.1). The seven themes are the factors contributing to challenges faced by young entrepreneurs, the expectations and gaps in entrepreneurship development programmes, finding and learning new information, gamification as a learning method, entrepreneurs' appetite for gamification and success**,** the **e**xperience of the gamification process and system and **c**ontent and usefulness of the game for learning.

Table 4.1: Themes and sub-themes of the gamification study

Phase	Sub-themes	Themes
Pre-gamification	Lack of skills & experience	Theme 1: Factors contributing to challenges faced by youth entrepreneurs
	Inadequate big-picture thinking & achievement mindset	
	New entrants' issues	
	Lack of open-mindedness to be taught	
	Stretched beyond comfort zone	
	Inclusive and continual developmental approach	Theme 2: Expectations and gaps in ED programmes
	Skills development & mentorship	
	Access to funding	
	Access to market	
	Networking with preceders & industry players	
	Unintended disempowerment	
	Lack of follow-through and incompleteness	
	Inadequate breakthrough with new solution	
	Ineffective ED programmes	
	Learn by experience	Theme 3: Find and learn new information
	Internet searches & online learning	
	Creative and fun learning	
	Group learning (with family)	
	Theoretical knowledge only	Theme 4: Gamification as a learning method
	Improve propensity for technology use	
	Useful for recreation, distress and refocus	
	Useful learning tool	
	Good awareness & positive intent to use	
Gamification	High level of user registration	Theme 5: Entrepreneurs' appetite for gamification and success
	High levels of engagement	
	No difference in success rate for targeted vs non-targeted audience	
	Inclusive results on game application as vehicle for learning	

Phase	Sub-themes	Themes
Post-gamification	Device used to play the game	Theme 6: Experience of gamification process and system
	Previous participation in learning games	
	Experience in first-time accessing the game	
	Return and frequency of participation	
	Concerns navigating the game platform	
	Content of the game	Theme 7: Content and learning usefulness of the game
	Prize of the game	
	Usefulness of learning information in game format	

Source: Data Analysis.

4.4 Pre-gamification dynamics

4.4.1 Factors contributing to challenges faced by young entrepreneurs

The empirical data showed various elements that contribute to the obstacles experienced by young entrepreneurs. These are the challenges that entrepreneurship development programmes are designed to address to contribute to youth employment; the lack of skills and experience, achievement mindset, big picture thinking, new entrants' issues, an attitude not allowing to be taught and being stretched beyond comfort zone (Figure 4.2).

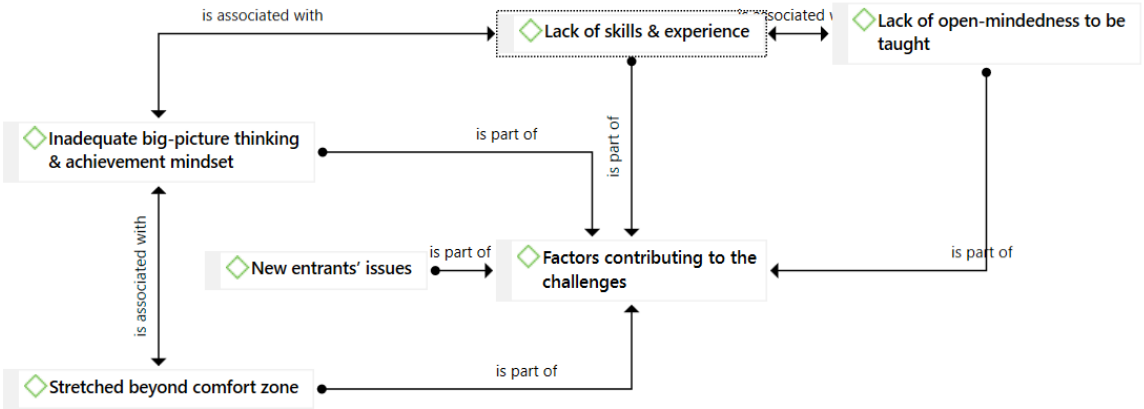

Figure 4.2: Thematic map of factors contributing to challenges faced by youth entrepreneurs

Source: Data Analysis.

Lack of experience and expertise is one of the primary contributors to the difficulties that young people who want to start their own businesses confront. This should not come as a surprise

when taking into account the fact that a significant number of young people enter the business world out of a sense of desperation due to the high levels of unemployment and the skills gap that exists in South Africa. Skills that are necessary for the efficient operation of a small business are therefore required, and business owners emphasised the difficulties associated with financial management as well as the requirement for practical experience that is comparable to real-life employment.

> That's a good thing, but it has a number of challenges because we need real-life work. We need experience in doing this and that! [IINT2]

> I mean more jobs, especially with the times changing with the broadcasters also find the challenges that the budget is not enough. [FG1]

> I feel like all those things deal with the balance statement. Finance is a bit of a challenge. [FG4]

The lack of achievement attitude and ability to see the large picture was identified as the second difficulty faced by young entrepreneurs. When an entrepreneur is short-sighted, they find themselves making decisions that will only affect them in the short term. This is in direct opposition to the process of creating a firm, which requires vision in order to develop and be sustainable in the long run. This difficulty is compounded when the entrepreneur is paralysed by a fear of failing and does not cultivate a growth-oriented and victorious mindset. This situation is made much worse by the influence of doomsayers who were unable to accomplish their planned goal and had to settle for what they could get from the surrounding environment.

> But for me, the biggest challenge is for, for a start-up is getting to sustain yourself and what, what might come tomorrow and the fact that how do you, how do you bring business instead of, you know - okay, we do not have this - because what you do then? [FG1]

> I think what damages us a lot is general knowledge; we listen too much to people who are running informal businesses on the street; they will always tell you it is difficult when you start your own business to start of fear that you cannot handle a million; but if we could have positive people around us, mindset could have been different. [FG4]

The entry of new and young businesspeople from peri-urban and township areas into the market is the third problem that needs to be addressed. They enter the market and begin working under challenging conditions, with a shortage of investors or with the investor's faith in their business not yet established. This requires skills, resiliency, and occasionally experience, all of which are things that are often missing in new businesses.

> There is no investor; there is no one who can check how the markets are. They just tell us what they want to tell us. That this what, what…Then when we go out, we all have business here. There is no one, I am telling you. There is no help; you are still struggling with your own challenges [FG2/3]

> Being new to the kind of space has also been a challenge for us; luxury products, the target and the chain have been a challenge also. [FG4]

As a result, the lack of financial investors influences some of the decisions that young business owners make which, in turn, limits the growth of their businesses because they do not have any financial security or are unable to risk the small amount of money that they have already invested in their businesses.

> I think the biggest challenge for me was big. The major challenge is money. Yeah, like, and money like influences a bit of the decision that you're in currently or how you're trying to navigate whatever you're doing. So it's like it either you're in it for the money, but also it's like how long can you hold out, without getting the money 'cos I could be making money somewhere else but not necessarily doing what I want [FG1]

Practitioners of enterprise development have identified two additional challenges that contribute negatively to the problems faced by young entrepreneurs. These are the lack of open-mindedness of the entrepreneurs who are to be taught, as well as the struggles of the entrepreneurs when they are stretched beyond their comfort zone. These are mentalities that need to be addressed because they provide a barrier to the growth and development of business owners and entrepreneurs. This is especially true when the young entrepreneur believes that they already know what they need to know, believes that what they have in mind is a winner regardless of the circumstances, or have received advice either from their parents or from

neighbouring entrepreneurs who have advised them from their own experiences, which may not necessarily be true or right for this particular entrepreneur.

> It is the attitude of not allowing yourself to be taught/learn. You know, when you cannot be taught or advised because you think you have, [that is] what we picked up. The guys that we worked with; will be passionate about their ideas, right? And we will say to them - guys, it is nice and cute that you have an idea, but what problems do we have? Can we rather address the problems that we have first? Then, when we have time, we can address what you are passionate about. [PFG1]

> Or be stretched beyond their comfort zone … [PFG1]

4.4.2 Expectations and gaps in enterprise development programmes

The goal of this research was to gain an understanding of the expectations placed on enterprise development programmes that are available to young business owners. There were general as well as particular requirements here. Factors noted by the participants in the survey were an inclusive and continual approach to development approach, skills development and mentorship, access to funding, access to markets and networking with peers and industry players (Figure 4.3).

Both individual entrepreneurs [IINT2] and a focus group of entrepreneurs [FG1] felt that enterprise development programmes met their expectations, specifying that the enterprise development programme was a catalyst that helped achieve some of their immediate objectives.

> All the programmes I've been a part of, whatever expectations I would have of it, they all met them. [IINT2]

> I think for me my expectations were for the ED program. It allows me to get to where I want to go more quickly. So, it is more of a catalyst. [FG1]

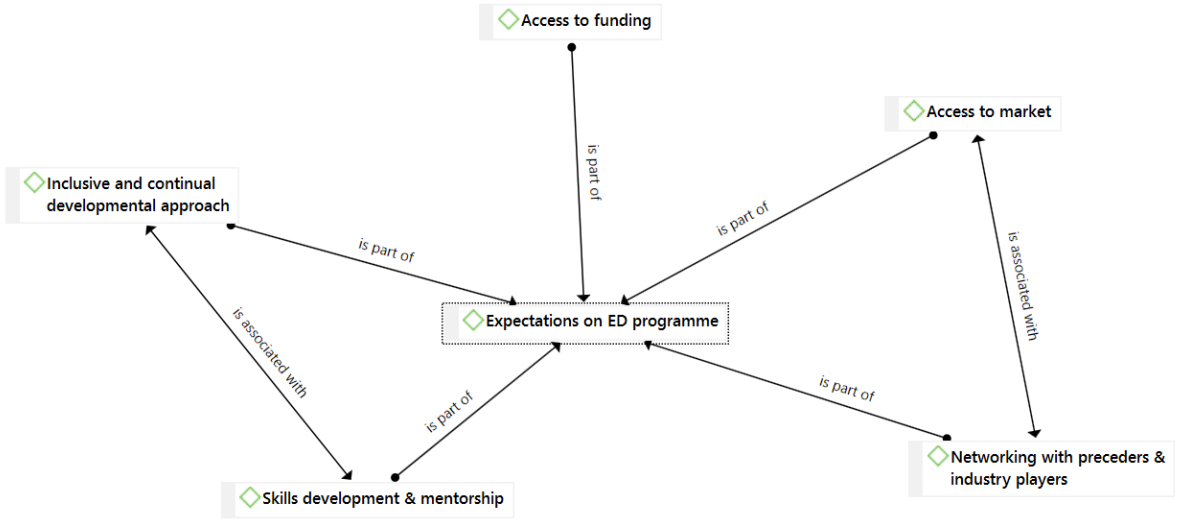

Figure 4.3: Thematic map on the expectation of ED programmes

Source: Data Analysis.

Practitioners explained that there was an expectation of an inclusive developmental approach, ensuring that entrepreneurs from different backgrounds can benefit from the entrepreneurship development programme, regardless of their different educational levels, using the example of the differences between entrepreneurs with a school leaving certificate and those with a university degree. In other words, an inclusive developmental approach should be one that will ensure that entrepreneurs with different backgrounds can benefit from the programme. This means that the facilitator needs to be able to pitch at a variety of levels for a variety of audiences. When there is continuous learning, this is helpful since it ensures that the learning never ends, which is essential for the development of entrepreneurs.

> And also, the fact that in a program, you will find someone with a matric and someone with a degree. So, a good facilitator is able to bridge that gap in the classroom. [PFG1]

> …business is a learning process on its own; I don't think it ever stops, So I can say we are constantly learning; I guess it does help. [FG4]

At a more specific level, entrepreneurs who participated in individual interviews, as well as those who participated in a focus group, discussed the things that they anticipate receiving from the entrepreneurship development programme. These things include, but are not limited to,

financial assistance, business skills and mentorship, networking opportunities with industry or similar businesses, particularly those who take part in the entrepreneurship development programme, and assistance with accessing the market.

> The expectations were to get access to the market and mentorship and funding. [IINT1]

> Money! Money! Of course, we need money in the business; we were expecting money. I expected to gain business skills. I am not creative. Financial guidance I do not look at my numbers to see whether I am making a profit or a loss. [FG4]

> …when you come to ED programs, you often realise that you are not the first set of companies to come into an ED program. So, you would expect you would have access to the companies who came before you, but often you do not have that introduction to the people who came before you in that program. [FG1]

Businesses that received financing from entrepreneurship development programmes were held to a higher standard in terms of longevity, business support, and business performance. But this was not always the case and, in some entrepreneurship development programmes, the majority of the businesses that were sponsored failed within the first year.

> The businesses that they fund do not last a year. Number two, there is political interference that comes from you getting money and friends that get money. Number three, the teachings that they give you, you already know. Number four, they cannot cater to special businesses. And it's not a special business, but just because it's not a typical black business.[FG2&3]

Both entrepreneurs and practitioners highlighted gaps in some enterprise development programmes. Four aspects were highlighted: unintended disempowerment, lack of follow-through and incompleteness, inadequate breakthrough with new solutions, and enterprise development programmes that are ineffectual (Figure 4.4).

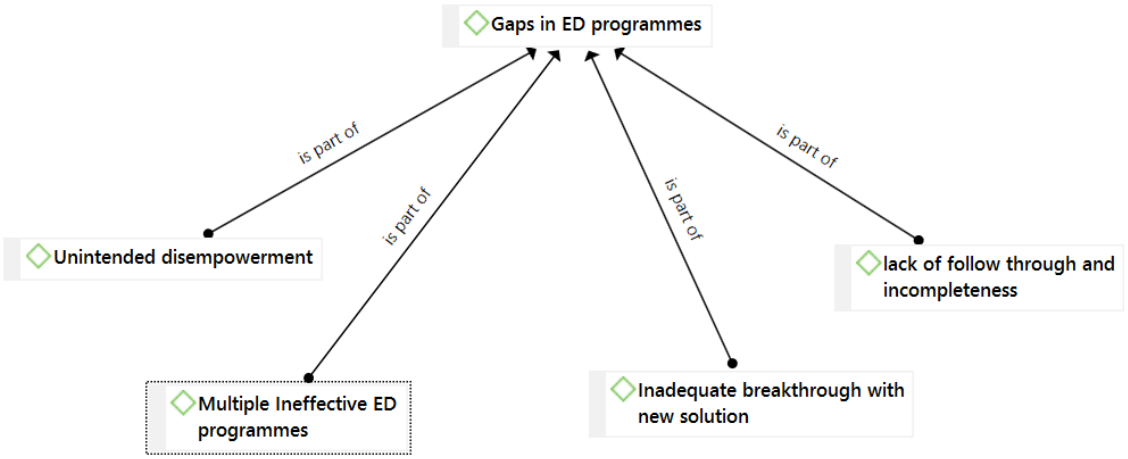

Figure 4.4: Thematic map on gaps in the ED programmes

Source: Data Analysis.

Disempowering someone by dictating their actions or being overly directive was one of the crucial factors that were underlined. When viewed from the point of view of the entrepreneur, the programme may, at times, come across as authoritative and overbearing in its suggestions regarding how things should be done in order to improve the entrepreneur's business. This can have unintended consequences, as was the case in the case of an entrepreneur who was interviewed [IINT1], whose company struggled with sales after the implementation of a branding strategy that was driven by the enterprise development programme.

> …they wanted to brand everything in our company, like from the logos and all that. Like they were rebranding us, they wanted something new and fresh. Ever since then, I haven't gotten anything. [IINT1]

There were examples of disempowerment given by enterprise development practitioners as well, although theirs were more focused on spoon-feeding too much information. Simply said, entrepreneurs were sometimes seen as receiving everything with the lowest amount of effort from them, demonstrating a discrepancy between what the entrepreneur is prepared to accomplish and what the enterprise development practitioners are providing through programme.

> …what is that person who does not have access to enter the door? What are they willing to do versus what our guys are doing? And this is where Enterprise Development is disempowering

> people. 'Cos it's saying that - here's a platform to become an entrepreneur, people will give you stuff. [PFG1]

What is clear is that an enterprise development programme may contain a flaw that might be characterised as "unintended disempowerment." This flaw needs to be remedied in order to make the programme as a whole more effective. Another problem that came to light was a lack of follow-through and an incomplete approach. This was due to a failure to properly manage the value chain as well as using service providers who did not finish the programme. This gave the impression that the organisation that was providing the enterprise development programme had an insufficient level of dedication.

> They put me through to ABSA; ABSA put me through to one of their service providers, who did my books for me, and that was done. Then another service provider was supposed to do strategy, then halfway through it just went… [no completion] [FG2/3]

Practitioners also emphasised the fact that there is sometimes an issue with inadequate breakthroughs with new ideas because they are working with the "experts," such as the owner or manager of a firm who has extensive experience in their business or industry. This can make things tough because there is a possibility that opportunities will be lost as a result, and this can sometimes cause the entrepreneurship development programme to be less beneficial for the entrepreneurs than it otherwise could have been.

> So, you know you come to the ED program because they have the expertise. But you often find that because you have a new solution, you do not know how to always communicate your solution [PFG1]

In addition, practitioners were of the opinion that certain programmes were unable to deal with, or accommodate, emerging business solutions. This was typically the result of a lack of appropriate screening procedures, as well as the inability to organise firms according to the level of standards that they needed to meet, and the inability to place enterprises that offered novel solutions in the appropriate enterprise development programme. As a consequence of this, young people just starting out in business found that they had to take the same classes several times, or learn material that was redundant to what they already knew, because other people in their class still required this information. This then resulted in a waste of time and

money for the entrepreneur, as well as resulting in a lack of a positive attitude on their part, which inhibited them from learning anything new or seeing an opportunity within the programme.

> They tell you things you already know; you are in a room full of people who have not registered, right? Or have registered but do not have tax clearance, or they are not sure what they want to do. [FG2&3]

> Only to find out that your business is sort of unique. It's not your usual spatlo business or chesa nyama business. You know, those car washes, those common businesses. Only to find out that they cannot cater to such businesses. And that's a waste of time. [FG2&3]

Enterprise development practitioners all agreed that, sometimes, the design of a programme is flawed, and is offered only to "tick the box" because there are funds that are available. This problem is sometimes made worse by the fact that there are a lot of programmes that are available. This is seen as the key issue that contributes to how ineffective the programme is.

> Sometimes I think the design of the programmes is wrong. And the intention of the program is to just tick a box, right? And you find a bunch of young people, yah they have passion, but they need steering right? If you go up the stairs lean this way you know? Sometimes I think there's many programs. But I sometimes think a lot of them haven't done what you're saying that you've done. To really understand the, the 'why' behind the program. Programmes are now just out there to tick a box. They've got the funds, let's just do it. But there's no long-term intention around supporting these people. Because I think the one thing that does kill entrepreneurs is they need support. Similarly, the same way that as employee within the organisation my support structure is very strong. [PFG1]

In addition, as a result of the insufficiencies of some programmes, participants needed to participate in more than one enterprise development programme in order to receive the necessary assistance they required for their businesses. Participants also discovered that existing education programmes did not address a variety of business issues but rather specifically focused on one area of business either by doing that aspect exceptionally well or by overlooking other aspects. This meant that entrepreneurs who participated in these programmes had to choose and explore which programme would better suit them. They were also required to be intentional about the outcomes they expected from the programme. This

highlights the problem that there are a great number of enterprise development programmes, some of which are of very little use. Practitioners explained that one of the things that can make their jobs more challenging is when they come across a self-assured entrepreneur who is sure of themselves because they participated in a similar programme in the past that was ineffective and did not provide what the programme was supposed to provide in order to develop the entrepreneur.

> So, I think, for me, some of these programs are actually what's making rubbish entrepreneurs. Because they take them through some things that are very fluffy and you come and meet a person, they say they've been through program X. And you ask them - what did you learn? You know? They just perpetually then think that because I've been through a program, I've done well. But actually, I think the program was what was a disservice to entrepreneurs X, Y, Z. [PFG1]

> The degree of these they vary. But I would like to classify a hardcore ED program; it would be the MultiChoice Bootcamp. But there's been other ones; Redbull Amaphiko (part of their CSI), and then with SAB (they've developed a foundation, they put part of their ED funds through that. And through that foundation, they support social innovations). So yeah, I'd say those are the three main ones. [INDV2]

However, the success of educational development programmes was not only based on the programmes themselves; rather, success was also dependent on the participants' level of enthusiasm and preparation, as well as the strength of their desire to be in business and their ability to spot an opportunity where others may not have noticed it.

> The problem is that sometimes the entrepreneurs think that the business (corporate) needs to give them something for them to engage with them. When sometimes, they don't even have an idea. It's just wishy-washy. So, the ones that have made it have like something different about them, unique. Sometimes it's not the knowledge. Sometimes it's the interest. I think what I found with the entrepreneurs who come externally in to come and try and work internally it's people who are very opportunistic in a good way in that they are also able to pivot on what they think they're offering so that it works for the organisation. So, it's people who are quite versatile and are able to pivot quite a lot. [FG1]

Despite this, there were some modules which participants found very useful in programmes, such as the modules in marketing, accounting modules, business process creation modules as well as mentorship modules.

> The marketing module I found it useful; I like accounting, and it helps; business process creation was a good one. I wish it could be intense. It is more complex, especially if you attend them 100%, but I liked accounting. It helped us with a lot of things; I wish it could be a going thing or complex; I think if you attend them seriously, they are very valuable [FG4]

> There were modules that we did last year; there was mentorship. Every second two weeks, a session whereby, this month, how much you want to reach the end of the month. I would say, "R7000". We would push to get there, even if it's not there. But there's a difference that okay, this week we did 1,2,3. This is where you went wrong, so that was the best for me. [FG2&3]

In highlighting that they were generally struggling with the finance module, these young entrepreneurs demonstrated that financial first principles were generally foreign to most of start-ups even though this is critical for the effective running of any business.

4.4.3 Find and learn new information

Four factors were identified in the interviews, that help in understanding how young entrepreneurs in the township and peri-urban areas find and learn new information, especially pertaining to their businesses. These were learning by experience, learning through an internet search and social media, a preference for creative and fun learning, and group learning, including learning with family (Figure 4.5).

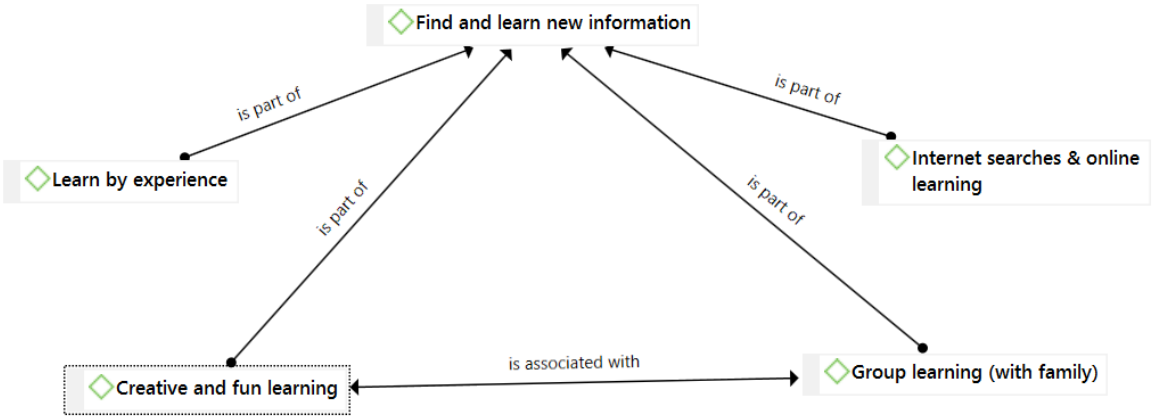

Figure 4.5: Thematic map find and learn new information

Source: Data Analysis.

Participants presented a variety of arguments in support of learning via the internet and conducting internet searches. Some of these included the availability of a network to learn from, particularly within the social media realm, as well as the cost-effectiveness of utilising online learning, which is essential for young businesspeople who are just starting out and are struggling financially. In addition to this, they emphasised how quick and simple it is to learn online.

> I keep learning online because I do not want to waste a lot of money, [Also] for me, I am quite lucky; I use social media for my business. I [also] feel like google is the best way; you make mistakes and learn them from google. [FG4]

In spite of this, another point of view was that the internet does not provide all of the answers that are necessary for the entrepreneur. Consequently, Google is not the only learning platform available when one is looking for fresh information.

> Google does not have all the answers, but at the same time, it helps. It helps! [IINT1]

Other participants emphasised the usefulness of learning methods that are both creative and enjoyable, as well as learning with family in their own time and at their own speed. According to participants, this method of learning assisted in improving their level of comprehension and allowed new knowledge to be more effective, and to sink in more.

> So, it would make life easier if I was fun, and then when I get home, I get to do it with the kids. [IINT1]

> …yes, there's information that would rather make sense or sink in or comprehend better if it was to be made fun. [FG2/3]

> Absolutely! I feel like we can be taught that way; I remember even in high school, I had very few teachers who were very playful. You looked forward to being in their classroom; there's something amazing with that where you accidentally learn as you're having fun. I like that, and for me, because I'm generally a creative person versus, I'll struggle if you give just a bunch of notes to read. [INDV2]

In spite of the fact that these various modes of education were considered to be more advanced, there were members within the first focus group who emphasised the significance of learning by doing, which allows one to obtain more experience.

> ... it's like you can learn something theoretically, but you don't understand it or use it until the experience [FG1]

4.4.4 Gamification as a learning method

It was important to investigate whether or not gamification is a workable choice for presenting new and occasionally difficult ideas and, if so, to understand what date from gamification says about the learning and development of young businesspeople in townships and peri-urban areas. This is significant since it has been discovered that gamification procedures can boost users' desires and encourage certain behavioural adjustments in order to achieve specified goals. This set of sub-themes is set out in Figure 4.6.

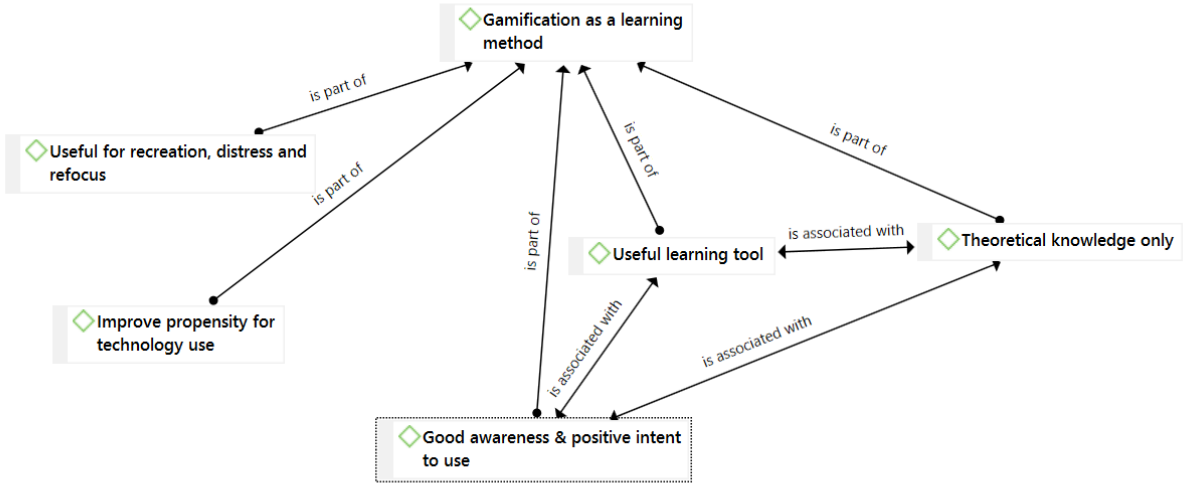

Figure 4.6: Thematic map on gamification as a learning method

Source: Data Analysis.

In the interviews, some young businesspeople in the peri-urban and township areas emphasised the fact that they have not utilised gamification as a mode of education. On the other hand, the vast majority of them were aware of what it included and hence possessed a conceptual understanding of gamification.

> With gamification, it's not something we haven't applied yet in our business. But in general, my understanding is that it gets to the point quickly when you're learning [IINT2]

> So actually, like I read gamification a lot. The way we understand it is that it is really just a human-focused design. So, for example, maths is boring, and if you gamify maths and you like have a popping bubble game on your phone that says - 2 + 2 is 5 - it makes the experience of whatever you are going through like feel better, like it makes it more interesting. [FG1]

There were other individuals who had been exposed to, and had utilised, gamification as a learning approach. These participants described how successful this approach is, where you learn without overthinking things and gain various abilities, particularly problem-solving skills and the ability to think about the broader picture. These participants vouched for the efficiency and effectiveness of gamification for educational purposes.

> For me, I think that thing is brilliant. You made a good example with pilots; you do not fly a real 474 before you fly a simulation 474 [FG2/3]

> I will attest to gamification; that is why I carry around my Rubix cube. It helps me think. [FG2/3]

> So, I think gamification will help in that regard because now you are making a mountain, which is, which looks impossible to climb. [FG2/3]

> Monopoly is learning; 30 seconds is learning [FG4]

> You do not really see that it is a game; you are supposed to be learning from the game. But that application of that and how do you solve problems. [FG1]

Others described how gamification was used for other things that support the development and well-being of entrepreneurs. These factors are not necessarily the core of gamification, but nevertheless support the development of the entrepreneur.

> The gadgets I did not like but now, since I'm more with the children, I see the value of them and for us to understand. [IINT1]

> Coz sometimes when you've got a lot to do, then there's a game on your phone you just go to clear your mind and then play that game for a while. [IINT1]

> I like to play games most of my games will require more simulation, as it requires you to lift the arm or the leg and jump; more sporting games require that. [FG4]

From the point of view of educational practitioners, the question is whether or not gamification is a workable choice for presenting novel and occasionally difficult ideas. There was widespread consensus that it is and, when appropriate, practitioners described using simulations which help to improve learning and, more importantly, helps young entrepreneurs solve problems, which is essential for a successful business.

> …we did a lot of simulations where we said because you have not been exposed to studying, we want you to have as much face time potential with clients as possible because this simulates

> your environment outside of that program. And that worked really well, but it was not easy because of resistance and reluctance in the beginning [PFG1]

> I agree; I think for me that the more and more I work in this space less I realise the theory. It is about - is there a simulation, is there a video that somebody can connect with, is there a tool that you can show them that they go do, that they can go do it themselves? Uhm, you know, I think small things. I am finding that, like, we were showing people how to use a Yoco, and they were so excited. [PFG1]

In conclusion, another positive outcome of the interviews was evidence that even those who were not using gamification had an awareness of it as well as the intention of using this approach. This indicates that there is a high probability of buy-in, acceptance, and use of gamification the development of both themselves and their businesses if gamification were to be introduced as a learning method.

> For me, I could do well in a classroom if we could find gamification, you know, those kinds of things. [IINT2]

The games that participants favoured were those that engaged them in learning and were interactive. Participants in the interviews felt that attaching some emotion to learning points would make it easier to retain information. However, these kinds of learning games were rare and hard to find for some participants.

> The best one for me would be the one that engages; that lets you touch, feel, lift, drop, all of those kinds of things. But that's another one; it's quite rare to find those. [INDV 2]

4.5 Entrepreneurs' appetite for gamification and success

4.5.1 Theme 5: Entrepreneurs' appetite for gamification and success

In this stage of the study, the focus was on entrepreneurs' hunger for gamification. When compared to traditional, non-gamified marketing, the gamified campaign performed as expected, engaging consumers with a high degree of session time and total activity.

Awareness was primarily promoted through African Entrepreneurship Initiative's (AEI)

social media and mailing lists because of the nature of the campaign and the audience that it was intended to reach. A positive association is apparent between spikes in social media exposure and the growth of registered users on the platform by comparing the social media report of AEI with the engagement data of the selected platform (Figure 4.7). In addition, a significant proportion of users who landed on the app went on to complete the registration process. The statistics extracted from the game development report are presented in Figure 4.8.

Figure 4.7: Comparison of the platform by the users

Source: Data Analysis.

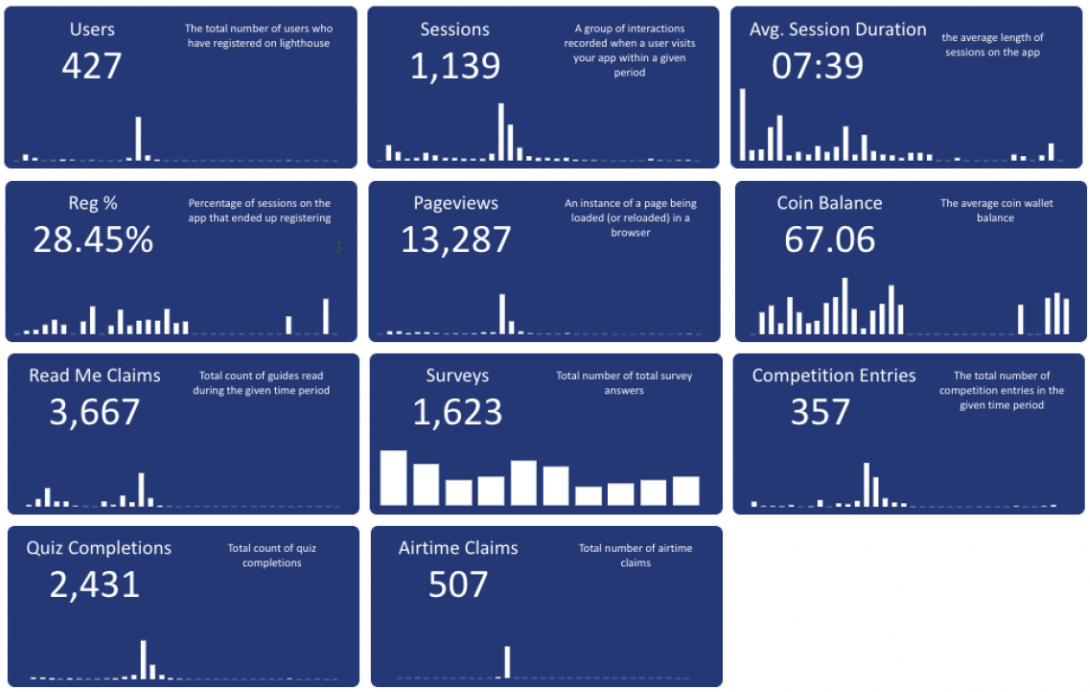

Figure 4.8: Gamification statistics from the activities led by the game developer

Source: Data Analysis.

When focusing on how the participants answered the questions, the breakdown of the success rate per question varies considerably. Out of the 13 areas, eight were higher than 50%, while five were lower than 50% (Figure 4.9).

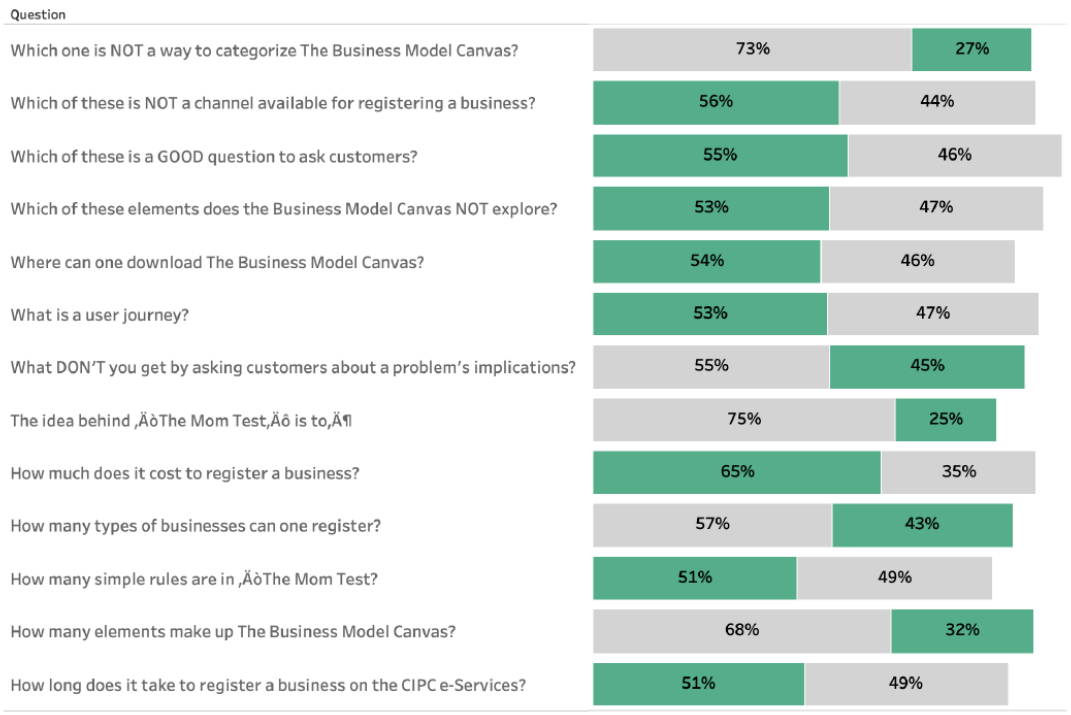

Figure 4.9: Success rate per question during gamification

Source: Data Analysis.

The highest success rate was for the question concerning the registration costs of a business (65%), followed by the question on the channel available for registering a business at 56% and then 'which of these is a good question to ask customers' with a success rate of 55%. This was followed by the question 'where can one download The Business Model Canvas?' with a success rate of 54%. The next highest success rate was the question 'which of these elements does the business model canvas not explore' and 'what is user journey', both at 53%. The worst success rates were for the questions 'the idea behind the test at only 25% success rate, then 'which one is not a way to categorise the business model canvas' with only 27% success and then 'how many elements make up the business model canvas' with 32%.

It should be observed that the targeted group (those who satisfied the survey criteria and participated in a competition) had a greater overall engagement than those who were not targeted, despite the fact that the latter group participated at a lower rate. This would suggest that, while gamification was able to effectively engage other audiences as well, the targeted demographic showed a higher level of interest in spot prizes, such as airtime, in comparison to untargeted audiences (Figure 4.10).

Figure 4.10: Comparison of outcomes for the targeted audience and non-targeted audience

Source: Data Analysis.

Of the nearly 2,400 quiz answers given, 47% of them were correct – some questions scoring higher than others. Even more important, the percentage of questions answered correctly between the target vs non-targeted users was 44% vs 48%, respectively. This simply means that non-targeted users had a slightly higher success rate compared to the targeted user group. The final results of the gamification were inconclusive on whether the serious game was an effective learning vehicle in this instance, given the average outcomes of the quizzes.

Although the quizzes produced middling results, the outcomes were still interesting for all audiences.

4.6 Post-gamification

4.6.1 Theme 6: Experience of gamification process and system

The purpose of this study was to investigate the dynamics of participating in gamification, focusing on the device on which participants play the game, as well as determining whether or not they have previously participated in a learning game. For those users who were using the platform for the first time their experience, and the frequency with which they have returned to the platform to participate in the educational game, are of interest (Figure 4.11).

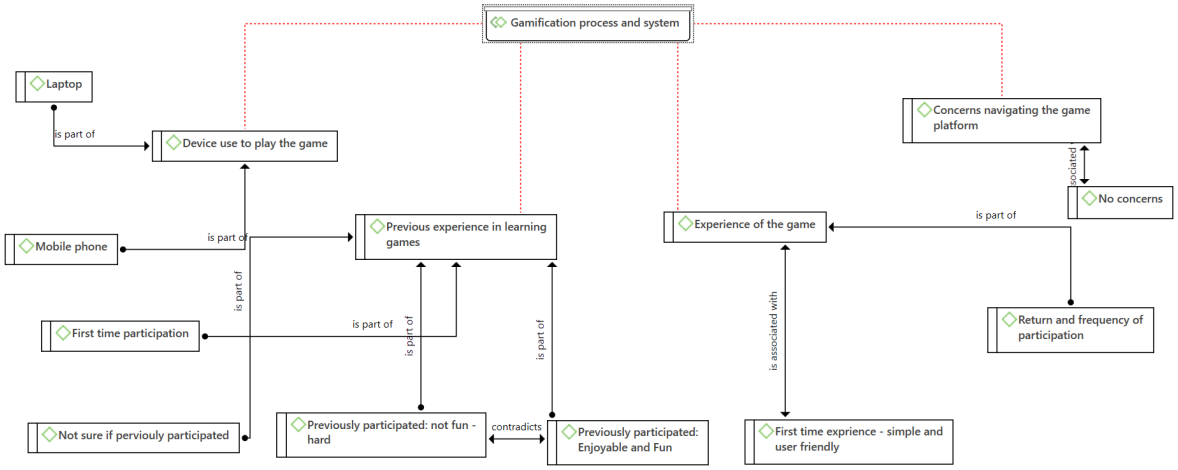

Figure 4.11: Network of gamification process and system

Source: Data Analysis.

4.6.2 Device used to play the game

The purpose of this question was to identify the platforms that were utilised by the players in order to play the game. Seven of the ten participants accessed the game via their mobile devices, while the remaining three utilised laptops (Table 4.2).

Table 4.2: Devices used to play the game

Device used to play game	Frequency
Mobile phone	7
Laptop	3

Source: Data Analysis.

Participants explained their decisions about device that they used for the game, with the most common reasons being convenience and the ability to access the game in conjunction with other activities. When asked about their experiences with mobile phones, participants reported that they found them to be convenient since they used them when attempting to sleep or while accessing the game in conjunction with social media platforms like Twitter.

> My phone. It was just convenient for me to use the phone because I just played while I was trying to get to sleep [PGPAT1]

> I was using my phone 'cos, you know, obviously, you will be browsing through Twitter using your phone more than anything. You do not do it on your laptop. I used an Apple. My phone is i6. [PGPAT6]

Participants who used laptops explained that laptops were ideal as access was linked to their emails, and it was easy to navigate using the link.

> I used my laptop, I think. 'Cos, I think I just went on when I read the email. I just clicked on the link and went through the process there. [PGPAT2]

> I used a Mac Book desktop; it's a work computer. [PGPAT4]

> It was my computer. [PGPAT10]

These results show a stronger preference for the phone than the laptop. This can be attributed to the capabilities of the phone, which cover most of the functions of the laptop, but with the added advantage of being easy to carry and use within different settings than the formality that comes with the laptop.

4.6.3 Previous participation in learning games

Out of the ten people who participated in this exercise, six had not previously participated in a learning game, while the other four had. However, two of the four who had participated in a learning game emphasised that it was not to the extent of this particular game.

Those who participated in learning games before commented as follows:

> I suppose I had, and I can't remember what it's called. It was one of those, it was like a brain games thing, like improve your cognitive ability, improve your memory, that type of thing. It was tough, though. It wasn't fun. It was too hard. PGPAT2

> This is probably, like, the other ones that we've actually dug into, that survey-type of games. It's not really much, yeah. But this is the best one I have come across that is more educational and insightful than anything. PGPAT6

Some of the participants who had not previously participated commented:

> No, this was actually my first time playing a game like this. PGPAT3

> I have only just kind of played nonsense games, but not really an educational one. So, it was my first time. PGPAT9

Participant 10, who had previously taken part in a learning game, described that game as being similar to a questionnaire, in which individuals' knowledge of a specific topic is evaluated in a setting that assumes a common level of familiarity among a group as a whole, its inhabitants, prior to the individuals' entering a course or being able to complete that.

> The fact that it was enjoyable contributed greatly to the overall quality of the game. The need to check in with everyone and find out where they are, given that the other person on the side would have the dashboard that shows how everyone is responding to these questions. After that, once the participants have seen all of the appropriate and inappropriate replies, they will have the opportunity to set the stage for how the lesson should be organised. It is beneficial to the instructors who are being trained since it gives the participants the opportunity to determine the overall direction of the lesson and how it should be organised. PGPAT10

> Similar to this one ... yes, I have. So, this one that I played would be a group exercise. I think it is called Cohort. I loved that game. It was really nice. It adds value to the teachers who train because it gets you to set the tone in terms of how you can structure the lesson. So that one was useful PGPAT10

This was in contrast to the experience of participant 2, who had also participated in the game before by did not enjoy it as it was too hard.

> I suppose I had, and I cannot remember what it is called. It was one of those, it was like a brain games thing, like improve your cognitive ability, improve your memory, that type of thing. It was tough, though. It was not fun. It was too hard. [PGPAT2]

4.6.4 Experience in first time accessing the game

Participants who were playing for the first time were requested to discuss any difficulties they had in gaining access to the game. The opinion among those who took part in the activity was that the game was uncomplicated, user-friendly, and straightforward, all of which contributed to a pleasurable experience. The participants said that they did not engage in combat, and they found the game to be fairly impressive, taking into consideration a large number of novel elements and the occasionally challenging interfaces. Everything functioned as expected and it was satisfactory. After accurately entering the start-up information and creating a profile, it was not too difficult to accomplish everything that was required.

> Well, it was user-friendly. I cannot say that I really struggled with anything. And it was quite impressive because, with a lot of upcoming things, you will find that the interfaces are not friendly. [PGPAT1]

> The first experience was pretty simple and straightforward. There was not much confusion about it. I knew exactly what to do. And I think what also helped is the introduction and everything else. It was just very simple and easy to follow. [PGPAT5]

> I think it was really straightforward, and it was user-friendly. So, I did not really struggle with any functions. It was quite straightforward. Everything was in front of you. [PGPAT7]

Participant 2 [PGPAT2] described their journey to highlight the ease of the game and provide their evaluation:

> I had to plug in my details, right? I had to create my profile type of thing, if I remember correctly. It was all pretty simple. I thought it was a pretty good prototype. It was simple to use,

> and it was all very straightforward in terms of the order of things. Because there were the questionnaires and the quizzes, and then it was the click-through to the rewards and claiming the rewards section after that. I thought it was all very straightforward and easy to use. And then the questions, yeah, I felt like you had just the right number of questions in each section. But it wasn't, and I assumed this is a prototype, so it's probably not going to be very in-depth, but I thought it was sort of pitched just right when it came to the number of questions that you had and then went through the quiz. PGPAT2

The players thought that everything was really clear and easy to use, and when it came to the questions, they believed that the game featured the necessary number of questions in each section. Participant 10 shared that their experience as a product manager taught them that ease of use was one of the most important factors to take into account while developing new products.

> Navigating it was not so hard. And it was self-explanatory. It was not something that you would probably need a help book for. You just navigated through what you had to do, play the games, and earn the coins. PGPAT6

> It was quite easy. I played it in like 2 to 3 minutes, if I remember well. I may have paused in between. But it was quite easy to play, but that is one of the things that are usually important to me as the product manager ... how easy, or difficult something is to play with or to use. PGPAT10

4.6.5 Return and frequency of participation

On the basis of the participants' previous interactions with the gaming platform, we inquired as to whether or not they returned to the game in order to continue playing it and how frequently they did so. There were some participants who only played once, while others played a total of five times. There were no major navigation issues.

> No, so when I started initially, I thought – oh, I can see a problem here because I'm not an entrepreneur – so I was not going to answer this from that perspective. But then you actually gave that option. At some point, I think you did ask. And I thought – okay, good shot – because now, at least, I can carry on knowing that I'm not lying. So that was cool. PGPAT2

This view was supported by other participants, with virtually a consensus that there were no navigation concerns when going through the platform.

> No, I didn't. It was actually pretty straightforward. PGPAT5

> No, I haven't. This is probably, like, the other ones that we've actually dug into, that survey-type of games. It's not really much, yeah. But this is the best one I've come across, that's more educational and insightful than anything. PGPAT6

Some participants had no reason to return to the game because they had completed the exercises or had a prior grasp of the concepts being explained. This demonstrates how important it is to make sure that the game is set at t appropriate levels based for the people who are playing it.

> Well, I did not go to it a lot because I thought some of the things I already understood, maybe because I have been in the entrepreneurial field for some time now. PGPAT1

> I think I only went back to the app once afterwards because I had finished all the activities in the first round of using it. So, I did not have any reason to go back multiple times. PGPAT9

Participants who played the game multiple times highlighted that this was due to the nature of the game being educational, in some cases helping them with their business, or because there was an opportunity to win prizes.

> It was interesting as a business person. It was relevant, it was packaged in an easy way, and also, and gamifying everything just made the process fun. At times I opened it as a reminder of certain things that I had forgotten. PGPAT8

> Maybe about five times. It was for multiple reasons. One of them was to earn points so I could win something. It was also very enjoyable, and it taught me some things I did not know as well. So yeah, it was very informative. So, I just did it to get some things right and make sure that I know some things perfectly because I also run a business myself. PGPAT3

4.6.6 Concerns navigating the game platform

Participants were asked whether they had any difficulties navigating the platform, and not a single one of them discovered any problems. The forward and return buttons, among other features, were really straightforward to operate. As a result, there was never any room for interpretation regarding the manner in which the participants should travel through the game. In addition, participants were able to quickly tell which section they were in thanks to the iconography.

> Like, hence I said because it was a pilot beta version, so you kind of knew that - okay, this is not perfect fully, but it was getting the job done, it was necessary, I could access what was needed, what was being advertised. PGPAT6

> The forward and back were quite easy to use. So, there was not any doubt in - how do I go back to where I was? Everything was clearly marked, like the path of going through the app was very clearly laid out. PGPAT9

In conclusion, the majority of the players participated in the game by means of their mobile phones. Some of the players had previously taken part in a serious learning game, while others had not. They had a positive overall experience with the game, and some of them gained new skills as a result of playing it. They had no problems navigating the game platform.

4.7 Theme 7: Content and learning usefulness of the game

To understand the usefulness of the content of the learning game, participants were asked how they found the content, whether they had learned any new information, whether it was easy or difficult for them to earn the coin, and which of the game prizes enticed them most.

4.7.1 Content of the game

It was generally agreed that the information presented in the game had significance for the participants. Despite this, there were differing opinions regarding the value of the content; the primary factor that drove these differences was the level of experience and stage at which the entrepreneurs were operating. Those who were just getting started and had less experience said

that they gained knowledge from playing the game and that they put some of that knowledge to use either in their personal lives or in their professional endeavours.

> [I] was familiar with some of it but not with parts of it as well. It was informative. I learnt a couple of new things, which was great. PGPAT3

> I found it pretty useful, especially the company registration, because I eventually used that information for my personal benefit PGPAT7

Other participants, as was indicated earlier, were of the opinion that the game was beneficial for anybody who is entering the world of entrepreneurship for the first time. The content was not as valuable for seasoned entrepreneurs or those who have entrepreneurial knowledge and have been in entrepreneurship for some time.

> Well, I think it is good for someone who is like coming into the entrepreneur space. I think that tool would have been great for me when I left my job. It is just that now I understand a whole lot of things because I have been in this game for quite some time.PGPAT1

> I found it to be quite, I suppose, elementary in that way. You know that it was for someone who has no base to start from, I suppose. I am not an entrepreneur, but because I work in this space, it was easy for me. PGPAT2

> It was very useful. But I also feel like it would have been more useful if I were really like a beginner, like a real start-up. Like it is very useful for someone who's just starting up their business. PGPAT4

Participant 6 **[**PGPAT6] explained that the game was relevant and provided valuable insights in justifying this view, explaining that it was precise, concise, and came from someone who was experienced and has entrepreneurial knowledge. The critical basics that are sometimes overlooked, even by the experienced people, were covered.

> The content was very relevant. It was precise, and it was concise. You could literally feel it. I think 'feel' is probably like the wrong term, but you would feel the sense that this is coming from someone who understands what's really going on outside there. And the things that you really need for you as an entrepreneur should you dive into the business side and, like you want

> to grow as an individual, grow within your business. So, it was really cool. Like gave you pointers even as to how you can tackle certain issues. How to start up even because I think we all talk about how we want to start a business, but we never actually dive into it and don't know how to do it at times. We may think we know, but yeah, it was covering the basics, like literally the foundation that's required for you to start out and what to look out for and how to actually hit your target market.

4.7.2 Prizes

In order to have a better idea of what role the game's prize entails in incentivisation, players were asked whether it was simple or challenging to accumulate coins, as well as which of the prizes appealed to them the most and why they were interested in that particular prize the most. The majority of the participants (nine out of ten) reported that it was simple to obtain the coin. In spite of this, some individuals stated that despite the fact that it was not tough, it required comprehension of the material and levels of focus.

> It was very simple. I thought it was going to be harder, actually. Me, I found it very easy. PGPAT5

> It was super-easy. There was some level of difficulty... first, they make you earn it, which is quite nice. So, kind of makes you want to earn some more coins as well. PGPAT9

The remaining individual stated that they did not attain the level required for earning the currency. Further context was provided by Participant 9, who explained that the entrepreneur initially underestimated the requirements of the game as a result of rapidly through the information. However, once the participant started with the real game, the time went by rapidly. In addition to this, it was necessary for the participant to have an understanding of the material that was being provided.. As a result, a greater amount of effort was necessary than had initially been envisaged. It was necessary to focus one's attention.

Of the prizes, four participants preferred the mentorship and one-on-one sessions, three the downloadable book and two participants preferred prizes of airtime. The one participant who did not finish was open to any of the prizes. The ones who preferred mentorship explained that they opted for it because you can never have enough individuals to consult for advice; everyone speaks from their own experiences, which is beneficial for development and growth. Also,

mentorship and one-on-one sessions allow for interaction that can help the entrepreneur to voice their concerns and get information that is specific to their needs at that point, and that can help their business.

> I wanted the mentorship one, so I went for the mentorship one. Because I feel like you can never have enough people to talk to for advice because everyone talks from their experiences. PGPAT1

> The mentorship enticed me the most. It is because I think last year or the year before last, I actually realised that I have been learning through trial and error. And I realised that some of the things, some of the mistakes I have been making, I should not have been doing if I had somebody to guide me. PGPAT5

The participants that went for the book explained that it was a long-term manual that they could use as a frame of reference. It would be useful to refresh memory by highlighting particular sections in finance and accounting and also help to learn new information.

> I wanted to downloadable the book thing. I do not know why I went for the airtime. I do not know if I did not have enough points for the book.PGPAT2

> The book because it was a manual. I knew I could use it as a frame of reference on different days, and I could always go back to it. PGPAT8

Those who preferred the airtime did so because airtime is expensive in South Africa; businesses need airtime to operate.

4.7.3 Usefulness of learning information in game format

All of the participants came to the conclusion that the learning exercise presented in the form of a game was extremely beneficial. Not only was it an enjoyable way to learn, but it was also visually engaging, making it possible to learn as leisure, without disrupting the normal flow of business or time spent with family, and was presented in an appealing manner.

> Yes, it is because, you know, most of the time, you don't want to feel like you're in a lecture 'cos lectures are like you are in school again. So, such a game keeps you alive. Plus, I enjoyed the fact that you played a game, plus it was timed. PGPAT6

> Yes, because they say interaction, and also, pictures speak louder than any other thing. So, the animation and all that was interesting. PGPAT7

> Yes, absolutely. That is useful as an entry into entrepreneurship. There is a lot of reading for many people. But when you take some time off, do something easy. But packaged in a game format, that also helps because one of my functions is that if we can have the easiest, something like a hook in. PGPAT10

> Yeah, 'cos games are fun. So, anything that is fun, I enjoy doing. PGPAT8

This contextualises the importance of gamification as a useful tool for learning for entrepreneurs. Based on these findings, gamification can be used as a learning method.

4.8 Summary of the findings

The findings of the research gave essential insights into gamification as an instrument for educational purposes.

The first question that was investigated was, 'how do entrepreneurship programmes address youth unemployment? And what are the expectations of these programmes?' The findings in the pre-gamification phase (qualitative research) revealed that the lack of skills and experience, inadequate big-picture thinking and achievement mindset, lack of openness to be taught, new entrants' issues into the space, and being stretched beyond the comfort zone are some of the factors that are contributing towards the challenges that are faced by young entrepreneurs.
This suggests that any intervention, such as the emphasis of the study, which is gamification, should be looked at through the lenses of these obstacles and requirements of the young entrepreneurs.

Despite the fact that several shortcomings were pointed out in the entrepreneurship development programmes by both the young entrepreneurs and entrepreneurship development practitioners, it was evident that the young entrepreneurs had expectations of inclusive and continual development, skills development, and mentorship. In addition, they had business-specific expectations such as assistance with access to funding, market access, and networking with their peers and industry players.

Young entrepreneurs and entrepreneurship development practitioners also identified several gaps in the entrepreneurship development programmes. Unintentional disempowerment was one of them, as was a lack of follow-through and incompleteness, an inadequate breakthrough with new ideas, and multiple failed entrepreneurship development programmes. If addressed these gaps could ensure effective entrepreneurship development programmes for young entrepreneurs.

The second study question was, 'how do youth entrepreneurs in the township and peri-urban areas find and learn new information?' To mitigate the gaps identified, the business owners mentioned that they learn through experience, conduct internet searches and participate in online learning, favour learning that is creative and enjoyable, and prefer to learn in groups with family members. All of these methods seem to also highlight the favourable characteristics of gamification as a teaching method.

The third study question inquired, 'what does gamification data reveal about learning and development for youth entrepreneurs in the township and peri-urban areas?' Given the typical results of the quizzes, the gamification results were equivocal regarding the question of whether or not the serious game was a successful learning vehicle in this particular scenario. These materials were entertaining for all audiences, despite the fact that the outcomes of the quizzes were not very noteworthy. In spite of this, the post-gamification interviews that were based on players' experiences suggest that gamification has become a teaching approach for black youth entrepreneurs in townships and peri-urban areas.

CHAPTER 5 – PRAXIS MODEL (SERIOUS GAME PROTOTYPE)

5.1 Introduction

The term ‘gamification’ refers to the process of applying elements of game thinking and game design to settings, products, and services such as educational settings. The purpose of gamification is to increase levels of engagement and motivation across various settings while also providing users with a fun and interesting overall experience (Adam et al., 2022). Gamification in education has a lot of untapped potential that might be used to supplement and improve real-world educational opportunities (Bai et al., 2020). In spite of the original wave of research that had good results, more current studies are revealing equivocal or conflicting results regarding the efficacy of using gamification in educational settings (Antonaci et al., 2019). This highlights the necessity for both theoretical and empirically rigorous analyses of gamified educational interventions (Bolat & Taş, 2022).

This chapter will explore the process that was taken in building and testing the serious game prototype. The previous chapter identified recurring themes and sub-themes that came through from the qualitative analysis. From the five themes that emerged, two provide the cornerstone for the process of designing the serious game prototype; finding and learning new information and gamification as a learning method.

The “agile” approach was used in the development of the game, taking an iterative approach that incorporated feedback into the game design. The development concept was created from the combination of the qualitative findings, the product vision, the project definition, and appropriate project milestones.

The prototype focused on the learning topics of entrepreneurship, business registration, market research and the customer approach. Before going live, there was a beta testing phase in which five individuals tested technical aspects, user experience and the engagement qualities of the

prototype. Once feedback from beta testing had been implemented, the game went live on 20 January 2022.

5.2 The Developers

The game was developed in partnership with Sea Monster, a company based in Cape Town, South Africa. Sea Monster creates engaging and memorable content and experiences to change attitudes and inspire behaviour change for clients from around the world. "They solve communication challenges using their specialised skills in animation, gaming and immersive technologies. The experiences they create have the power to grip hearts, spring people into action and shatter beliefs. Their talent and experience in 2D animation, serious games, Augmented Reality, and Virtual Reality solutions development lies at the heart of their business. All of their digital solutions are strongly story-driven, well researched and offer full analytics and user insights" (SeaMonster, 2022).

5.3 The Game Platform

The serious game prototype was housed on a platform called Lighthouse. Lighthouse is a white-labelled web app with built-in games, activities and rewards which help you to build great gamified digital experiences. The digital experiences are customised on a per-user basis and allow for a bespoke user journey (Lighthouse Online, 2022).

Lighthouse is a mobile-first, digital engagement platform optimised for low-income contexts. Lighthouse delivers content in an engaging manner to drive improvements in knowledge, changes in attitude, and positive changes in behaviour. It can live on any cellphone; therefore, it doesn't necessarily only work on a smartphone. The data consumption depends on the player's engagement and rewards cards. A user would be hard-pressed to use more than 20MB on the app (with a mini-game, for instance), while downloaded apps are often 80 - 100 MB and then still use data when you are using them (Spotify/Youtube, for instance).

5.4 Game Design Rules

The following rules were defined to direct the development process:

(1) Resource management. Cooldowns are the length of time imposed on the player before they can commence playing the game again (for example, when the player gives incorrect answers, they need to wait a specified amount of time before trying to play again). Cooldowns on activities switch on "internal motivators" about the conservation of resources and opportunities (for example, a high-coin-yield quiz has a medium cooldown to increase focus when users have the opportunity to try again). This gamification approach brings deeper and repeated engagement with actions such as readmes and quizzing simply by gating them behind time and opportunity cost.

(2) Rewards. Lighthouse motivates action through “extrinsic rewards” on short, medium and long-term tiers. This is in line with how popular mobile games compel users to re-engage. Short-term rewards are Lighthouse coins for performing activities. Medium-term rewards are things like Airtime and E-books, which users earn Lighthouse coins to redeem. Finally, the long-term rewards are competition entries and other rewards that resolve only at the end of the live testing of the game. These correspond with short-, medium- and long-term goal setting, with similar phrasing.

(3) Balanced Game Economy. Activities are assigned different values, costs and cooldowns depending on their priority for user engagement. For example, collecting survey data from users was highlighted as an important goal for the campaign. The Survey Engagement card was thus attached to a high Lighthouse coin award and ordered near the top of the activity list. Reading guides could give small coin awards for re-reads and be given a short cooldown to encourage frequent review. All Activities and Rewards have been balanced in this way to encourage the user journeys which suit best.

5.5 The Game

During the initial discovery stage, the game was called 'Entrepreneur Booster SA', which changed during the development stage; it was then decided that the name would be 'Business Boost SA'. The researcher settled on a name that immediately lets the user know what the game is all about.

The landing page gives the player three login options; via their cellphone number, their Google email address or using their Facebook login details (Figure 5.1). The login page was designed to ensure simplicity and ease with which to access the game.

Once the player had successfully logged in, they could see language options (only English for the purposes of this prototype), Terms and Conditions and the Privacy Policy (Figure 5.2). When players clicked on the Privacy Policy, it explained that their information would not be used as per the South African Protection of Personal Information Act, which is legislation that governs the law of data protection and privacy. The Privacy Policy also contained a copy of the consent form by the researcher informing participants that this game is in fulfilment of UCT GSBs MPhil in Inclusive Innovation and that ethics clearance has been granted.

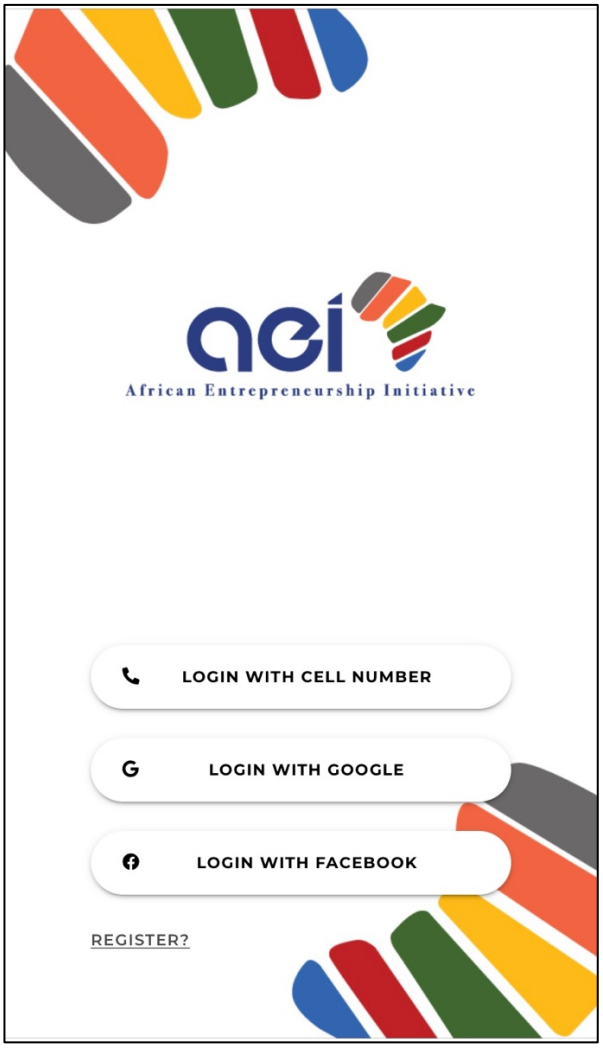

Figure 5.1: The landing page/screen

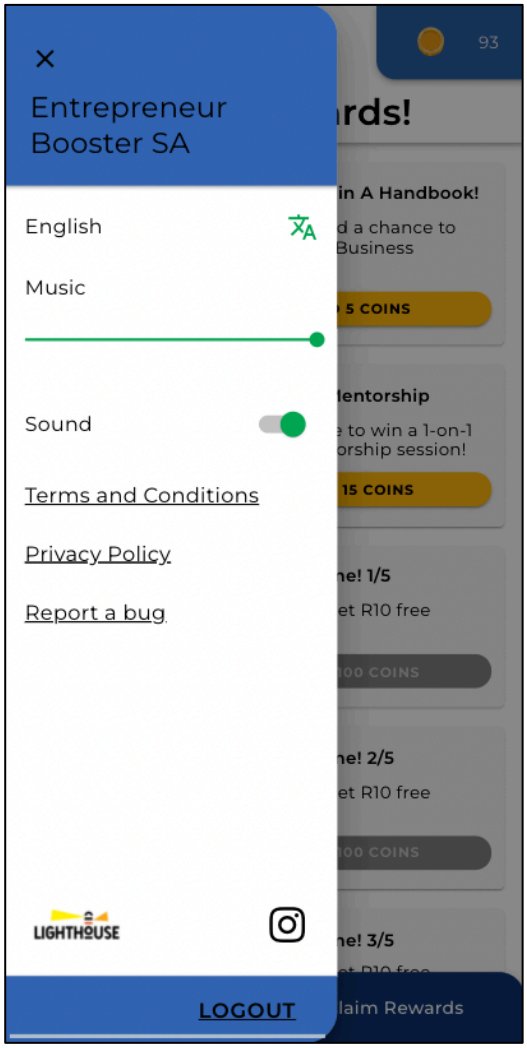

Figure 5.2: Information Page

Source: Author's own.

The Information Page comprised of 'About This App', the survey and the learning topics (Figure 5.3). Players could learn more information about the game. This is where certain rules were explained; how to earn coins, how to redeem coins and how to get help should one experience any technical problems.

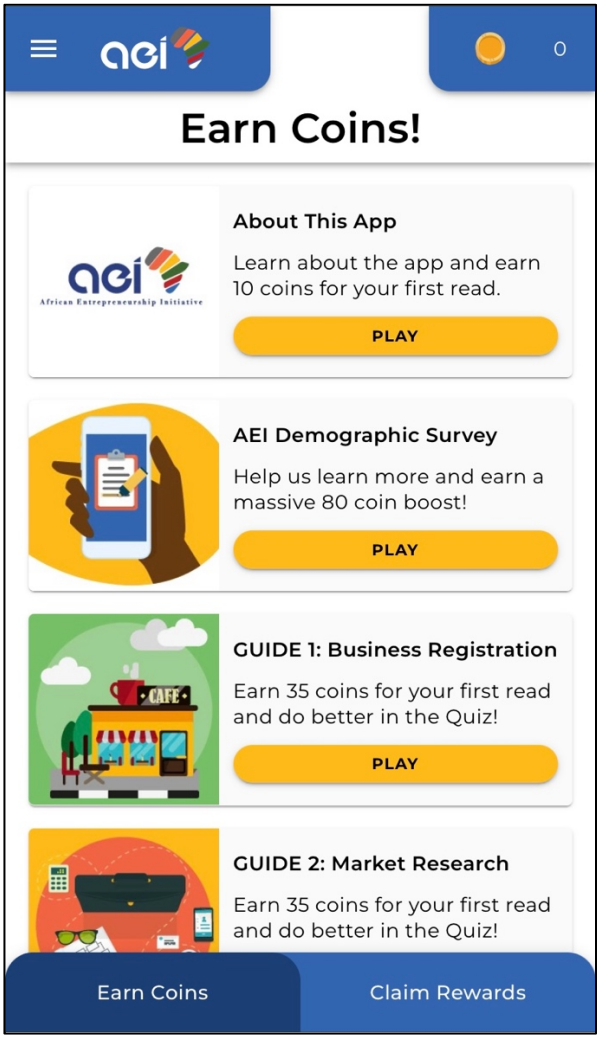

Figure 5.3: About this App screen

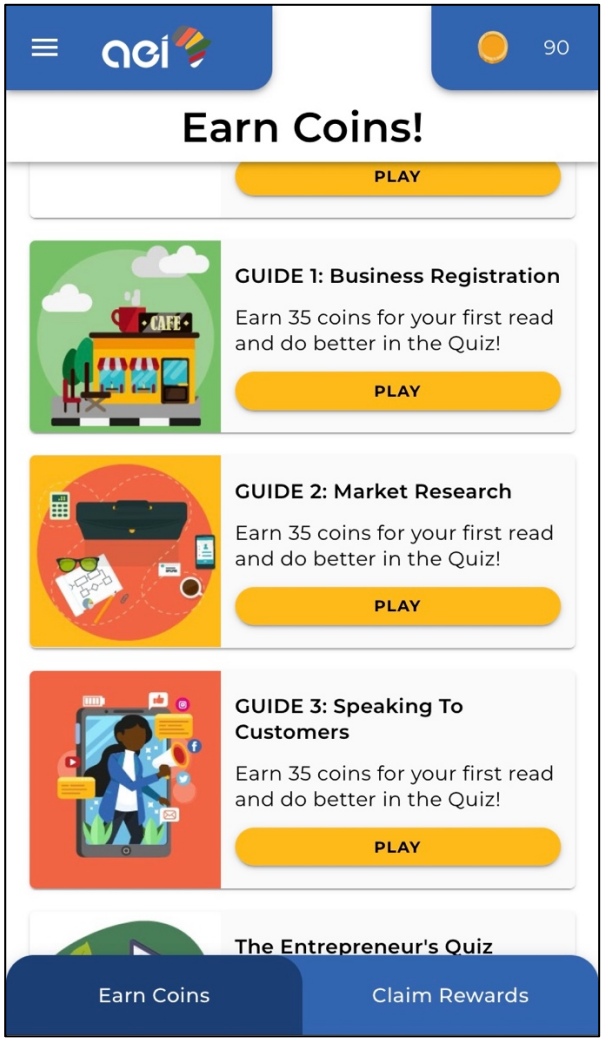

Figure 5.4: Entrepreneurship Learning Topics

Source: Author's own.

The researcher chose three learning topics to focus on when designing the game (Figure 5.4). These topics are usually the first things that an individual embarking on starting a business would need to consider. The first one was 'Business Registration', then 'Market Research', and

finally 'Speaking to Customers'. Each topic contained some interesting facts, and once the player had completed going through them, they had to answer a timed quiz. The players would earn coins for the correct number of answers. There would be a cooling period, after which players could try to take the quiz again to improve their scores.

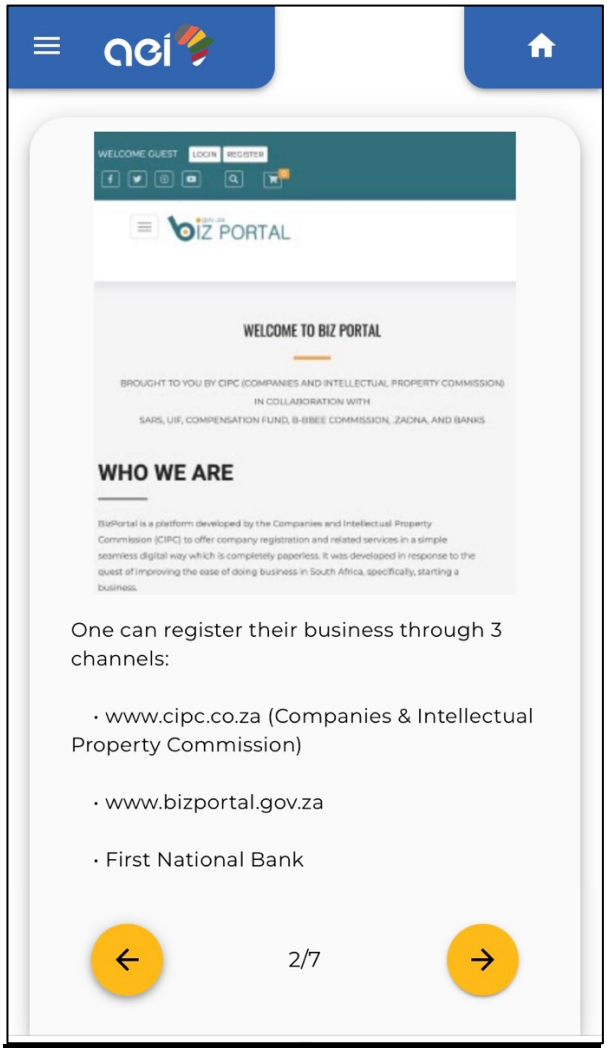

Figure 5.5: Example of Information Provided within the Topics

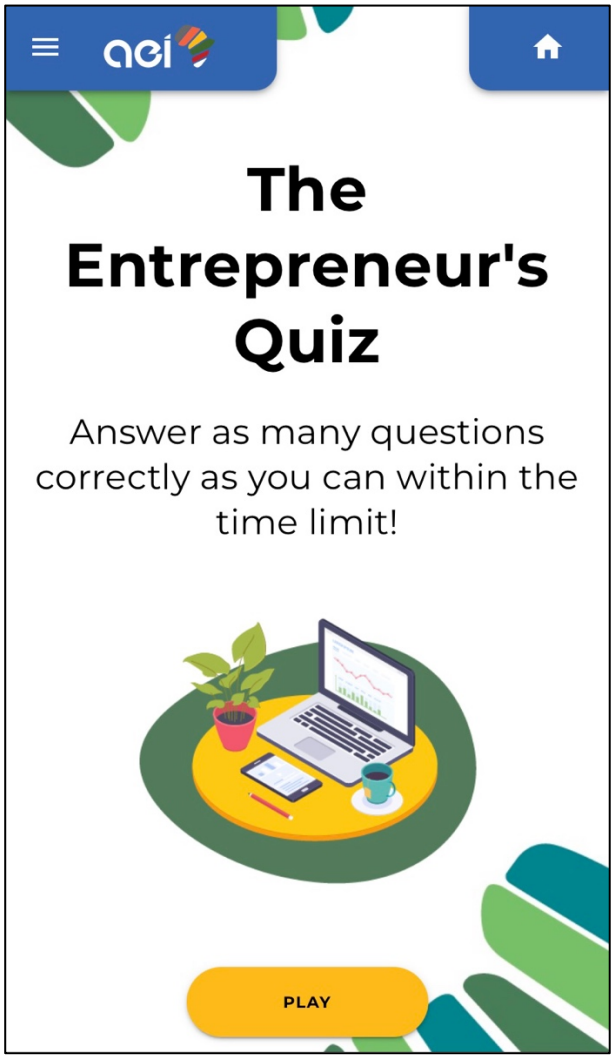

Figure 5.6: Taking the Quiz

Source: Author's own.

Figure 5.5 provides an example of the information presented in the 'Business Registration' learning topic. This information is relevant to any entrepreneur in South Africa and was provided to ensure that players learn new information that can be applied outside the context of the game.

The players had to answer the quiz questions from all three learning topics within a specified amount of time (Figure 5.6). Players answer multiple-choice questions during the quiz and have four options to choose from (Figure 5.7). If the answer is correct, the square becomes green, and if the answer is incorrect, it will become red. At the end of the quiz, the game calculates the number of correct answers. Once the time is up, the game reflects how many correct answers the player received and what that means in coins earned (Figure 5.8). The coins earned are immediately added to the player's current total.

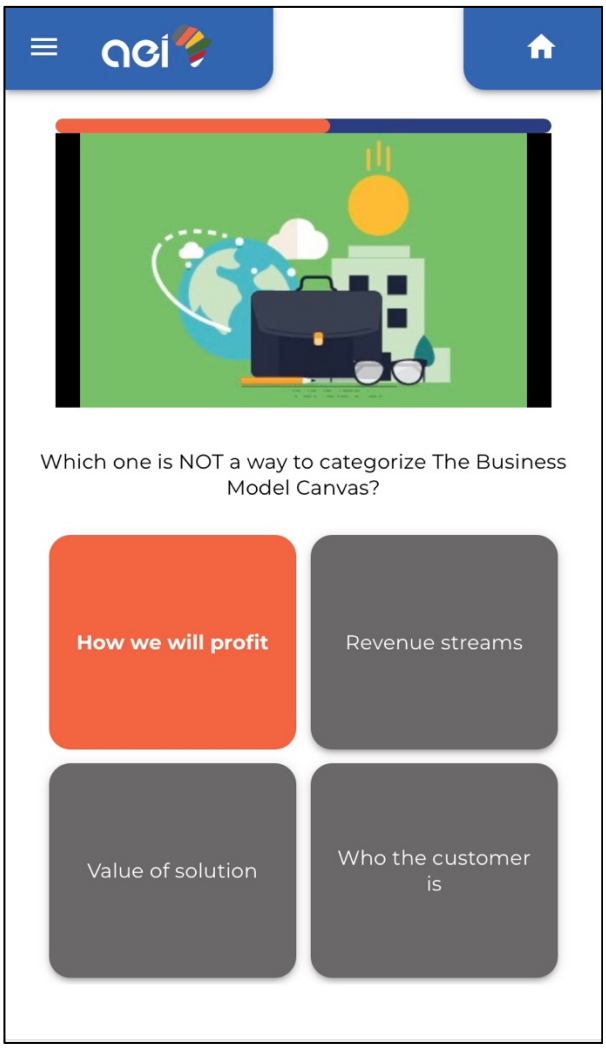

Figure 5.7: Multiple-Choice Questions

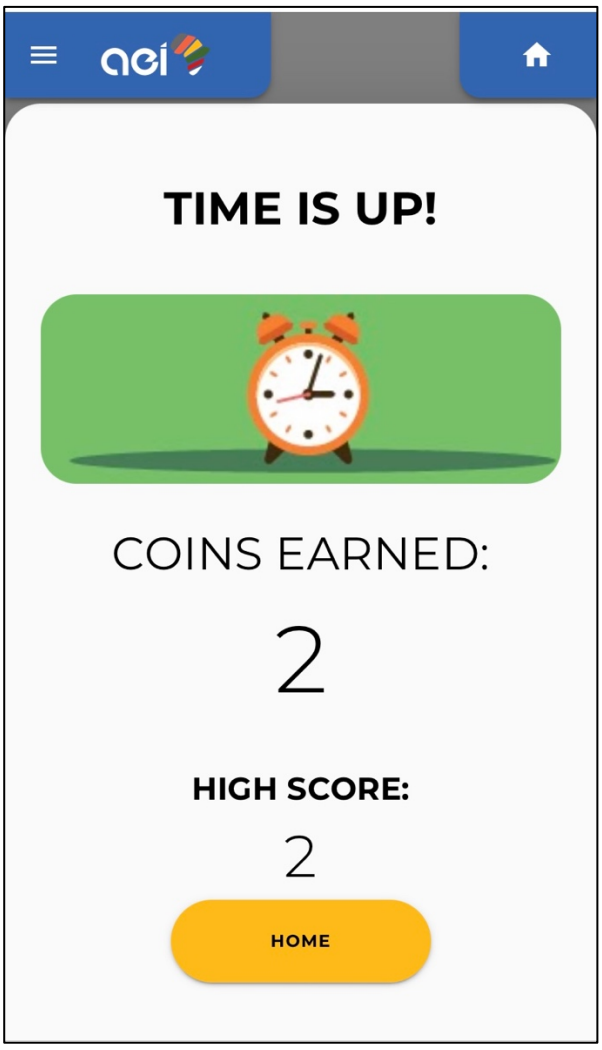

Figure 5.8: Coins Earned for Correct Answers

Source: Author's own.

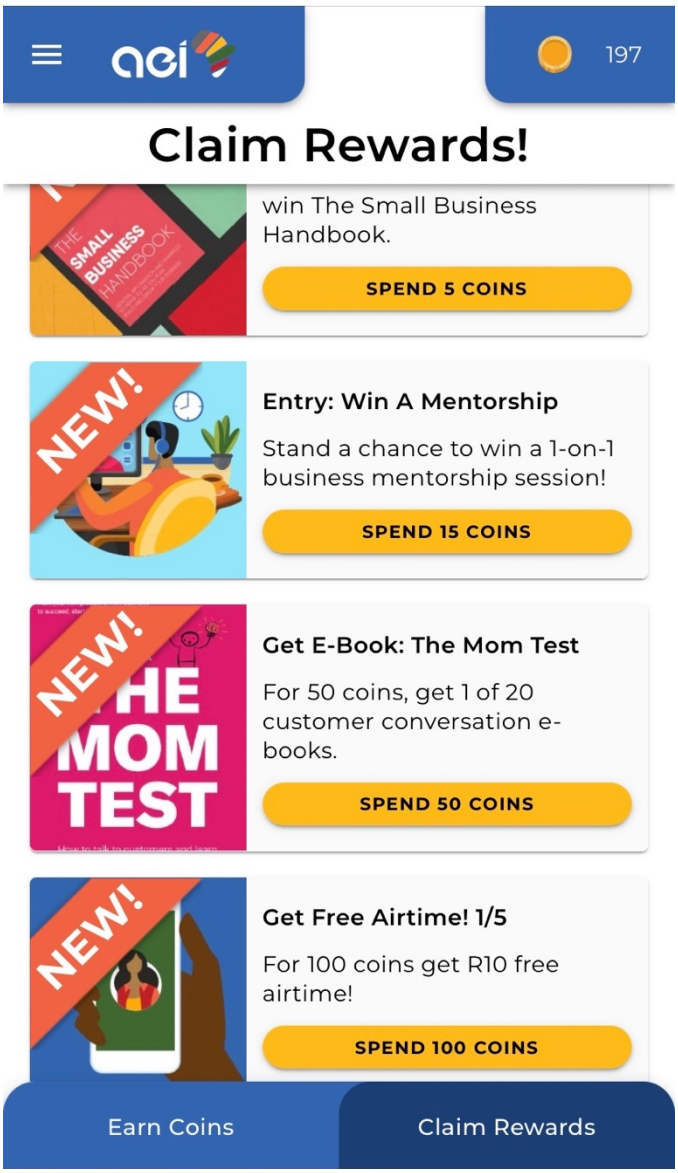

Figure 5.9: Prizes/Rewards to Choose From

Source: Author's own.

Once players have earned coins, they can redeem them for rewards (prizes). Some of the prizes can be collected immediately, and some can be redeemed for the opportunity to enter a draw, (Figure 5.9). The rewards were R10 airtime, an e-book, entry into a draw to win an hour of mentorship and an entry to a draw to win a hard copy of the Business Handbook. It was

important to have rewards that would benefit entrepreneurs and their businesses and these prizes can assist a business looking for extra help navigating its environment.

5.6 Conclusion

The live testing of the game prototype continued for 18 days. During this time anyone from the targeted group with a link could play and stand a chance to win prizes. There was a total of 13287 pageviews, in which 2431 quizzes were completed and 357 competition entries (to go into a draw to win mentorship and books).

After completing the live game testing, the winners were randomly selected from a draw and contacted and sent their prizes. Ten players won the mentorship, 20 received books and 507 won airtime.

There were numerous lessons learnt from this process and what the suggestions could be going forward. The next chapter will focus on those recommendations and areas for future research.

CHAPTER 6 – CONCLUSION

6.1 Introduction

There has never been a time in history when entrepreneurialism was more crucial than it is right now (ILO, 2022). Education on entrepreneurship has been a major priority on policy agendas all around the world as a tool to foster economic growth, combat unemployment, and build social capital (Pijoos, 2019). Because of the significance of entrepreneurship, it is necessary to design effective educational structures and training opportunities for entrepreneurs Smiderle et al., 2020). In order to educate, encourage, and implant entrepreneurship in younger people in an appropriate manner, the development of educational frameworks that are both efficient and effective in the teaching of entrepreneurship is a highly sought goal (du Toit & Kempen, 2020). Despite this, it is generally acknowledged to be an extremely difficult field (Hyams-Ssekasi & Taheri, 2022).

The teaching of entrepreneurship may be improved and made more sustainable using novel instructional approaches such as game-based learning, gamification and virtual reality (Dicheva, Irwin & Dichev, 2018b). Students can study in immersive ways and participate in game-based learning activities against real challenges that can be found in business environments because the digital educational environment uses educational infrastructure and pedagogical approaches based on gamification principles (Khine et al., 2017). Students can obtain useful skills and the confidence to overcome common challenges along their entrepreneurial journeys by participating in gamification activities.

The review of the relevant literature revealed results and conclusions that suggest that effective gamified learning activities boost students' motivation and assist in the formation of an entrepreneurial mindset, skills, and competencies (Wangi et al., 2020). According to the findings of the review of related literature, gamified learning activities that put students in realistic settings and require them to apply theoretical knowledge in real-world settings have a greater impact on student learning in terms of entrepreneurship concepts, as well as on the

student's ability to comprehend the material and their overall learning experience (Pozo Sánchez et al., 2020).

This study sought to explore whether gamification could become a tool for teaching entrepreneurship education amongst black youth entrepreneurs in townships and peri-urban areas in South Africa. The research findings from the game analytics were inconclusive. But the individual interviews of players after they had experienced the game indicated that they found the game engaging, learnt new information and would prefer this method of learning going forward.

In this final chapter, the researcher provides a conclusion, the major findings, areas for future research, recommendations, and the research limitations.

6.2 Youth unemployment – a South African crisis

Over the past decade, most of the world has been experiencing higher levels of unemployment, especially among the youth. This problem was further exacerbated in 2019 when the COVID-19 pandemic spread on a global scale. The pandemic negatively affected all individuals, businesses and governments tremendously.

South Africa's youth unemployment rate has steadily increased over the past few years, further creating more socio-economic challenges for young people. South Africa's National Development Plan (NDP) highlighted that one of the ways in which government should tackle youth unemployment is through developing entrepreneurship. Other countries around the world are evidence that this solution works. A country that has a robust economy that supports entrepreneurship has solid growth potential, and Small and Medium Enterprises (SMMEs) have the capacity to create the employment required. Unfortunately, however, South Africa does not have an enabling environment for SMMEs to thrive, and without adequate support, most businesses are set up to fail. From this, and from the researcher's own background, it is evident why this study focuses specifically on young black entrepreneurs in marginalised areas.

From this, the question becomes, how do we create an environment that provides young black entrepreneurs in the township and peri-urban areas with the necessary knowledge and skills to

navigate entrepreneurship successfully? There is probably not one correct answer, but rather a combination of interventions is necessary. This research explored serious games as an option to teach entrepreneurship amongst young people in marginalised areas, therefore giving them the opportunity to gain the necessary knowledge and skills. The formal research question was:

"how can the development and deployment of serious games enable the key skills of entrepreneurship to be learned and applied to create support in the sustainability of enterprises for economically marginalised youth in South Africa".

This research problem raises a set of complex issues. To understand these the following contextual areas were explored:

- Unemployment and youth unemployment
- Inequality and the South African Government's transformative objectives
- Entrepreneurship and entrepreneurship education
- Gamification and simulations
- Gamification in entrepreneurship education

Gamification is the process of developing information systems to provide users with experiences and motives that are analogous to those found in video games, with the ultimate goal of influencing user behaviour (Almeida, 2017). In recent years, there has been a meteoric rise in the popularity of gamification, which has been reflected both in an ever-increasing number of gamified applications and an ever-increasing amount of research (Vargas-Morúa, 2022). Nevertheless, the majority of the progress in this line of research has been made without an agenda, theoretical guidance, or a distinct picture of the topic (Goi, 2022).

The potential exists for serious games to improve educational processes by providing tools that are appealing, inspiring, and effective (Saggah, 2020). These games also have the potential to create favourable conditions among students and between students and teachers (Nikolopoulou, Akriotou & Gialamas, 2019). The perfect model for matching the content in a variety of ways and incorporating the stimulation of problem-solving and reasoning, which ultimately leads to the acquisition of core competencies, is the use of serious games (Almeida, 2017). Because being an entrepreneur requires talents from multiple disciplines and creative,

exploratory, and argumentative modes of thinking, these components are particularly important in this sector (Du Toit & Kempen, 2020).

The literature reveals that interventions such as serious games have worked in some contexts. But the complex layers in South Africa are the socio-economic issues such as inequality, crime, and unemployment make it difficult for entrepreneurs. If young people are to become employment creators through entrepreneurship, the government must do better to improve the environment.

6.3 Exploring gamification to address youth unemployment

In order to explore the use of gamification in addressing the crisis of youth unemployment in South Africa, a sequential embedded mixed-method research model was adopted. The study was guided by a case study conducted in Europe to promote the reduction of energy consumption and carbon emissions by changing the participants' behaviour. The case study made it easy to emulate the steps taken from game design (inception) right through to the implementation and final reporting. The data sets used as exemplars in creating the game requirements were as follows:

- Literature review: a detailed review of previous projects, publications and reports related to the design and use of information technology in social housing was undertaken and used as starting point for the definition of requirements.
- Socio-economic characteristics, energy consumption motivations, behaviour and perceptions, game experiences and IT literacy: collected during a large-scale, city-wide survey administered in Plymouth (United Kingdom) to 2772 social houses (social housing survey).
- Game experiences and game feature preferences: collected during three focus groups with social housing tenants in Plymouth (gameplay scenario focus groups).
- Building characteristics of social housing stock in Plymouth: information contained in the social housing provider database (building stock condition database) was used.

The researcher modelled some elements from these precedents in the sequential embedded mixed method study for addressing the development of youth entrepreneurship in South Africa.

For the purposes of pre-game planning, a qualitative study was conducted using focus groups and individual interviews. The analysis of the qualitative results was then used in the creation of a serious game prototype with the provisional name of "Business Boost SA". A report was assembled using the game analytics data collected when players engaged with the game prototype. Post-game play, individual interviews were conducted with the participants who played the game. The research findings from this exercise provided the necessary insights into gamification as a method for learning about entrepreneurship in the South African context.

Answering the main research question required in-depth exploration of a number of sub-questions. The first of these was: 'how do entrepreneurship development programmes address youth unemployment? And what are the expectations of these programmes?'.

Research in the pre-gamification phase of the research project revealed that the following elements contribute to the challenges that the youth entrepreneur faces:

- lack of skills and experience,
- inadequate big-picture thinking and achievement mindset
- lack of openness to be taught
- being stretched beyond the comfort zone.

This implies that any intervention - such as gamification, the focus of the study - should be looked at through the lenses of these challenges and the specific needs of young entrepreneurs. What was also evident from the findings was that the young entrepreneurs had expectations of inclusive and continual development, skills development and mentorship but at the same time had business-specific expectations such as assistance with access to funding, market access, and networking with their peers and industry players.

The pre-gamification research also identified a number of gaps in teaching provided by entrepreneurship development practitioners: unintended disempowerment, lack of follow-through and incompleteness, and inadequate breakthrough with new solutions. Young entrepreneurs who were interviewed indicated that they learn by experience, use internet

searches and online learning, and prefer creative and fun learning as well as group learning with family.

A second sub-question question was: 'how do youth entrepreneurs in the township and peri-urban areas find and learn new information?' The findings indicated that the entrepreneurs mentioned that they learn through experience, conduct internet searches, and participate in online learning, favour learning that is creative and enjoyable, and prefer to learn in groups with family members.

The third sub-question was: 'what does gamification data reveal about learning and development for youth entrepreneurs in the township and peri-urban areas?'. The gamification results were inconclusive on whether the application was an effective learning vehicle in this instance, given the average outcomes of quizzes. Although the quizzes produced middling results, these materials were still interesting for all audiences. Despite this, the post-gamification interviews based on their experience confirm that gamification is appropriate as teaching method for black youth entrepreneurs in townships and peri-urban areas.

In combination, these research outcomes were used to set up the design specifications for the praxis model – a serious game prototype initially called “Entrepreneurship Booster SA” developed in partnership with the company Sea Monster and developed on the Lighthouse platform. Renamed “Business Boost SA” in its final iteration, this serious game provides players with the opportunity to develop their knowledge of entrepreneurship by engaging with relevant sources of knowledge, assessing their levels of comprehension through online quizzes, completing a survey and earning rewards in the form of virtual coins which can be exchanged for either instant prizes (airtime and a downloadable soft copy book) or used to enter a draw for an opportunity to win a mentorship session or a hardcopy business handbook. The live game was active for a total of eighteen days, with more than thirteen thousand page views and over four hundred registered users.

As with all research projects, there are also limitations to the research reported in this dissertation. These limitations include:

- Budget constraints in the building of the prototype. The project was self-funded by the researcher; therefore, there were some elements within the prototype that couldn't be included.
- Geography and research methods. The focus groups were difficult to coordinate because Gauteng is a large province. Coordinating individuals across different metropolitan areas posed some challenges, leading to constantly moving interview dates or cancellations. This led to focus on individuals located within enterprise development hubs and incubators.
- Language. Participants could speak in any language they were comfortable with, which ended up being mostly English and some Zulu and Sotho. The translation of the Zulu and Sotho means that some things might have been literally 'lost in translation'.

6.4 Recommendations and Future Research

The results of the research described in previous chapters, in conjunction with the design, development and implementation of the praxis model, underpin recommendations for addressing the crisis of youth unemployment in South Africa. These recommendations are of relevance to four groups of stakeholders:

- Youth entrepreneurs
    - Participate in programmes and initiatives that contribute to acquiring knowledge and skills that contribute to growing businesses. Research what is available for you and choose the opportunities that provide the best fit. Large companies can spend 1% of nett profit after tax on Enterprise Supplier Development (ESD) programmes for their BBBEE points. That means there are quite a few ESD programmes. Be careful not to participate in programmes for the sake of it. Rather identify which programmes will be of specific benefit.

- Government
    - Investigate standard monitoring and evaluation methods for enterprise development programmes in the country. Currently, there is no standard unit measure for ESD programmes. Some programmes measure their 'success' using the number of entrepreneurs trained, others an average number of people

employed by the entrepreneurs, or the average revenue made by the entrepreneurs. It is difficult to determine what 'success' should be and to compare and contrast programmes. A standard monitoring and evaluation tool could possibly make it easier to document what works and what doesn't in this space. This could allow one to customise interventions for all types of entrepreneurs and create measurable impact.

- Corporate businesses
    - Use BBBEE funds to create impactful ESD programmes with a long-term strategy. Some businesses conduct ESD programmes as a tick box exercise because it is a compliance requirement and not a legal one. Businesses should have a long-term strategy (up to five years) for their ESD objectives. This should take into account the business's vision and mission.

- Training and Education Institutions (including practitioners)
    - These findings should be shared with the relevant participants in an easy and accessible manner. Black people in marginalised areas are one of the most researched categories, but the results or findings are rarely shared with them. This will also ensure that participants are open to being interviewed by future researchers.

Research projects – such as the work described in this dissertation – require funding. One of the formal requirements for the Graduate School of Business's Masters in Philosophy in Inclusive Innovation is that students have to create a praxis model as part of their research and add it as a chapter in the final dissertation. Over the past few years, the number of students working on technological solutions has increased and the student is expected to develop the praxis model on their own without any financial support from the university.

However the researcher discovered, after self-funding the development of her praxis model, that the University of Cape Town (UCT) has a University Technology Fund (UTF) managed by the Research Contracts and Innovation Department and launched on 31 January 2020, a first of its kind in Africa. This now provides UCT spin-off companies with access to ZAR50 million of funding for Seed and Series A funding rounds and additional seed funding to support

innovation projects within the university (Figure 6.1). An aspect of this fund is the provision of smaller amounts for very early-stage investment – PreSeed (up to ZAR500 thousand) and Seed (up to ZAR1.5 million) – in order to develop the pipeline that may be invested in during either Series Seed (pre-revenue, ZAR5 million) or Series A (post-revenue, ~ZAR12.5 million).

Looking ahead, it would be valuable if students registered for the Masters in Inclusive Innovation, who have appropriate research projects, were to be given the opportunity to apply for early-stage funding.

UNIVERSITY TECHNOLOGY FUND	PRESEED	SEED	SERIES INVESTMENTS Series Seed (Pre-Revenue) / Series A (Post Revenue)
Amount Available	R 3.75m	R 7.25m	R50m (excl. UCT co-investment)
Size of Investment	< R500k	> R500k < R 1.5m	< R12.5m (R17.5 incl UCT)
UCT Decision Maker	Director RC&I	Director RC&I	IP Advisory Committee (IPAC)
UCT Contribution	1:3 (UTF)	none	20:50 (UTF)
UCT Source	Evergreen donation		Evergreen Fund
Investment Basis	First right of refusal – UTF, but not counted as investment	First right of refusal – UTF, counted as investment by the UTF, debt / convertible debt	UCT & UTF equity / assigned equity via "Safe/Convertible Note"

Figure 6.1: University Technology Fund terms and conditions

A research project such as the one described in this dissertation addresses existing research problems while, at the same time, generating new research questions. Given how quickly technology advances, there are frequently sudden and significant shifts in the world. Because of this, education about entrepreneurship will also need to adapt to these changes in the environment and the people being educated. As a result, it is crucial to continue developing playful teaching techniques as an important body of knowledge as technology continues to develop and evolve. Several areas for refining future research are:

Platform related improvements:

- The criteria for assembling the participant groups for the research could be expanded, especially in terms of the stage at which the entrepreneurs are in

their journey. In addition, the test group could be segmented into stages such as 'Ideation', 'Start-up', and 'Scale-up'. Entrepreneurs require different things at different levels of their journeys.

- Introduce more business topics on the platform. With the test prototype, there were three business topics: 'Business Registration', 'How to Speak to Customers' and 'Market Research'. More topics would give players more knowledge and skills and create more engagement and time spent on the platform. The field of entrepreneurship has a wide variety of potential topics, such as Innovation, Human Resources, Finance, Sales and New Business Development, and Operations Management. Additional topics could also be customised according to industry.
- Create a more interactive platform that allows players to get as close to having a real-time experience as possible. The next level of gamification currently is virtual reality, such as the metaverse. The future of peer-to-peer engagement lies in futuristic tools such as this.
- With the feedback gained from the individual interviews after users played the game, some participants indicated that they would have valued the opportunity to ask specific questions to a 'mentor' and get an immediate response.
- Scale the research of the prototype to other local regions and, in future, the rest of Sub-Saharan Africa, to gain a broader outlook on responses from participants in different geographical areas. As unemployment has increased in Sub-Saharan Africa, so has the need for individuals to create their own employment opportunities through entrepreneurship. Due to this, some people enter entrepreneurship out of desperation and the need to survive. Survivalist entrepreneurs, therefore, tend to have little or no knowledge of what it takes to start and maintain a successful enterprise. Serious games could become a vital method of transferring knowledge and skills.

Virtual reality

- It is evident that the evolution of games and simulations is moving towards the world of virtual reality through the metaverse. Virtual reality provides users with an immersive experience that combines digital and physical lives in real-time (Mckinsey & Company, n.d.). The metaverse could become whatever we

imagine it to be; a gaming platform that can take shape as an advertising gateway, a training tool, a shopping destination or a digital classroom (PWC, n.d.).

- The estimated global value of future innovations in virtual reality is up to US $2.6 trillion in e-commerce by 2030, up to US $270 billion in the academic virtual learning space, and up to US $125 billion in the gaming industry (Mckinsey & Company, n.d.). With such a high valuation of what the metaverse could provide it is imperative that organisations be strategic in how they leverage some of these opportunities.
- PWC (2022) reported that the future of growth in the entertainment and media industry in Africa would be through the development of the metaverse and the use of non-fungible tokens (NFTs). This could be groundbreaking should it come to fruition. But we also must not forget what this will mean for different stakeholders, especially individuals on the ground. For example, currently, the metaverse headsets retail for US $399, which is very expensive for the average African (Hill, 2022).
- The company Meta has stated that the metaverse could contribute around US $40 billion to the economies of sub-Saharan markets such as South Africa, Nigeria and Kenya; more than 16% of South African gamers were said to have participated in a ‘virtual world’ in the last 12 months (PWC, 2022). Africarare's Ubuntuland, Africa's first metaverse, was launched in 2021 and Nedbank (one of South Africa’s top four banks) has collaborated as part the bank's strategies to be the leader of digital banking and beyond (Africarare, 2022).
- Even though the opportunities highlighted seem limitless, there are also some challenges that organisations need to be aware of. There is the issue of a labour force not being adequately skilled for the new trajectory of virtual reality. Secondly, there need to be clear guidelines and policies that ensure a safe, ethical and inclusive metaverse experience. And thirdly, the user is assured that their personal data and privacy is not compromised. There is a missed opportunity for in-depth studies about how these challenges can be mitigated before users are exposed to irreparable harm.

Methodological opportunities

- Although this study focused on young people, gamification as a strategy has relevance for would-be entrepreneurs of all ages. An area for future study would be related to generational differences and trends with the take-up on new technologies. Different generational cohorts (Gen Y, Gen X, Millenials etc.) had differing comfort levels with digital technologies, so it would be interesting to examine the differences for different cohorts.
- In addition, longitudinal studies might be conducted to investigate the effects of entrepreneurial education after the student has completed the instruction, as well as to evaluate the significance of the learning gained from such instruction and the degree to which it was beneficial.

Complementary lines of enquiry

- The subjects that teachers are knowledgeable in, as well as those for which they have received training, are the ones that they teach. In order to be effective, educational policy in this area needs to anticipate, and be followed by, a strategy for the training of entrepreneurial educators, be it initial training or in-service training.
- It is recommended that gamification elements are researched individually, according to instructional and motivational design theories, to avoid unwanted impacts and to determine under what conditions they operate well (Bai, Hew & Huang, 2020; Koivisto & Hamari, 2019; Toda et al., 2018). At present, the determinants of successful gamification remain undefined (Sailer & Homner, 2020).
- Conducting follow-up studies to validate and better assess the effects of gamification on learning is a priority (Sailer & Homner, 2020). Rather than relying solely on assignment grades and other academic achievement assessments (Koivisto & Hamari, 2019), examining behavioural outcomes with robust approaches are recommended (Antonaci et al., 2019). In addition, increasing the scope of the gamification study to examine its impact on primary and secondary education (Zainuddin et al., 2020).

6.5 Finally

This study's purpose was to address the underlying crisis caused by structural unemployment among youth in South Africa, and to determine whether entrepreneurship and support through entrepreneurship education tools could assist black youth entrepreneurs in the township and peri-urban areas. This led to the creation of a serious game prototype to test whether this could become a tool to teach entrepreneurship education to black youth entrepreneurs in marginalised areas.

Gamification has a number of important practical implications, some of which are:

- the possibility of fostering cognitive foundations associated with early learning (Collantes Inga et al., 2022; García-Iruela et al., 2022);
- the chance to participate in the entire entrepreneurship process through simulators in such a way that an almost real experience is provided (Saleem et al., 2022);
- the familiarisation of students with the fundamental ideas of entrepreneurship and business management (Goi, 2022);
- the determination of students' intentions to become entrepreneurs, as well as the stimulation of the emulation of entrepreneurial behaviour (Wangi et al., 2020);
- and the familiarisation of students with the basic concepts of entrepreneurship and business (Vargas-Morúa, 2022).

Gamification will become a significant instructional strategy as the immediate future unfolds and education about entrepreneurship has risen to the top of political agendas around the world as a means of fostering economic growth, combating unemployment, and constructing social capital (ILO, 2022; Moodley, 2022; Soni, 2022). Students can be taught to formulate entrepreneurial mindsets, skills, and competencies through gamification, an important premise of entrepreneurship education (Bai et al., 2020). This can contribute significantly to the formation of start-ups and business initiatives. It is anticipated that the use of gamification in the context of entrepreneurial education will become the preferred means for training and enabling the emerging entrepreneurs making, in turn, a significant contribution to solving the crisis of youth unemployment, both in South Africa and in other parts of the world.

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List of Appendices

Appendix A – Participant Information Sheet

Good day

I hope you're well.

My name is Anele Mkuzo, Zuko gave me your details to discuss the game prototype. I'm the managing director and founder of AEi. Thank you for trying out the prototype, I'm so glad you loved it. It's been a passion of mine to create it since 2016.

My biggest reason for creating such a platform was to see its viability for youth entrepreneurs, which is what AEi does. But also it's been part of my Masters thesis. I'm currently doing my MPhil in Inclusive Innovation at UCTs GSB. My topic is around exploring whether gamification could be used as a teaching method for youth entrepreneurs in township and peri-urban areas.

I would love to extend the opportunity to your team and the youth in the workshop to play it. We technically have closed the game since today, but I've asked the developers to keep the link live till Sunday. Your team and participants can still play, earn coins and redeem them for prizes. My only ask is that I'd have the opportunity to have a short feedback session, that will be used as a focus group element in my research. As with all research, all participants information and details is confidential.

I have attached the ethics clearance from the university for your perusal.

But would also love to chat further on any other synergies we can work on going forward.

Have a great day further.

Thank you

Kind Regards

Anele Mkuzo

Founder & Managing Director

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Appendix B – Informed Consent

Graduate School of BUSINESS UNIVERSITY OF CAPE TOWN

MASTER OF PHILOSOPHY IN INCLUSIVE INNOVATION

INTERVIEW CONSENT FORM:

Participant name: .....

I volunteer to participate in a research project conducted by Anele Mkuzo as partial fulfilment of the requirements for the MPhil Degree at the Graduate School of Business. I understand that the research is designed to gather information about 'An exploration of gamification as a teaching method for entrepreneurship education amongst black youth entrepreneurs in townships and peri-urban areas' and that I will be one of approximately 40 people being interviewed for this research.

Background and purpose of the research

In this research, an exploration of the possibilities of gamification being a teaching method for
entrepreneurship education amongst black youth in townships and peri-urban areas will be undertaken. The study will require the researcher to develop a new approach to the learning principles of entrepreneurship by using a mixed-method research methodology. The qualitative
study will be in the form of Grounded theory. And the quantitative study will test a serious game prototype that will be built for the purpose of the research.

Ethics approval

Ethical consent for the study has been approved by the *UCT Commerce Faculty Ethics in Research Committee*.

Graduate School of BUSINESS UNIVERSITY OF CAPE TOWN

Participation and confidentiality

I understand that my participation in this research is voluntary, that I will not be compensated and that I may withdraw at any time.

The focus group will take approximately 60 - 90 minutes to complete and will be audio recorded.

I understand that I will not be identified by name in any reports using information obtained from this interview and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.

Consent

I consent to participate in this interview, based on the terms outlined above and subject to the following additional condition of my own (if any).

---------- ----------

Signed by interviewee **Date**

....

Signed by Student **Date**

Appendix C – Research Instrument – Pre-Game

Questions for ED Practitioners

1. What stages in their businesses are the entrepreneurs you work with?
2. Have you worked with youth-owned businesses?
3. What skills do you think are important for these businesses to succeed?
4. What skills gap have you identified with this demographic of entrepreneurs?
5. Have you conducted ED programmes for these entrepreneurs?
6. How long were the programmes?
7. Was the attrition? If so, what was the percentage?
8. What were some of the reasons given for entrepreneurs dropping out of the programmes?
9. Which modules did the entrepreneurs find the most valuable?
10. Which modules did entrepreneurs struggle the most with?
11. What tools do you use in the modules to engage the entrepreneurs?
12. Do you measure the impact of the programmes?
13. How do you measure the impact?
14. What are some of the things that have worked well with the programmes?
15. What are some of the things that didn't work?

Questions for Entrepreneurs

1. Have you participated in an ED programme?
2. Did you complete the programme? If not, why?
3. What were your expectations of the programme outcomes?
4. Were your expectations met?
5. What modules had value for your business?
6. Which modules did you struggle with?
7. What could've been done differently to assist you with those modules?
8. How best do you learn new information?
9. Where do you find information to assist you in your business?
10. What type of information do you search for?
11. What is your understanding of simulations or gamification?
12. When was the last time you played a game?
13. Was it a game for entertainment or learning?
14. What type of games do you enjoy playing?
15. Would learning new information be easier if it were presented in a less conventional and more 'fun' way?

Appendix D – Research Instrument – Post-Game

Questions for Players

1. How did you hear about the game?
2. Which device did you use to play the game?
3. Have you participated/played a serious game before? If so, please share details
4. How was your first experience of accessing the game?
5. Did you have any concerns navigating the platform?
6. How many times did you come back to the platform to play?
7. How did you find the content?
8. Did you learn any new information? If so, which information?
9. Was it easy/difficult for you to earn the coins?
10. Which of the prizes enticed you the most? Why?
11. Would you engage with an entrepreneurship game such as this one again?
12. Was it useful that the information was in a game format?

Appendix E – Ethics Clearance

Faculty of Commerce
Private Bag X3, Rondebosch, 7701
2.26 Leslie Commerce Building, Upper Campus
Tel: +27 (0) 21 650 4375/ 5748 Fax: +27 (0) 21 650 4369
E-mail: jacques.rousseau@uct.ac.za
Internet: www.uct.ac.za
@Commerce UCT **UCT Commerce Faculty Office**

11 03 2021

Anele Mkuzo

Graduate School of Business

University of Cape Town

REF: REC 2021/03/010

An exploration of gamification as a teaching method for entrepreneurship education amongst black youth entrepreneurs in townships and peri-urban areas

We are pleased to inform you that your ethics application has been approved. Unless otherwise specified this ethical clearance is valid until 31-Mar-2022 .

Your clearance may be renewed upon application.

Please be aware that you need to notify the Ethics Committee immediately should any aspect of your study regarding the engagement with participants as approved in this application, change. This may include aspects such as changes to the research design, questionnaires, or choice of participants.

The ongoing ethical conduct throughout the duration of the study remains the responsibility of the principal investigator.

We wish you well for your research.

2021.03.11
15:49:39 +02'00'

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