



Using Gamification to enhance student engagement at a South African Private Higher Education Institution: A Design Based Research approach

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Abstract

This study investigates the use of gamification as an instructional approach to boost student engagement in a Management Information Systems (MIS) course at a South African Private Higher Education Institution (PHEI). Utilizing a Design-Based Research (DBR) framework, the research aims to develop evidence-based design principles for effectively incorporating gamification into teaching practices in higher education. The central research question focused on identifying effective design principles for gamification, while additional questions examined its impact on student engagement, the most effective gamification elements, and the role of tools like Quizalize in achieving these outcomes. The study involved 15 students who chose to take part in the research on a voluntary basis. Findings revealed that gamification significantly enhances student engagement by fostering motivation, encouraging active involvement, and instilling a sense of achievement. The study identified key gamification elements, including leaderboards, badges, and real-time feedback, as especially effective in boosting engagement. Quizalize, as the selected gamification tool, proved instrumental in transforming traditional learning experiences into dynamic, interactive environments that aligned with students' preferences and needs. The research culminated in a series of design principles emphasizing the need to align gamification with educational goals, achieve a harmonious blend of competition and collaboration, and sustain student engagement through varied content and immediate feedback mechanisms. While the study demonstrated the potential of gamification to address challenges related to student disengagement, it also highlighted limitations, including technical constraints and the need for equitable access to resources. This study highlights the impact of gamification in creating engaging, learner-centred educational experiences and offers practical guidance for educators and institutions seeking to incorporate gamification into their teaching strategies.

Keywords: Gamification, Student Engagement, Design-Based Research, Higher Education, Quizalize.

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Plagiarism Declaration

I, Remaketse Francis Zulu, student number ZLXREM001, declare that:

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List of abbreviations or acronyms

APS	Admission Points Score
DBR	Design Based Research
DP	Design Principles
DITM	Diploma in Information Technology Management
ESL	English as a Second Language
HE	Higher Education
ICT	Information and Communication Technology
IHE	Institutions of Higher Education
LMS	Learning Management Systems
MIS	Management Information Systems
PHEI	Private Higher Education Institution
SA	South Africa
SDT	Self Determination Theory
RQs	Research Questions
T&L	Teaching and Learning
TOY	Turkey Gamification Model

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Chapter 1: Introduction

1.1 Introduction and Research Problem

Student engagement remains a critical challenge for numerous educational institutions, including those in the private higher education sector (Marc et al., 2023; Stein & Wei, 2024; Suklun & Bengü, 2024). Student engagement, as defined by Giang et al. (2022), encompasses the level of interest, involvement, and active participation that students demonstrate in academic activities, both within and beyond the classroom. A lack of engagement can adversely impact academic performance, retention rates, and overall satisfaction with the educational experience (Chiu & Chen, 2024; Lindsay, 2023; Oya et al., 2024; Rajabalee & Santally, 2021).

In South Africa (SA), Private Higher Education Institutions (PHEI) draw a diverse student population, many of whom come from low-income households (Chikuni, et al., 2021; Tafadzwa, 2021). These students often encounter distinct challenges in pursuing Higher Education (HE), stemming from their limited preparedness for the demands of tertiary education. Moreover, inadequate exposure to supportive learning environments can result in a culture shock upon entering university. Furthermore, a considerable portion of these students fail to meet the standard Admission Points Score (APS) criteria required for entry into traditional universities. Traditional universities are Institutions of Higher Education (IHE) characterized by their long standing history, comprehensive academic programmes, and focus on research and theoretical knowledge (University of Cape Town, 2024). Nevertheless, regardless of their socio-cultural backgrounds, these students have access to smart mobile devices. Students' access to mobile devices poses other challenges such as technology distractions in the classroom (Coelhoso & Kalogeras, 2024; Nikolopoulou, et al., 2023; Stockwell & Wang, 2024). In an age of constant connectivity, students may be easily distracted by technology, which can reduce their engagement in the classroom and hinder academic performance (Schwartz, et al., 2021). Students at the PHEI are no exception as they often face a challenge that can impact their engagement and academic performance. Like many other IHE throughout the world, those in SA are constantly looking for novel methods to improve students' performance and

engagement (Burnett, 2024; Hsueh, et al., 2022; Patterson, 2022). This study focused on the Management Information Systems (MIS) course at PHEI, primarily due to its inherent complexity. This complexity arises from various factors, including the wide range of topics covered, the interdisciplinary nature of the subject, the technical skills required, and the need to integrate theoretical concepts with practical applications. As a result, integrating gamification strategies presents a promising opportunity to improve the learning experience in MIS. Gamification refers to the integration of game Design Principles(DPs) and elements into non-gaming contexts or activities (Harika, 2022). The problem found is that the MIS module at the PHEI lacks student involvement, which contributes to students' poor academic performance as revealed by the literature. Mahdiuon et al. (2020) investigated the impact of social media on student engagement and academic performance, emphasizing the vital role of engagement in improving academic outcomes. Likewise, Sunu and Baidoo-Anu (2024) demonstrated a significant connection between student engagement and academic achievement. In another study, Lin et al. (2023) examined the engagement factors during the pandemic and found that increased student engagement positively impacted academic achievement. Additionally, it is not entirely evident from the literature how gamification is used to promote learning as opposed to how it affects student engagement (Dikmen, 2021; Li & Chu, 2021; Rivera & Garden, 2021; Rodrigues, et al., 2022). The distinction between how gamification promotes learning versus how it affects student engagement is a crucial but often underexplored aspect in the literature (Bouchrika, et al., 2021; Rivera & Garden, 2021). While gamification has shown potential in both areas, research tends to conflate these two outcomes, making it difficult to determine the direct mechanisms by which gamification fosters learning. The current literature highlights gamification's strong potential to enhance engagement but provides less clarity on its ability to promote learning (Imran, 2023; Li, et al., 2024). The Design Based Research (DBR) approach could help uncover these connections by iteratively testing and refining gamification strategies to maximize their impact on both engagement and learning. The reason for doing this study is to address the problem at PHEI by designing and implementing innovative intervention to help enhance student engagement. For this study DBR (will be discussed in more detail in Chapter 2 and Chapter 3) will be used to develop the DPs (will be discussed in more detail in Chapter 4). DBR is essential for this study because it combines practical problem-solving with theoretical inquiry (Hoadley & Campos,

2022). This approach, characterized by its iterative, collaborative, and context-sensitive framework, tailors gamification approaches to tackle the distinctive needs of students, while also fostering the progress of educational technology (Adams & Du Preez, 2022). By effectively linking theory with practice, it is particularly suited for addressing the complex issue of student engagement (Mundy et al., 2024). The study's objective is to create effective, context-specific interventions that can enhance student learning outcomes and experiences. The research will take place at the PHEI, where the researcher holds the position of Programme Coordinator for ICT-related courses. The focus of this study will be on the MIS module, which is undertaken by second-year Diploma students. The cohort comprises a total of 15 students.

The following research questions guide this study, aiming to explore the impact and effectiveness of gamification in enhancing student engagement within the context of an MIS course at a South African PHEI.

1.2 Research questions(RQs)

1.2.1 The primary question for this study is:

- What are the design principles for using gamification as a pedagogical tool at a South African PHEI?

1.2.2 Sub questions:

- How does gamification influence student engagement? (RQ1)
- Which gamification elements stimulate students' engagement? (RQ2)
- How can the use of gamification technologies (Quizalize) increase student engagement in MIS? (RQ3)

These RQs will be further explored and analysed in detail in Chapters 5 and 6, where the findings and implications will be discussed in relation to the broader context of gamification in higher education.

1.3 General Objective of the Study

To develop contextually appropriate design principles for using gamification as a pedagogical tool to enhance student engagement in a MIS module at a South African PHEI, using a DBR approach.

1.4 Specific Objectives of the Study

Objective 1: To examine the influence of gamification on student engagement in the context of a higher education MIS module.

(Addresses RQ1)

Objective 2: To identify specific gamification elements that effectively stimulate student engagement.

(Addresses RQ2)

Objective 3: To explore how gamification technologies, particularly Quizalize, can be applied to increase student engagement in MIS.

(Addresses RQ3)

Objective 4: To formulate design principles for the implementation of gamification as a pedagogical tool within a South African Private Higher Education Institution.

(Addresses the Primary Research Question)

1.5 Chapter Summary

In summary, student engagement is crucial for improving academic achievement, retention rates, and overall satisfaction, especially within South African PHEI. These institutions often serve diverse student populations who face challenges such as under-preparedness and socio-economic difficulties. The MIS course at the PHEI has been identified as lacking in student engagement, contributing to poor academic outcomes. With the complexity of MIS and the challenges students face, gamification emerges as a promising pedagogical approach. Although existing research highlights the crucial role of engagement in academic achievement, the particular effect of gamification on student engagement and performance remains insufficiently investigated. This study seeks to develop DPs for gamification by adopting a DBR

approach. The objective is to create tailored, context-relevant interventions that can improve student engagement in the MIS course at the PHEI.

The research will explore how gamification elements¹, particularly the use of platforms such as Quizalize, can stimulate and sustain student engagement, ultimately contributing to improved academic performance.

¹ In the literature, terms such as "game mechanics," "gamification elements," and "gamification strategies" are often used interchangeably, though distinctions can sometimes be made. For the purposes of this study, these terms will be used synonymously to refer to the various components and approaches employed in the design of gamified learning environments aimed at enhancing student engagement (Werbach & Hunter, 2012; Deterding et al., 2011).

Chapter 2: Review of Relevant Literature

2.1 Introduction

Recently, gamification has emerged as a prominent approach to boost student engagement in HE, especially as institutions confront growing challenges in maintaining student motivation, active participation, and dedication to their academic goals (Hamari et al., 2014; Harrington & Mellors, 2021). Within the South African PHEI context, gamification offers a promising opportunity to bridge the engagement gap, especially amidst the rapidly changing digital landscape. This chapter offers an extensive review of the current literature on gamification and student engagement, focusing specifically on HE, the South African educational setting, and the usage of DBR methodologies to incorporate technology-driven learning approaches.

2.2 The Impact of Gamification in Academic Environments

Gamification involves the integration of game-based elements and mechanics into non-game environments to enhance user engagement as well as motivation (Makemson, 2024). In educational settings, it leverages features like points, leaderboards, badges, and challenges to foster more engaging and dynamic learning experiences. According to Zainuddin et al. (2020), gamification has been demonstrated to positively influence students' motivation, engagement, including academic performance across several educational environments.

2.2.1 Game Elements in Educational Contexts

Numerous studies have highlighted essential game mechanics that can enhance student engagement (Alahmari, et al., 2023; Ardi & Rianita, 2022; Rincon-Flores, Mena, & López-Camacho, 2022; Sandoval & Lamb, 2023). Kapp (2012) identified key game dynamics, including rewards, competition, collaboration, and feedback loops, as crucial for promoting student participation. These elements leverage students' intrinsic motivation by fostering feelings of achievement, mastery, and progress (Ryan & Deci, 2000). Studies have indicated that incorporating these game mechanics into educational settings can enhance deeper learning, promote better abilities to solve

problems, as well as stimulate students analytical thinking abilities (Alahmari et al., 2023; Subhash & Cudney, 2018). Additionally, Rishma (2021) noted that the integration of game elements could reduce student anxiety, creating a more relaxed and interactive learning environment.

2.3 Gamification and Student Engagement in HE

Student engagement is a vital determinant of academic success, with Sebti and Baroudi (2024) defining it as the extent of attention, interest, curiosity, and participation students demonstrate in their learning journey. Increased engagement is linked to improved retention, academic achievement, and overall student satisfaction (Sankar & Edward, 2024). However, in HE environments, sustaining engagement proves to be particularly difficult, especially due to the rise of digital distractions and the diverse motivations of students (Sánchez-Mena & Martí-Parreño, 2017).

2.3.1 Theoretical Underpinnings of Engagement

Engagement theory provides a framework that links student engagement to active and meaningful participation in collaborative and goal-oriented tasks (Collaço, 2017). Gamification can be considered an extension of this theory, as it offers interactive environments where students collaborate, compete, and progress toward learning objectives through game-based activities (Jorge, 2016).

2.3.2 Evidence of Gamification's Effect on Engagement

Numerous studies have investigated the effect of gamification on student engagement in HE (Ardi & Rianita, 2022; Demirbilek, Talan, & Alzouebi, 2022; Popp & Schuhbauer, 2023; Rincon-Flores, Mena, & López-Camacho, 2022; Sandoval & Lamb, 2023). A meta-analysis conducted by Hamari et al. (2014), which evaluated 24 studies, revealed that gamification generally leads to positive increases in engagement, with the most notable improvements observed in courses with traditionally lower engagement levels, such as those in STEM fields. Similarly, Nah et al. (2014) observed that game-based mechanics increase students' time on task and their intrinsic motivation to participate in course activities. This is particularly important in HE, where autonomy and self-regulation play key roles in academic success (Lasala, 2024).

Rincon-Flores, Mena, and López-Camacho (2022) conducted a study using quantitative and qualitative research approaches. For the qualitative approach 4 students were selected (Rincon-Flores, Mena, & López-Camacho, 2022). Data collection was carried out using semi-structured interviews and open-ended questions, following the approach outlined by Rincon-Flores, Mena, and López-Camacho (2022). The study sought to examine several factors, including academic performance (grades), motivation, assignment quality, participation, and emotional reactions, among undergraduate students in Engineering, Economics, and Social Sciences. Their study was conducted for the duration of the COVID-19 pandemic, when educators incorporated gamification as an innovative teaching method (Rincon-Flores, Mena, & López-Camacho, 2022). The purpose of their study was to assess the effect of gamification, particularly focusing on reward systems, within a structured academic context. To achieve this, two Higher Level Calculus courses were compared: one for Engineering students and the other for students from Economics and Social Sciences (Rincon-Flores, Mena, & López-Camacho, 2022). The main findings reveal a stronger positive correlation between the variables for Engineering students compared to their peers in Economics and Social Sciences. Furthermore, study's findings indicate that emotional factors show a less significant correlation with academic performance, particularly among Economics and Social Sciences students, many of whom display a negative attitude concerning learning mathematics (Rincon-Flores, Mena, & López-Camacho, 2022). The academic significance of this study lies in its provision of evidence regarding how undergraduate students engage with gamification within their classroom settings (Rincon-Flores, Mena, & López-Camacho, 2022). The results indicate that gamification is capable of being a powerful instrument for educators to foster engaging educational experiences. Overall, their research offers meaningful insights into the benefits as well as potential applications of incorporating this approach into the classroom setting (Rincon-Flores, Mena, & López-Camacho, 2022). Additionally, reward mechanics have been shown to effectively capture attention and encourage participation in class, making them a useful tool in online sessions (Rincon-Flores, Mena, & López-Camacho, 2022). Although gamification is acknowledged as a valuable pedagogical approach for boosting engagement and motivation among undergraduate students, its impact on enhancing academic performance appears to be relatively modest (Rincon-Flores, Mena, & López-Camacho, 2022). This study

partly answers the following question from the researcher's study: How does gamification as pedagogy influence student engagement?

Ardi and Rianita (2022) carried out a study within the English Language Education Study Programme (ELESP) at Sanata Dharma University in Yogyakarta, Indonesia, during the fall semester of the 2018/2019 academic year, before the COVID-19 pandemic outbreak. Data collection included classroom observations, interviews, and students' reflective journals (Ardi & Rianita, 2022). Observations were carried out throughout the semester to document classroom activities supported by Kahoot! (Ardi & Rianita, 2022). To reduce the observer's impact on the environment and ensure unbiased data collection, one of the researchers acted as a non-participant observer (Ardi & Rianita, 2022). These observations specifically concentrated on students' engagement and actions within the classroom setting (Ardi & Rianita, 2022). The findings from the observations were documented in a descriptive narrative (Ardi & Rianita, 2022). At the conclusion of the class, participants were instructed to compose reflective journals that outlined their experiences with Kahoot!, documenting their emotions, interests, activities, and any obstacles they encountered (Ardi & Rianita, 2022). Ardi and Rianita (2022) highlight the importance of student reflections in gaining insights into their perceptions of learning experiences. To facilitate the reflection process, the researchers offered students guiding questions to help them assess their engagement with grammar learning via Kahoot!. Subsequently, semi-structured interviews were carried out with the lecturer and six students to obtain further insights (Ardi & Rianita, 2022). The interviews, each lasting approximately 25–30 minutes, were designed to delve deeper into the participants' experiences (Ardi & Rianita, 2022). To uphold trustworthiness, the researchers shared the interview transcripts with the participants for verification (Ardi & Rianita, 2022). Data gathered from observations, reflective journals, and interviews were analysed through coding techniques to identify recurring patterns and themes (Ardi & Rianita, 2022). Following the coding process, the researchers employed triangulation to validate the findings. Ardi and Rianita (2022) emphasize that triangulation entails cross-referencing data from various sources to confirm consistency and enhance the reliability of the findings. This approach enhanced the researchers' understanding of the phenomenon by utilizing multiple methods, thereby minimizing potential biases (Ardi & Rianita, 2022). The study explores the effect of Kahoot!, which is a commonly utilized game-based

learning² tool, on enhancing student engagement in English as a Foreign Language (EFL) grammar classes (Ardi & Rianita, 2022). The central research question addressed in the study is: 'In what ways does Kahoot! contribute to improved student engagement in EFL grammar learning?' Kahoot! was employed to foster active involvement and boost engagement during the EFL grammar sessions (Ardi & Rianita, 2022). The findings showed that the platform had a substantial impact on student engagement in grammar learning, driven by six primary factors: assisting students in establishing learning objectives, boosting their focus on tasks, igniting enthusiasm and curiosity, providing avenues for fun and interactive learning, encouraging peer collaboration, and satisfying their desire for rewards and competitive elements (Ardi & Rianita, 2022). This study examines the notable influence of Kahoot! in enhancing student engagement during English grammar classes in Indonesia (Ardi & Rianita, 2022). The findings revealed that the platform effectively fostered engagement through six key aspects: allowing students to establish their own learning goals, improving task focus, generating excitement and curiosity, providing enjoyable and interactive educational experiences, encouraging peer collaboration, and fulfilling the need for rewards and competitive dynamics (Ardi & Rianita, 2022). The features of the platform allowed students to enjoy learning English grammar. Throughout its implementation, students demonstrated engagement in behavioral, cognitive, and emotional aspects (Ardi & Rianita, 2022). Behavioral engagement was observed through students' attentiveness to the lecturer's explanations, focus on the tasks, adherence to rules and instructions, eagerness to complete assignments, and active participation in class discussions (Ardi & Rianita, 2022). This indicates that gamification is adaptable to a variety of subjects, and the findings of this study strongly confirm its effectiveness in enhancing student engagement (Ardi & Rianita, 2022).

Topu (2023) carried out a study to explore how gamification influences the engagement and cognitive load of active versus reflective learners. The research compared the experiences of these two groups over a 10-week gamification intervention and

² Gamification refers to the use of game design elements in non-game contexts, such as education, to motivate and engage learners (Deterding et al., 2011). This might include points, leaderboards, badges, and levels embedded within traditional learning activities. In contrast, game-based learning involves the use of actual games—digital or physical—as the medium of instruction, wherein the learning content is embedded within the gameplay itself (Plass, Homer & Kinzer, 2015). While both aim to enhance engagement and learning outcomes, gamification modifies the structure of existing learning environments, whereas game-based learning introduces new game environments as the primary mode of instruction.

revealed that both active and reflective learners demonstrated strong behavioural, emotional, and cognitive engagement, while also maintaining a minimal cognitive load. These findings highlight the potential of well-designed gamified learning environments to stimulate meaningful engagement without overloading learners' cognitive capacities—an outcome that is particularly relevant to the theoretical underpinnings of this study.

In alignment with these insights, Cognitive Load Theory (CLT), developed by Sweller (1988), played a critical role in informing the design of the gamified intervention implemented in this research. CLT emphasises the limitations of working memory and the importance of designing instructional materials in ways that optimise cognitive processing by reducing extraneous cognitive load while promoting germane load that directly supports learning (Sweller, Ayres and Kalyuga, 2011). Within the context of gamification, the inclusion of overly complex game mechanics or visually overwhelming elements can increase extraneous load and impede the learning process. To mitigate such risks, this study's intervention was purposefully designed with simple, intuitive game features—such as progress bars, badges, and a point system—clearly aligned with the learning objectives of the Management Information Systems (MIS) module. Furthermore, the asynchronous delivery format supported learners' ability to engage with the content at their own pace, thereby minimising cognitive overload and fostering deeper processing. By integrating motivational game elements while adhering to cognitive design principles, the intervention ensures an optimal balance between engagement and learning efficiency, consistent with both Cognitive Load Theory and Constructivist Learning Theory. This dual-theoretical foundation enhances the intervention's potential to facilitate effective knowledge construction within the South African Private Higher Education context.

Sandoval and Lamb (2023) employed a mixed-methods approach in their study, integrating quantitative data on student performance with qualitative insights from educators' experiences. The data were derived from existing literature on gamification, teacher feedback, and measurable student engagement and achievement outcomes (Sandoval & Lamb, 2023). The findings highlighted the essential role of professional development in helping teachers successfully implement gamification (Sandoval & Lamb, 2023). The research study aimed to scrutinize the potential of gamification in enhancing learning, identify obstacles to its widespread adoption, and highlight the

vital importance of professional development in helping educators navigate the challenges of integrating gamification into their teaching practices (Sandoval & Lamb, 2023). The study revealed that teachers who had a positive experience with gamification were more successful in incorporating it into their curriculum, which, in turn, heightened students' sense of urgency (Sandoval & Lamb, 2023). Students valued the immediate feedback they received and were motivated to make necessary adjustments (Sandoval & Lamb, 2023). The study underscores gamification's potential as an effective tool for boosting engagement and academic achievement while also identifying significant challenges that limit its wider implementation in educational contexts (Sandoval & Lamb, 2023). Overcoming these barriers through targeted professional development and continued research on best practices is crucial to unlocking the full potential of gamification in both K-12 and HE settings (Sandoval & Lamb, 2023). Furthermore, expanding the study to include an analysis of student perceptions of gamification could offer a deeper insight into its effects on the learning environment (Sandoval & Lamb, 2023). This approach is in line with ongoing discussions regarding the need for educational innovation, where active learning strategies such as gamification are gaining increasing importance (Sandoval & Lamb, 2023). This study supports the findings of the current research, as it also demonstrates that gamification enhances student engagement and motivates students to improve their academic performance (Sandoval & Lamb, 2023). The results regarding gamification, student engagement, and teacher adoption are consistent with existing literature on educational technology and innovation (Sandoval & Lamb, 2023). Common barriers, such as resistance stemming from beliefs, time constraints, and lack of training, are frequently identified in the field. Furthermore, other studies support the idea that gamification not only enhances engagement but also helps develop important soft skills, including communication and self-management (Sandoval & Lamb, 2023).

Alahmari et al. (2023) carried out a systematic literature review, analyzing 31 studies sourced from various international databases. In their review, Alahmari et al. (2023) found that the majority of studies emphasized the positive effects of gamification on science education, particularly in increasing student engagement and improving learning outcomes. However, they also pointed out the necessity for additional research to fill existing gaps in the literature. By analyzing 31 studies, the research

provided an assessment of the current state of gamification in science education, highlighting its benefits while proposing areas for further exploration. The results showed that gamification has proven to be highly effective in enhancing student engagement and boosting academic performance in science education. However, the study also highlighted the need for ongoing research to address the remaining gaps and explore less-studied aspects. Their research makes a notable contribution to the expanding body of knowledge on gamification's impact in education, with a particular focus on its application within the science domain (Alahmari et al., 2023). While it offers promising evidence regarding the effectiveness of gamification, the call for further investigation—especially concerning long-term effects and its applicability in diverse contexts—underscores the challenges of fully integrating gamification into educational systems (Alahmari et al., 2023). This study offers a strong foundation for the researcher's investigation by validating the overall effectiveness of gamification in enhancing student engagement and academic performance (Alahmari et al., 2023). However, to adapt the research to the specific context, additional studies focused on gamification in private institutions and subject-specific areas, such as MIS, are needed (Alahmari et al., 2023). The findings highlight the significance of promoting student skill development through gamification, suggesting that adaptable DPs and thoughtfully selected gamification elements can significantly boost student engagement in various educational settings (Alahmari et al., 2023).

El-Tanahi et al. (2024) undertook a study to address a notable gap in the existing literature regarding the use of gamification in physical education. Despite the rapid advancement and integration of digital technology across various educational disciplines, there has been limited research on how gamification influences students' physical skill development within the physical education context (El-Tanahi et al., 2024). The study is based on the results and conclusions from 27 selected studies, offering an in-depth examination of the current understanding of gamification's effects on physical education (El-Tanahi et al., 2024). By systematically reviewing this body of work, the authors seek to offer valuable insights into how technology can enhance student skills, while also emphasizing the necessity for additional research to address the gaps that remain in the field (El-Tanahi et al., 2024). The study concluded that gamification is generally effective in physical education, especially in improving students' physical skills. However, it highlighted the necessity for further research to

investigate other potential benefits, strategies, and implications of gamification within this area (El-Tanahi et al., 2024). This study lays a strong foundation for comprehending the current landscape of gamification in physical education (El-Tanahi et al., 2024). The study also underscores the necessity for further research to address existing gaps, such as exploring additional potential benefits of gamification, assessing its long-term impacts, and determining the most effective strategies for its implementation (El-Tanahi et al., 2024). While the positive results are encouraging, a more detailed examination of the challenges, limitations, and varied methodologies would provide deeper insights and further enrich the field (El-Tanahi et al., 2024). Although the study focuses on gamification in a different educational context, its findings align with the notion that gamification generally enhances student engagement and skill development (El-Tanahi et al., 2024).

Yaccob et al. (2022) explored the existing literature on gamification in the context of teaching and learning English as a Second Language (ESL). Their review highlighted that gamification, through its focus on motivation, engagement, and competition, has the potential to foster meaningful learning experiences for ESL learners. Yaccob et al. (2022) discovered that incorporating gamification in ESL classrooms is notably more effective than traditional, non-game-based teaching methods. It was noted that games help increase student engagement and interaction with the subject matter, which may lead to higher scores or better learning outcomes (Yaccob et al., 2022). Gamification's unique motivational structure encourages active student participation, and the game elements that boost engagement also contribute to improved learning (Yaccob et al., 2022).

Taşkın and Çakmak (2022) carried out a study using a split-plot factorial design, a mixed research methodology that enables the analysis of multiple variables and their interactions within groups. The key factors explored in their study were the flipped learning environment and the incorporation of gamification (Taşkın & Çakmak, 2022). Taşkın and Çakmak (2022) conducted a study with 54 students from a public university in Turkey, splitting them into experimental and control groups. Throughout a 12-week period, both groups engaged in a flipped learning model (Taşkın & Çakmak, 2022). The researchers likely selected a sample size that was feasible for a classroom setting, a typical approach in educational research, though a larger sample could provide more broadly applicable findings (Taşkın & Çakmak, 2022). Taşkın & Çakmak (2022) found

that gamification had no substantial effect on motivation, engagement, or academic achievement in the flipped learning environment. This suggests that incorporating gamified elements into out-of-classroom activities within a flipped model did not lead to measurable improvements in students' learning experiences (Taşkın & Çakmak, 2022). The research concluded that the application of gamification in out-of-classroom activities in the flipped learning model did not significantly influence student motivation, engagement, or academic achievement (Taşkın & Çakmak, 2022). The authors questioned the need for gamification when the key components of flipped learning are effectively designed and implemented (Taşkın & Çakmak, 2022). This research provides valuable insights into the effects of gamification in flipped learning environments, indicating that elements such as the quality of course content and interactive activities may be more influential in shaping student outcomes (Taşkın & Çakmak, 2022). The study sought to investigate the impact of gamification on student motivation, engagement, and academic performance within the context of flipped learning (Taşkın & Çakmak, 2022). Motivated by the increasing interest in integrating digital technologies and innovative teaching approaches like gamification and flipped learning, the study sought to enhance educational outcomes (Taşkın & Çakmak, 2022). The researchers sought to address a gap in the current literature by investigating the potential impact of gamification in flipped learning environments. They aimed to assess its effectiveness and identify the most successful strategies for enhancing student outcomes in digital learning contexts (Taşkın & Çakmak, 2022). The results revealed that the application of gamification within this flipped learning environment did not lead to improvements in motivation, engagement, or academic performance (Taşkın & Çakmak, 2022). This finding highlights the need for further exploration into how specific components of flipped learning could benefit from gamification and whether the inherent quality of course design alone is sufficient to foster student engagement, without the need for additional gamified elements (Taşkın & Çakmak, 2022). The study adds to the ongoing conversation about educational technology and innovative pedagogy by emphasizing the importance of context and design quality in the success of gamified learning (Taşkın & Çakmak, 2022). It urges educators and researchers to rethink the significance of gamification in flipped learning environments, while also posing critical questions for future investigations (Taşkın & Çakmak, 2022). However, providing more detailed information on the gamification model employed and the cultural context of the participants would enhance the study's relevance and offer

clearer recommendations for implementing gamification across different educational environments (Taşkın & Çakmak, 2022). The study revealed that gamification had no notable impact on out-of-classroom activities within the flipped learning environment (Taşkın & Çakmak, 2022). The design model used in this research considered the unique characteristics of the target audience, which was a key aspect of the study (Taşkın & Çakmak, 2022). The findings indicated that gamification had minimal to no significant impact on student engagement in the specific flipped learning context studied (Taşkın & Çakmak, 2022). This suggests that, in this particular context, gamification did not deliver the expected increase in student engagement (Taşkın & Çakmak, 2022). The study lacked detailed information on the specific gamification elements employed or their design (Taşkın & Çakmak, 2022). It merely indicated that gamification did not produce significant effects in this case (Taşkın & Çakmak, 2022). While the study explored a particular gamification implementation within a flipped learning environment, it did not focus on technologies like Quizalize (Taşkın & Çakmak, 2022). The findings emphasize that gamification may not consistently enhance motivation or engagement, and its success is largely influenced by how effectively it is integrated into the learning context (Taşkın & Çakmak, 2022). When applying gamification in a South African PHEI, it is crucial to adopt DPs that cater to the distinct needs of the target audience, while also ensuring that gamification is effectively integrated with high-quality educational content (Taşkın & Çakmak, 2022). Furthermore, identifying which specific gamification elements are most effective and understanding how technologies such as Quizalize can be utilized to enhance engagement in subjects like MIS can offer valuable guidance to educators aiming to adopt gamification strategies successfully (Taşkın & Çakmak, 2022).

Popp and Schuhbauer (2023) carried out a structured meta-analysis that involved a systematic review of the literature, including screening titles and abstracts, examining full texts, and assessing the quality of the studies. They drew on evidence from prior research that focused on specific gamification elements to evaluate their effectiveness in enhancing motivation within e-learning environments (Popp & Schuhbauer, 2023). Through this comprehensive methodology, Popp and Schuhbauer (2023) were able to identify the most effective gamification elements and combinations for boosting learner motivation. The research sought to address a gap in existing literature regarding the application of gamification in e-learning environments (Popp & Schuhbauer, 2023).

While prior studies and meta-analyses have examined the general effects of gamification on learning effort and engagement, they often overlooked identifying which specific gamification elements could enhance motivation in asynchronous e-learning settings (Popp & Schuhbauer, 2023). This gap emphasized the need for a more targeted analysis of elements like badges and leaderboards, which could effectively increase student motivation (Popp & Schuhbauer, 2023). Through a systematic meta-analysis of the existing literature, the study aimed to offer evidence-based recommendations for the effective application of gamification in educational technology. This would help educators and platform developers create more engaging learning experiences (Popp & Schuhbauer, 2023). The findings revealed that badges, leaderboards, level-up systems, and progress bars were the most commonly implemented and effective gamification elements for enhancing motivation in asynchronous e-learning environments (Popp & Schuhbauer, 2023). The study concluded that combining multiple gamification elements yielded a greater impact on motivation compared to employing individual elements in isolation (Popp & Schuhbauer, 2023). Notably, the combination of badges with either leaderboards or level-up systems significantly boosted user motivation (Popp & Schuhbauer, 2023). These findings suggest that incorporating these highly effective gamification elements into the design of e-learning platforms could help enhance student motivation (Popp & Schuhbauer, 2023). In conclusion, the study emphasizes that the thoughtful application of targeted gamification elements and their combinations can notably enhance learners' motivation, offering valuable guidance for educators and instructional designers in crafting more engaging e-learning experiences (Popp & Schuhbauer, 2023). The research provides important insights into the role specific gamification elements play in boosting student motivation within asynchronous e-learning environments (Popp & Schuhbauer, 2023). This research highlights essential gamification elements such as badges, leaderboards, level-up systems, and progress bars, effectively addressing a significant gap in the current literature. While previous research often considered gamification broadly, this investigation identifies the components with the most substantial impact (Popp & Schuhbauer, 2023). Ultimately, this research represents a meaningful contribution to the field of educational technology (Popp & Schuhbauer, 2023). Future studies could examine the impact of these gamification elements across different settings and explore ways to optimize their design for sustained engagement and enhanced learning outcomes (Popp &

Schuhbauer, 2023). The findings underscore the importance of these specific gamification components in enhancing motivation within asynchronous e-learning environments (Popp & Schuhbauer, 2023). These elements are directly relevant to the current research on DPs, offering key components to consider when implementing gamification strategies in educational settings (Popp & Schuhbauer, 2023). The findings emphasize that combining multiple gamification elements tends to be more effective than relying on a single element alone (Popp & Schuhbauer, 2023). This insight aligns with the current research on DPs, suggesting that a comprehensive approach to gamification, involving several elements working together, could be more impactful in enhancing student engagement at the current institution where the study is carried out (Popp & Schuhbauer, 2023). The article highlights how gamification significantly boosts motivation, which in turn influences engagement (Popp & Schuhbauer, 2023). Through examining how gamification elements like badges and leaderboards influence student motivation, the article provides valuable insights into their capacity to enhance student engagement (Popp & Schuhbauer, 2023). In relation to the current research, this suggests that strategically designed gamification elements could be instrumental in improving student engagement in courses like MIS. The article indicates that incorporating specific gamification elements leads to a notable increase in motivation among users (Popp & Schuhbauer, 2023). This reinforces the idea that integrating these elements into learning tools, like Quizalize, could create a more engaging learning environment. The article identifies badges, leaderboards, level-up systems, and progress bars as the most influential gamification elements, providing a solid basis for choosing which features to integrate into the current research (Popp & Schuhbauer, 2023). These elements could be tested through platforms like Quizalize at the current institution where the study is carried out, to evaluate their effectiveness in boosting student engagement in MIS courses (Popp & Schuhbauer, 2023). The discovery that combining gamification elements (e.g., badges and leaderboards) significantly boosts motivation is particularly pertinent to the current research (Popp & Schuhbauer, 2023). This suggests that creating a gamified learning environment with a mix of elements could appeal to diverse student learning preferences, thereby fostering greater engagement (Popp & Schuhbauer, 2023). While the article does not specifically mention technologies such as Quizalize, its insights on the effectiveness of certain gamification components can guide the design of the researcher's implementation using Quizalize (Popp & Schuhbauer, 2023). For instance,

incorporating badges and progress tracking features within Quizalize could be a practical way to apply the study's findings to the current institution's context (Popp & Schuhbauer, 2023). The article's focus on the deliberate selection and combination of gamification elements supports the need for a thoughtful and purposeful approach to gamification in platforms like Quizalize (Popp & Schuhbauer, 2023). This implies that the current research should investigate how to incorporate these elements in ways that align with the learning goals of MIS courses, thereby enhancing student motivation and engagement. The study contributes the current research by identifying key gamification components that have been shown to positively impact learner motivation, a critical factor in student engagement. It suggests that a successful gamification strategy should use a mix of elements, which can guide the exploration of DPs in the current study. Additionally, it provides a basis for examining how these elements could be implemented in technologies like Quizalize to increase engagement in specific subjects such as MIS. The article offers evidence-based insights into how gamification elements influence motivation and engagement, which are directly applicable to the current study's research questions (Popp & Schuhbauer, 2023). It serves as a guide for creating and applying gamified learning experiences in HE, especially within South African private institutions (Popp & Schuhbauer, 2023).

Calik, et al. (2023) conducted research through the development and presentation of a new gamification model known as the Turkey Gamification Model (TOY) Gamification Model. The research involved critically reviewing existing gamification models, identifying their limitations, and subsequently developing a more holistic framework (the TOY Gamification Model) (Calik, et al., 2023). This model is informed by various elements of gamification and behavioural design and is structured as an iterative process to allow for flexibility (Calik, et al., 2023). Each stage of the model was described in detail, drawing from existing theoretical perspectives and practical application models in gamification design (Calik, et al., 2023). The research concludes with an evaluation of the model's potential impact on managing sustained behavioural change through gamification (Calik, et al., 2023). This research was undertaken to address a gap in existing gamification models, which are frequently limited in scope and typically emphasize individual aspects of gamification design (Calik, et al., 2023). While existing models can solve specific motivational issues, they may not adequately support the long-term behavioral change necessary for sustained engagement (Calik,

et al., 2023). The study aimed to create a more comprehensive, flexible, and iterative model that integrates different components of gamification and behavioral design to better address real-life motivational challenges (Calik, et al., 2023). The TOY Gamification Model was created as a comprehensive framework encompassing multiple dimensions of gamification, such as business objectives, desired behaviors, user personas, the player's journey, core motivations, game elements, rewards, technology, triggers, and metrics for evaluation (Calik, et al., 2023). By doing so, the research sought to provide a flexible tool that could help in creating more effective gamification strategies capable of facilitating long-term behavioral change (Calik, et al., 2023). The main objective of the study was to offer a structured and thorough method for implementing gamification, ensuring its flexibility across different settings while providing actionable insights for educators and researchers (Calik et al., 2023). The findings suggest that the TOY Gamification Model provides a more comprehensive and integrated approach to gamification design when compared to current models (Calik et al., 2023). By incorporating elements such as business objectives, desired behaviors, user personas, the player's journey, core motivations, game mechanics, rewards, technology, triggers, and evaluation metrics, the model overcomes the limitations of earlier frameworks that typically concentrated on individual components of gamification (Calik, et al., 2023). The findings indicate that the TOY Gamification Model offers a versatile, comprehensive, and detailed framework for creating gamification strategies focused on achieving long-term motivational change, addressing the limitations of earlier models that were more fragmented and limited in scope (Calik, et al., 2023). The study on the TOY Gamification Model is thought-provoking and addresses an important gap in the field of gamification (Calik, et al., 2023). One key strength is its holistic approach, which integrates multiple aspects of gamification design (Calik, et al., 2023). This is particularly important, as most existing models are often too narrowly focused, missing out on the broader elements that can contribute to sustained behavioral change (Calik, et al., 2023). This model recognizes the complexity of designing effective gamified experiences by integrating various components, including business objectives, desired behaviors, user personas, core motivations, and game mechanics. The iterative nature of the model is another valuable aspect (Calik, et al., 2023). A standardized, inflexible approach is seldom successful in addressing the diverse needs of educational settings (Calik et al., 2023). The TOY Model's flexibility in transitioning between stages can be especially useful for

adapting to different learners' needs, changing objectives, or technological advancements (Calik, et al., 2023). Overall, this study contributes valuable insights into gamification design by offering a comprehensive model (Calik, et al., 2023). Further research could investigate the application of the TOY Gamification Model across diverse educational contexts to assess its flexibility and impact (Calik et al., 2023).

2.4 Challenges and Opportunities in South African Higher Education: Enhancing Engagement and Learning Outcomes

In SA, IHE face challenges such as high student attrition rates, inequality in educational access, and socio-economic barriers that affect student engagement and academic success (Otu & Mkhize, 2018). PHEI, in particular, are increasingly seeking innovative solutions to enhance the student experience and improve learning outcomes. According to Cloete (2016), one of the critical issues in South African HE is the need to foster more inclusive and engaging learning environments, especially in light of diverse student populations and varying levels of preparedness.

2.4.1 The Use of Gamification in South African Higher Education: A Review of Interventions and Contextual Factors

Technology-enhanced learning has emerged as a potential solution to the engagement crisis in South African HE (Czerniewicz & Brown, 2014). While public universities have been slower in adopting digital platforms due to infrastructural limitations, private institutions have been more agile in integrating e-learning tools, including gamification (Bozalek et al., 2013). However, research specifically exploring the application of gamification in South African HE remains sparse, pointing to a gap in the literature.

A study by Lampropoulos and Kinshuk (2024) highlighted that gamification, particularly when integrated into blended learning environments, can improve students' engagement and motivation, even in resource-constrained settings. Despite these advantages, the authors also highlighted challenges, including the digital divide and

restricted access to advanced technological infrastructure, particularly in rural or economically underprivileged regions (Lampropoulos & Kinshuk, 2024). These barriers must be considered in any application of gamification in South African private institutions.

2.5 DBR in Education

DBR is an iterative, collaborative approach to developing educational interventions, aimed at improving learning and teaching practices (Anderson & Shattuck, 2012). DBR combines theory and practice by enabling researchers and practitioners to collaborate on addressing real-world issues while also contributing to the development of new theoretical knowledge (Anderson & Shattuck, 2012).

2.5.1 Principles of DBR

DBR is characterized by several key principles: (1) iterative design, (2) real-world application, (3) collaboration between researchers and practitioners, and (4) theory-driven intervention (Liyoshi, et al., 2006). The cyclical nature of DBR means that gamified interventions can be continuously refined based on feedback from students and educators, leading to more effective solutions over time (Sebbowa & Ng'ambi, 2020).

2.5.2 DBR in the Context of Gamification

DBR offers a strong framework for embedding gamification into educational settings, enabling the thoughtful development, evaluation, and improvement of game-based learning strategies. According to Adams and Du Preez (2022), DBR is particularly suited to technological interventions like gamification, where both the learning environment and the students' engagement with it can evolve rapidly. Through the use of DBR, educators at South African private institutions can progressively develop and

refine gamified interventions that are customized to meet the unique needs of their student cohorts.

2.6 Literature Gaps

Although the existing literature consistently underscores the beneficial impact of gamification on student engagement, notable gaps still persist. First, while much of the research has focused on HE globally, there is limited research specific to the South African context, particularly within private institutions. Furthermore, most studies have explored gamification as a static intervention rather than through iterative design frameworks like DBR. This points to an opportunity for research that not only applies gamification to South African PHEI but also utilizes DBR to ensure continuous improvement and context-specific solutions.

2.7 Draft Design Principles for Gamification-Based Engagement

Building on the preceding literature review and aligned with the principles of DBR, this section outlines a set of draft design principles intended to inform the development of a gamified intervention aimed at enhancing student engagement in the MIS module at a SA PHEI. The formulation of these principles reflects insights from empirical research on gamification and its contextual application in higher education, particularly in asynchronous and technology-mediated learning environments.

As DBR advocates for iterative design grounded in both theory and practice (Anderson and Shattuck, 2012; McKenney and Reeves, 2012), these initial principles represent theoretically-informed guidelines that will be refined through subsequent intervention cycles and practitioner feedback. Their purpose is to scaffold the effective integration of gamification elements in a manner that is pedagogically sound, contextually appropriate, and aligned with learner needs.

2.7.1 Design Principle 1: Leverage Motivational Game Elements to Enhance Engagement

The intervention should incorporate gamification components such as badges, leaderboards, progress bars, and level-up systems, which have been shown to

significantly enhance learner motivation in asynchronous environments (Popp and Schuhbauer, 2023). These elements provide immediate feedback, stimulate competition or cooperation, and offer a sense of progression that supports sustained learner participation (Deterding et al., 2011; Werbach and Hunter, 2012).

2.7.2 Design Principle 2: Embed Timely and Formative Feedback Loops

Effective gamification should include mechanisms for ongoing formative feedback, allowing learners to monitor their progress and adjust their learning strategies accordingly. Feedback loops, facilitated by digital platforms such as Quizalize, can promote self-regulated learning and reinforce academic goals (Kapp, 2012; Sandoval and Lamb, 2023).

2.7.3 Design Principle 3: Ensure Accessibility and Contextual Fit

Given the socio-economic disparities and infrastructural constraints present in the South African higher education landscape, particularly in private institutions serving diverse student populations, the gamified intervention must be designed with digital equity in mind. This includes minimising bandwidth requirements, supporting mobile access, and ensuring usability across devices (Lampropoulos and Kinshuk, 2024; Bozalek et al., 2013).

2.7.4 Design Principle 4: Support Asynchronous, Self-Paced Learning

As the intervention will be delivered in an asynchronous format, game mechanics should be designed to accommodate flexible participation. This involves allowing students to engage with gamified content at their own pace while maintaining clear learning paths and structured challenges (Popp and Schuhbauer, 2023; Lasala, 2024).

2.7.5 Design Principle 5: Facilitate Peer Interaction Through Gamified Collaboration and Competition

Social engagement is a critical component of student motivation. Incorporating collaborative or competitive features—such as team-based challenges or peer-ranking leaderboards—can foster a sense of community and enhance emotional and behavioural engagement (Jorge, 2016; Ardi and Rianita, 2022).

2.7.6 Design Principle 6: Align Game Elements with Pedagogical Objectives

Game elements must be meaningfully integrated to serve pedagogical functions, rather than added superficially. This includes ensuring that each gamification component directly supports learning outcomes and contributes to the development of relevant cognitive or practical skills (Plass, Homer and Kinzer, 2015; Subhash and Cudney, 2018).

These draft design principles serve as a foundational guide for the development of the gamified intervention in this study. They will be iteratively refined in accordance with the DBR methodology, drawing on data collected from student engagement patterns, practitioner observations, and contextual feedback during implementation phases.

2.8 Chapter Summary

Recent studies on gamification and student engagement highlight the promising role of game-based learning approaches in boosting student motivation, participation, and academic achievement. In the South African HE context, where issues like access, engagement, and retention continue to challenge institutions, gamification offers a promising avenue for fostering inclusive and interactive learning environments. Despite existing literature, there are gaps, especially in relation to the application of DBR and the unique challenges faced by South African private institutions, which call for further investigation. This study aims to address these gaps by exploring the application of gamification within a DBR framework to enhance student engagement at a PHEI in SA.

Chapter 3: Methodology and Research Design

3.1 Introduction

This chapter presents a detailed overview of the research methodology and design used in the study, offering a thorough explanation of the research approach, data gathering methods, and analysis techniques. DBR was chosen as the primary methodology to evaluate the impact of gamification on student engagement and academic performance in an MIS course. This chapter also delves into the iterative nature of DBR, explains the rationale behind employing both qualitative and quantitative methods, and outlines the ethical principles followed throughout the research.

3.2 Research Methodology

3.2.1 DBR

The research adopts a DBR methodology, a powerful approach that integrates theory and practice while focusing on solving real-world educational challenges (Hoadley & Campos, 2022). DBR is a cyclical process that enables the continuous development and refinement of educational interventions through repeated phases of design, implementation, analysis, and reflection. This methodology is well-suited to the goals of the current study, as it tackles the complexities of educational environments and aims to enhance student engagement by incorporating gamification into an MIS course.

The iterative cycles in DBR provide a structured approach to improving educational interventions. Each iteration involves collecting data, analysing its effectiveness, and refining the intervention based on feedback and findings. In this study, the gamification

intervention will undergo multiple iterations, allowing for continuous improvement of the approach to foster better student engagement and performance.

3.3 Research Design

3.3.1 *The Gamification Intervention*

The gamification intervention in this study was implemented in one qualification stream in T&L, focusing on a second-year MIS course. The chosen platform for gamification is Quizalize, an educational tool designed to make learning more engaging through quizzes, competitions, and real-time feedback (Quizalize, 2024).

Students were introduced to pedagogical game creation using Quizalize, where they developed and played quizzes in the classroom. Essential gamified elements, including points, badges, leaderboards, feedback, and social interactions, were incorporated into the learning process to boost student engagement and motivation (Sandor & Tamas, 2020).

The intervention in this study is based on Constructivist Learning Theory, which emphasises the importance of hands-on learning, collaborative engagement, and the construction of knowledge through experiential, activity-driven approaches (McNeill et al., 2024). Gamification aligns well with this theoretical orientation, as it activates students' intrinsic motivation, encourages peer collaboration, and stimulates higher-order thinking and problem-solving (Awais et al., 2021). As such, gamification is not merely a tool for engagement but a pedagogically appropriate strategy for fostering deep learning in line with constructivist principles.

Building on this foundation, Constructivist Learning Theory serves as the overarching pedagogical framework that informs the design and implementation of the gamified intervention in this study, aligning closely with the iterative and context-sensitive nature of DBR. Rooted in the seminal works of Piaget (1970) and Vygotsky (1978), constructivism asserts that learners actively construct knowledge through interaction with their environment, meaningful social exchange, and critical reflection. In the context of this research, constructivist principles are operationalised through game-

based elements that promote learner autonomy, contextualised learning, and the co-construction of understanding. Game mechanics such as badges, progress bars, and collaborative tasks are purposefully integrated not simply to reward participation but to promote sustained engagement, cognitive challenge, and reflective thinking (Kapp, 2012; Plass, Homer and Kinzer, 2015). The asynchronous nature of the intervention further strengthens its alignment with constructivist ideals, providing learners with the flexibility to interact with content at their own pace, make self-directed choices, and engage with timely feedback—practices known to enhance metacognition and self-regulated learning (Deci and Ryan, 2000; Lasala, 2024). Moreover, the iterative and collaborative processes inherent to DBR mirror constructivist commitments to contextual responsiveness and continuous refinement. Thus, constructivism not only underpins the theoretical rationale for gamification but also serves as a guiding lens throughout the design and evaluation of the intervention within a South African Private Higher Education Institution.

3.3.2 Participants

This study employed purposive sampling to deliberately choose participants. All 15 second-year students enrolled in the Diploma in Information Technology Management (DITM) programme, who were taking the MIS module, were invited to participate. This approach was chosen due to the researcher's familiarity with the students, ensuring that participants possess the necessary background to engage with the gamified interventions.

3.3.3 Data Generation

A combined approach utilizing both quantitative and qualitative methods was adopted to ensure a thorough and balanced data collection process:

- **Quantitative Data Collection:** After each DBR cycle, students filled out questionnaires comprising both closed and open-ended items. These tools were created to evaluate engagement and performance levels, providing quantifiable insights into the effect of the gamification intervention.

- **Qualitative Data Collection:** Semi-structured interviews were carried out with chosen participants, enabling them to express their experiences, perspectives, and challenges regarding gamification. Focus groups fostered interaction among students, encouraging discussions on common themes and experiences. Observations were conducted, where the researcher took notes on students' behaviour, interactions, and engagement with the gamified activities in real time.

3.3.4 Ensuring Credibility and Reliability of Data Collection Instruments

To ensure the credibility of the qualitative instruments—namely, semi-structured interviews, focus groups, and classroom observations—several trustworthiness strategies were employed. First, triangulation was used to cross-verify findings by comparing data collected from multiple sources (interviews, focus groups, and observation notes), thereby enhancing the depth and consistency of interpretations (Lincoln and Guba, 1985). Second, member checking was conducted by sharing summaries of interview responses with participants to confirm the accuracy and authenticity of their reported experiences. Additionally, detailed field notes were maintained during observations to capture contextual and behavioural nuances, which were later coded and analysed thematically to ensure interpretive integrity.

For the quantitative components, reliability was addressed through the piloting of questionnaires with a small, similar cohort not involved in the final study. Feedback from the pilot informed revisions to improve the clarity, consistency, and internal coherence of survey items. Furthermore, the survey instruments were structured using closed-ended items with Likert scales and open-ended questions, allowing for both consistency in response measurement and qualitative elaboration. Internal consistency of the Likert-scale items was assessed using Cronbach's alpha during preliminary analysis, ensuring the reliability of responses regarding student engagement and perceptions of gamification.

By employing both credibility-enhancing and reliability-assurance techniques, the research ensured that the data collection instruments were valid, dependable, and suitable for evaluating the effects of gamification on student engagement within the Design-Based Research framework.

3.4 Data Analysis

3.4.1 Quantitative Analysis

The quantitative data obtained from the questionnaires were examined using descriptive statistics to identify trends and patterns in student engagement and performance. Furthermore, data visualization techniques, such as charts, graphs, and tables, were also used in presenting trends and patterns.

3.4.2 Qualitative Analysis

The qualitative data gathered from interviews, focus groups, and observations were analysed using thematic analysis to uncover key themes and trends. This process included coding the data, uncovering recurring themes, and drawing links between students' experiences and the gamification elements utilized. The findings were then compared across different iterations to observe how students' attitudes, behaviours, and engagement evolve.

3.5 Various DBR Iterations

This research aims to improve student engagement by integrating gamified elements into the course. The researcher envisioned that three cycles of DBR will allow enough refinement to develop a well-tested gamification framework suitable for broader application.

3.5.1 Cycle 1: Initial Design and Pilot Testing

Design Phase: The researcher facilitated a structured training session for students enrolled in the Management Information Systems (MIS) module to equip them with the foundational concepts of gamification and its pedagogical relevance. During this

training, students were introduced to key gamification elements—such as points, badges, and leaderboards—along with examples of their application in educational settings. The process of designing gamification elements entailed a participatory and collaborative activity in which students were divided into small groups and tasked with conceptualising and customising these elements to align with the learning outcomes of the MIS curriculum. Using a combination of digital tools (e.g., templates on Quizalize) and guided worksheets, students created visual designs for badges corresponding to completed modules, formulated rules for a points system linked to quiz performance, and proposed the structure and criteria for leaderboards aimed at fostering friendly competition. This approach not only allowed students to engage creatively with the course content but also positioned them as co-designers in the learning process, consistent with constructivist principles of learner agency and active participation (Piaget, 1970; Vygotsky, 1978). The participatory design process was instrumental in fostering ownership, increasing motivation, and ensuring that the gamified elements were contextually relevant and meaningful to the learners.

Implementation: These elements were implemented in one class over a single semester.

Data Collection: Engagement was assessed through pre- and post-intervention surveys, supplemented by qualitative feedback from students. Additionally, engagement metrics, including quiz attempt frequency and completed modules, were also recorded.

Analysis and Refinement: Analysis shows moderate engagement improvement, but some participants reported that the leaderboard felt overly competitive. Based on this, the researcher advised students to refine their gamification designs, by introducing smaller, more frequent rewards that emphasize personal improvement over competition.

3.5.2 Cycle 2: Refinement and Expanded Testing

Redesign and Adaptation: In response to Cycle 1 feedback, the researcher assisted students to modify the gamification design to emphasize personalized achievements.

This includes adding levels of achievement that focus on individual progress (e.g., “Personal Best” badges) rather than comparing students against each other.

Implementation: The revised design is tested within one MIS class to see if there are any improvements from cycle 1.

Data Collection: Data collection includes qualitative feedback, observation logs, and academic performance data to measure both engagement and learning outcomes.

Analysis and Further Refinement: Analysis revealed that engagement improved across different participants’ groups, but some participants found the gamification elements confusing or unnecessary. The researcher advised participants to simplify certain elements, making rewards clearer and aligning them more closely with learning objectives.

3.5.3 Cycle 3: Final Validation and Optimization

Design Stabilization: After refining the design, the researcher makes small adjustments based on clarity and accessibility to ensure ease of use and alignment with course goals.

Implementation: The optimized gamified course is implemented in several MIS sections across the institution.

Data Collection and Summative Analysis: A more extensive data collection is conducted to validate findings, including tracking engagement, student performance throughout the semester.

Theoretical Implications and Practical Recommendations: The analysis shows that the optimized intervention improves both engagement and performance, leading the researcher to formulate DPs for incorporating gamification in comparable courses. These principles might include guidelines for balancing competitive and personal achievement elements and tips for adapting gamification to different types of MIS content.

3.6 Ethical Implications

Ethical clearance for this research was received from the UCT, and consent was secured from the participating PHEI. The research followed key ethical guidelines, including acquiring informed consent, safeguarding confidentiality, and ensuring participant anonymity. Participants were thoroughly informed about the goals of the study, the structure of the gamified activities, and their right to withdraw from the study at any point without facing any negative consequences. The researcher guaranteed secure storage of all data and safeguarded participants' identities through anonymization.

Moreover, the study-maintained inclusivity and avoided any discrimination based on race, gender, or other personal characteristics. All participants were treated with respect, and care was taken to accurately report findings without exaggeration or bias.

3.7 Chapter Summary

This chapter offered an in-depth explanation of the research methodology and design used throughout the study. Employing a DBR methodology alongside a mixed-methods approach, the study aimed to design, implement, and iteratively improve a gamification intervention to boost student engagement in an MIS course. By integrating both quantitative and qualitative methods for data collection and analysis, the study enabled a thorough assessment of the intervention's impact, providing key insights into the potential of gamification as an effective educational strategy to enhance student engagement. Additionally, strict ethical guidelines were adhered to throughout the research to safeguard participants' rights and well-being.

Chapter 4: Results and Data Analysis

4.1 Introduction

This chapter presents the study's findings and analysis, structured around the phases of the DBR process and directly aligned with the research objectives and questions. The results are analysed through data triangulation, incorporating surveys, focus group discussions, and observational notes, thereby strengthening the validity and reliability of the conclusions. The analysis identifies critical patterns, themes, and connections, laying the groundwork for formulating DPs that guide the successful implementation of gamification in higher education settings.

The chapter is structured into several key sections. **Section 4.2, *Participant Demographics and Contextual Information***, offers a summary of the demographic characteristics and contextual information related to the study participants. **Section 4.3, *Examination of data evaluating the effect of gamification on student engagement and motivation***, examines the data related to the first sub-question, with an emphasis on how gamification impacts student engagement and motivation.

Following this, **Section 4.4, *Data Analysis focusing on identifying the most effective gamification elements in the learning environment***, addresses the second research sub-question by determining the most impactful gamification elements within the learning environment. **Section 4.5, *Data Analysis from various DBR Iterations***, discusses the iterative design process and outcomes of the DBR phases.

Section 4.6, *Data Analysis from Observations, Interviews and Focus groups*, discusses data analysis from interviews, observations and focus groups. **Section 4.7, *Desing Principles from participants' feedback and recommendations***, discusses data analysis from participants' feedback and recommendations on how to design engaging gamification activities.

The penultimate section, **Section 4.8, *Summary of the key findings and their alignment with the research questions***, presents an overview of the key results and their relevance to the research questions. Finally, **Section 4.9 *Chapter Summary*** analyses the study's findings, demonstrating how gamification enhances student engagement

in an MIS course. It highlights the effectiveness of specific gamification elements, the iterative DBR process, and challenges faced, providing foundational insights for integrating gamification into higher education.

Through this chapter, the study aims to uncover how gamified teaching strategies impact student motivation, participation, and overall engagement, providing a foundation for the discussion in Chapter 5.

4.2 Participant Demographics and Contextual Information

This study involved a group of 15 students enrolled in a DITM programme at a PHEI. The study participants group was made up of 60% (9/15) of male students and 40% (6/15) of female students as seen in *Figure 1* below. Furthermore, 7% of the students' age ranged between 25-34 years while 93% of the participants' age ranged between 18-24 years as seen in *Figure 2* under Appendix E. Moreover, the participants' group was made up of 13% 1st year participants, 67% 2nd year students and 20% 3rd year participants as seen in *Figure 3* under Appendix E.

Figure 1

Gender Distribution of Study Participants



When asked about their familiarity with the term gamification in the context of teaching and learning, 87% (13/15) of participants indicated that they were familiar with the

term, meanwhile, 13% (2/15) indicated that they were unfamiliar with it prior, as illustrated in *Figure 7* in below.

Figure 7

Participants' Familiarity with the Term "Gamification" in a Teaching and Learning Context



4.3 Examination of data evaluating the effect of gamification on student engagement and motivation

When participants were asked how Quizalize has affected their motivation to complete coursework and participate in class activities, 47% (7/15) of participants indicated that their motivation level has moderately increased. While 33% (5/15) of participants indicated that their motivation level has significantly increased, and 20% (2/15) of participants indicated that their motivation level has slightly increased. See participants' results in *Figure 4* under Appendix E. The findings demonstrate that Quizalize effectively enhances student engagement and motivation in this context. When participants were asked to share examples of how particular gamified elements had heightened their motivation, their responses were as follows and have been group into the following themes: immediate feedback and progress tracking, competition and social interaction, urgency and excitement, as well as achievement and recognition.

Table 1

Immediate Feedback and Progress Tracking

<i>"Point Systems increased my motivation by giving immediate feedback."</i>
<i>"Progress bars provide instant, visual feedback, which often motivates learners by showing how close they are to achieving a goal."</i>
<i>"Progress Tracking – Being able to see my progress visually, like through a progress bar or level-up system, has kept me focused on long-term goals. For instance, when I see that I've moved up a level, it reminds me that my hard work is paying off. Tracking my progress has made studying feel more purposeful, and I'm more motivated to keep improving because I can see my efforts making a difference."</i>
<i>"Progress Bars – Watching a progress bar fill up as I complete activities gives me a clear sense of achievement. For instance, when I'm preparing for a test, seeing the bar inch closer to 100% makes me want to keep going until it's full. It's a small thing, but it makes studying feel like a series of wins instead of a chore."</i>

The theme of immediate feedback and progress tracking emphasizes the significant role of gamified elements in fostering student motivation and engagement. Point systems provide instant feedback, satisfying the psychological need for competence by validating effort and achievement. Similarly, progress bars and tracking systems leverage the goal gradient effect, encouraging persistence by visually highlighting progress toward goals. These tools transform the learning experience by breaking down large, abstract objectives into manageable milestones, creating a sense of achievement at each step. By framing studying as a series of small, attainable wins, progress tracking fosters a sense of purpose and reduces the monotony of academic tasks. This aligns with motivational theories, such as Deci and Ryan's Self-Determination Theory, which emphasize the importance of timely feedback and goal clarity in sustaining engagement (Manninen, et al., 2022). Overall, these elements make the learning process feel dynamic and rewarding, promoting long-term focus and self-regulated learning.

Table 2

Competition and Social Interaction

“Leaderboards introduce a competitive element that encourages individuals to challenge themselves. They are effective because they satisfy the social need for comparison and recognition among peers.”

“When we had leaderboards in our quizzes, I felt motivated to improve my ranking. It wasn't just about getting the answers right, but also about being faster than others. The friendly competition pushed me to study more because I wanted to keep climbing up the board. Knowing that I could see my progress relative to my classmates made me feel like I was part of something more interactive, and it encouraged me to keep working hard to stay competitive.”

“Making tasks more fun, providing rewards, and fostering a sense of competition.”

The theme of competition and social interaction underscores the motivational power of gamified elements like leaderboards in education. Leaderboards introduce a competitive dynamic that motivates individuals to challenge themselves, appealing to the human need for social comparison and recognition. This aligns with Gerber (2020) Social Comparison Theory, which posits that individuals evaluate their progress and abilities relative to others. By fostering a sense of friendly rivalry, leaderboards encourage students to improve both accuracy and speed, transforming routine tasks into engaging challenges. Additionally, these elements promote a sense of community and interactivity, as students view their efforts within a broader social context. The combination of rewards, fun, and competition not only enhances engagement but also drives sustained effort, as students strive to achieve higher rankings and gain acknowledgment from peers. This approach taps into intrinsic and extrinsic motivators, making learning a dynamic and socially enriching experience.

Table 3:

Urgency and Excitement

“The element of racing against the clock introduces urgency and excitement, motivating students to recall information faster. Time-based challenges like these push students to practice repeatedly to improve their times, making studying feel more like a competitive game than a chore.”

“Timed Quizzes – Timed quizzes add a layer of challenge that’s really engaging. The countdown clock creates a sense of urgency that makes me more focused and alert while answering questions. It’s like a mini test of my ability to recall information quickly, which is motivating because it feels like I’m improving my skills in a practical way. I also find myself more motivated to prepare ahead of time so I can perform better under the time pressure.”

The theme of urgency and excitement highlights how time-based challenges, such as timed quizzes, can effectively enhance student motivation and engagement. The use of countdown clocks introduces a sense of urgency, which heightens focus and alertness during tasks, aligning with the principles of arousal theory in motivation (Española & Ouano, 2024). These challenges encourage students to recall information more quickly, fostering repeated practice and skill improvement in a way that feels dynamic and game-like rather than tedious. By creating a controlled pressure environment, timed activities tap into extrinsic motivators, as students strive to meet the challenge, and intrinsic motivators, as they perceive personal growth in their ability to perform under time constraints. This approach not only prepares students for real-world scenarios where quick decision-making is essential but also makes learning more engaging and rewarding by turning routine studying into an exciting and purposeful competition.

Table 4

Achievement and Recognition

“The points system, where I earn points for completing quizzes or tasks, keeps me motivated to keep going. The more points I earn, the more it feels like I’m making progress in the course. It’s like a running total of my success, and the desire to accumulate as many points as possible pushes me to stay engaged and complete additional challenges.”

“These gamified elements each tap into unique motivational drivers—achievement, recognition, progression, and social interaction—making learning feel more dynamic, purposeful, and rewarding.”

The theme of achievement and recognition illustrates how point systems and other gamified elements effectively drive student motivation by providing clear markers of progress and success. Earning points creates a sense of accomplishment and reinforces effort, aligning with Bandura’s theory of self-efficacy, which emphasizes the

importance of positive reinforcement in building confidence and sustaining engagement (Clasquin-Johnson & Ebrahim, 2024). The accumulation of points serves as a tangible representation of progression, transforming abstract academic goals into measurable achievements. Furthermore, these systems tap into intrinsic and extrinsic motivational drivers, such as the desire for recognition, progression, and social validation. By fostering a sense of purpose and rewarding effort, gamified elements make the learning process more dynamic and enjoyable. This approach not only encourages students to persist in their studies but also creates an environment where achievements are celebrated and engagement is sustained, ultimately enhancing the overall educational experience.

The participants' responses in *Table 1*, *Table 2*, *Table 3* and *Table 4* highlight the multifaceted impact of gamified elements on their motivation and engagement in learning. Key gamification strategies such as point systems, leaderboards, timed quizzes, progress bars, and progress tracking tap into diverse psychological and social drivers, including achievement, competition, recognition, and goal progression. These features improve the educational experience by making tasks more engaging, rewarding, and enjoyable.

Leaderboards and time-restricted challenges instil a sense of urgency, encouraging participants to improve their own performance and that of their peers. These elements also cultivate a sense of community by promoting collaboration. Likewise, progress tracking features, such as progress bars, offer immediate visual feedback, enhancing the feeling of achievement and motivating learners to continue striving towards their goals. The use of point systems and level-ups provides a concrete display of success, further motivating participants to stay engaged with their learning.

Overall, these responses underscore the effectiveness of gamification in making learning dynamic and purposeful. By addressing both intrinsic and extrinsic motivational factors, gamified elements help participants perceive education not as a chore but as an engaging, goal-oriented activity, leading to sustained effort and improved academic performance.

When participants were asked about the impact of Quizalize on their motivation to engage in academic activities, 60% (9/15) reported that Quizalize had somewhat increased their motivation to participate. Additionally, 27% (4/15) of participants stated

that Quizalize had moderately boosted their motivation. Moreover, 13% (2/15) of participants indicated that Quizalize has significantly increased their motivation. See participants' results in *Figure 5* under Appendix E. These findings suggest that while Quizalize contributes to improved motivation, the extent of its impact varies among participants.

When participants were asked how the inclusion of Quizalize elements has affected their motivation to participate in class activities and assignments 60% (9/15) of the participants indicated that the inclusion of Quizalize elements affected their motivation positively. Moreover, 13% (2/15) of participants indicated that the inclusion of Quizalize elements affected their motivation very positively. However, 27% (4/15) of participants remained neutral. See participants' results in *Figure 15* under Appendix E.

4.4 Data Analysis focusing on identifying the most effective gamification elements in the learning environment

When participants were asked to indicate the features of Quizalize they found most engaging, 32% (12/15) of the participants indicated that they found Instant feedback more engaging, 30% (11/15) of the participants indicate that they found leaderboards more engaging, 27% (10/15) of the participants indicate that they found quizzes more engaging, 11% (4/15) of the participants indicated that they found class progress tracking engaging. See participants' results in *Figure 8* below.

Figure 8

Participants' Perceptions of the Most Engaging Features of Quizalize



The findings suggest that instant feedback is the most engaging feature of Quizalize, with 32% (12/15) of participants prioritizing it. This highlights the importance of providing participants with immediate responses to their answers, which likely supports their learning process by offering real-time clarification and reinforcement. Instant feedback aligns with educational best practices that emphasize formative assessment to improve understanding and retention.

Leaderboards, which 30% (11/15) of participants found engaging, demonstrate the appeal of gamification in learning. Leaderboards foster a sense of competition and motivation, driving participants to enhance their performance while incorporating an enjoyable aspect into the learning experience. However, their high ranking might also indicate that participants value recognition and peer comparison in a learning environment.

Quizzes, engaging for 27% (10/15) of participants, suggest that participants enjoy interactive content, possibly because it allows them to apply their knowledge in a structured format. This feature might also work as a tool for self-assessment, helping participants identify gaps in their understanding.

Finally, class progress tracking, noted by only 11% (4/15) of participants, was the least engaging feature. This may indicate that while participants value features directly impacting their individual learning experience, they are less interested in tools aimed at broader class-level monitoring, which may be more beneficial to educators than to participants themselves.

Implications of the findings are as follows:

Prioritize Instant Feedback: The results emphasize the critical role of incorporating tools that provide timely and actionable feedback, as this greatly impacts student engagement and academic performance.

Leverage Gamification: The widespread appeal of leaderboards highlights the value of incorporating gamified features to boost motivation and encourage active participation.

Enhance Quizzes: While quizzes are engaging, further optimizing their design—e.g., by incorporating adaptive learning paths—could make them even more effective.

Reassess Class Progress Tracking: Since this feature holds limited appeal to participants, its design or communication may need rethinking to demonstrate how it benefits individual learners or their academic goals.

Overall, the analysis indicates that Quizalize should continue emphasizing personalized and interactive learning experiences while exploring ways to make less popular features more engaging.

When participants were asked if there were any Quizalize elements they found less engaging or even disengaging and participants had an option to choose multiple elements, 30% specified that they found none of the Quizalize elements less engaging or even disengaging. 25% specified that they found competitive aspects elements less engaging or even disengaging. 20% specified that they found leaderboards to be less engaging or even disengaging. 15% specified that they found timed quizzes to be less engaging or even disengaging. 10% specified that they found lack of personalised feedback to be less engaging or even disengaging. See participants' results in *Figure 9* under Appendix E.

The findings reveal that the majority of participants (30%) did not find any Quizalize elements disengaging, indicating overall positive reception. However, 25% identified competitive aspects as less engaging, while 20% found leaderboards disengaging, suggesting that some students may not thrive in highly competitive environments. Additionally, 15% found timed quizzes to be less engaging, possibly due to the pressure they impose. Finally, 10% identified the absence of personalized feedback as a factor contributing to disengagement, emphasizing the need for customized support to sustain student engagement. These findings emphasize the significance of implementing a comprehensive gamification strategy that caters to diverse learning preferences.

4.5 Data Analysis from various DBR Iterations

4.5.1 Cycle 1 Initial Design and Pilot Testing

Participants suggested several enhancements to improve the effectiveness of Quizalize in educational settings. They emphasized fostering peer recognition through

verbal or written acknowledgment of top performers and introducing team-based challenges to encourage collaboration without altering the platform. Time-based incentives, such as classroom rewards for completing quizzes quickly, and offline accessibility were proposed to accommodate students with limited internet access. Incorporating real-life scenarios into quiz questions and implementing tangible motivators like classroom trophies were highlighted to boost engagement. Personalized features, such as peer challenges where students nominate each other for quizzes, were suggested to add a competitive and social element. See *Figure 16* under Appendix E.

Post-quiz activities, such as discussions to review scores and common mistakes, were recommended to enhance learning outcomes. Visual tools, like displaying leaderboards on a projector or whiteboard, could increase excitement, while student-generated quiz questions would provide ownership of the learning process. Structured goals, like achieving consecutive high scores, and class celebrations for engagement milestones were proposed to sustain motivation. Lastly, friendly rivalries, such as one-on-one quiz duels, were suggested to create healthy competition, making the platform more interactive and engaging.

When participants were asked if they think Quizalize has had any impact on their academic performance or understanding of the course material 87% (13/15) of the participants indicated that Quizalize indeed somewhat improved their academic performance and understanding. Furthermore, 7% (1/15) of the participants pointed out that Quizalize significantly improved their academic performance and understanding. However, 7% (1/15) of the participants pointed out that they did not notice any change in academic performance or understanding. See participants results in *Figure 13.1* under Appendix E.

When participants were asked about the influence of Quizalize on their academic performance, 87% (13/15) indicated that it had a moderately positive impact on their academic outcomes. Additionally, 7% (1/15) noted that Quizalize had a moderately positive influence on their performance. Moreover, 7% (1/15) of the participants noted that Quizalize significantly impacted their performance positively. See participants results in *Figure 13.2* under Appendix E.

When participants were asked which challenges or frustrations they have encountered with gamified learning 100% (15/15) of the participants pointed out that they have not encountered any challenges with Quizalize. See participants results in *Figure 14.1* under Appendix E.

4.5.2 Cycle 2 Refinement and Expanded Testing

Participants suggested various enhancements to Quizalize tools and practices to improve engagement and motivation in education. These include introducing personalized rewards like certificates or stickers to recognize achievements and themed quiz sessions centred on various topics within the module. Encouraging student participation by allowing them to take turns as "Quiz Master" and contribute questions fosters ownership and involvement. Fun and interactive quiz names along with classroom scoreboards help maintain enthusiasm and track progress visually. To add excitement, surprise challenges, timed quizzes, and friendly rivalries between teams or individuals are recommended. Collaborative elements like team challenges, class-level rewards, and role-playing quizzes can create a supportive learning environment. Additionally, incorporating narrative frameworks (e.g., quizzes as part of a story) and visual celebrations like emojis or balloons enhance the fun and celebratory aspect of learning. These suggestions aim to create a dynamic, interactive, and rewarding educational experience through gamification.

When participants were asked if they think Quizalize has had any impact on their academic performance or understanding of the course material 47% (7/15) of the participants said there was significantly improved academic performance and understanding. While another 47% (7/15) of the participants said there was somewhat improved academic performance and understanding. Lastly only 7% (1/15) of the participants said they have noticed no change in their academic performance or understanding. See participants' results in *Figure 13.3* under Appendix E.

When asked about Quizalize's impact on their academic performance, 53% (8/15) of participants noted a slight positive impact. In addition, 27% (4/15) indicated that Quizalize had a moderate positive effect on their performance, while 20% (3/15)

reported a significant positive impact. See participants' results in *Figure 13.4* under Appendix E.

When participants were asked which challenges or frustrations they have encountered with gamified learning 87% (13/15) of the participants pointed out that they have not encountered any challenges with Quizalize. On the other hand, 13% (2/15) of the participants indicated that there was lack of integration or compatibility with other course materials. See participants' results in *Figure 14.2* under Appendix E.

4.5.3 Cycle 3 Final Validation and Optimization

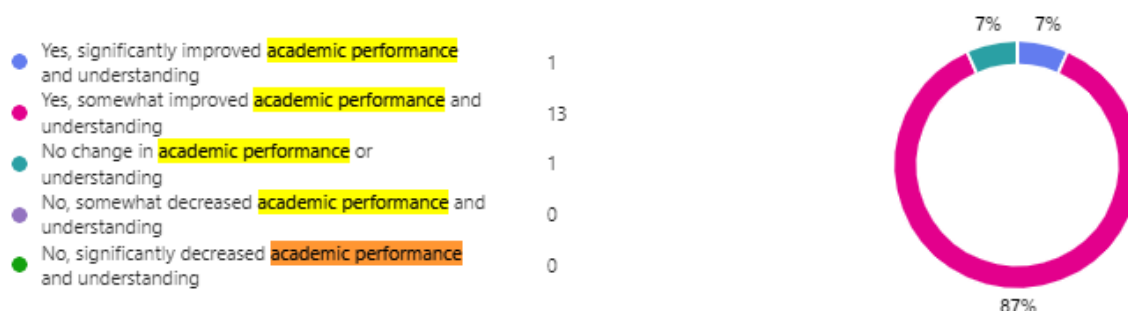
Participants suggested several improvements to enhance Quizalize's alignment with gamified learning principles. They emphasized the need for integration with Learning Management Systems (LMS) and AI-driven adaptive difficulty adjustments to personalize learning experiences based on individual performance. Expanding assessment formats, such as adding open-ended questions, drag-and-drop activities, and multimedia elements, would support diverse cognitive levels and encourage higher-order thinking. Features like storyline-based learning paths, where students unlock new chapters by meeting goals, could sustain engagement through narrative-driven tasks. Participants also recommended tools for progress tracking, such as detailed analytics on strengths and weaknesses, to guide focused preparation. Enhancing inclusivity was highlighted, with calls for accessibility features like text-to-speech, closed captions, and customizable interfaces for students with disabilities. To foster engagement and collaboration, they proposed incorporating game-based elements, supporting the flipped classroom model, and promoting teamwork. Lastly, suggestions for an offline mode would allow students to access quizzes without internet access, increasing flexibility and accessibility. These enhancements aim to make learning more interactive, inclusive, and engaging, catering to varied student needs while maintaining a focus on motivation and progression. See *Figure 18* under Appendix E: Graphical Data from Questionnaires.

When participants were asked if they think Quizalize has had any impact on their academic performance or understanding of the course material 73% (11/15) of the participants indicated that Quizalize indeed somewhat improved their academic performance and understanding. Furthermore, 13% (2/15) of the participants pointed out that Quizalize significantly improved their academic performance and

understanding. Moreover, 13% (2/15) of the participants pointed out that they did not notice any change in academic performance or understanding. See participants' results in *Figure 13* below.

Figure 13

Participants' Perceptions of Quizalize's Impact on Academic Performance and Understanding



When participants were asked about any challenges or frustrations they faced with gamified learning, 60% (9/15) stated they did not experience any issues with Quizalize. Meanwhile, 27% (4/15) mentioned facing some technical problems or bugs on the Quizalize platform. Moreover, 7% (1/15) of the participants indicated they found instructions for gamified activities confusing or unclear. Lastly, 7% (1/15) of the participants reported that there was lack of integration or compatibility with other course materials. See participants results in *Figure 14* under Appendix E.

4.6 Data Analysis from Observations, Interviews and Focus groups

The observation results reveal that Quizalize significantly enhanced engagement, motivation, and learning outcomes for the 2nd-year DITM students. Students displayed heightened participation, enthusiasm, and curiosity, particularly during competitive and collaborative activities such as leaderboards and team-based challenges. The platform's gamified elements, including instant feedback and progress tracking, were instrumental in fostering a sense of accomplishment and encouraging persistence. Behavioural changes included improved attendance, greater time spent on tasks, and a deeper commitment to learning. While the initial novelty of gamification generated

excitement, sustained interest was maintained through routine integration into lessons, albeit with some waning enthusiasm over time. Emotional responses were predominantly positive, marked by enjoyment and curiosity, though occasional frustration and stress arose, particularly in highly competitive scenarios. Accessibility and comfort with technology were largely unproblematic, though minor connectivity issues and a need for platform enhancements were noted. Overall, the results demonstrate that Quizalize effectively supported active learning and knowledge retention while highlighting areas for improvement, such as increasing content variety, refining user interfaces, and maintaining engagement through fresh challenges and rewards.

The data gathered from interviews and focus groups revealed both the advantages and challenges of incorporating Quizalize into education. Participants, primarily second-year DITM students, found the tool highly engaging due to its gamified elements such as leaderboards, badges, and instant feedback. These features motivated students to participate actively and made learning more interactive, particularly for complex technical subjects. Quizalize also facilitated collaborative learning through team-based challenges, fostering peer interaction and knowledge sharing. Personalized feedback and progress tracking were cited as critical features that helped identify and address knowledge gaps. However, challenges identified included restricted access to devices and internet connectivity, technical issues, and the stress induced by time-limited quizzes and competition, which at times deterred some students. Participants suggested several improvements, such as integrating simulations for hands-on learning, diversifying question formats, enhancing accessibility, and using AI for adaptive learning. Ethical concerns like data security and equitable access were also raised. In summary, the findings highlight Quizalize's potential to improve learning outcomes, provided that the identified challenges are resolved, and the platform adapts to meet students' evolving needs.

4.7 Design Principles from participants' feedback and recommendations

The research findings suggest several key DPs for enhancing gamified learning platforms like Quizalize (see section 4.5.3). These include ***DP1 fostering peer recognition*** through acknowledgments and rewards to boost motivation and engagement. Emphasizing ***DP2 collaboration and social learning*** via team-based challenges, peer-nominated quizzes, and classroom discussions promotes interaction and shared learning. ***DP3 Personalization and adaptive learning*** are vital, with features such as AI-driven difficulty adjustments, tailored learning paths, and detailed analytics to address individual strengths and weaknesses. To sustain engagement, ***DP4 diverse content formats*** like open-ended questions, multimedia elements, and real-life scenarios should be incorporated, along with dynamic features like storyline-driven learning paths and surprise challenges. Accessibility is critical, requiring ***DP5 inclusive design*** with text-to-speech, closed captions, and offline modes to support diverse learners. Additionally, ***DP6 integration with LMS*** ensures seamless use within broader educational frameworks. The principles also highlight balancing competition and emotional well-being by fostering healthy rivalries while minimizing stress. Finally, gamified platforms should maintain long-term interest through refreshed content, varied rewards, and user-friendly interfaces, creating a dynamic, inclusive, and motivating educational environment.

4.8 Summary of the key findings and their alignment with the research questions

The results revealed that students appreciate the integration of gamification in education, as it enhances their engagement and adds enjoyment to the learning experience (see section 4.3). Feedback from participants highlighted the substantial influence of gamified elements in boosting motivation and engagement throughout the learning experience (see section 4.3). Techniques such as leaderboards, timed quizzes, progress bars, and point systems tap into psychological and social motivators like achievement, competition, recognition, and goal advancement (see section 4.4). Leaderboards and timed challenges create a sense of urgency and foster friendly

competition, encouraging participants to excel individually while building a sense of collective belonging. Progress tracking tools, such as progress bars, provide immediate visual feedback, reinforcing a sense of accomplishment and motivating continued effort (see section 4.3). Point systems and level-ups offer tangible indicators of success, inspiring further engagement. Overall, gamification transforms education into a dynamic, goal-oriented, and enjoyable experience, addressing both intrinsic and extrinsic motivators to promote sustained effort and improved academic outcomes. The findings suggest that Quizalize has a positive effect on students' motivation to participate in academic tasks, though the degree of impact differs from one individual to another (see section 4.3). A majority (60%) of participants reported that Quizalize slightly increased their motivation, while 27% noted a moderate increase, and 13% experienced a significant boost in motivation (see section 4.3). Regarding class activities and assignments, 60% of participants stated that the inclusion of Quizalize elements positively affected their motivation, and 13% reported a very positive effect (see section 4.3). However, 27% of participants expressed neutrality toward its impact. These findings emphasize the potential of Quizalize to boost motivation for the majority of students, although its impact varies among individuals in the group (see section 4.3).

The study explored the iterative design and evaluation of Quizalize through three cycles, focusing on its impact, challenges, and potential enhancements. Participants highlighted improvements such as peer recognition, team-based challenges, and offline accessibility to make the platform more inclusive and engaging. Personalized features like student-generated questions, themed quiz sessions, and narrative-driven learning paths were recommended to foster ownership and motivation. Across cycles, Quizalize was noted to positively impact academic performance and understanding, with varying degrees of improvement reported. While most participants (up to 87% in Cycle 2) experienced no challenges, later cycles revealed minor technical issues, lack of integration with course materials, and unclear instructions for gamified activities (see section 4.5.2). Suggestions included AI-driven adaptive difficulty, multimedia elements, progress tracking analytics, and accessibility features to enhance inclusivity. These findings underscore the importance of iterative refinement in gamified tools, demonstrating that Quizalize can be an effective, interactive, and adaptable platform for improving motivation, engagement, and academic outcomes.

The study revealed that Quizalize significantly enhanced engagement, motivation, and learning outcomes for second-year DITM students. Elements of gamification, including leaderboards, badges, real-time feedback, and progress tracking, encouraged active participation, collaboration, and a feeling of achievement. Students demonstrated increased attendance, task commitment, and enthusiasm, particularly during competitive and team-based activities. While the tool was highly engaging, challenges such as limited device and internet access, occasional technical glitches, and stress from time-based quizzes were noted. Participants highlighted the importance of routine integration to sustain interest, though waning enthusiasm was observed over time. Recommendations included diversifying content, incorporating simulations for hands-on learning, integrating adaptive AI features, and addressing ethical concerns like data security and equitable access. Despite these challenges, Quizalize proved effective in making learning interactive and supportive of knowledge retention, with potential for further improvement to meet evolving student needs.

This study offers important insights into the DPs required for the successful implementation of gamification as a teaching strategy within a South African PHEI. These findings directly address the primary research question and sub-questions by examining how gamification affects student engagement, identifying the essential gamification elements that promote this engagement, and illustrating how gamification tools like Quizalize can boost student participation in academic tasks.

DPs for Using Gamification: The study's results reinforce the design principle of incorporating interactive, goal-driven features that address both intrinsic and extrinsic sources of motivation. Gamified elements such as leaderboards, point systems, progress bars, and timed quizzes tap into psychological drivers like achievement, competition, recognition, and goal progression, making learning more dynamic and enjoyable. The iterative refinement of Quizalize through participant feedback suggests that gamification tools should be adaptable to different student needs, with features like peer recognition, team-based challenges, offline accessibility, and personalized feedback mechanisms enhancing inclusivity and engagement.

Influence of Gamification on Student Engagement: Gamification is instrumental in enhancing student engagement by transforming learning into a more interactive and motivating experience. The incorporation of competitive features, such as

leaderboards and timed challenges, cultivates a sense of urgency and promotes friendly competition. Students also report increased enthusiasm and commitment to learning through the sense of accomplishment created by progress tracking tools, such as progress bars, and tangible indicators of success, such as point systems and level-ups. The incorporation of features like collaborative challenges further promotes engagement by facilitating peer interaction and knowledge sharing, aligning with the findings that Quizalize has positively impacted student motivation and participation in academic activities.

Gamification Elements That Stimulate Engagement: Key gamification elements identified in the study—such as leaderboards, point systems, badges, and instant feedback—are instrumental in stimulating engagement. These elements provide continuous reinforcement, encourage competition, and create a dynamic learning environment. By including personalized feedback and progress tracking, which participants deemed particularly helpful, students are able to identify their strengths and areas for improvement, motivating them to persist in their learning process. Additionally, the suggestion to include team-based challenges and student-generated questions further emphasizes the role of collaboration and ownership in maintaining high levels of engagement.

Effect of Quizalize on Student Engagement in the MIS Course: Quizalize, as a gamification tool, effectively enhances engagement in MIS courses. Its ability to incorporate elements like badges, leaderboards, and progress tracking contributes to the creation of an interactive and motivating learning atmosphere. The study demonstrates that Quizalize enhances academic performance and understanding by transforming the learning experience into a more enjoyable and engaging one. However, challenges such as restricted access to devices, connectivity problems, and the pressure associated with time-based activities were identified, highlighting the need for ongoing platform optimization to ensure its effectiveness and inclusivity for all students.

4.9 Chapter Summary

This chapter provides an in-depth analysis of the study's results, systematically aligning them with the research questions and objectives by employing data triangulation. The results offer strong evidence that gamification effectively enhances student engagement, particularly in the context of an MIS course at a South African PHEI.

The findings indicated that gamification elements like leaderboards, timed quizzes, progress bars, and point systems notably boost student engagement and motivation. These features align with psychological and social drivers like achievement, competition, and goal progression, transforming the learning experience into an interactive, goal-oriented activity. Quizalize, the gamification platform utilized in this study, demonstrated its effectiveness by increasing students' motivation to participate in academic activities, improving attendance, and fostering a sense of accomplishment. However, the extent of its impact varied among participants, highlighting the importance of personalized and adaptive design features.

The iterative design process, grounded in the DBR methodology, enabled the refinement of Quizalize through feedback and multiple testing cycles. This iterative approach highlighted the importance of balancing competitive and collaborative components, integrating personalized and user-friendly features, and tackling technical challenges to improve the inclusivity and effectiveness of gamified learning.

Although the study emphasized notable benefits, it also acknowledged challenges such as limited device and internet access, occasional technical issues, and the pressure caused by timed quizzes. These findings point to the need for ongoing optimization of gamification platforms to address diverse learner needs and maintain long-term engagement.

In conclusion, the findings provide essential insights into the DPs for integrating gamification as an educational tool in HE. These principles emphasize the significance of encouraging interactivity, maintaining flexibility, and supporting inclusivity, thereby providing a solid foundation for leveraging gamification to boost student engagement

and academic success. This chapter sets the stage for the upcoming discussion and an exploration of its implications in the following section.

Chapter 5: Analysis and Suggestions

5.1 Introduction

This chapter analyses and contextualizes the findings discussed in Chapter 4, connecting them to the research questions and relevant literature on the use of gamification in education. The primary objective is to assess the effectiveness of gamification as a teaching strategy within South African PHEI, with a particular focus on second-year DITM students. By examining the repeated design and application of Quizalize, the discussion explores its impact on student engagement, motivation, and academic performance.

This chapter focuses on the primary research question: *What are the design principles for using gamification as a pedagogical tool at a South African PHEI?* (Section 5.2.1) It also examines the sub-questions; *how does gamification stimulate students' engagement?* (Section 5.2.2), *Which gamification elements stimulate students' engagement?* (Section 5.2.3), and *how can the use of gamification technologies (Quizalize) increase student engagement in MIS?* (Section 5.2.4).

The discussion integrates insights from the data analysis, comparing these findings with existing research to highlight convergences, divergences, and implications for educational practice. Key themes include the psychological and social drivers of gamification, the challenges and opportunities of using gamified learning technologies, and the potential for scalability and adaptability in HE contexts. This chapter also outlines the limitations of the study and proposes avenues for future research and practical applications. It emphasizes the need for further development of gamification tools to more effectively meet the varied needs of students.

This chapter offers a comprehensive analysis of the potential impact of gamification on teaching and learning outcomes, contributing valuable insights to the expanding body of literature on interventions that use gamification in an SA context.

5.2 Interpretation of Key Findings

The results of this research emphasize the significant potential of gamification, especially with tools like Quizalize, in enhancing student engagement, motivation, and academic success within HE. The next section presents an analysis of the major findings, aligning them with the research questions:

5.2.1 Design Principles for Gamification

The research findings outline comprehensive DPs for using gamification as a pedagogical tool within a South African PHEI, focusing on fostering engagement and inclusivity while aligning with the educational context. Central to these principles is DP1, which emphasizes fostering peer recognition through acknowledgments and rewards to enhance motivation and engagement (see section 4.7). Recognizing the importance of social learning, DP2 highlights collaboration through team-based challenges, peer-nominated quizzes, and classroom discussions to cultivate a sense of community and shared knowledge (see section 4.7). Personalization and adaptive learning, as outlined in DP3, are critical, incorporating features such as AI-driven difficulty adjustments, tailored learning paths, and detailed analytics to cater to individual strengths and weaknesses (see section 4.7). To sustain engagement, DP4 advocates for diverse content formats, including open-ended questions, multimedia elements, real-life scenarios, and dynamic features such as storyline-driven learning paths and surprise challenges (see section 4.7). DP5 underscores accessibility through inclusive design features like text-to-speech functionality, closed captions, and offline modes, ensuring equitable participation for diverse learners (see section 4.7). Additionally, DP6 stresses the importance of seamless integration with LMS to embed gamification effectively within broader educational frameworks (see section 4.7). Balancing competition and emotional well-being emerge as a critical element, fostering healthy rivalries while minimizing stress and anxiety. Furthermore, sustaining long-term interest requires refreshed content, varied rewards, and intuitive interfaces to maintain a dynamic and engaging educational environment. Together, these principles provide a holistic framework for leveraging gamification to enhance learning

experiences, aligning technological innovation with pedagogical best practices to support diverse student needs and promote sustained engagement.

5.2.2 Impact on Student Engagement

Quizalize positively influenced student engagement by transforming traditional learning into an interactive and enjoyable process. Features such as leaderboards and timed quizzes encouraged healthy competition, while progress tracking tools motivated students to persist toward academic goals (see section 4.5.1). Observations showed increased attendance, participation, and time spent on tasks, confirming the efficacy of gamification in fostering engagement (see section 4.6). However, occasional stress and waning enthusiasm over time suggest the need for regular updates and varied content to sustain long-term interest (see section 4.6).

5.2.3 Gamification Elements that Stimulate Engagement

Key elements like instant feedback, leaderboards, and progress bars were particularly effective in stimulating engagement. Instant feedback supported immediate learning reinforcement, while leaderboards introduced a sense of competition and peer recognition. Timed quizzes and progress tracking tools added urgency and a sense of accomplishment, further driving engagement. Personalized features, such as student-generated quiz questions and peer-nominated challenges, added an element of ownership, enhancing both motivation and involvement.

5.2.4 Use of Quizalize to Increase Engagement in MIS:

Quizalize was demonstrated to be a successful gamification tool for enhancing student engagement in MIS courses. Its gamified features made complex technical subjects more accessible and interactive. Personalized feedback and collaborative activities fostered a deeper understanding of the content while addressing individual learning

gaps. Challenges such as device access limitations, technical glitches, and the pressure of time-based tasks were noted, emphasizing the importance of platform refinement to maximize its effectiveness.

The results affirm that gamification serves as a powerful pedagogical tool for enhancing student engagement and academic outcomes in higher education, aligning with findings from earlier studies (Demirbilek et al., 2022; Lee et al., 2023; Rincon-Flores et al., 2022; Taşkın & Çakmak, 2022; Turan et al., 2022). The study demonstrates that with careful design and iterative refinement, gamified tools like Quizalize can effectively address diverse student needs while making learning more dynamic and purposeful. Future improvements should focus on inclusivity, technological enhancements, and the development of sustainable engagement strategies.

5.3 Contributions to Theory

This study's theoretical implications enhance the understanding of gamification as an educational tool in HE, particularly within the South African context. This study explores the relationship between different gamification features—such as leaderboards, point systems, progress indicators, and badges—and their impact on student engagement. This study contributes to the broader conversation in educational psychology and motivational theories, including Self Determination Theory (SDT) and Goal-Setting Theory. The results underscore the role of gamification in tapping into both intrinsic and extrinsic motivators, such as the pursuit of achievement, competition, and social recognition, thereby transforming traditional learning settings into dynamic and interactive experiences. Furthermore, the application of DBR underscores the value of iterative design in developing contextually relevant educational technologies, offering a model for integrating theoretical frameworks with practical pedagogical innovations. This study enhances the theoretical framework by highlighting how gamification can integrate cognitive, social, and emotional aspects of learning, promoting lasting engagement and better academic performance.

This research offers valuable theoretical contributions that deepen the current understanding of educational technology, gamification models, and strategies for enhancing student engagement. Below are the key theoretical implications:

5.3.1 Contribution to Gamification Theory

Motivational Frameworks: This study reinforces and extends SDT by illustrating how gamified elements like leaderboards, badges, and progress bars support intrinsic and extrinsic motivation. It demonstrates how gamification taps into psychological needs such as competence (achievement through progress tracking), autonomy (student-driven challenges), and relatedness (team-based activities).

Competition and Social Interaction: The findings enhance the understanding of how competition and collaboration intersect in gamified settings, reinforcing theories that highlight the combined impact of competitive and social dynamics in boosting engagement.

Dynamic Engagement Models: The study advances models of engagement by demonstrating how gamification transforms passive learning into an active, goal-oriented process, integrating cognitive, emotional, and behavioral dimensions of engagement.

5.3.2 Expansion of Constructivist Learning Theories

The use of gamification aligns with constructivist theories by providing interactive, student-centered learning environments (Vosiqova & Khadjibayeva, 2024). Elements like narrative-driven quizzes, real-life scenarios, and student-generated content reinforce the idea that learners construct knowledge more effectively through active participation and meaningful tasks (Safira, 2024).

Incorporating peer challenges and collaborative tasks underscores the principles of social constructivism, where knowledge is built collectively through peer interaction. (Wang, 2024).

5.3.3 Support for DBR in Educational Technology

The iterative development and improvement of gamified tools illustrate the practical implementation of DBR, highlighting its cyclical approach to designing, testing, and refining educational interventions (Gallah, 2021). This contributes to theoretical frameworks by providing a structured methodology for integrating gamification into HE.

The feedback-driven enhancement of Quizalize offers a model for adaptive and context-specific gamification, supporting the theory that educational technologies must evolve to address diverse learner needs and challenges.

5.3.4 Implications for Student Engagement Theories:

By pinpointing the gamification elements that drive engagement, such as instant feedback and progress tracking, this study refines current engagement theories, especially within the realm of digital and gamified learning environments.

The findings underscore the importance of personalization, showing how tailored feedback and adaptive challenges align with theories that stress individualized pathways to sustained engagement.

5.3.5 Equity and Inclusivity in Educational Technology

The study underscores issues of digital equity, including limited access to devices and internet connectivity, and suggests solutions such as incorporating offline capabilities and designing inclusive features to address these challenges. These findings contribute to theoretical discussions on how gamification can be equitably implemented in resource-constrained contexts.

5.3.6 Integration with Cognitive Load Theory

The research indicates that gamification elements such as instant feedback and progress monitoring can reduce cognitive load by simplifying complex tasks into smaller, more achievable steps. This aligns with theoretical perspectives suggesting that gamification can reduce cognitive strain, enabling students to engage more effectively with the material.

This study bridges gaps in the theoretical understanding of gamification by demonstrating its applicability and adaptability in HE. The study underscores the significance of an integrated approach to gamified learning, drawing on motivational, cognitive, and social theories to create engaging, inclusive, and impactful educational experiences. These theoretical insights not only advance gamification research but also provide a foundation for future studies exploring innovative applications of educational technology.

5.4 Practical Implications

The practical insights from this study provide valuable strategies for integrating gamification into higher education to boost student engagement and improve academic results. The findings highlight the importance of including interactive and motivating elements, such as leaderboards, progress tracking, real-time feedback, and point systems, in T&L approaches. These gamification features not only foster a competitive yet collaborative learning environment but also provide immediate reinforcement, encouraging students to stay engaged and motivated. This research provides educators with a comprehensive guide for creating gamified activities that address the diverse needs and preferences of students, highlighting the significance of adaptability, personalization, and inclusivity. Institutions can use these insights to refine curriculum delivery methods by adopting platforms like Quizalize, which support active learning and knowledge retention. Moreover, the iterative DPs identified in this research—such as incorporating team-based challenges, narrative-driven tasks, and AI-driven personalization—provide a roadmap for optimizing gamified tools to ensure their relevance and effectiveness. These practical outcomes can guide policymaking

and resource allocation to promote technology-driven, engaging, and student-centered education, particularly within South African PHEI.

5.5 Lessons Learned from the DBR Process

The iterative nature of DBR was central to this study, reflecting its first principle through continuous cycles of design, implementation, and refinement of gamified interventions. Feedback from students during each iteration informed adjustments, ensuring that the interventions, such as the design of Quizalize features, aligned with the evolving needs of the learning environment. Real-world application, the second principle, was evident as the interventions were tested within the authentic context of a South African PHEI, allowing for practical insights into their effectiveness and adaptability. Collaboration between the researcher and students was a cornerstone of the study, embodying the third principle, as the lecturer and students actively contributed to the development and evaluation of gamified tools, ensuring their relevance and pedagogical soundness. Finally, the theory-driven nature of the intervention ensured alignment with established frameworks in gamification and engagement, as discussed in section 2.5.1. By grounding the intervention in principles such as peer recognition, collaboration, and accessibility, the study demonstrated how theoretical constructs could translate into practical, impactful solutions. Together, these characteristics underscored the dynamic and iterative nature of DBR, enabling the creation of a robust framework for using gamification to enhance student engagement.

5.6 Literature Comparison

The results of this study are consistent with recent studies, further supporting the beneficial impact of gamification on student motivation and engagement in educational contexts. In line with Popp and Schuhbauer (2023), the study shows that gamification elements like point systems, leaderboards, timed quizzes, and progress tracking tap into both intrinsic and extrinsic motivational factors, such as achievement, competition, recognition, and goal progress. Participants reported that these features enriched their learning experience, making it more engaging, meaningful, and rewarding. This supports Deci and Ryan's (2000) Self-Determination Theory (SDT) highlights the importance of competence, autonomy, and relatedness as key factors that influence

motivation. Furthermore, the emphasis on instant feedback through progress bars and point systems is consistent with Koivisto and Hamari's (2019) findings, which indicate that real-time feedback enhances students' sense of accomplishment and encourages sustained effort. The incorporation of competitive elements like leaderboards aligns with Rincon-Flores, et al. (2022), who noted that gamification's ability to balance individual performance and collective belonging increases its effectiveness. Additionally, the study's observation that gamification promotes task completion and deeper engagement reflects the conclusions of Ertan and Kocadere, (2022), which found that gamified learning strategies improve academic performance by sustaining student interest and effort. The differences in motivation levels observed among participants are consistent with Seaborn and Fels' (2015) findings, which stress that the effectiveness of gamification is influenced by individual preferences and the context in which it is implemented.

The findings of this study are consistent with prior research on gamification in educational settings, highlighting the crucial impact of components like real-time feedback, leaderboards, and quizzes in enhancing student engagement (Ardi & Rianita, 2022; Ertan & Kocadere, 2022; Rincon-Flores et al., 2022; Schuhbauer, 2023). The preference for instant feedback, identified as the most engaging feature by 32% of participants, supports research by Ertan and Kocadere (2022), which highlights the motivational value of real-time feedback in reinforcing understanding and sustaining engagement. The appeal of leaderboards (30%) mirrors findings by Ertan and Kocadere (2022) as well as Popp and Schuhbauer (2023), who noted that competition and recognition foster motivation and participation, although this study corroborates concerns raised by Seaborn and Fels (2015) regarding the potential disengagement of some students in highly competitive environments. Quizzes, favoured by 27% of participants, align with Dichev and Dicheva (2017), who emphasized the role of interactive and structured activities in promoting knowledge application and self-assessment. However, the lower engagement with class progress tracking (11%) reflects observations by Domínguez et al. (2013) that features benefiting educators may not resonate as strongly with learners. The study also found that elements like competitive aspects, timed quizzes, and lack of personalized feedback were less engaging for some, reinforcing calls by Zichermann and Cunningham (2011) for a

balanced and tailored approach to gamification to accommodate diverse learning preferences.

The findings of this study contribute to the growing body of literature, providing further support for the positive effects of gamification on student engagement, motivation, and academic performance (Ardi & Rianita, 2022; Saud et al., 2022; Taşkın & Çakmak, 2022; Yaccob et al., 2022). Similar to the work of Taşkın and Çakmak (2022), the study demonstrates that gamified elements like leaderboards, instant feedback, and badges effectively foster student engagement and persistence by tapping into intrinsic motivators such as achievement and curiosity. Collaborative activities, such as team-based challenges, have demonstrated a positive influence, aligning with the observations of Zichermann and Cunningham (2011), who highlighted the critical role of social interaction and peer recognition in enhancing learning within gamified environments. Furthermore, the study's observation of behavioural changes, including improved attendance and task commitment, supports research by Dichev and Dicheva (2017) as well as Sandoval and Lamb, 2023, which highlights the transformative potential of gamification in fostering active learning. However, challenges such as limited device access, technical glitches, and time-based quiz pressure reflect concerns raised by Seaborn and Fels (2015) about the contextual and individual factors that can limit gamification's effectiveness. The participants' suggestions for features like adaptive learning, hands-on simulations, and diversified content formats align with recommendations from Landers et al. (2014), who advocate for personalized and context-aware gamification designs. Ethical concerns, including data security and equitable access, also resonate with discussions in Sofiadin (2021), underscoring the need for responsible implementation.

In summary, this research offers significant insights to the current body of literature by validating the effectiveness of gamification as a powerful pedagogical tool. It highlights the critical importance of tailoring gamified strategies to accommodate the diverse needs of students, stressing the need for adaptable and inclusive design approaches. Moreover, the findings validate gamification's potential as an effective pedagogical tool while highlighting the necessity of addressing technological design, and inclusivity challenges to optimize its impact.

5.7 Study Constraints

The research was conducted with a small sample of 15 second-year DITM students from one PHEI, which limits the ability to generalize the results to larger populations or different educational settings. Moreover, the research was conducted within a South African higher education institution, concentrating on a specific gamification platform (Quizalize) and subject matter (MIS). These contextual factors may influence the outcomes, making it challenging to apply the findings universally to other disciplines, institutions, or gamification tools. The short timeframe of the study might have limited its ability to fully evaluate the long-term impacts of gamification on student engagement, motivation, and academic achievement. Sustained enthusiasm or potential fatigue with gamified elements over extended periods remains unexplored. Issues like limited access to devices, internet connectivity, and minor technical glitches were noted. These limitations could have impacted the participants' overall experience and potentially skewed perceptions of the effectiveness of Quizalize. The use of self-reported data via surveys, interviews, and focus groups may lead to response bias, as participants could have given answers they felt were socially acceptable instead of truthful representations of their experiences. While the study identified elements of Quizalize that enhanced motivation, it paid less attention to the potential negative impacts of gamification, such as stress from competition, pressure from timed quizzes, or disengagement among certain learners. The study did not compare Quizalize's effectiveness with other gamified tools or traditional teaching methods. This limits the ability to contextualize its impact relative to alternative pedagogical approaches. Although ethical issues like data security and equitable access were raised, the study did not delve deeply into how these challenges were addressed or their broader implications for gamification in education.

5.8 Recommendations

Based on the study's outcomes and its constraints, several suggestions are provided to enhance the implementation of gamification in educational environments. First,

institutions should implement larger-scale studies involving diverse student populations and disciplines to improve the generalizability of findings. To address technological constraints, educators and institutions should ensure equitable access to devices and internet connectivity while advocating for offline functionality in gamified tools like Quizalize. Enhancing the platform with adaptive learning features, diversified question formats, and narrative-driven tasks could further sustain student engagement and cater to varied learning preferences. Educators are encouraged to strike a balance between competitive features, such as leaderboards, and collaborative or tailored activities to foster an inclusive learning atmosphere that addresses the diverse needs of students. Additionally, regular professional development workshops should be organized to ensure educators are equipped with the skills needed to effectively incorporate gamification into their teaching practices. Furthermore, addressing ethical concerns such as data security and accessibility is critical to ensuring responsible implementation. Subsequent research should examine the prolonged effects of gamification, its implementation across varied educational environments, and its effectiveness relative to other instructional methods to optimize its design and outcomes.

5.9 Chapter Summary

This chapter offered a comprehensive examination of the findings, linking them to the research questions and situating them within the wider academic discourse on the role of gamification in education. The research emphasized the considerable promise of gamification, particularly through tools like Quizalize, in enhancing student engagement, motivation, and academic performance. With features such as leaderboards, instant feedback, and progress tracking, Quizalize creates an interactive, goal-oriented learning environment that effectively leverages both intrinsic and extrinsic motivators.

However, the study also highlighted challenges such as technological constraints, the varying impact of competition, and the need for platform refinements. These limitations underscore the importance of designing inclusive and context-aware gamification strategies. Theoretical implications emphasized the role of gamification in supporting

constructivist and engagement theories, while practical implications outlined strategies for enhancing gamified tools and their implementation.

In summary, the results confirm the efficacy of gamification as a valuable educational strategy, highlighting the need for continuous improvement to address the diverse requirements of learners. This research identified DPs for developing gamification tools that can be incorporated into teaching practices in HE. Future studies should focus on overcoming the limitations noted in this research, investigating the sustained impact of gamification, and evaluating its applicability across various educational contexts and disciplines.

Chapter 6: Final Thoughts

6.1 Introduction

This concluding chapter offers a comprehensive summary of the key findings and insights from the study, providing a detailed overview of its methodology and contributions. The research explored the effects of gamification on student engagement in an MIS course at a PHEI in South Africa, employing a DBR approach. It addressed essential questions regarding the DPs, gamification elements, and technological tools, including Quizalize, that effectively foster student engagement.

The chapter is structured into several key sections. **Section 6.2**, *The Study Overview* offers a succinct summary of the research aims, methods, and main findings, highlighting the study's development and key results. **Section 6.3**, *The conclusion* delves into the findings, aligning them with the primary and secondary research questions, and highlights their significance within the broader context of educational technology and pedagogical practices.

Following this, **Section 6.4**, *Study Contributions* outlines the theoretical, practical, and methodological advancements made in the areas of educational technology and engagement strategies. The penultimate section, **Section 6.5**, *Final Reflections*, presents a personal and scholarly reflection on the research experience, including lessons learned and areas for growth. Finally, **Section 6.6**, *Chapter Summary* brings the chapter and the study to a close, highlighting its significance and proposing potential directions for future research in this area.

6.2 Study Overview

This study aimed to explore how gamification, as a teaching strategy, influences student engagement in an MIS course at a PHEI. Using a DBR approach, the study employed iterative cycles of designing, implementing, evaluating, and refining, with the goal of developing evidence-driven DPs for the successful incorporation of gamification in HE.

The primary question guiding this research study was: *What are the design principles for using gamification as a pedagogical tool at a South African PHEI?* This overarching inquiry was supplemented by three secondary questions:

- How does gamification influence student engagement?
- Which gamification elements stimulate students' engagement?
- How can the use of gamification technologies (e.g., Quizalize) increase student engagement in MIS?

Data collection and analysis spanned multiple sources, including student surveys, focus groups, observational data, and performance metrics. The results revealed that gamification can notably boost student engagement by promoting motivation, interaction, and a sense of accomplishment (Ardi & Rianita, 2022; Rincon-Flores, et al., 2022; Sandoval & Lamb, 2023). Key gamification elements, including leaderboards, badges, and interactive quizzes, were found to be especially effective in enhancing engagement (Ertan & Kocadere, 2022; Popp & Schuhbauer, 2023; Turan, et al., 2022). Quizalize, as the gamification tool used in the study, proved instrumental in transforming traditional learning activities into engaging experiences that aligned with students' needs and preferences.

The study concluded with a collection of DPs specifically crafted for the successful integration of gamification in HE. These principles highlight the need to align gamification components with educational objectives, maintain a balance between competition and collaboration, and utilize real-time feedback to keep students engaged.

This study provided DPs for designing gamification elements with the aim to boost student engagement. It also highlights the potential of gamification technologies to address challenges in HE, particularly within the South African context, where innovative teaching methods are essential for improving student outcomes.

6.3 Conclusions

The main aim of this study was to explore how gamification, as an instructional approach, can improve student engagement in an MIS course at a PHEI in SA. Utilizing

a DBR methodology, the study's findings offered valuable insights into the relationship between gamification, student engagement, and academic achievement.

The key conclusion drawn from this study is that, when thoughtfully designed and executed, gamification can substantially enhance student engagement. The use of gamification elements such as leaderboards, badges, points, and interactive quizzes contributed to heightened motivation, greater participation, and a stronger sense of accomplishment among students. These findings highlight the potential of gamification to overcome challenges associated with student disengagement, particularly in subjects that are traditionally theoretical and abstract, such as MIS.

Three key conclusions emerged from the study:

6.3.1 Gamification Influences Engagement Across Multiple Dimensions

Gamification was found to enhance behavioural, emotional and cognitive engagement. Behaviourally, students demonstrated increased participation in class activities and a greater willingness to complete tasks. Emotionally the use of gamified elements created excitement and fostered a sense of competition and collaboration. Cognitively gamification encourages deeper learning and critical thinking by breaking down complex topics into interactive and manageable components.

6.3.2 Specific Gamification Elements Drive Engagement

The study identified that certain gamification elements, particularly leaderboards and badges, were effective in sustaining motivation and fostering a competitive yet collaborative learning environment. Real-time feedback, facilitated by platforms like Quizalize, enhanced engagement by enabling students to track their progress and pinpoint areas in need of improvement.

6.3.3 Gamification Technologies Are Key to Sustained Engagement

Technologies such as Quizalize were instrumental in transforming traditional lecture-based content into dynamic, interactive experiences. The platform enabled a seamless integration of gamification elements, providing a user-friendly and accessible way for both students and educators to engage with the content.

The study also concluded that the success of gamification relies on how well it aligns with the educational goals and the thoughtful choice of elements that address the specific needs of the student group. Overuse or poor design of gamification features may lead to disengagement or frustration, underscoring the need for careful and purposeful implementation.

To conclude, this study underscores the considerable influence of gamification in education, providing actionable recommendations for its application in higher education. The results add valuable insights to the ongoing conversation about innovative teaching practices, positioning gamification as a potent tool for boosting student engagement and enhancing academic performance.

6.4 Study Contributions

This study offers valuable contributions to the domains of educational technology, pedagogy, and gamification in HE. Through an investigation of gamification's role in boosting student engagement in an MIS course at a South African private institution, it delivers both theoretical insights and practical applications. The primary contributions are outlined as follows:

6.4.1 Theoretical Contributions

6.4.1.1 Enhancing Insights into Gamification in Education

The study contributes to the theoretical discussion on gamification by showcasing its diverse effects on student engagement—spanning behavioural, emotional, and cognitive dimensions. It extends prior research by illustrating how specific gamification elements, including leaderboards, badges, and real-time feedback, impact different facets of student engagement.

6.4.1.2 Development of DPs for Gamification

A core theoretical output of the study is the creation of context-specific DPs for using gamification in HE. These principles offer a structured framework for educators and instructional designers, emphasizing alignment with pedagogical goals, careful

selection of gamification elements, and the balance between competition and collaboration.

6.4.1.3 Application of DBR in Gamification

The study demonstrates the utility of the DBR methodology in educational research, showing how iterative cycles of design, implementation, and refinement can yield actionable insights for technology-enhanced learning. This approach contributes to methodological discussions on how DBR can be effectively applied in the context of gamification studies.

6.4.2 Practical Contributions

6.4.2.1 Recommendations for Educators and Academic Institutions

The research provides practical suggestions for educators and institutional leaders on effectively incorporating gamification into teaching and learning strategies. These guidelines are particularly relevant for South African IHE, providing contextually appropriate strategies to address challenges such as student disengagement and low motivation.

6.4.2.3 Insights into Effective Use of Gamification Tools

By examining the use of Quizalize, the research provides practical insights into selecting and implementing gamification technologies. The findings emphasize the essential role of usability, accessibility, and real-time feedback in sustaining student engagement.

6.4.2.4 Promotion of Innovative Pedagogies in South African HE

The study emphasizes gamification's capacity to revolutionize conventional teaching methods, supporting ongoing initiatives to innovate and improve education quality in

SA. It offers a blueprint for how private institutions can leverage gamification to improve student outcomes and remain competitive in the evolving educational landscape.

6.4.3 Methodological Contributions

6.4.3.1 Localized Research in Gamification

This study addresses a significant gap in the existing literature by focusing on the South African context, an area that has been underrepresented in gamification research, which has predominantly concentrated on developed nations. It offers a deeper understanding of how gamification functions within varied educational environments.

6.4.3.2 Combining Quantitative and Qualitative Approaches

The study utilizes a mixed-methods approach, integrating surveys, focus groups, observational data, and performance metrics, creating a comprehensive framework for conducting in-depth evaluations of gamification interventions.

In conclusion, this research bridges theoretical frameworks and practical applications, advancing the discourse on gamification in education and offering a foundation for further exploration. The results and suggestions provide useful insights for educators, instructional designers, policymakers, and technology developers focused on enhancing student engagement in HE.

6.5 Final Reflections

Reflecting on the journey of this research, it is evident that the process of exploring gamification as a pedagogical tool has been both intellectually enriching and practically enlightening. The study's focus on enhancing student engagement in an MIS course at a South African PHEI allowed for a meaningful intersection of educational theory, technology, and practice.

One of the most striking reflections is the transformative potential of gamification, not just for students but for educators as well. Developing and integrating gamified activities necessitated a transition from conventional teaching practices to innovative, student-focused strategies. This transformation emphasized the need for flexibility and innovation in meeting the changing demands of 21st-century learners.

The iterative approach of the DBR methodology was instrumental in connecting theoretical concepts with practical application. By engaging in cycles of design, implementation, and refinement, the research evolved in response to real-world challenges and feedback. This flexibility emphasized that educational research is a dynamic, iterative, and collaborative process rather than a straightforward linear progression.

The research also underscored the significance of maintaining contextual relevance. Research within the South African higher education context revealed distinct challenges and opportunities, including limited resources, diverse student populations, and the urgent demand for innovative teaching methods. These factors influenced the study's outcomes, highlighting the necessity for solutions specifically designed to address the distinct needs and circumstances of the local educational environment.

On a personal level, this study was a journey of growth and learning. It deepened the researcher's understanding of gamification, enriched the researcher's research skills, and strengthened the researcher's appreciation for the complexities of T&L in HE. The experience underscored the value of persistence, collaboration, and critical reflection in achieving meaningful outcomes.

Ultimately, this research has reinforced the researcher's dedication to promoting innovative and inclusive teaching practices. The findings and insights from this study contribute to the broader academic conversation surrounding gamification, while also promoting substantial advancements in teaching and learning practices, both within the institution and throughout the wider educational sector.

6.6 Overall Summary

This chapter provides a detailed summary of the study's key findings, insights, and contributions, demonstrating how gamification can serve as a powerful pedagogical

strategy to enhance student engagement in an MIS course at a South African PHEI. By employing a DBR approach, the study systematically explored the DP, gamification elements, and technological tools that foster engagement.

The findings confirmed the transformative potential of gamification to address challenges related to student disengagement, particularly in complex and abstract subjects like MIS. Through the ongoing application and evaluation of Quizalize, the study identified successful gamification approaches, offering both theoretical and practical insights that contribute meaningfully to the field of educational technology.

In reflecting on the study's journey, it is clear that gamification not only benefits students but also challenges educators to adopt more innovative and inclusive teaching practices. While the study revealed notable successes, it also highlighted areas for improvement, such as addressing technical challenges, ensuring equitable access, and maintaining sustained engagement over time.

This research ultimately reaffirms the value of gamification in HE and offers a roadmap for future studies to build on its findings. As education progresses, gamification remains a compelling approach for fostering dynamic, student-focused learning environments that address the varied needs of learners. This research was a retrospective abstract on Using Gamification to enhance student engagement at a South African Private Institution of Higher Education: A Design Based Research (DBR) approach.

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Appendix A: Ethical Clearance



SCHOOL OF EDUCATION

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EDNREC20240904

13 September 2024

FRANCIS ZULU
ZLXREM001

I am pleased to inform you that ethical clearance has been granted by the School of Education Ethics Review Committee of the Faculty of Humanities for your academic project: " Using Gamification to enhance student engagement at a South African Private Higher Education Institution: a Design Based Research Approach "

This clearance is valid until : 13 September 2025
Regards

Signature Removed

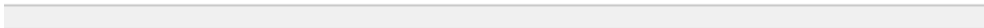
PROFESSOR JOANNE HARDMAN

ETHICS CHAIR

Appendix B: Interviews, Focus group questions & Observations.

Interview Questions & Focus Group Questions

Conducting interviews with students about the use of Quizalize in teaching and learning can provide in-depth insights.



Introduction:

1. Can you please introduce yourself briefly, including your role in education and any experience you have with gamification in teaching and learning?
2. To begin, could you explain what the term "gamification" means to you in the context of teaching and learning?
3. How familiar are you with the concept of gamification in education? Have you encountered it before in your educational experiences?

4. Have you ever used gamification techniques or tools in your teaching or learning experiences? If so, could you describe a specific example of how you implemented gamification?
5. What motivated you to incorporate gamification into your teaching or learning approach?
6. Could you share any specific positive outcomes or benefits you've observed as a result of using Quizalize in education?
7. On the flip side, what challenges or limitations have you encountered when trying to use Quizalize in education? How did you address or overcome these challenges?
10. Can you provide examples of how Quizalize has influenced engagement, motivation, or learning outcomes in your context?
11. What Quizalize elements or mechanics do you find most effective in your teaching or learning practices? Can you share examples of how you've applied these elements?
12. Are there any specific Quizalize strategies or elements that you believe work better for certain subjects or age groups?
13. Have you used specific Quizalize tools or platforms in your educational activities? If so, could you describe your experience with these tools and their impact?
14. Are there any features or functionalities that you consider essential when choosing a gamification tool or platform for education?
15. Looking ahead, do you plan to continue using Quizalize in your teaching or learning practices? If yes, how do you envision its role evolving in the future?
16. What improvements or innovations would you like to see in Quizalize practices or tools in the field of education?
17. Are there any ethical concerns or potential pitfalls associated with the use of Quizalize in education that you think educators and policymakers should be aware of?
18. Based on your experiences, what advice or recommendations would you give to educators or institutions interested in incorporating Quizalize into their teaching and learning strategies?
19. Is there anything else you would like to add or share regarding your experiences with Quizalize in teaching and learning?

Observations

1. Engagement Levels:

- Observe whether Quizalize increases participants' engagement in the learning process.
- Look for signs of active participation, enthusiasm, and sustained interest in educational activities that incorporate gamification.

2. Motivation and Intrinsic Rewards:

- Assess whether Quizalize motivates participants to achieve learning objectives.
- Observe if participants express a sense of accomplishment or enjoyment when engaging with gamified content.

3. Learning Outcomes:

- Measure the impact of Quizalize on participants' knowledge acquisition, skills development, and retention.
- Observe whether participants demonstrate improved understanding or mastery of educational content.

4. Collaboration and Competition:

- Note how Quizalize elements like leaderboards and team-based challenges affect collaboration and competition among participants.
- Observe whether healthy competition enhances motivation or creates negative dynamics.

5. Feedback and Assessment:

- Assess how Quizalize integrates feedback mechanisms, such as immediate feedback on quiz performance or progress tracking.
- Observe how participants respond to assessment and grading methods in gamified contexts.

6. Inclusivity and Accessibility:

- Observe whether Quizalize strategies consider diverse learning styles and accommodate participants with varying abilities.
- Look for any barriers or accessibility challenges that may arise in gamified learning environments.

7. Behavioural Changes:

- Observe any behavioural changes in participants, such as increased time spent on learning tasks, improved attendance, or persistence in completing challenges.

8. Technology Use:

- Note participants' comfort and proficiency with technology tools and platforms used for gamified learning.
- Assess whether technology-related issues, such as device compatibility or connectivity problems, impact the learning experience.

9. Feedback and Suggestions:

- Encourage participants to provide feedback on their experiences with Quizalize, including what worked well and what could be improved.
- Pay attention to specific suggestions and recommendations for enhancing gamified learning.

10. Emotional Responses:

- Observe emotional responses such as frustration, enjoyment, curiosity, or stress during gamified learning activities.
- Consider how emotional experiences may affect learning outcomes and overall satisfaction.

11. Sustainability and Long-Term Engagement:

- Assess whether participants continue to engage with gamified learning activities over an extended period.
- Observe whether the novelty of Quizalize wears off or if it leads to sustained interest.

Appendix C: Questionnaire

1. Name & Surname 

Enter your answer

2. Do you enjoy your module? * 

- ☐ Yes
- ☐ No
- ☐ Maybe

3. How do you feel about using Quizalize in teaching and learning? * 

Enter your answer

4. **What is your Age group?** *

☐ Under 18

☐ 18-24

☐ 25-34

☐ 35-44

☐ 45-54

5. **What is your Gender** *

☐ Male

☐ Female

☐ Non-binary

☐ Prefer not to say

6. **What is your level of education?** * 

- ☐ 1st year student
- ☐ 2nd year student
- ☐ 3rd year student
- ☐ 4th year student

7. **Years of experience in education** * 

- ☐ 0-1
- ☐ 2-3
- ☐ 4-5
- ☐ 6-7
- ☐ 8-9
- ☐ 10+

8. Have you heard of the term "gamification" in the context of teaching and learning before taking this survey? *



☐ Yes

☐ No

9. How would you define gamification in education? * 

Enter your answer

10. How were you introduced to Quizalize in your MIS course? * 

☐ During Orientation

☐ Course Syllabus/Outline

☐ First Class/ Lecture

☐ Email/Announcement from Instructor

☐ Other

11. What was your initial reaction to the use of Quizalize in MIS? * 

- ☐ Very Excited
- ☐ Somewhat Excited
- ☐ Neutral
- ☐ Somewhat Skeptical
- ☐ Other

12. How well do you understand the gamified elements used in your course (points, badges, leader boards, challenges)? * 

- ☐ Very well
- ☐ Well
- ☐ Neutral
- ☐ Poorly
- ☐ Not at all

13. Have you ever used gamification techniques or tools in your teaching or learning experiences? * 

☐ Yes

☐ No

14. If yes to Question 13, please briefly describe your experience with gamification in education. 

Enter your answer

15. Which Quizalize elements do you enjoy the most? (Select all that apply) * 

☐ Points

☐ Badges

☐ Leaderboards

☐ Challenges

☐ Other

16. Can you give specific examples of gamified elements that you found particularly effective or enjoyable? * 

Enter your answer

17. How does your level of engagement with gamified learning compare to your engagement with traditional teaching methods? * 

☐ Much higher with gamified learning

☐ Higher with gamified learning

☐ About the same

☐ Higher with traditional methods

☐ Much higher with traditional methods

18. **Are there specific elements of Quizalize that you believe are more effective than traditional methods in keeping you engaged? (Select all that apply)** * 

☐ Points

☐ Badges

☐ Leaderboards

☐ Challenges

☐ Other

19. **Has your engagement with the gamified course remained consistent throughout the semester, or has it changed over time?** * 

☐ Increased significantly

☐ Increased slightly

☐ Decreased slightly

☐ Decreased significantly

20. **How has Quizalize affected your motivation to complete coursework and participate in class activities?** * 

- ☐ Significantly increased
- ☐ Moderately increased
- ☐ Slightly increased
- ☐ No change
- ☐ Slightly decreased

21. **Can you provide examples of how specific gamified elements have increased your motivation?** * 

Enter your answer

22. **Has the use of Quizalize changed the way you participate in class discussions or group work?** * 

- ☐ Yes, significantly
- ☐ Yes, somewhat
- ☐ No, it has not changed
- ☐ Not applicable (I don't participate in group work)

23. **Do you find yourself more likely to engage with peers and instructors due to the use of Quizalize?** * 

- ☐ Much more likely
- ☐ More likely
- ☐ About the same
- ☐ Less likely
- ☐ Much less likely

24. **How has Quizalize influenced your interest in the course material?** * 

- ☐ Significantly increased
- ☐ Moderately increased
- ☐ Slightly increased
- ☐ No change
- ☐ Slightly decreased

25. **Do you find the learning process more enjoyable due to Quizalize?** * 

- ☐ Much more enjoyable
- ☐ More enjoyable
- ☐ About the same
- ☐ Less enjoyable
- ☐ Much less enjoyable

26. **How do Quizalize elements influence your participation in class activities and assignments?** * 

- ☐ Significantly increase participation
- ☐ Moderately increase participation
- ☐ Slightly increase participation
- ☐ No significant change in participation
- ☐ Slightly decrease participation

27. **How do gamified feedback mechanisms (e.g., instant feedback, progress tracking) influence your engagement?** *



- ☐ Significantly increase engagement
- ☐ Moderately increase engagement
- ☐ Slightly increase engagement
- ☐ No significant change in engagement
- ☐ Slightly decrease engagement

28. **Which feedback-related elements do you find particularly useful for staying engaged? (Select all that apply)?** *



- ☐ Instant feedback on assignments or quizzes
- ☐ Progress tracking (e.g., levelling up, progress bars)
- ☐ Detailed performance analytics
- ☐ Achievement notifications (e.g., badges earned)
- ☐ Other

29. **Have you noticed a change in your level of engagement with the MIS course since the introduction of Quizalize?** *



- ☐ Yes, significantly more engaged
- ☐ Yes, somewhat more engaged
- ☐ No noticeable change in engagement
- ☐ Somewhat less engaged
- ☐ Significantly less engaged

30. **Can you provide specific examples of how Quizalize has influenced your engagement?** *



Enter your answer

31. **In your opinion, what are the main benefits of using Quizalize in teaching and learning? (Select all that apply) *** 



- ☐ Increased student engagement
- ☐ Improved retention of knowledge
- ☐ Enhanced motivation to learn
- ☐ Better understanding of complex concepts
- ☐ Other

32. **What challenges or limitations have you encountered when implementing Quizalize in education? (Select all that apply) *** 

- ☐ Lack of resources or access to Quizalize tools
- ☐ Resistance from students or educators
- ☐ Difficulty in designing effective gamified content
- ☐ Assessment and grading challenges
- ☐ Other

33. **Which challenges or frustrations have you encountered with gamified learning? (Select all that apply) *** 

- ☐ Confusing or unclear instructions for gamified activities
- ☐ Technical issues or bugs with Quizalize platforms
- ☐ Lack of integration or compatibility with other course materials
- ☐ None, I haven't encountered any challenges
- ☐ Other

34. **Which aspects of the Quizalize strategy do you think need improvement? (Select all that apply) *** 

- ☐ Clarity of objectives and goals
- ☐ Integration with course content
- ☐ User interface and experience (UI/UX)
- ☐ None, I think the Quizalize strategy is effective as is
- ☐ Other

35. **Has the use of Quizalize made the learning process more enjoyable or interesting for you?** * 

- ☐ Yes, significantly more enjoyable/interesting
- ☐ Yes, somewhat more enjoyable/interesting
- ☐ No change in enjoyment/interest
- ☐ No, somewhat less enjoyable/interesting
- ☐ No, significantly less enjoyable/interesting

36. **Has Quizalize influenced your level of participation in class discussions, group activities, or online forums?** * 

- ☐ Significantly increased participation
- ☐ Moderately increased participation
- ☐ Slightly increased participation
- ☐ No change in participation
- ☐ Slightly decreased participation

37. **Do you find yourself participating more frequently or more actively because of Quizalize?** * 

- ☐ Yes, significantly more frequently and actively
- ☐ Yes, somewhat more frequently and actively
- ☐ No change in frequency or activity level
- ☐ No, somewhat less frequently and actively
- ☐ No, significantly less frequently and actively

38. **Has Quizalize helped you stay focused and attentive during lectures and study sessions?** * 

- ☐ Yes, significantly more focused and attentive
- ☐ Yes, somewhat more focused and attentive
- ☐ No change in focus or attentiveness
- ☐ No, somewhat less focused and attentive
- ☐ No, significantly less focused and attentive

39. **Do you feel more engaged with the course content on a cognitive level due to Quizalize?** * 

- ☐ Yes, significantly more cognitively engaged
- ☐ Yes, somewhat more cognitively engaged
- ☐ No change in cognitive engagement
- ☐ No, somewhat less cognitively engaged
- ☐ No, significantly less cognitively engaged

40. **Do you think Quizalize has had any impact on your academic performance or understanding of the course material?** * 

- ☐ Yes, significantly improved academic performance and understanding
- ☐ Yes, somewhat improved academic performance and understanding
- ☐ No change in academic performance or understanding
- ☐ No, somewhat decreased academic performance and understanding
- ☐ No, significantly decreased academic performance and understanding

41. **Have you noticed any improvement in your grades or test scores in the gamified course?** * 

- ☐ Yes, significant improvement
- ☐ Yes, moderate improvement
- ☐ Yes, slight improvement
- ☐ No noticeable change
- ☐ No, slight decline
- ☐ No, moderate decline
- ☐ No, significant decline

42. **In what ways has Quizalize influenced your emotional engagement (interest, enjoyment) in the course?** * 

- ☐ Significantly increased interest and enjoyment
- ☐ Moderately increased interest and enjoyment
- ☐ Slightly increased interest and enjoyment
- ☐ No change in interest or enjoyment
- ☐ Slightly decreased interest and enjoyment

- ☐ Moderately decreased interest and enjoyment
- ☐ Significantly decreased interest and enjoyment

43. **How has Quizalize impacted your behavioural engagement (participation, effort) in class activities and assignments?** * 

- ☐ Significantly increased participation and effort
- ☐ Moderately increased participation and effort
- ☐ Slightly increased participation and effort
- ☐ No change in participation or effort
- ☐ Slightly decreased participation and effort
- ☐ Moderately decreased participation and effort
- ☐ Significantly decreased participation and effort

44. **Do you believe that Quizalize has had an impact on your academic performance?** * 

- ☐ Yes, significantly positive impact
- ☐ Yes, moderately positive impact

- ☐ Yes, slightly positive impact
- ☐ No noticeable impact
- ☐ Yes, slightly negative impact
- ☐ Yes, moderately negative impact
- ☐ Yes, significantly negative impact

45. **Have you noticed any improvements in your grades or understanding of the material due to Quizalize?** * 

- ☐ Yes, significant improvement
- ☐ Yes, moderate improvement
- ☐ Yes, slight improvement
- ☐ No noticeable change
- ☐ No, slight decline
- ☐ No, moderate decline
- ☐ No, significant decline

46. **Which Quizalize elements or mechanics do you believe are the most effective for enhancing the learning**

46. Which Quizalize elements or mechanics do you believe are the most effective for enhancing the learning experience? (Select all that apply) * 

- ☐ Points and rewards
- ☐ Leaderboards and competition
- ☐ Badges and achievements
- ☐ Quests or challenges
- ☐ Other

47. Are there any gamified elements that you find less effective or engaging? * 

- ☐ Yes
- ☐ No

48. If you answered "yes" to Question 47 Why is that? * 

Enter your answer

49. How well do the gamified elements align with your learning objectives and course content? * 

- ☐ Very well aligned
- ☐ Moderately aligned
- ☐ Slightly aligned
- ☐ Not aligned
- ☐ Not sure

50. Do you feel that the Quizalize elements are relevant and appropriately tailored to your courses? * 

- ☐ Strongly agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree
- ☐ Strongly disagree

51. How has Quizalize influenced your motivation to participate in academic activities? * 

- ☐ Significantly increased motivation
- ☐ Moderately increased motivation
- ☐ Slightly increased motivation
- ☐ No noticeable change in motivation
- ☐ Slightly decreased motivation
- ☐ Moderately decreased motivation
- ☐ Significantly decreased motivation

52. What specific aspects of Quizalize do you find most motivating? (Select all that apply) * 

- ☐ Points and scoring systems
- ☐ Badges and achievements
- ☐ Leaderboards and rankings
- ☐ Challenges and quests
- ☐ Other

53. **How has Quizalize affected your engagement and participation in classes, assignments, and group activities?** *



- ☐ Significantly increased engagement
- ☐ Moderately increased engagement
- ☐ Slightly increased engagement
- ☐ No noticeable change in engagement
- ☐ Slightly decreased engagement
- ☐ Moderately decreased engagement
- ☐ Significantly decreased engagement

54. **Do you think Quizalize has impacted your academic performance?** *



- ☐ Yes, significantly positively impacted
- ☐ Yes, moderately positively impacted
- ☐ Yes, slightly positively impacted
- ☐ No noticeable impact
- ☐ Yes, slightly negatively impacted

- ☐ Yes, moderately negatively impacted
- ☐ Yes, significantly negatively impacted

55. **Have you noticed improvements in your grades or comprehension of the material due to Quizalize?** * 

- ☐ Yes, significant improvements
- ☐ Yes, moderate improvements
- ☐ Yes, slight improvements
- ☐ No noticeable improvements
- ☐ No, slight declines
- ☐ No, moderate declines
- ☐ No, significant declines

56. **Has the use of Quizalize increased your effort in completing assignments or studying for exams?** * 

- ☐ Yes, significantly increased effort
- ☐ Yes, moderately increased effort
- ☐ Yes, slightly increased effort

- ☐ Yes, slightly increased effort
- ☐ No noticeable change in effort
- ☐ Slightly decreased effort
- ☐ Moderately decreased effort
- ☐ Significantly decreased effort

57. **Have you noticed any changes in your persistence or determination to overcome challenging tasks in the course?** *



- ☐ Yes, significantly increased persistence/determination
- ☐ Yes, moderately increased persistence/determination
- ☐ Yes, slightly increased persistence/determination
- ☐ No noticeable change in persistence/determination
- ☐ Slightly decreased persistence/determination
- ☐ Moderately decreased persistence/determination
- ☐ Significantly decreased persistence/determination

58. **Can you provide examples of how Quizalize elements have helped you stay engaged with the course content? (Select all that apply)** *



- ☐ Points and scoring systems motivated me to complete tasks.
- ☐ Badges and achievements provided milestones to strive for.
- ☐ Leaderboards and rankings encouraged healthy competition.
- ☐ Challenges and quests made learning interactive and enjoyable.
- ☐ Other

59. **Which Quizalize elements make the learning process more enjoyable or interesting for you? (Select all that apply)**



- ☐ Interactive quizzes and assessments
- ☐ Points and scoring systems
- ☐ Badges and achievements
- ☐ Leaderboards and rankings
- ☐ Other

60. Which Quizalize elements provide the most effective incentives for you to engage more deeply with the material? (Select all that apply) * 

☐ Points

☐ Badges

☐ Leaderboards

☐ Challenges

☐ Other

61. Do elements like points, badges, or leaderboards influence your desire to complete tasks or participate in activities? * 

☐ Strongly motivate me

☐ Somewhat motivate me

☐ Neutral

☐ Somewhat demotivate me

☐ Strongly demotivate me

62. How do Quizalize elements impact your interaction and collaboration with peers? * 

☐ Strongly motivate me

☐ Somewhat motivate me

☐ Neutral

☐ Somewhat demotivate me

☐ Strongly demotivate me

63. Do Quizalize elements that encourage you to work with others or compete in a positive way? * 

☐ Encourages working with others

☐ Encourages positive competition

☐ Neither

64. Are there any Quizalize elements that you find less engaging or even disengaging? (Select all that apply) * 

- ☐ Leaderboards
- ☐ Timed quizzes
- ☐ Competitive aspects
- ☐ Lack of personalized feedback
- ☐ Other

65. Which features of Quizalize (e.g., quizzes, instant feedback, leaderboards, class progress tracking) do you find most engaging? (Select all that apply) * 

- ☐ Quizzes
- ☐ Instant feedback
- ☐ Leaderboards
- ☐ Class progress tracking
- ☐ Other

66. How satisfied are you with the Quizalize tools you have used? * 

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Neutral
- ☐ Dissatisfied
- ☐ Very Dissatisfied

67. How has the inclusion of Quizalize elements affected your motivation to participate in class activities and assignments? * 

- ☐ Very negatively
- ☐ Negatively
- ☐ Neutrally
- ☐ Positively
- ☐ Very positively

68. Can you describe any specific instances where Quizalize made you more motivated to engage with the course material? * 

Enter your answer

69. Do you plan to continue or increase the use of Quizalize in teaching or learning in the future? * 

☐ Yes

☐ No

70. What improvements or enhancements would you like to see in Quizalize tools or practices in education? * 

Enter your answer

71. Are there any additional game elements or strategies that you think could enhance your learning experience? *



☐ More interactive quizzes

☐ Advanced levels or stages

☐ Storyline or narrative-based learning

☐ Virtual rewards (e.g., badges, points)

☐ Other

72. Would you like to see Quizalize used in other courses you take in the future? * 

☐ Yes

☐ No

☐ Maybe

73. How do you think integrating Quizalize into other subjects would impact your engagement with the material? *



☐ Very negatively

☐ Negatively

☐ Neutrally

☐ Positively

☐ Very positively

74. **What additional support or resources do you think faculty need to effectively use Quizalize as a pedagogical tool?**

* 

- ☐ Training workshops or webinars specifically for Quizalize
- ☐ Access to comprehensive user guides or tutorials
- ☐ Examples of successful Quizalize implementations in different subjects
- ☐ Templates or sample quizzes for different educational levels and subjects
- ☐ Technical support for setting up and troubleshooting Quizalize
- ☐ Integration guides for aligning Quizalize with curriculum goals
- ☐ Strategies for incorporating Quizalize into various teaching methods (e.g., flipped classroom, blended learning)
- ☐ Assessment strategies for evaluating student performance using Quizalize
- ☐ Collaboration opportunities with other faculty using Quizalize
- ☐ Research and evidence on the effectiveness of Quizalize in education
- ☐ Other

75. **What suggestions do you have for improving the Quizalize elements to better stimulate engagement? (Select all that apply)** * 

- ☐ Enhance visual appeal (e.g., graphics, design)
- ☐ Introduce more diverse and challenging quiz formats
- ☐ Provide clearer instructions and objectives for quizzes
- ☐ Increase customization options for quizzes (e.g., difficulty levels, question types)
- ☐ Other

76. **Are there any additional gamification elements or strategies you think could be added to Quizalize to enhance engagement?** * 

Enter your answer

77. **Do you have any additional comments, insights, or suggestions regarding the use of Quizalize in teaching and learning?** * 

Enter your answer

78. How would you describe the overall impact of Quizalize on your engagement with the course? * 

Enter your answer

Appendix D: Consent Form

PARTICIPANTS STUDY CONSENT FORM

I, _____ (full name/s and surname), a student at IIE Rosebank College Bloemfontein, hereby give my consent and agree to participate in the study titled *Using Gamification to enhance student engagement at a South African Private Higher Education Institution: A Design Based Research approach*.

I acknowledge and understand that my participation entails:

- Being video recorded learning using Quizalize Gamification Tool.
- Being photographed learning using Quizalize Gamification Tool.
- Having the researcher observe these lessons.
- Participating in an interview.
- Possibility of being directly quoted when the research is published, but my identity will be protected.

I understand that my participation in this research is voluntary, and my consent can be withdrawn at any time during the duration of the study. I understand that my own anonymity as well as that of the college and other students will be maintained in the reporting of the findings.

Signature: _____ Date: _____

Name and contact number: _____

Appendix E: Graphical Data from Questionnaires

5. What is your Gender

Male	9
Female	6
Non-binary	0
Prefer not to say	0

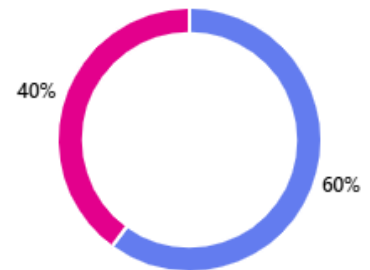


Figure 1

4. What is your Age group?

Under 18	0
18-24	14
25-34	1
35-44	0
45-54	0



Figure 2

6. What is your level of education?

1st year student	2
2nd year student	10
3rd year student	3
4th year student	0

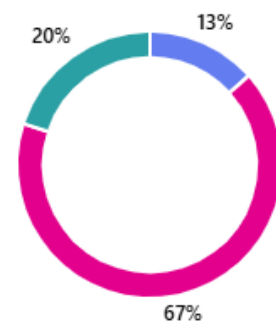


Figure 3

20. How has Quizalize affected your **motivation** to complete coursework and participate in class activities?



Figure 4

51. How has Quizalize influenced your **motivation** to participate in academic activities?

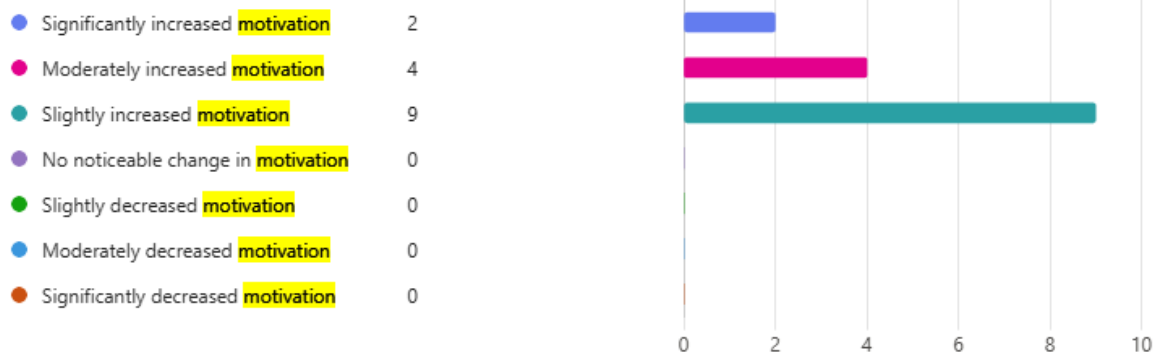


Figure 5

67. How has the inclusion of Quizalize elements affected your **motivation** to participate in class activities and ass...



Figure 6

8. Have you heard of the term "gamification" in the context of teaching and learning before taking this survey?



Figure 7

65. Which features of Quizalize (e.g., quizzes, instant feedback, leaderboards, class progress tracking) do you find most **engaging**? (Select all that apply)



Figure 8

64. Are there any Quizalize elements that you find less **engaging** or even **disengaging**? (Select all that apply)



Figure 9

69. Do you plan to continue or increase the use of Quizalize in teaching or learning in the **future**?



Figure 10

72. Would you like to see Quizalize used in other courses you take in the **future**?



Figure 11

75. What **suggestions** do you have for improving the Quizalize elements to better stimulate engagement? (Select all that apply)



Figure 12

40. Do you think Quizalize has had any impact on your **academic performance** or understanding of the course material?

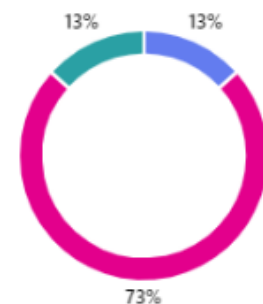
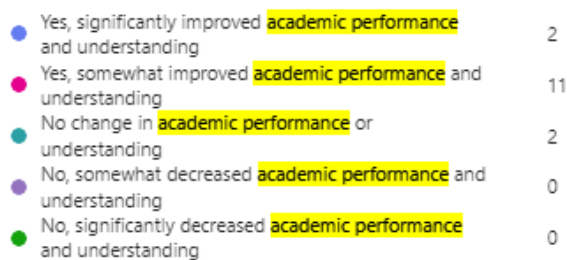


Figure 13

40. Do you think Quizalize has had any impact on your **academic performance** or understanding of the course material?

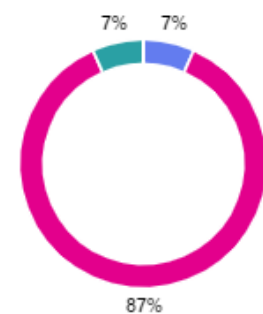
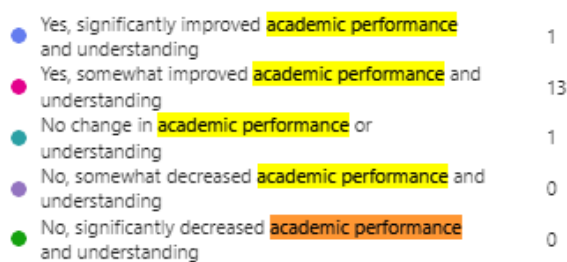


Figure 13.1

44. Do you believe that Quizalize has had an impact on your **academic performance**?

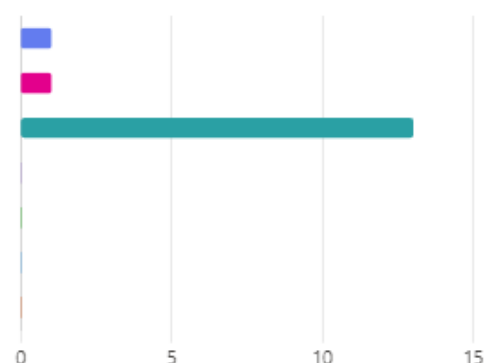
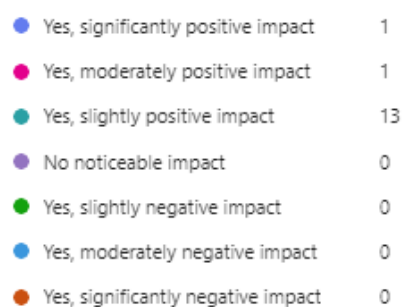


Figure 13.2

40. Do you think Quizalize has had any impact on your **academic performance** or understanding of the course material?

- Yes, significantly improved **academic performance** and understanding 7
- Yes, somewhat improved **academic performance** and understanding 7
- No change in **academic performance** or understanding 1
- No, somewhat decreased **academic performance** and understanding 0
- No, significantly decreased **academic performance** and understanding 0

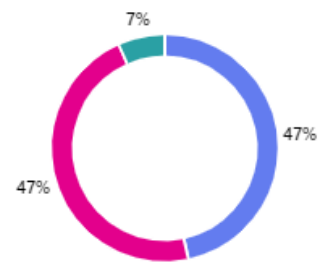


Figure 13.3

44. Do you believe that Quizalize has had an impact on your **academic performance**?

- Yes, significantly positive impact 3
- Yes, moderately positive impact 4
- Yes, slightly positive impact 8
- No noticeable impact 0
- Yes, slightly negative impact 0
- Yes, moderately negative impact 0
- Yes, significantly negative impact 0

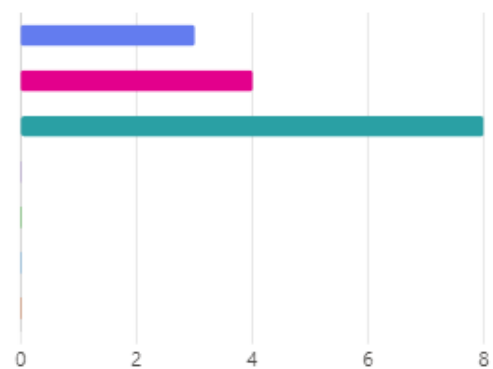


Figure 13.4

33. Which challenges or **frustrations** have you encountered with gamified learning? (Select all that apply)

- Confusing or unclear instructions for gamified activities 1
- Technical issues or bugs with Quizalize platforms 4
- Lack of integration or compatibility with other course materials 1
- None, I haven't encountered any challenges 9
- Other 0

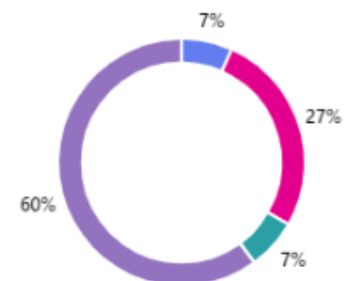


Figure 14

33. Which challenges or frustrations have you encountered with gamified learning? (Select all that apply)

● Confusing or unclear instructions for gamified activities	0
● Technical issues or bugs with Quizalize platforms	0
● Lack of integration or compatibility with other course materials	0
● None, I haven't encountered any challenges	15
● Other	0

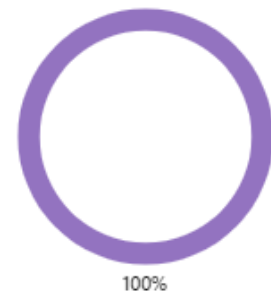


Figure 14.1

33. Which challenges or frustrations have you encountered with gamified learning? (Select all that apply)

● Confusing or unclear instructions for gamified activities	0
● Technical issues or bugs with Quizalize platforms	0
● Lack of integration or compatibility with other course materials	2
● None, I haven't encountered any challenges	13
● Other	0

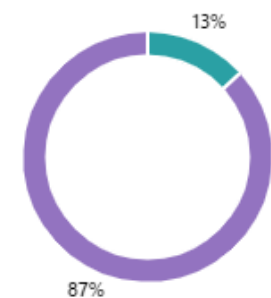


Figure 14.2

67. How has the inclusion of Quizalize elements affected your motivation to participate in class activities and assignments?

● Very negatively	0
● Negatively	0
● Neutrally	4
● Positively	9
● Very positively	2

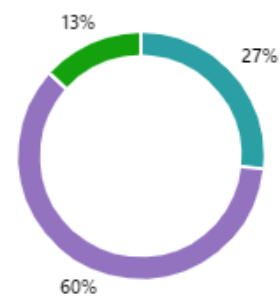


Figure 15

What improvements or enhancements would you like to see in Quizalize tools or practices in education?
Encourage Peer Recognition: Introduce verbal or written acknowledgment for top-performing students during class discussions to complement leaderboard rankings.
Use Team-Based Challenges: Organize students into teams for quizzes and competitions, fostering collaboration and engagement without altering the platform.
None in my opinion
None
Use Time-Based Rewards: Offer small classroom rewards (e.g., extra credit, stickers, or privileges) for students who complete quizzes within a specific timeframe.
Perhaps if could be available offline as well, to support students without data.
Incorporate Real-Life Scenarios: Frame quiz questions around real-world applications or relatable examples to make them more engaging.
Implement Classroom Trophies: Create a physical trophy or rotating award for the "Quiz Champion of the Week" to motivate participation.
Encourage Peer Challenges: Allow students to nominate peers to take specific quizzes or challenges, adding a personalized competitive element.
Integrate Post-Quiz Discussions: Conduct brief, interactive discussions after quizzes to review top scores, common mistakes, and strategies for improvement.
Use Visual Scoreboards: Display leaderboard results on a classroom projector or whiteboard to increase visibility and excitement.
Create Collaborative Quizzes: Encourage students to contribute questions for future quizzes, giving them ownership of the learning process.
Set Up Progressive Goals: Announce specific achievement goals, such as "Complete three quizzes in a row with 80% or higher" to encourage consistent effort.
Plan Class Celebrations: Organize small class celebrations or acknowledgments (e.g., applause, snacks) for groups or individuals with high engagement in quizzes.
Introduce Friendly Rivalries: Pair students with similar performance levels for one-on-one "quiz duels" during or after class to create healthy competition.

Figure 16

What improvements or enhancements would you like to see in Quizalize tools or practices in education?
Personalized Rewards: Provide small, tangible rewards like stationery, stickers, or certificates for top performers or consistent participants.
Themed Quiz Sessions: Design quizzes around interesting themes like holidays, sports, or pop culture to make them more engaging.
Rotating Quiz Master: Allow students to take turns being the "Quiz Master," responsible for reading questions or reviewing answers, creating a sense of ownership.
Interactive Quiz Names: Give quizzes fun, creative names that resonate with the topic or class interests (e.g., "Battle of the Brains" for general knowledge quizzes).
Peer-Generated Questions: Invite students to contribute quiz questions, giving them an active role in the learning process.
Classroom Scoreboard: Use a physical leaderboard (on a whiteboard or poster) to track quiz performance over time, creating a visual sense of progression.
Classroom Scoreboard: Use a physical leaderboard (on a whiteboard or poster) to track quiz performance over time, creating a visual sense of progression.
Surprise Challenges: Introduce surprise bonus rounds with quirky or humorous questions unrelated to the core material for added fun.
Visual Celebrations: Use simple in-class visuals (e.g., balloons, stars, or emojis on the board) to celebrate quiz milestones or top performers.
Team Challenges: Divide the class into teams to foster collaboration and create a supportive competitive environment.
Quiz-Based Stories: Frame quizzes within a narrative or story (e.g., "Unlock the treasure chest by answering the questions correctly").
Class-Level Rewards: Offer collective incentives like extra break time or a class treat when everyone achieves a certain score threshold.
Role-Playing Quizzes: Assign students roles (e.g., "scientist," "historian") during quizzes, where they answer questions related to their character.
Minute-to-Win-It Quizzes: Introduce timed challenges where students answer as many questions as possible within one minute.
Friendly Rivalries: Pair students or teams for head-to-head quiz competitions, fostering camaraderie and light-hearted competition.

Figure 17

What improvements or enhancements would you like to see in Quizalize tools or practices in education?
1.Visualization
I would like to see it integrated with the learning management system that we currently use at school.
I'd like to see what we call "Adaptive Difficulty Adjustment". Where they adjust question difficulty based on student performance.
More quizzes with different cognitive levels.
I would like for it to be integrated into our learning management system.
Use Digital Game-based Learning.
Distinguish Between Students.
Make Use of Flipped Classroom Model.
Promote Collaborative Learning.
Communicate with Coworkers.
While Quizalize supports multiple-choice and true/false questions, adding formats like open-ended questions, drag-and-drop, and short-answer responses would allow for a broader range of assessment types, helping to
A storyline-based learning path, where students unlock new chapters or levels by achieving quiz goals, could add a narrative layer to learning, increasing sustained engagement and encouraging curiosity.
Adding features for students with disabilities, like text-to-speech for visually impaired users or closed captions for videos, would make Quizalize more inclusive. Offering customization for font size and color contrast
Integrating AI-driven analytics that analyze student responses and automatically adjust question difficulty, frequency, or topic coverage could provide a more personalized learning experience.
While Quizalize already has some customization options, it would be great if teachers could create more varied types of assessments. For example, the ability to incorporate multimedia elements like videos or audio clips
in quizzes would make it even more interactive. It could also be helpful to allow for open-ended questions where we could write out our answers, giving us a chance to demonstrate deeper understanding beyond multiple-
While Quizalize shows progress over time, I think it would be more useful if there was a more detailed breakdown of strengths and weaknesses. For example, tracking the topics or types of questions that I repeatedly
struggle with would help me focus my studies. Having a personalized report on where I need the most improvement would guide me in my preparation for upcoming exams or assignments.
N/A
Personalized Learning Paths – It would be helpful if Quizalize could suggest personalized learning paths based on my performance. For instance, if I struggle with certain topics, it could recommend quizzes or resources
Offline Mode – Sometimes, especially when studying on the go or in areas with limited internet access, it would be useful to have an offline mode where students can download quizzes and complete them without needing a
constant internet connection. This would make it more convenient for students to engage with the material at any time.

Figure 18