Book Widgets as a gamification tool to support teaching and learning in Grade 5

by

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Submitted in fulfilment of the requirements for the degree of
Magister Educationis
in the
Department of Science, Mathematics and Technology Education
FACULTY OF EDUCATION

at the

UNIVERSITY OF PRETORIA

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August 2023

Declaration

I declare that the dissertation, which I hereby submit for the degree of MEd Science, Mathematics and Technology Education at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

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DEGREE AND PROJECT	MEd Book Widgets as a gamification tool to support teaching and learning in Grade 5
INVESTIGATOR	Ms. Sabeehah Anver Allie
DEPARTMENT	Science Mathematics and Technology Education
APPROVAL TO COMMENCE STUDY	21 October 2022
DATE OF CLEARANCE CERTIFICATE	22 June 2023
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- Compliance with approved research protocol,
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Dedication

This research is dedicated to my mother, who always believed in me and encouraged me to pursue my dreams. Throughout this journey, she has been my greatest source of strength and inspiration. She has always been a source of unconditional love and support for me and I am forever grateful.

Acknowledgments

My sincere gratitude goes out to the following individuals for assisting me in reaching this milestone in my life. My mother, who provided me with strength and encouraged me to pursue my dreams and supported me in whatever endeavour I chose. My friends, who were always available to listen to me, motivate me, and supported me in times of need. They have also provided me with moral and emotional support. Throughout the course of the process, my colleagues were supportive and provided me with valuable feedback and constructive criticism. In particular, I would like to thank my supervisors, Dr Kimera Moodley and Dr Mari van Wyk, for their guidance, advice, and constant compassion, as well as their support and encouragement. They also provided me with valuable comments and suggestions. I am very grateful for their assistance and would not have been able to reach this level of success without them. I cannot thank them enough for their dedication and commitment. I am truly fortunate to have such exceptional mentors.

Abstract

Gamification has been demonstrated to be helpful in enhancing educational activities as well as motivating students to learn. This study explored the use of a gamification tool to support teachers when facing students with low levels of engagement and participation. Considering the impact of the COVID-19 pandemic and the excessive use of online learning, students have lost interest and motivation to learn in the classroom. Hence, gamification tools like Book Widgets were used to encourage motivation, engagement, and participation to enhance student learning. The research questions guided the study, examines the gamification elements within Book Widgets and demonstrates how the elements are used to motivate students and improve engagement and participation. To address these questions, a gamification evaluation rubric was used, along with a qualitative research design using semi-structured interviews with students from Grade 5 in a private primary school located in Riyadh, Saudi Arabia. In this study, the researcher aimed to gain a better understanding of how the gamification elements in Book Widgets support teaching and learning by providing students with motivation, engagement, and participation within the classroom.

Guided by the gamification taxonomy, the results of the analysis showed the students were motivated to learn more and that gamification elements, like badges, time frames, and animations, helped enhance classroom engagement. Moreover, gamification elements in Book Widgets have shown to improve students' attention, motivation, and engagement, as well as participation in various learning activities. Further, the study made a significant contribution to the scholarly community at several levels. Firstly, this study provided an in-depth understanding of the gamification elements of the Book Widget application and how they motivate students both intrinsically and extrinsically and promote engagement and participation in the classroom. Secondly, the researcher is now aware that the Book Widget application does support teaching and learning in the classroom through the incorporation of gamification elements. Lastly, the study contributed to a knowledge gap in gamification regarding the value of gamification elements in education.

Keywords: Book Widgets, engagement, gamification, gamification elements, motivation, participation

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DECLARATION

To whom it may concern,

I hereby declare that I language edited the mini-dissertation authored by **Sabeehah Allie**, titled: ***Book Widgets as a gamification tool to support teaching and learning in Grade 5***

All aspects of this mini-dissertation were carefully looked at, corrections made and suggestions given with regards to certain wording and sentence structure, however, the academic content was not influenced in any way. The layout and presentation as well as the referencing of this mini-dissertation were edited as per the referencing and technical/style template/guide provided by the client. Final acceptance of all proposed corrections/changes/comments is at the discretion of the author.

Kind regards

Janine Ellis

Janine Ellis

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1. CHAPTER 1: GENERAL ORIENTATION

1.1 Introduction and Background

Gamified experiences have emerged prominently in the education environment through the integration of gamification elements in teaching and learning. Gamification elements refer to the strategies used in games to enhance activities. Adopting gamification in teaching and learning increases efficiency, motivation, and learner engagement which leads to successful learning (Simões et al., 2013).

According to Kapp (2012), gamification has the potential to motivate learners and capture their attention in learning activities. As part of the gamification process, game mechanics or elements are often added to an experience in order to improve engagement and enjoyment of the learning process (Wright, 2023). Since the extensive use of technology and the growing interest in student experience have contributed to a growing interest in gamification in recent years (Koivisto & Hamari, 2019), gamification has gained a significant amount of attention.

A thorough literature review (Chapter 2) has been conducted to explore existing studies on gamification in education. The effectiveness of gamification in education has been examined in numerous studies, and researchers have explored how gamification can improve learning outcomes, enhance engagement, and motivate students (Azzouz Boudadi & Gutiérrez-Colón, 2020; Ku et al., 2013; Smiderle et al., 2020). Nevertheless, there have been few studies on how gamification tools, such as the Book Widget application, can motivate student learning and promote engagement and participation. Motivation and engagement hold substantial importance in teaching and learning, as they are recognised as facilitators for both immediate and enduring academic success and achievement (Reschly & Christenson, 2012). Therefore, this study will explore the use of Book Widgets as a gamification tool to support teaching and learning in Grade 5. It seeks to bridge the existing knowledge gap by highlighting the effectiveness of gamification tools such as Book Widgets in boosting engagement, thereby making learning more enjoyable and motivating for students, especially in subjects where traditional methods might fail to capture their interest (Selawsky, 2021).

The literature review reveals several key findings. First, gamification has proven to be an effective method for captivating users and motivating them to complete various tasks. By incorporating elements of gamification, such as points, scoring, badges, leader-boards, and challenges, students are more likely to stay engaged and actively participate (Vesa & Harviainen, 2018). Second, gamification technologies can be adopted in educational institutions to create interactive exercises combined with gamification elements to promote learning, respond to the learners' learning needs, and facilitate formative and summative assessment through smart devices, such as smartphones, tablets, and laptops (Flores, 2015). When game mechanics and dynamics are incorporated into educational activities, students are motivated to learn and retain information more effectively (Koivisto & Hamari, 2014). Third, gamification elements can contribute to student motivation by rewarding them for achieving success in learning activities, which may enhance their engagement and participation (Furdu et al., 2017; Landers et al., 2017).

To better understand the gamification elements within a specific gamification technology such as Book Widgets, the gamification taxonomy framework (Toda, Do Carmo et al., 2019) will guide the study and describe key dimensions in which gamification occurs. This taxonomy will provide an understanding of how these dimensions are represented in the literature. These dimensions include ecological, social, personal, fictional, and performance dimensions. The gamification taxonomy framework also presents a systematic structure for understanding the diverse elements employed in the Book Widgets application.

1.2 Key Theoretical Concepts

This section focuses on clarifying the theoretical concepts (see Table 1 below) that are used in this study.

Table 1: Key theoretical concepts

Concept	Definition
Engagement	This is a level of attentiveness, interest, and passion that students display when learning, along with the motivation to learn and improve (Bernstein, 2022).
Extrinsic motivation	The desire to earn rewards or avoid punishment. The primary motivator is external (Tranquillo & Stecker, 2016).

Gamification	The adoption of elements and concepts of games to fulfil learning outcomes (Burke, 2014).
Gamification Elements	Features of games that can be integrated into teaching and learning (Landers et al., 2017).
Intrinsic Motivation	Motivating oneself intrinsically means having a desire to succeed to advance personally. The primary motivator is internal (Keller, 2009; Tranquillo & Stecker, 2016;).
Motivation	The act of selecting, initiating, increasing, or persisting in goal-directed behaviour during interactions between the learner and the environment (Pintrich, 2003).
Participation	The participation involves learners being active and engaged in the classroom, taking part in the learning activities as well as being interactive during lessons (Bergmark & Westman, 2018).

1.3 Problem Statement

As a result of the COVID-19 pandemic, the biggest challenge teachers face when teaching, is a lack of engagement and participation of students in learning activities. Initially, most schools began using online learning platforms during the COVID-19 pandemic. Learners are now used to learning online, therefore returning to school with the same traditional methods of rote learning may result in students losing interest and motivation in certain aspects of learning (Su & Cheng, 2015). As highlighted by Helsa & Lidiawati (2021), prioritizing student engagement is essential due to the shift in learning methods with gadgets, like mobile phones and laptops, leading to physical isolation. This change has resulted in social ramifications such as increased social anxiety, stress, and reduced confidence in social settings, ultimately diminishing students' sense of social connection (Skinner et al., 2008). Thus, integrating elements from games, aimed at entertainment and engagement, into the learning process can make lessons more captivating for learners, sustaining their focus and motivation. Gamification, as seen in literature, encourages student engagement and participation (Mirzoyan, 2021). Therefore, integrating gamification elements in teaching could enhance the learner’s interest and motivation as well as improve the learner's engagement and participation.

1.4 Aim of the Research

The main aim of this study is to investigate how Book Widgets can be used as a gamification tool to support teaching and learning.

1.5 Purpose of the Research

The purpose of this study is to provide insight into how the gamification elements of the Book Widgets application can be used to support teaching and learning in classroom instruction to increase motivation, engagement, and participation.

1.6 Research Questions under Investigation

To achieve the research purpose, the following main and secondary questions are posed:

- Main research question:
  How can Book Widgets be used as a gamification tool to support teaching and learning in Grade 5?
- Secondary questions:
  - SRQ1:
  What are the gamification elements that are used in Book Widgets?
  - SRQ2:
  How do the gamification elements in Book Widgets motivate student learning?
  - SRQ3:
  How does the Book Widgets application improve engagement and participation in the classroom?

1.7 Methodology

The focus of this qualitative case study within the interpretivist paradigm was to obtain in-depth information and to gain insight into ways in which gamification elements can support student learning. In preparation for this study, the gamification evaluation rubric was used to evaluate the gamification tool, Book Widgets, and the study's data collection instruments were based on the dimensions of the gamification taxonomy framework as discussed in Chapter 2. The research design is summarised in Table 2 below, while a more detailed description is presented in Chapter 3.

Table 2: Summary of the methodology

Sub-Research Questions	Data Collection Instruments	Sample Source
SRQ1: What are the gamification elements that are used in Book Widgets?	Gamification evaluation rubric	Book Widgets application evaluated by the researcher
SRQ2: How do the gamification elements in Book Widgets motivate student learning? SRQ3: How does the Book Widget application improve engagement and participation in the classroom?	Semi-structured interviews consisting of 12 open-ended questions	10 Grade 5 learners purposively selected

1.8 Ethical Considerations

The ethical issues considered include informed consent, confidentiality, voluntary participation, and protection of participants. As part of this study, ethical procedures were followed in accordance with the policies of the University of Pretoria and the Protection of Personal Information (POPi) Act, and permission was obtained from the school. Further details concerning the ethical considerations can be found in Chapter 3 in section 3.8.

1.9 Chapter Summary

This chapter frames the study and provides the underlying questions that the study intends to explore. Gamification, which is well known in the field of education, will be explored using the Book Widgets application among Grade 5 students. An examination will be conducted on the motivation, engagement, and participation of students. Book Widgets will be used as a measure of how gamification can support the teaching and learning process. As part of this chapter, background information is given regarding the topic, a problem statement, the aims of the research, the purpose of the research, the research questions under investigation, key theoretical terms, short description of the methodology, as well as the ethical considerations. In the upcoming chapter, a thorough analysis of the current body of literature related to the research subject will be presented, along with a detailed explanation of the theoretical framework that shapes the study. This chapter aims to provide a comprehensive

understanding of the existing scholarly work and the theoretical principles that guide the research.

2. CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

According to Kiryakova et al. (2014), the primary challenge faced in modern education revolves around the absence of student engagement and motivation to actively participate in educational tasks. As a result, educational games have the potential to be utilised as a method of delivering educational material within the classroom setting. Several studies have been conducted examining how games can facilitate learning (Dichev & Dicheva, 2017; Knutas et al., 2014; Vlachopoulos & Makri, 2017). According to Soflano et al. (2015), game-based learning, serious games, and gamification have become prominent research concerns. Game-based learning involves the utilisation of elements found in games to teach students a particular skill or achieve specific learning objectives. The learning experience is enhanced by its ability to provide core subject content and objectives as well as make learning enjoyable. According to Michael and Chen (2005), serious games are computer-based games that are primarily intended to accomplish non-entertainment-related goals. They can range from advertisements to military training exercises. Gamification, on the other hand, refers to the application of game mechanics to non-game contexts with the aim of promoting engagement and drive learning outcomes (Laning, 2020). The gamification process involves amongst others, using points, badges, leader-boards, and incentives to increase engagement and participation. A significant difference exists between game-based learning, serious games, and gamification in terms of the extent to which the game mechanics are integrated into the learning process. Game-based learning encompasses both serious games and gamification, however, the game itself serves as the basis for training. Instead, gamification involves using game elements to motivate students to achieve their training goals (Findlay, 2016). The purpose of this study is to utilise gamification (game mechanics) as a motivating and engaging tool for students. Serious games or games that are specifically designed to facilitate specific learning outcomes, were not included in the current study. In this chapter, the existing literature will be reviewed on the research topic of Book Widgets as a gamification tool, to support teaching and learning in Grade 5. As part of this study, the scope of the literature includes information on the concept of gamification, the gamification elements in education in terms of the value of common gamification elements, and the application evaluation based on gamification elements as well as

the implications of gamification for designing learning environments, gamification in teaching and learning, Book Widgets in teaching and learning, and the gamification taxonomy framework.

2.2 The Concept of Gamification, Game-based Learning, and Serious Games

The use of digital technology has significantly influenced the students of today. They are continually integrating technology into their daily lives, especially through gamification (Facer & Selwyn, 2021). As game-based learning, serious games, and gamification are all interconnected (Armstrong & Landers, 2018), the definition of gamification is often misunderstood, even though their concepts differ. Therefore, there have been numerous approaches in the literature to define the concept of gamification. Kapp (2012) describes gamification as the process of improving students' learning and problem-solving abilities using game-based mechanics and game-thinking approaches. Using game-thinking approaches facilitates more creative, faster innovation, and more engaging experiences by combining game design with systems thinking and design thinking (Kim, 2017). Alternatively, Deterding, Sicart et al. (2011) have defined ‘gamification’ as using elements and techniques of game design in a non-gaming environment. Similarly, Muangsrinoon and Boonbrahm (2019) state that gamification, which involves incorporating game elements and techniques into non-game environments, can motivate learners and increase their engagement in learning.

In contrast, according to Spires (2015), game-based learning goes beyond the mere development of games for student entertainment, but also encompasses the creation of interactive learning activities that facilitate the gradual transmission of concepts and guide students in achieving a specific objective. In addition to offering a variety of educational benefits, serious games also provide engaging and motivating experiences, interactive learning environments, and opportunities for collaboration. Both game-based learning and serious games are effective educational tools that facilitate student learning and meet their educational needs. Gamification aims to maximise students’ satisfaction and interest in learning by capturing their attention and motivating them to continue learning (Kapp, 2012).

Gamification encompasses a variety of components which can be divided into two sections: dynamics and mechanics (Bunchball, 2010). The gamification concepts and elements that are included in both components are similar, despite their terminologies and approaches. Mechanics refer to the components of gamification that establish the rules, procedures, and algorithms of the game. Furthermore, badges, points, leader-boards, levels, and challenges are popular incentives employed to motivate students (Hamari et al., 2014). In contrast, dynamics are abstract ideas that arise from the interaction between students and game mechanics. Examples of these dynamics include achievement, competition, status, and progress monitoring (Uz Bilgin & Gul, 2019).

Using gamification components of mechanics and dynamics, gamification aims to elevate intrinsic and extrinsic motivations through gameplay and game-like approaches in order to motivate students and enhance engagement and participation (Järvinen et al., 2002). An intrinsic motivation method involves integrating ideas and elements to cultivate an engaging experience for students, where students are motivated to participate irrespective of the reward, whilst extrinsic motivation involves the use of gamification elements, such as points scoring and leader-boards to enhance learning (Marczewski, 2017). Gamification is a method by which teachers can integrate aspects of a video game design into their teaching environments. Therefore, the integration of elements found in video games, such as game mechanics and game dynamics, within non-game applications and programs, plays a crucial function in facilitating and supporting teaching and learning (Koivisto & Hamari, 2014). It is usually intended to boost the learning experience by making it more engaging (Blankman, 2022). In addition to maintaining students' intrinsic or extrinsic motivation and engagement, gamification also enables them to actively take part in learning activities and tasks (Cheung & Ng, 2021).

Liu et al. (2017) report that gamification has been demonstrated to improve students' engagement and participation in educational activities. Further, it has been found that gamification elements can enhance students' engagement by encouraging them to think critically and solve problems (Mee Mee et al., 2020).

Aside from using game mechanics and dynamics in non-game settings, gamification is also capable of influencing behaviour, motivating learners, and increasing

engagement through an attractive learning environment and rewarding learners (Kam & Umar, 2018). Moreover, gamification may facilitate deep learning, enhance the retention of information, stimulate collaborative learning, and motivate students to solve problems (Buljan, 2021). The concept of gamification does not entail the creation of a game, but rather the performance of game-like tasks that integrate didactic content. According to some scholars, however, gamification should be carefully considered and planned before implementation, regardless of how beneficial it might be for low-performing students (Cheng, 2020).

According to Sudhakar (2017), a dramatic increase in school dropout rates is indicative of a general lack of motivation among students. This lack of drive and enthusiasm appears to be significantly impacting the commitment of students to education and, subsequently, their perseverance to remain engaged in the learning environment. Sudhakar's assertion underscores the critical role of motivation as a driving force behind students' sustained interest in the learning process (Herpratiwi & Tohir, 2022). As a result, incorporating game elements into education is logical, since many facts associated with games and training are prevalent (Glover, 2013). Regardless of how it is presented, game elements can enhance both intrinsic and extrinsic motivation through engagement. As indicated by McCarthy (2021), some criticise the practice of rewarding students for their accomplishments, contending that it is counterproductive since the focus is more on receiving prizes than learning. Thus, students' performance is highly influenced by the type of work they must complete and the rewards they receive. It has been proven, however, that game elements have a positive influence on education, which is why many researchers have investigated the benefits of rewarding students with games, resulting in favourable results, such as increased engagement, participation, motivation, and cooperation (Hakulinen & Auvinen, 2014; Tvarozek & Brza, 2014). Therefore, gamification offers students an opportunity to gain independent learning skills, competence, and relationships through self-directed learning.

2.3 Gamification Elements in Education

To implement gamification, elements such as points, scoring, badges, and leader-boards could be incorporated into the existing curriculum (Wang et al., 2022), to enhance the learning process. Incorporating gamification elements into the teaching

and learning process can lead to increased motivation and interest among students. As a result, students are more likely to actively engage with the subject content, leading to higher levels of concentration and enjoyment of the activity (Furdu et al., 2017; Landers et al., 2017).

2.3.1 Value of common gamification elements

According to Dominguez et al. (2013), a variety of gamification elements are being employed to engage students in the classroom, such as rewards, challenges, points, badges, and leader-boards. A student's learning experience is vastly improved when they are motivated and focused. Incorporating gamification elements into education will increase engagement and participation of both students and teachers (Ghavifekr et al., 2016; Tan & Tan, 2020; Wang et al., 2022), making the learning process more enjoyable and fun. Emerging gamification elements in education in a non-gaming context has many learning benefits, including student motivation (Werbach, 2014). A student's motivation is one of the most important factors that determine a student's academic success, since it determines how much effort and time they devote to learning and the likelihood that they will succeed in their educational outcomes (Linehan et al., 2011; Mee Mee et al., 2020)

Various gamifications elements were identified from the research of Alsawaier (2018); Osatuyi et al. (2018); Pedreira et al. (2015); and Souza et al. (2018). These elements consist of achievements, rewards (given upon completion of a task), points (rewards in the form of points), story, time, personalisation, and micro-interactions. Accordingly, developers should consider learners' preferences rather than presuming an all-in-one approach, where learners are expected to adopt popular elements (such as badges and point systems) that are imposed on them. The following gaming elements were derived and are presented in Table 3 below (Alsawaier, 2018; Osatuyi et al., 2018; Pedreira et al., 2015; Souza et al., 2018). The relevancy to the learning environment is also indicated.

Table 3: Common gamification elements

Game element	Examples	Relevance to Learning Environment
Achievement (Progression)	• Points • Badges • Levelling • Leader-boards • Progression bars • Certificates	Points, badges, levelling, leader-boards, progress bars, and certificates are common elements of online games that reward students for their achievements and provide progress as they advance. Simple methods of focusing learners' attention can include using a schedule of events (e.g., before doing 2 and 3, I must complete 1)..
Rewards	• Equipment used in a game is composed of tools and other resources • Collectible items • Bonuses • Power-ups	Online games reward students for completing tasks through collectibles, bonuses, and power-ups. Additionally, these items motivate students to continue playing and progressing in the game. In order to demonstrate intelligence or awareness, repurpose previous responses. For instance, retrieve an earlier response later in the game. Engaging and motivating learners through personalisation, adds an extra dimension to their learning experience.
Story	• Narrative arc • Quest: The hero's journey	Whether the story is based on an adventure setting, a scenario that involves thwarting a disaster, or a narrative in which the learners beat the competition, learners are motivated and engaged. By adding characters, conflicts, and audiobooks, the learning experience will be integrated into a compelling narrative.
Time	• Countdown • Schedule	There are often timers in online games that indicate the amount of time remaining and countdown clocks to emphasise the urgency of completing the game objectives. Using a schedule of events (e.g., before I do 2 or 3, I must complete 1) can assist in focusing learners' attention on the task at hand.
Personalisation	• Choosing an avatar • Avatar customisation • Naming of characters • Interactive conversation	A personalisation solution is now easier than ever with HTML5 and dynamic CSS. Avatar selection and customisation, look-and-feel options (e.g., dreamy themes or bright colour schemes), can all be customised to suit individual preferences. Learners' input fields can be used to gather information. In the case of a learner who enters a nickname in a text field, the nickname should be used throughout the environment or narrative. In order to demonstrate intelligence or awareness, repurpose previous responses. For instance, retrieve an earlier response later in the game. Engaging and motivating learners

Game element	Examples	Relevance to Learning Environment
		through personalisation, adds an extra dimension to their learning experience.
Micro interactions	• Toggles • Animated rollovers • Easter eggs	It is important to pay attention to details when creating a memorable experience. Gameplay is filled with numerous satisfying moments and micro interactions, such as hover-state animations, sound effects, and cut-screen narrations. However, be cautious not to overdo it. Utilise sound, subtle animation, and cool transition screens to provide nuanced environmental responses to learner actions.

Source: adapted from Jackson (2017)

Incorporating these gamification elements into education, enhances the learning experience and makes it more enjoyable (Alsawaier, 2018). The most used game design elements are the achievement or progression element, with examples such as badges and leader-boards. A badge is a digital credential awarded for achieving a particular skill, while a leader-board is an overall ranking of a student's performance (Alaswad & Nadolny, 2015; Grant, 2014). It has been shown in Table 3 that several key elements of a game, such as points, badges, and leader-boards, can be efficiently applied to non-game contexts as a means of motivating students (Deterding, Khaled et al., 2011; Faiella & Ricciardi, 2015; Seaborn & Fels, 2015).

In gamification studies, badges represent the skills and achievements of users, and they appear as an acknowledgment of the users' achievement after they have accomplished certain tasks (Da Rocha Seixas et al., 2016; Grant, 2014). By awarding badges, students can keep track of their accomplishments and as a result, improve their performance (Abramovich et al., 2013; Johnson et al., 2016; Lewis et al., 2016; Looyestyn et al., 2017; Seaborn & Fels, 2015). According to Kapp (2012) and McDaniel and Fanfarelli, (2015), badges are used to provide users with instant feedback and monitor their performance after completing a task. In addition to receiving badges as rewards for completing a task, students may become more motivated and less likely to procrastinate (Haaranen et al., 2014).

Digital leader-boards provide rankings based on student performance. A leader-board allows individuals to receive individual feedback based on their accomplishments and

progress, while a group leader-board allows peers to compare performance (Landers & Landers, 2014; Nebel et al., 2017). Leader-boards can provide students with the motivation to achieve their goals and improve their performance (Landers et al., 2017). By guiding learners to set goals and displaying the outcomes, the leader-board provides a clear picture of their progress (Majuri et al., 2018). As a gamification element, leader-boards permit participants to engage interactively through competition and cooperation (Huang & Soman, 2013). By maintaining a running leader-board and sharing accomplishments, students are encouraged to stay motivated in the learning environment (Nah et al., 2014). According to O'Donovan et al. (2013), leader-boards increase learners' motivation more than progress bars, badges, and awards.

A gamified activity not only rewards students with points and badges, it also provides an opportunity for them to engage with the game, receive feedback, and feel accomplished by participating (Kapp, 2012). Thus, incorporating these elements can create a more engaging learning environment that improves learning, motivation, and effectiveness.

2.3.2 Application evaluation based on gamification elements

Recently, teachers have shown a considerable interest in determining the educational possibilities offered by online game-like activities, with the aim of improving students' learning experiences (Hava & Cakir, 2017). Even though the outcomes of various studies are quite positive, it appears that a significant number of teachers have difficulty understanding the methods through which gamification elements can be effectively utilized to augment the learning experience (Ke, 2014). In most cases, this is since teachers tend to focus only on the gamification application itself, rather than the elements that are employed. As shown in Table 3, the common gamification elements include achievement, rewards, stories, time, personalisation, and micro interactions. According to Alsawaier (2018); Osatuyi et al. (2018); Pedreira et al. (2015); and Souza et al. (2018), these elements can enhance motivation, engagement, and participation in the classroom. However, from a teacher's perspective, there are other elements in gamification tools that should also be taken into consideration. Based on the evaluation rubric presented by Altanis et al. (2018), instructions and training elements, for instance, are fundamental to ensuring that a user is aware of relevant information regarding the application. If the information is not

conveyed effectively, the users' experience may be negatively impacted (Altanis et al., 2018). Moreover, the lack of knowledge can make the games 'unfair' and challenging for users. Thus, information received by the user is crucial to their experience with the application and gameplay (Editorial Aela, 2022). It is vital that an application is user-friendliness, since it determines the application's success in terms of readability, navigation, and compatibility, as well as enhancing user satisfaction, which may provide teachers with an indication of whether the application is appropriate and easy to use (Jones, 2021). The playability and usefulness elements are also significant as playability is widely recognised as one of the key concepts reflecting the overall excellence of a game in terms of its rules, mechanics, objectives, and design (Sánchez et al., 2012). According to literature, usability has also been recognised as a crucial aspect contributing to the triumph of interactive applications (Maguire, 2001). As a result, playability and usability can contribute in providing teachers with an indication of how effective the application is at providing a functional gaming experience.

Moreover, as mentioned by Dahabiyeh et al. (2021), curiosity is regarded as a significant individual element that impacts both the assessment of risk and the choice to engage in the game. In this regard, curiosity is one of the elements that can assist teachers in determining whether the games in applications are likely to create a sense of curiosity in students to increase participation (Jirout & Klahr, 2012; Litman, 2008; Litman, 2010). In addition, a simple, clear, and efficient navigation allows users to quickly understand what the application offers, as well as enable them to explore further by searching the application quickly and effortlessly. In the application, the ease of navigation breaks up the information into consistent, easy-to-digest chunks, so that users can browse with ease and is more likely to stay on the application for longer (Jones, 2021). As such, the easy-to-navigate element provides a sense of whether the application is worth using in terms of its simplicity and ease of use.

In addition to the gamification elements in Table 3, the following elements should therefore be analysed to provide a detailed analysis of an application's performance, namely instructions and training, user-friendliness, playability and usefulness, curiosity, and ease of navigation (Altanis et al., 2018). These elements assist teachers in understanding that there is more to motivating students and encouraging

engagement and participation than simply points and badges. The following section will explore the Implications of gamification in designing a learning environment.

2.4 Implications of Gamification in Designing a Learning Environment

For teachers to use gamification effectively, they need to consider the learning outcomes, then plan and select tools that fit the kind of learning (Kiryakova et al., 2014). They also need to make sure that the environment is conducive to learning. Consequently, learning designers are faced with implications when gamification is introduced. These implications include practice opportunities, learner engagement, assessment, and feedback (Tay & Lam, 2022).

2.4.1 Practice opportunities

Though the saying goes 'practice makes perfect', neuroscience and education research indicate that over time, practice has positive effects, such as explicitly teaching, reinforcing, and incorporating regular opportunities for students to develop social, emotional, and cognitive skills during the school day (Darling-Hammond et al., 2020). It is through repeated practice of differentiated tasks that teachers can acquire competence and enhance the transfer of knowledge, therefore, allowing them to incorporate best practices to provide all their students with the knowledge and skills necessary to attain proficiency (Anderson, 2007). Gamification is a very effective method for keeping learning activities at the forefront of the learning process, in other words, activities are challenging enough without being too demanding. For students to retain information, practicing games is beneficial (Zahedi, 2019). It is through repetition that students learn, which is why the repeat function in games is so valuable. Therefore, students can learn as they practice through repeating games or even tell a story through gameplay as they build on their previous game knowledge (Burke, 2022).

2.4.2 Learner engagement

According to Barkley and Major (2020), learner engagement is a mental state that students are in when learning. It represents how they feel and how they think about learning as well as their eagerness to be involved in the learning process. Engagement in the learning process enables learners to pay attention, focus, and engage as well

as think critically on a higher level, since they care about the subject and feel motivated or excited to learn (Amerstorfer & Freiin von Münster-Kistner, 2021). A combination of short, discrete puzzle-solving activities coupled with reward systems and progress meters ensure that brain activity is sustained and attention is maintained. Players are more likely to remain engaged as they progress through quests, unlock milestones, and accumulate rewards or status symbols (Jackson, 2017). Several game mechanics are designed to naturally appeal to intrinsic and extrinsic motivations. As such, gamification in education combines elements of game design with the goal of improving learning outcomes, enhancing the enjoyment of monotonous tasks, and encouraging students to participate in the educational process (Liu et al., 2017).

Incorporating gamification into a learning context can facilitate the construction of higher-level knowledge by providing learners with trial-and-error opportunities that are ambiguous and challenging, thus, boosting their level of active engagement (Wu et al., 2012. By using gamification, learners can enhance their comprehension of the subject matter in conjunction with a more effective and efficient method of learning. For example, when gamification is incorporated into math homework and assignments, gamification is seen as an effective method of increasing participation and engagement in classrooms. This process involves learners accumulating points and determining their ranking among each other (Plass et al., 2015).

2.4.3 Assessment

As stated by Bransford et al. (2000), assessment plays a central role in the educational process. In the assessment process, a variety of tools or methods are employed to measure students' learning progress. The assessment process is, however, often embedded in the learning activities during a module and is not limited to a high-stakes examination at the end of a unit. As part of educational gamification, assessment is incorporated into the gameplay as a performance-based activity. In the assessment of success, the cause-and-effect variable is affected by a player's decision (or the absence of their choices) (Shute & Ke, 2012). Imagine assessing the performance of real-life performance variables in the same manner. This results in the identification of a much broader range of competencies and improvement areas. Therefore, it is imperative to create assessments in educational games that are valid, reliable, and

practical (to maintain engagement) to enhance school learning environments (and elsewhere) (Shute & Ke, 2012).

A learning outcome describes what a student is expected to understand, know, and exhibit by the conclusion of the learning process. In addition, learning outcomes must be capable of being validly assessed. Through the correlation of teaching, learning outcomes, and assessment, students can have a more meaningful learning experience (McCarthy, 2011). While assessing students' knowledge, teachers are faced with the following questions: ‘How will I ensure that they have achieved the learning outcome they are aiming for?’ and ‘What will I do to measure their success in achieving this learning outcome?’ As a means of enhancing online learning outcomes, gamification could be used to enhance engagement, retention, and satisfaction among learners (Buljan, 2021). The integration of gamification and online learning can assist in evaluating students' understanding and learning outcomes by utilizing surveys, questionnaires, quizzes, tests, and reports. Gamification tools, such as Classcraft, Kahoot, or Book Widgets provide students with the means to monitor their own growth, performance, and behaviour. As a result, the use of gamification to assess student outcomes can provide students with immediate and constructive feedback while reinforcing their learning (Ryan, 2022).

2.4.4 Feedback

Feedback is a vital component of the learning process. Aside from boosting students' confidence, feedback improves their motivation and, ultimately, their performance. Through feedback, a student can identify what went wrong and learn from their mistake to improve in the future. When used in teaching and learning, feedback can significantly contribute to the process of acquiring knowledge, since it directly influences the teaching and learning process (Bordia, 2022). Gamification involves feedback as a reaction or response. During gameplay, the player executes an action, the game reacts to it, and the player responds to the situations generated by the game (Cieślak, 2021). There are several advantages to gamified activities, including the ability to calculate scores and answer questions. The use of gamification can be seen to provide real-time feedback to users in the form of points, meters, and dashboards that indicate resource allocation (Zapata-Rivera & Bauer, 2012). When applying incorrect logic or following incorrect process paths, natural consequences reveal

errors. One of the key components of adaptive learning is the ability to maintain a steady awareness of the learner's skill development. However, many games accomplish this for players using both simple metrics and complex algorithms (Zapata-Rivera & Bauer, 2012).

2.5 Gamification in Teaching and Learning

The concept of gamification in education does not necessarily mean you play games such as Scrabble or other similar games where skills can be practiced. It refers to how game elements (such as badges, challenges, and rewards) can be incorporated into learning activities (Limantara et al., 2019).

While gamification has been implemented in various settings, it has received considerable interest in the educational context (Hamari et al., 2014; Seaborn & Fels, 2015). To gamify learning, elements of games, including point scoring, competition among peers, teamwork, and score tables are employed, the aim is to actively involve students, help them absorb information, and assess their comprehension (Camilleri & Camilleri, 2020). Gamification incorporates elements of games to ensure that students will be interested in the content and actively participate in the learning process (Bordia, 2022).

Gamification in education has been demonstrated to be effective with considerable evidence. According to Zichermann and Linder (2013), game technologies have the potential to support the acquisition of fresh abilities, such as critical thinking and social skills. Moreover, the implementation of gamification has proven to enhance students' motivation and performance, as well as to foster social interaction than they would during a standard course of study. Thus, gamification is increasingly recognised as a viable method for addressing motivation and engagement challenges in the classroom (De-Marcos Ortega et al., 2017) rather than just focusing on entertainment.

According to Chapman and Rich (2018), gamification does not involve converting assignments into games. Instead, it attempts to enhance interaction by applying motivation principles from games to non-game contexts. As a teaching and learning approach, gamification can enrich student learning experiences in numerous contexts (Johnson et al., 2016). This led the current study to define educational gamification as

a technique in which student-centred game elements are used in non-game educational settings, to enhance student learning experiences (Buljan, 2021).

According to Martí-Parreño et al. (2016), gamification is extremely popular among teachers and presents a positive impact on their teaching practices. Several teachers believe that gamification can assist students in focusing, improving motivation, entertainment, and interactivity, as well as simplifying the learning process (Sanchez-Mena & Martí-Parreño, 2017). In a study conducted by Blumberg and Fisch (2013), it was found that the utilisation of gamification can enhance students' capacity to process and retain information as well as promote critical thinking and problem-solving (Best, 2020). As a result, gamifying teaching and learning may increase engagement and enhance learning experiences. Despite having positive experiences with gamification, Gupta (2022) believes that there are several downsides to gamification, one of which is the considerable time and financial investment required for its implementation compared to traditional methods. According to Malone and Lepper (1987), a well-developed game has certain mechanical elements which provide intrinsic rewards. Since mechanics are essentially used to control mechanical behaviour, removing the experience without removing the mechanics will have little or no impact on the psychology of the user. Thus, students who are not naturally competitive will not respond well to motivators like points, scoring, badges, and leader-boards which will eventually result in them losing interest.

Gamification comes with both positives and negatives as well as challenges. Sanchez-Mena and Martí-Parreño (2017) identified three primary challenges to implement gamification: insufficient resources, including a scarcity of time, training, and financial support; a lack of student engagement; and a lack of appropriate classroom settings. Although there are limitations to gamification in the classroom, it has the potential to enhance teamwork and foster deep relationships between students. Due to these reasons, gamification is being used increasingly in educational activities (De-Marcos Ortega et al., 2017) with extensive research being conducted to explore the incorporation of game elements in various educational settings, including elementary, secondary, and lifelong learning.

The development of rapid technological advancements has made gamification a prominent element of education, which is capable of motivating and engaging students

as well as teaching a wide range of subjects (Hamari et al., 2014; Toda et al., 2019). Accordingly, gamification could be used to teach mathematics and science literacy to students (Incikabi et al., 2019). Using a gamification platform, Buzzmath, which introduces mathematical concepts, students can engage in math in an enjoyable and engaging manner (Malartre & Laverdure, 2004). It nurtures their confidence in math, enables students to monitor their progress in real time, and offers educational games aligned with math curriculums. It facilitates autonomous learning and enables students to reach their full potential (Villarreal, 2023). Researchers have demonstrated that students' learning can be significantly improved by gamification and that gamification can promote their mastery of mathematics subjects (Bitter & Corral, 2015; Kim, 2015).

As a hands-on learning method, gamification can also embody a variety of learning theories to cater to the diverse needs of learners. The use of gamification can also be applied to English language teaching where well-designed games can be used to enhance and engage learners more effectively than any other method. Wordplay, language play, and digital platforms are among the methods for engaging learners with words, language, narratives, and role plays (Maloney, 2019). For instance, Duolingo is an educational platform that uses gamification. This platform allows users to practice and play while learning languages. For example, when learning a different language or improving your fluency in a foreign language, Duolingo provides instructions on how to use vocabulary words and grammar points in various contexts. Unlike most language classes, Duolingo teaches by context rather than through rote memorisation, which is not only unnatural, but also boring and ineffective when it comes to the retention of long-term memory. Using Duolingo, one can communicate effectively and remain engaged in the learning process (Lau, n.d.). As learners progress in their learning, they can acquire points, level up, and compete to stay motivated (Buljan, 2021). Using gamification can be beneficial to learners of all ages and levels of language, whether they are acquiring literacy skills, enhancing listening and speaking abilities, or working on critical thinking and problem-solving capabilities, as well as cultivating digital literacy competencies. When using gamification, learners can progress at their own pace, and there is a clear path of progression (Maloney, 2019).

Moreover, the concept of gamification is applicable in multiple contexts, and can be utilised in the classroom or classroom setting, including Book Widgets, Classcraft, Kahoot, and Google Classroom. Teachers have found Google Classroom and Book Widgets to be extremely valuable in supporting interactive learning to motivate students to become active participants in the educational process. Google Classroom is a free, cloud-based blended learning platform used in educational institutions to distribute, grade, and create assignments (Sukmawati & Nensia, 2019). One of the main purposes of Google Classroom is to facilitate the sharing of documents between teachers and students (McGinnis, 2022). In contrast, Book Widgets is an exceptionally useful tool for educators and curriculum developers since it allows them to create a wide variety of interactive content that can be assigned to students. Content can be shared in a variety of formats with students and comprehensive analytics on student performance are also provided (Karlin, 2016). However, even though Google Classroom was designed to facilitate the interaction between students and teachers in online classes, Book Widgets has gained popularity due to their compatibility with Google Classroom as well as several other well-known applications, such as Canvas, Moodle, digital whiteboards, and other electronic devices (Daily, 2020). As Book Widgets is compatible with Google Classroom, the application is far more effective at motivating students to learn and encouraging them to engage and participate in learning activities. Since Book Widgets is cross-platform, it can be installed on a variety of devices, regardless of their operating systems. Thus, the application has been optimized for mobile devices to provide users with the greatest convenience and ease of use (Renard, 2020).

The learners of today are born into a digital world and have a new profile. Due to their exposure to digital technologies, they have developed a different attitude toward the teaching and learning process and have higher expectations for the quality of education (Kiryakova et al., 2014). Thus, gamification in education has become increasingly popular since schools began utilising online learning platforms during the COVID-19 pandemic which caused physical institutions to close. As a result, gamification can be seen as an integral part of educational practices as a means of delivering educational content (Nieto-Escamez & Roldán-Tapia, 2021). The integration of gamification elements into online-based platforms increases learners' engagement and adds a sense of involvement using animations, leaderboards, and

other components of gamification design (Kallookaran & Robra-Bissantz, 2016). Among the applications used for gamification are Book Widgets which specifically address the contents of this study. According to Nieto-Escamez and Roldán-Tapia (2021), the same benefits of gamification may apply to the use of the Book Widgets application.

2.6 Book Widgets in Teaching and Learning

The Book Widgets application incorporates gamification elements; however, in its utilisation, it does not necessarily encompass all aspects typically associated with gamification. Notably, variations exist, including factors like student distractions (Araújo & Carvalho, 2022). Nevertheless, in today's digital classrooms, with more devices available than ever before, it is difficult for schools to choose a single platform that can meet a variety of needs. The Book Widgets application has been recognised as an effective way to support teaching and learning, since it allows teachers to create interactive activities for students through an easy-to-use platform. For example, Book Widgets contains more than 40 activity templates centred around various games, such as crossword puzzles, bingo sheets, and memory games, among others. For instance, the memory game shows that recognising a pair of terms provides a more accurate representation of the relationship between the terms, rather than only memorising them (Buckinx, 2020). It also assists learners in, for example, primary school classes, especially those struggling with learning activities. Several assessment activities are graded automatically, and instructions are provided for completing each assessment. The primary goal of this application is to offer teachers with the ability to monitor student activity in real-time. From the various activities offered by Book Widgets, students can utilise storytelling tools that integrate with seven different application tools that stimulate curiosity using picture- and video-based activities that keep students entertained in any subject area (Gómez-Maureira & Kniestedt, 2019; Tronçon, 2016). In a research investigation carried out by (Zaitun et al., 2021), the utilisation of Book Widgets as an educational tool provided students with a novel approach to learning English due to its distinctive features. The students exhibited enthusiasm, primarily driven by the diverse functionalities of Book Widgets, including engaging games. The incorporation of interesting and interactive media by teachers contributed to making the learning process more enjoyable for the students.

The educational industry is expected to witness rapid growth in the Book Widgets application, especially due to its ease of customisation and integration. Unlike other learning aids, Book Widgets is not restricted to one subject, however, the application covers a wide range of subjects. Since the application includes several features, such as quizzes, timelines, bingo games, hangman, flashcards, math features, such as spreadsheets and charts, as well as the capability to collaborate with images and videos, it is well suited to teaching Math, Science, English, Social Studies, Art, and other subjects (Tronçon, 2016). For example, math teachers may provide students with exercises in which they are required to enter formulas and plot data on an interactive chart. Using numerical data, they can also create bar charts that update based on the data, and practice basic addition, subtraction, multiplication, and division sums. A geography or social studies teacher can make use of the Book Widgets' tools to show students how to create and interpret maps. A science teacher can create a series of frames to illustrate the stages of life cycles, the processes of photosynthesis, or the evolution of organisms. In English language teaching, teachers can post visual materials to complement texts and encourage students to analyse how a theme is conveyed using different media types (TeachThought Staff, 2021). By using Book Widgets, teachers can engage students more quickly and boost their interest in learning. With this platform, paper worksheets and assignments can be transformed into interactive quizzes and assignments that are rich in multimedia (Burns, 2021). Widgets are potential game-changers in the educational industry. The use of Book Widgets will enhance the value of eBooks and add a new dimension to their interactive capabilities (Kotobee, 2016).

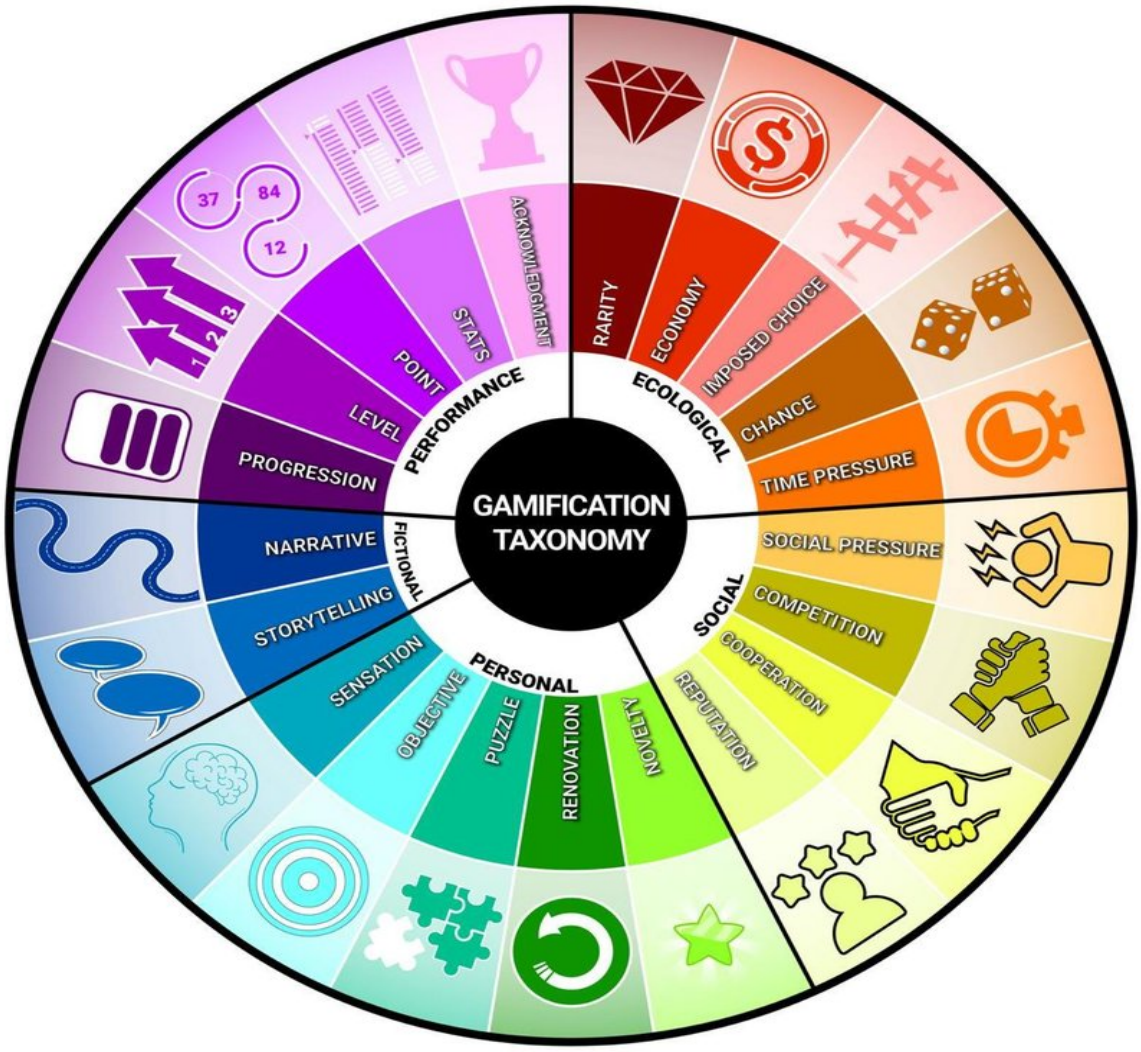
Several educational environments and instructional practices have included gamification elements outside of a fully-fledged game to enhance student motivation and engagement (Dichev & Dicheva, 2017). Although recognising the available game elements and selecting those that are meant to be incorporated into gamified environments is not an easy task, some frameworks exist to facilitate the process in which these elements can be selected. Most of these frameworks, however, do not possess a fundamental comprehension of the various types of game elements that gamified systems can employ and the methods by which they may be implemented (Klock et al., 2018). Apart from the lack of naming conventions, another issue encountered in gamification literature is the use of different terms when referring to the

same game elements, such as badges and trophies (Koivisto & Hamari, 2019). To maximise the benefits of gamification in the classroom, it should be incorporated as much as possible. Using technology to teach and learn will motivate students and increase their likelihood of participating in activities (Zaitun et al., 2021). Although there is limited knowledge about the specific types of game elements utilised in gamified systems and their implementation, the use of gamification has several positive aspects. By utilising gamification, students can access more engaging and effective learning materials, which enhances their educational experience. In a dynamic learning environment, students can acquire decision-making and problem-solving skills using gamification (Adachi & Willoughby, 2013). As part of this study, Book Widgets will be investigated as a gamification tool to support teaching and learning in Grade 5. The following section will explore the theoretical framework that informed the study.

2.7 Gamification Taxonomy Framework

The theoretical framework employed in this study, the gamification taxonomy framework (Toda, Oliveira, Klock et al., 2019) is used to guide the study and describes key dimensions in which gamification takes place. Although the gamification taxonomy was initially designed as a framework for constructing a gamified learning environment (Toda, Oliveira, Klock et al., 2019), it was subsequently employed to assess the gamified learning setting of the grade 5 class. Thus, the gamification taxonomy served as a guiding framework for this study, and its dimensions were utilised to concentrate on the gamified environment generated through an application like Book Widgets. This section focuses on understanding how these dimensions are represented in the literature as well as their relevance to the Book Widgets application. These dimensions include ecological, social, personal, fictional, and performance dimensions as shown in Figure 1 below. For the purposes of easy readability, the elements for each dimension will be in bold font going forward.

Figure 1: Gamification taxonomy framework



Source: Toda, Oliveira, Klock et al. (2019)

2.7.1 Ecological dimension

The Ecological dimension pertains to the environment in which gamification is carried out. The ecological dimension elements include chance, imposed choice, economy, rarity (Dignan, 2011), and time pressure (Toda, Oliveira, Shi et al., 2019). The ecological elements make the environment interactive.

According to this dimension, the ecological can be defined as properties of an environment that can be subtly used to influence users to follow a specific pattern of behaviour. **Chance** is associated with luck, randomness, probability, or fortune as a form of intrinsic motivation (Ortiz-Rojas et al., 2019). Whenever a learner receives bonus points following the duration for the completion of a task, this reward is based on probability or luck. The **imposed choice** element involves judgment, choice, or

paths that are based on extrinsic motivation. With imposed choice, learners are presented with choices and hurdles in which they must make a choice in order to move forward or they will be prevented from advancing. When players have a choice, they can determine what they want to do and where they want to go, based on their task or situation. Hence, students gain a sense of control by incorporating a sense of choice into their assignments and educational experiences (Hill & Brunvand 2018). Another element of extrinsic motivation is the **economy element**, which is a function of the market, transactions, and exchanges. For achieving a certain level or milestone in the game, a reward is provided as a trading point. The concept of **rarity** is based on the accumulation of limited items that rely on extrinsic motivation (Dignan, 2011). Students are motivated to achieve a specific goal when they collect limited items, regardless of how difficult the task may appear at first. **Time pressure** is determined by the deadline for completing the task. Learners are pressured to compete for a task or level using clocks or timers. It is the extrinsic motivation that motivates learners to complete the task by the deadline or on time (Toda, Oliveira, Shi et al., 2019).

2.7.2 Social dimension

The social dimension focuses on the interaction between learners in the environment. The key elements in this dimension include competition, cooperation, reputation, and social pressure. When the key social elements are not available in the environment, the interaction between learners becomes difficult (Toda, Oliveira, Klock et al., 2019).

Considering that this dimension focuses on facilitating interaction between learners (rather than facilitating interaction with the system), it should be carefully designed (Papadopoulos et al. 2016 & Toda, Do Carmo et al., 2019). The element of **competition** is associated with conflict, scoreboards, player versus player, or leaderboards in order to stimulate extrinsic motivations. A system of competition is effective when points, badges, or levels are earned to reach a certain level (Toda, Oliveira, Klock et al., 2019). **Cooperation** is defined as teamwork or group work that stimulates intrinsic motivation. In many educational settings, the importance of cooperation is highly regarded, even though it can be difficult to effectively incorporate into practice. As a result, learners are required to collaborate in order to accomplish a certain goal (Shi et al., 2014). **Reputation** is determined by the allocation of social status or classifications that are designed to stimulate intrinsic motivation. In this case,

achieving a certain level will lead to a title that reflects the learner's skills (Toda, Oliveira, Klock et al., 2019). **Social pressures** are derived from peer pressure or guild missions that stimulate intrinsic motivation. Through social interaction, learners are compelled to achieve a particular goal (Toda, Oliveira, Klock et al., 2019).

2.7.3 Personal dimension

This dimension is based on the learner within the environment. The personal elements required in the environment include novelty, an objective, puzzle, renovation, and sensation. When personal elements are unavailable in the environment, learners become demotivated in terms of participating (Toda, Oliveira, Klock et al., 2019).

In this dimension, the learner's interaction with the environment is directly related. The element of **novelty** can be defined as the discovery of new features, changes, updates, or surprises that stimulate intrinsic motivation. Users are more likely to be engaged when they are presented with new information and content (Hanus & Fox, 2015). An **objective** is a set of milestones and missions that must be completed in order to activate intrinsic motivation. Upon reaching specific objectives or missions, learners become excited (Toda, Do Carmo et al., 2019). The purpose of **puzzles** is to stimulate the intrinsic motivation of the child through cognitive tasks, challenges, or actual puzzles. Quizzes or challenges, for instance, serve as effective tools to incorporate puzzles into the learning experience (Toda, Oliveira, Klock et al., 2019). **Renovation** involves aspects of renewal, boost, or extra-life that motivate on an intrinsic level. If learners fail the first trial, they are given a second chance (Lee & Hammer, 2011). For the **sensation** element to be present, the senses must be stimulated, such as through the stimulation of sound, visual or tactile stimulation, which stimulates intrinsic motivation (Toda, Oliveira, Klock et al., 2019).

2.7.4 Fictional dimension

The Fictional dimension focuses on the experiences that create imagination or fiction. The elements of the fictional dimension include narrative and storytelling (Toda, Oliveira, Klock et al., 2019).

Even though this dimension is important, it is often overlooked during the development of gamified educational platforms. (Palomino et al., 2019). This leads to most

gamification frameworks failing to distinguish between narrative and storytelling at different levels. In the **narrative** element, implicit decisions are made that stimulate intrinsic motivation. Through the order of events within the game, the narrative stimulates learners' imagination (Palomino et al., 2019) or they gain knowledge about the information contained within them. In **storytelling**, text or audio stories are used to stimulate learners' intrinsic motivation in each environment. As part of storytelling in an environment, audio, text, and voice all play an integral role (Palomino et al., 2019).

2.7.5 Performance dimension

This dimension is related to the environmental response, which provides feedback to the learner through assessment of progress and level. The elements of the performance dimension include acknowledgment, level, progression, points, and stats (Toda, Oliveira, Klock et al., 2019).

The presence of this dimension is crucial for users to continuously obtain information regarding their actions (Qazi, 2021). The **acknowledgment** element is one of the most common components of gamified applications. This component includes points, badges, medals, trophies, and awards. As an extrinsic feedback mechanism, acknowledgments are used to commend a player's specific actions; for example, a ‘Solver’ badge may be earned after completing a certain number of challenges (Klock et al., 2018; Koivisto & Hamari, 2019; Toda, Do Carmo et al., 2019). The **level** element can also be called a ‘skill level’ or a ‘character level.’ Accordingly, it is connected to an extrinsic hierarchical layer that provides the user with additional benefits as they advance through the environment. Upon completion of a certain number of tasks, students gain a new level, enabling them to tackle more challenging tasks as they progress (Toda, Oliveira, Klock et al., 2019). The **progression** elements are alternatively known as progress bars, steps, and maps. The ability to progress allows students to locate themselves in an environment by providing an extrinsic sense of their progress (Toda, Oliveira, Klock et al., 2019) and to encourage students who are on the verge of achieving their educational goals. **Points** can also be referred to as scores, experience points, or skill points. The purpose is to provide the student with extrinsic feedback. In addition, all gamified applications rely on the concept of points as a fundamental component (Dichev & Dicheva, 2017). The **stats** element is also known as information, Head Up Display (HUD) and data. It refers specifically to

information provided by the environment (extrinsic), such as how many tasks the learner has completed. The same can be accomplished by using dashboards in virtual environments (Dignan, 2011).

The gamification taxonomy framework (Toda, Oliveira, Shi et al., 2019) was utilised in this study to assess learner motivation, engagement, and participation. The framework describes the environment that is required to provide learners with either intrinsic or extrinsic motivation to participate. In this study, the gamification taxonomy is an appropriate framework as it was used to analyse the features of the Book Widgets application. Using the 21 gamification elements of the five dimensions of the gamification taxonomy, the students were asked questions pertaining to these elements to gain insight into how the Book Widgets application supports teaching and learning as well as facilitates engagement and participation among Grade 5 students. Additionally, the gamification taxonomy will provide a means of structuring students' experiences.

2.8 Chapter Summary

This chapter presents a literature review that offers several insights into the use of gamification in educational settings. The literature aims to conceptualise constructs relevant to the research topic, while also presenting studies addressing the differences between game-based learning, serious games, and gamification. Furthermore, gamification elements have been discussed in relation to how they have been incorporated into gamification and their significance. The implications of gamification for designing learning environments were assessed from the perspective of practice opportunities, learner engagement, assessment, and feedback. The objective of this study was to introduce gamification into teaching and learning through the Book Widgets application, therefore, emphasising the importance of incorporating gamification into educational programmes. Book Widgets were explained and demonstrated in terms of their use in teaching and learning. As part of the gamification taxonomy framework, the use of a taxonomy to analyse gamified systems was discussed. In addition, the ecological, social, personal, fictional, and performance dimensions were explained in detail, including examples of each element within each dimension. As a result, it is anticipated that the insights proposed in this study will be of value in the future development of research related to measuring the outcomes of

gamification, as well as supporting the design of gamification in general. The subsequent chapter extends the discussion to outline the methodology employed in this study.

3. CHAPTER 3: METHODOLOGY

3.1 Introduction

This section presents a description of the research paradigm, the methodological approach, and the design of the study on Book Widgets as a gamification tool to support teaching and learning in Grade 5. Numerous aspects of the research were explored and justified, encompassing the research site, the sampling methodology, the techniques employed for data collection, the strategies employed for data analysis, quality assurance criteria, and ethical considerations.

3.2 Research Paradigm and Assumptions

The term 'research paradigm' refers to a method, an approach, a model, or a pattern that is used in the conduct of research. In other words, a paradigm can be thought of as a set of ideas, understandings, or beliefs based on which theories and practices function within a particular area of research. Most paradigms are based on either positivism or interpretivism, which serve as research methodologies. A research paradigm acts as a framework for developing research methodologies and conducting specific research projects to ensure its legitimacy and reasonableness. (Abbadia, 2022). The paradigms of research are based on three pillars, namely ontology, epistemology, and methodology (Punch, 2014). In the current analysis, critical attention will be paid to these concepts and their relevance.

3.2.1. Ontology

The term ontology refers to the description of the state and nature of reality (Cuervo-Cazurra et al., 2017). The concept of ontology can be viewed as multiple realities and the two concepts of interpretivism and constructivism can be used to describe multiple realities. Based on the assumption that there are multiple realities (Gorard, 2013), an interpretivist paradigm will be used for the purposes of this study. By employing the interpretivist paradigm, the researcher can acquire a more profound comprehension of a phenomenon instead of making broad generalisations and predictions about its outcomes (Hudson & Ozanne, 1988; Neuman, 2000). The articulation of multiple realities can be facilitated through active participation. According to the interpretivist paradigm, social reality is subjectively constructed and understood by individuals

involved in a particular situation. In this study, an interpretivist paradigm is useful for exploring the multiple realities of the integration of gamification elements into a Grade 5 classroom to support teaching and learning (Creswell, 2014). Through the interpretivist paradigm, it was possible to include all the possible realities and perceptions to integrate the gamification elements of the Book Widgets application for supporting teaching and learning in Grade 5. When using an interpretivist approach, it is vital to understand motives, meanings, and reasons, as well as additional subjective experiences rooted in this context and time (Hudson & Ozanne, 1988; Neuman, 2000).

3.2.2. Epistemology

According to Gorard (2013), epistemology is the theory of knowledge that defines the scope and methods of acquiring knowledge. Epistemology aids in identifying the appropriate place where specific knowledge of a specific nature can be acquired as well as the appropriate methods by which such knowledge can be acquired. It is the epistemological question that causes the debate about "the possibility and desirability of objectivity, subjectivity, causality, validity, and generalizability" (Patton, 2002, p. 134). This study employs the interpretivist paradigm as its epistemological basis. According to the interpretivist paradigm, the researcher holds a crucial position in the research process, interpreting the data, and cannot, therefore, be completely objective and detached from the study. The interpretivists focus on particular, contextualised environments, admitting that reality and knowledge cannot be objectively determined. Instead, they are shaped by individual behaviours within those environments (O'Gorman & MacIntosh, 2015). In this study, the Book Widgets application will be utilised as a gamification tool to support the teaching and learning of Grade 5, and the researcher will develop ideas based on the data collected from participant responses. As participants relate their personal experiences to the Book Widgets application, they share their opinions on how it has been integrated into their learning process.

3.2.3 Methodological paradigm

A methodology is a set of general concepts that are used by researchers to explore the social environment and verify the validity of their findings. The concept of a methodology is defined by Ellen (1984) as 'a method that involves the collection and analysis of data in an articulated, theoretically informed manner'. Within a methodology paradigm, there are a variety of techniques and methods that can be

used to examine a specific phenomenon. As a methodological issue, the question is: 'How do we determine the reality or answer to this phenomenon?' In terms of methodology, there are three major paradigms: qualitative; quantitative; and mixed methods (Creswell, 2014). In contrast to the quantitative method that focuses on large numerical datasets, the qualitative approach emphasises subjective, micro-scale, and in-depth inquiry when studying social phenomena (Smith, 2015). Additionally, the qualitative paradigm emphasises the quality of data rather than its quantity. According to the qualitative paradigm, every individual has their own subjective understandings and perceptions of reality based on their own social context (Marshall & Rossman, 2011). A qualitative research method was used for this study to understand the viewpoints and perceptions of the participants. It provides insights into different problems and assists the researcher in developing concepts and theories. Through analysis of problems, the qualitative approach helps to uncover new ideas and individual perspectives (Carol, 2016). As part of this research, interviews will be conducted with participants in their natural environment to determine the opinions and perceptions they have regarding the use of Book Widgets to support teaching and learning in Grade 5.

3.3 Research Approach and Design

A research approach is referred to a systematic and structured method of conducting research; it differs in terms of its methods of inquiry and underlying logic (Hassan, 2022). Research can be conducted in three different ways: quantitatively, qualitatively, and in a mixed methodological approach. Having a basic understanding of the different approaches to research designs will allow a researcher to determine which approach is the most appropriate for the study or which will produce the most accurate findings. In a quantitative research approach, the researcher can achieve research objectives that are coupled with a statistical conclusion that provides actionable insight (Burney & Saleem, 2008). The qualitative approach, on the other hand, aims to establish a relationship between collected data and observations. In attempting to capture, analyse, and discover the interconnections between related subjects, a considerable amount of raw data must be generated, regardless of whether it is gathered using statistical methods (Blaikie, 2000). A mixed methods approach encapsulates elements

of both qualitative and quantitative approaches and thus, falls in the middle of this continuum (Newman & Benz, 1998).

A research design outlines the way the researcher intends to address the central question of the study. It is therefore the research design that influences the type of data that will be collected and therefore, the results of the study (McCombes, 2019). Among the most common types of research designs are experimental studies, case studies, historical studies, ethnographies, and discourse analyses. Apart from the types of research designs, research is governed by the purpose of inquiry, which may be descriptive, explanatory, or exploratory.

This study adopted a qualitative approach alongside a case study design. A qualitative approach assisted the researcher to interact directly with the subjects to unearth their lived experience, perceptions, and views (Merriam, 2009). The qualitative approach emphasises the in-depth inquiry of multiple realities (Smith, 2015). In the current study, multiple realities were acquired by using a single case study to characterise the integration of gamification in learning. A case study enabled the researcher to gain detailed information about events, people, groups, organisation, or objects (Yin, 2015). Adopting a case study design in this study will provide insight into ways in which the integration of gamification elements supports learning in the classroom. The case study design offers a researcher flexibility in conducting qualitative research (Yin, 2015). The participants for this study will be drawn from one institution, hence, the study will be based on only one case study. Students from the same school will provide their perspectives on Book Widgets as a gamification tool for teaching and learning. Using the case study design, the researcher can obtain factual and primary information regarding Book Widgets as a tool that can be used to support the teaching and learning of Grade 5 students through gamification.

Moreover, in the course of this study, the selected methodology was applied within the framework of a deductive approach. This approach is chosen when there are existing perspectives, prior research findings, theories, or conceptual frameworks associated with the phenomenon of interest (Armat et al., 2018). Unlike inductive methods that start with open-ended research questions, the deductive approach typically begins with predetermined hypotheses, allowing for a more structured investigation. In contrast, the inductive approach, as advocated by Gabriel (2022), relies on research

questions to guide exploration and analysis, fostering flexibility and openness in examining the phenomena under investigation. Even though this method is consistent with the qualitative research tradition, the analysis of this study commences with pre-existing categories derived from the gamification taxonomy framework and previous research findings (Toda, Oliveira, Klock et al., 2019), illustrating a clear instance of deduction.

3.4 Research Site and Sampling

During this study, data was collected from a private primary school in Saudi Arabia. Only female students attend the school. Classes begin in kindergarten and continue through to Grade 5. As the academic year in Saudi Arabia typically spans from August to June, data collection was scheduled for December, a period representing the peak activity within the school. Interviews were strategically spread out across this month for data gathering. Permission was granted for the research to be conducted by the principal and directors of the school. The study targeted Grade 5 students who have all worked with the Book Widgets application. A non-probability sampling method was adopted alongside a purposive sampling technique. Non-probability sampling focused on the selection of participants based on their relevance and usefulness to fulfilling the purpose of the study. A non-probability sampling method considered the richness of the target group and selected the prospective participants to participate in the study (Creswell, 2014). Purposive sampling is one of the sampling techniques that fall into the categories of non-probability sampling methods. Purposive or judgemental sampling depends on the judgement and knowledge of the researcher regarding the target population (Sharma, 2017). A sample of 10 Grade 5 learners who were willing to participate in this study were selected (Jansen, 2023). The inclusion of a 10-student sample was essential due to the intricate nature of the research topic and the complexity of the collected data. Opting for a smaller sample facilitated a more comprehensive exploration of each participant's experiences, perceptions, and contextual insights, achieved using the Book Widget application. The sample was considered adequate since factual and detailed information was acquired to describe the integration of gamification elements in supporting teaching and learning in the classroom.

3.5 Data Collection Techniques

Collecting data involves obtaining information from all applicable sources to answer the research question and evaluate the outcomes (Dudovskiy, 2022). This study first utilised a gamification evaluation rubric (Appendix 1) adapted from the work of Altanis et al. (2018) to gather data regarding the elements within Book Widgets and to show that the Book Widgets application is suitable for gamification. The selection of this particular evaluation rubric was based on its prior use in Altanis et al.'s (2018) study, where it assessed the quality of students' design artifacts and Kinect games. This rubric was chosen due to its relevance and similarity to this study, focusing on gamification elements. This gamification evaluation rubric was determined to be an appropriate tool for evaluating the elements in Book Widgets, as other evaluation rubrics primarily focused on game design and learning organisation. The elements of Book Widgets were evaluated by the researcher using the criteria found in the evaluation rubric based on a five-point Likert scale. The purpose of evaluating the elements in Book Widgets was to evaluate its usability from a teacher's perspective in terms of motivation, engagement, and participation. Furthermore, interviews were also used in this study as a means of gathering data. In qualitative research, interviews play a pivotal role as the most used method of collecting data. According to Oakley (1998), qualitative interviewing is a method that aims not only to document practices and standards but also to attain them, challenge them, and reinforce them. Most qualitative research interviews are either semi-structured, structured, or in-depth. As part of the data collection process, the researcher selected semi-structured interviews to obtain qualitative data. In a semi-structured interview, questions are asked open-endedly and questions are followed up with probe questions to explore participants' responses and their interests (Adams, 2015). Accordingly, the researcher conducted semi-structured interviews by utilising a semi-structured interview schedule that contained 12 open-ended questions. Using open-ended questions, participants were able to express their experiences, opinions, or perceptions in relation to the gamification elements of the Book Widget application (Creswell, 2014). Open-ended questions were asked which allowed students to provide information regarding the integration of gamification elements to support teaching and learning in the classroom. Questions were asked in the order they were presented in the semi-structured interview schedule to ensure that all the intended objectives were covered. However,

some questions could be skipped or modified based on their relevance in the conversation with each participant. The interviews were audio-recorded for the purpose of data analysis. The audio recording captured a set of 12 open-ended questions, chosen for the purpose of obtaining detailed information within a constrained timeframe. Given that the participants were 9- and 10-year-old students, their attention span necessitated a limited number of questions to ensure their engagement. Additionally, the interviews were scheduled for a duration of 30 minutes each. The selected questions were carefully tailored to address the research questions and were specifically designed to align with the five dimensions specified in the gamification taxonomy framework.

3.6 Data Analysis Strategies

The responses from the audio recordings were transcribed to text before a thematic analysis was conducted. A thematic analysis is used to generate themes, sub-themes, and categories from the data. The researcher employed the steps outlined by Braun and Clarke (2006), which included familiarising with data, creating initial codes, identifying themes and patterns, evaluating and analysing themes, defining themes, and preparing a report of the findings. Based on the qualitative data, themes were derived that were useful for answering the research questions (Braun & Clarke, 2006). The thematic analysis was done using Atlas-Ti software version 2015. Given the substantial volume of data to manage and categorise, the utilisation of Atlas-Ti software enabled the researcher to effectively organise and handle a wide range of qualitative data, encompassing audio files.

3.7 Quality Assurance Criteria

In qualitative research, trustworthiness is measured using different concepts and terminology (Huberman & Miles, 1994). Using trustworthiness in research may be useful in convincing the reader that the results of the study deserve consideration (Lincoln & Guba, 1985). According to Lincoln and Guba (1985), trustworthiness is best assessed by the criteria of credibility, transferability, dependability, and confirmability, which is similar to the traditional quantitative assessment criteria of validity and reliability (Middleton, 2020). The concept of trustworthiness was examined in this study using the original, and readily recognised criteria of credibility, transferability,

dependability, and confirmability established by Lincoln and Guba, which have been widely accepted in qualitative research (Tracy, 2010). These trustworthiness criteria will be briefly discussed and then woven throughout a description of how the researcher attempted to conduct a reliable thematic analysis that is trustworthy.

3.7.1 Credibility

The credibility of a report depends on the validity of the conclusions derived from the data and the extent to which they are in accordance with reality (Mabuza et al., 2014). A quality assurance criterion was established to ensure the credibility of the findings to ensure that they are truly (Korstjens & Moser, 2018) reflective of the participants' responses, rather than the researcher's fabrication. In this study, the researcher separated the actual words of participants from the researcher's comments and interpretations. The words of participants were in italics, and each response was labelled with the participant number for easy identification.

3.7.2 Transferability

Transferability pertains to the extent to which the results of a research study can be extrapolated and applied to different contexts or situations (Korstjens & Moser, 2018) that differ from the original research environment. To assess the transferability of the findings, it is crucial for other researchers to have access to comprehensive information about the study's setting, participant selection, and the actual findings themselves. Often, this is referred to as a "thick description" (Mabuza et al., 2014, p. 3). The researcher compared the findings with existing literature.

3.7.3 Dependability

In terms of dependability, it is the extent to which comparable outcomes would be achieved if the study was repeated (Lincoln & Guba, 1985). Dependability shows the extent to which the findings can be trusted or believed through member checking. In the process of reviewing and exploring the data, member checking enabled the researcher to contact the participants and confirm whether their interpretation of the data transcripts is like that of the researcher's. Upon reviewing the participants' responses, the researcher confirmed that the meaning of their responses was in accordance with the researcher's interpretation.

3.7.4 Confirmability

The confirmability of a study is determined by the degree of objectivity demonstrated by the researcher in collecting and reporting data. To guarantee that the findings are genuinely derived from the data and not influenced by the researcher's personal opinions or biases, it is imperative for the researcher to ensure that the results are solely based on the data collected (Mabuza et al., 2014). Confirmability indicates the degree to which the findings can be replicated or confirmed by other researchers provided that the same methodologies are applied to the same sample at the same study site. Research methodologies were described thoroughly by the researcher to ensure the confirmability of the findings.

3.8 Ethical Considerations

The ethical issues considered include informed consent, confidentiality, voluntary participation, and protection of participants. As part of this study, ethical procedures were followed in accordance with the policies of the University of Pretoria and the Protection of Personal Information (POPi) Act, and permission was obtained from the school.

3.8.1 Informed consent

Providing informed consent is an essential component of ethical research (Appendix 3) (Denzin & Lincoln, 2011). It is essential that participants are informed about what is expected of them, the usage of their data, and the possible consequences of their involvement. Taking part in the research requires the participants' explicit, active, and written agreement, which encompasses the comprehension of their entitlement to access their data and the right to withdraw their involvement at any given moment. Essentially, informed consent functions as a formal agreement between the researcher and the participant (Fleming & Zegwaard, 2018). As a component of the process of obtaining informed consent, prospective participants were required to sign informed consent documents indicating that they agreed to participate in the study, and parents were required to sign informed consent documents indicating their permission for their children to be involved in the study. The researcher considered learner ascent forms to determine if they were in fact giving their informed consent without fear. The researcher obtained consent from the minors themselves, ensuring that they were given age-appropriate explanations about the research purpose,

procedures, and potential risks and benefits. This approach respects their autonomy and ensures that their participation is voluntary.

3.8.2 Confidentiality

During the data collection, analysis, presentation, and publication of findings, the researcher ensured the privacy and security of the participants. To identify the participant's responses, the researcher will use pseudonyms instead of using the actual names of the participants, thus, protecting the participant's identity and keeping the information confidential (Allen & Wiles, 2016). Research materials that may enable the identification of participants' personalities will be retained and will not be shared after the study has been completed. The personal information of participants was not shared, disclosed, or published in this study. During the storage of the data, softcopy data will be saved on the cloud and will be password-protected, whereas personal hardcopy data of the researcher will be secured in a locked drawer (Lin, 2009).

3.8.3 Voluntary participation

This is a voluntary study in which participants will not be forced to participate. Informed consent was required to participate in this study. Participants have the option to terminate their involvement in the study at any point after they have agreed to participate. In this study, no incentive or punishment was used to encourage participants to participate, and participants were free to withdraw from the study whenever they chose to do so (Lavrakas, 2008).

3.8.4 Protection of participants

The researcher ensured the privacy of participants by not disclosing any personal information and ensuring their comfort during data collection. Accordingly, the researcher protected the participants from physical, emotional, and social harm during the data collection process by preserving their privacy and keeping their private information confidential. This study also allowed participants to discontinue their involvement at any point without penalty.

3.9 Chapter Summary

In this chapter, an overview of the methodologies employed in this research has been presented. The research paradigm, approach, and design, as well as the research site and sampling, data collection techniques, data analysis strategies, quality assurance criteria, and ethical considerations, have all been discussed. Moving forward, the following chapter will focus on presenting the findings that have been derived from this study.

4. CHAPTER 4: ANALYSIS AND FINDINGS

4.1 Introduction

In the context of this study, the researcher seeks insight into how the gamification elements of the Book Widget application can be used to support teaching and learning in the classroom. As outlined in Chapter 3, the study employs a qualitative methodology, incorporating semi-structured interviews, thematic analyses, and the application of a gamification evaluation rubric. This chapter presents a comprehensive analysis of the results and findings derived from the extensive investigation conducted in this study, shedding light on key insights and contributing to a deeper understanding of the research objectives. Various elements of the Book Widgets application were evaluated using a gamification evaluation rubric. Additionally, as part of the evaluation of the gamification elements of the Book Widgets application, semi-structured interviews were conducted with Grade 5 students at a school located in Riyadh, Saudi Arabia. Accordingly, the evaluation included 12 open-ended questions addressing the elements in the gamification taxonomy framework and their relation to the research questions. The results were presented in combination with elements from the gamification taxonomy framework, direct quotes from participants, and the researcher's interpretation. To protect the identities of the 10 participants, pseudonyms have been used (Participants 1-10).

4.2 Evaluation of Book Widgets

As part of this study, the researcher examined the gamification elements contained in the Book Widgets application from a teacher’s perspective, to determine if it was an appropriate application for gamification. To evaluate these elements, the researcher used a gamification evaluation rubric (Altanis et al., 2018). Using this specific gamification evaluation rubric, was determined to be the best suited to evaluate the Book Widgets elements since the criteria were broad enough to evaluate the applications effectiveness in terms of motivation, engagement, and participation in educational activities. Nevertheless, the researcher simplified the criteria in the evaluation rubric and added some criteria so that it relates better to the elements of the Book Widgets application. As seen in Appendix 1, per the evaluation rubric, the researcher evaluated the criteria using a five-point Likert scale. According to the

gamification evaluation rubric, criteria 15, 16, and 17 are not evaluated based on a five-point Likert scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree); they were evaluated based on the researcher's opinion, since these criteria were too subjective to be assessed through a Likert scale. As a result, the researcher gave an opinion based on the observations made during the use of the Book Widgets application. Furthermore, Book Widgets were evaluated based on the 14 criteria of the evaluation rubric in terms of their ability to provide students with a motivating and engaging experience, and three questions regarding improvements, discussed below.

4.2.1 Instructions and training

As seen in Figure 2 below, Book Widgets provides detailed instructions on how teachers can create games using their own content, as well as previews and examples (Figure 2), and in-game instructions for students (Figure 3). The usefulness of in-game instructions plays an important role in the attitudes of students toward the game, which contributes to their engagement with the activity (Tan & Tan, 2020). In addition, the in-game instructions provide students with a better understanding of how the game works. Based on the evidence of Figures 2 and 3, from a teacher's perspective, Book Widgets provide instructions and training opportunities for teachers and students (see Appendix 1 for the full rubric).

Figure 2: Example of instructions and training within Book Widgets

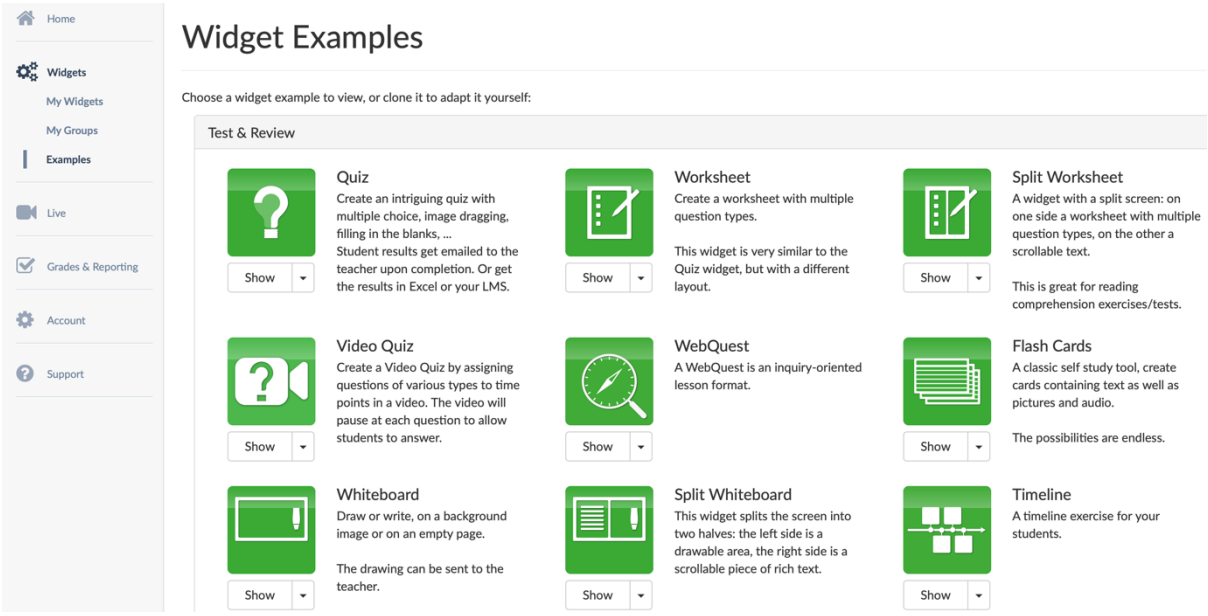
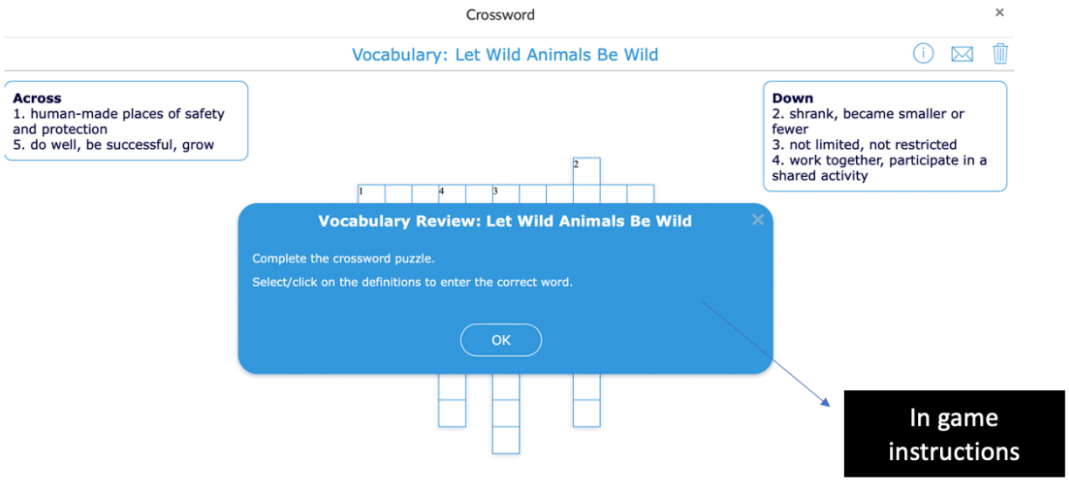


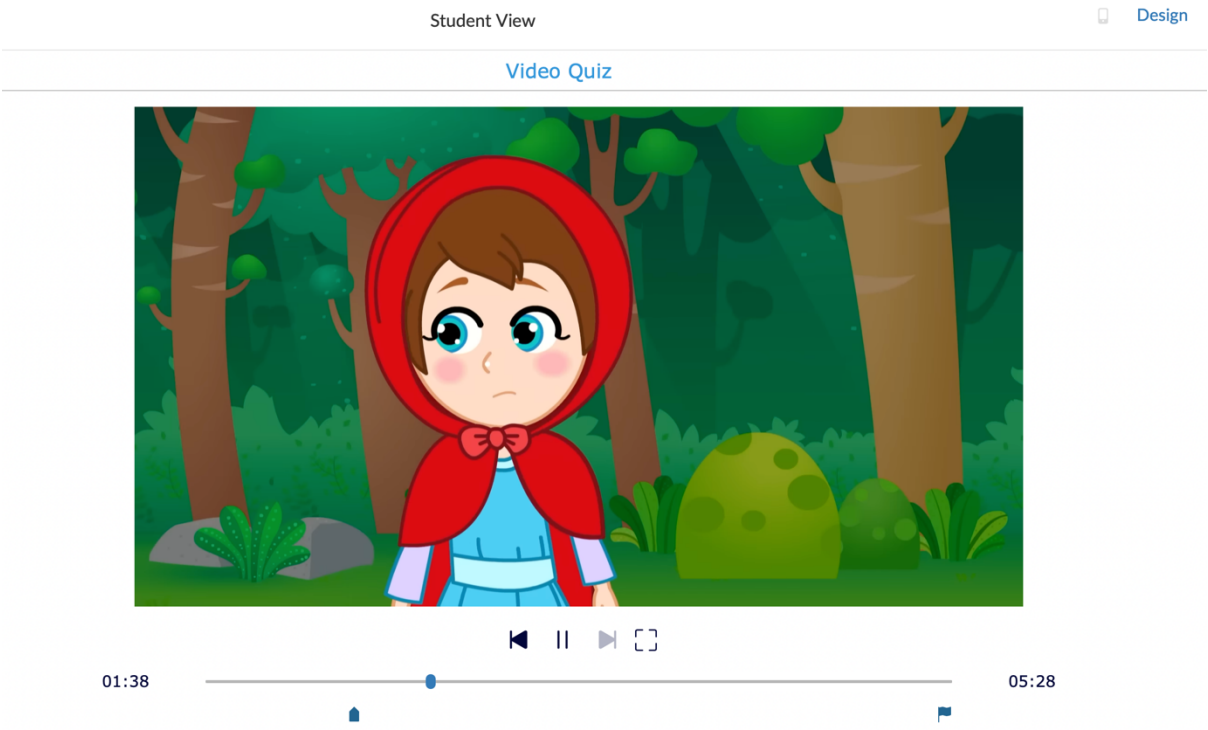
Figure 3: Example of in-game instructions within Book Widgets



4.2.2 Playability and usefulness

The evidence shown in Figure 4 below, indicates that Book Widgets enable teachers to create specific games with different mechanics as well as create their own storylines and choose the characters and sound effects. Thus, according to the teachers' perspective, the game features in Book Widgets meet both the criteria for playability and usefulness, resulting in enhancing the quality of the game (Sanchez et al., 2012). Book Widgets can, therefore, be recommended as a reliable source of educational games due to their high level of playability. Furthermore, the games featured in the Book Widgets are fully functional and playable, allowing teachers to create blended or flipped learning methods by utilising customised materials that can be conveniently allocated to students using Google Classroom. Among the numerous ways in which students interact with Book Widgets, graphic design, sound effects, and diverse gameplay mechanics contribute to their satisfaction with the application (Figure 4) (Järvinen et al., 2002). Even though games within Book Widgets are merely widgets, the graphics and sound effects are compelling on their own, and these contribute to student motivation and engagement. Thus, games in Book Widgets can be strategically developed to enhance the level of playability and usability, ultimately elevating the overall enjoyment of the learning process for students.

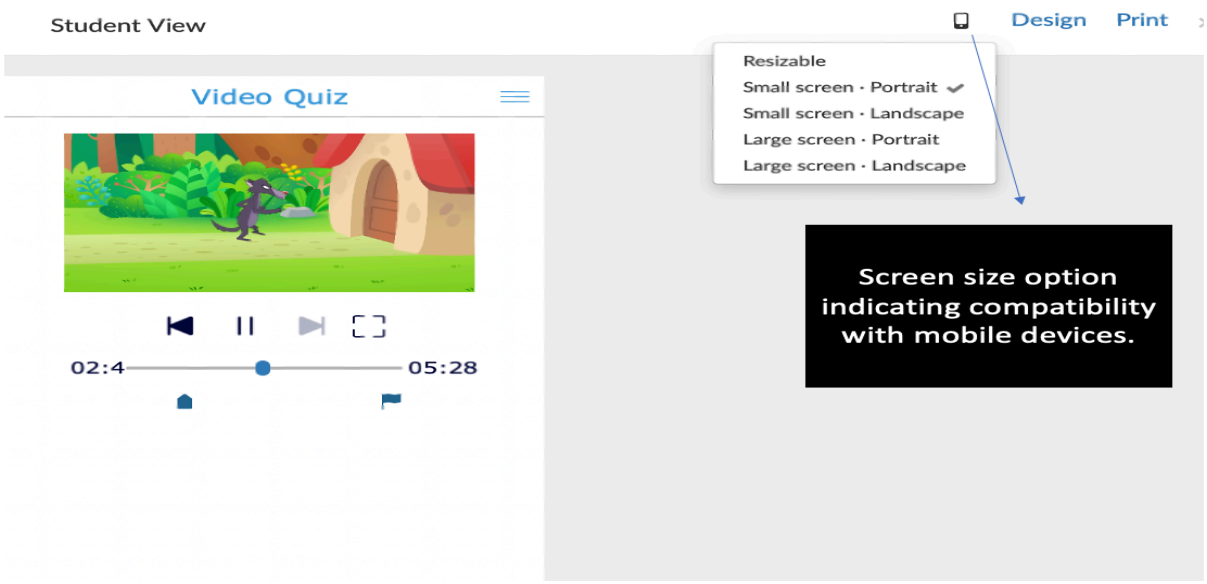
Figure 4: Example of video quiz created with a storyline, characters, and sound effects



4.2.3 User-friendliness

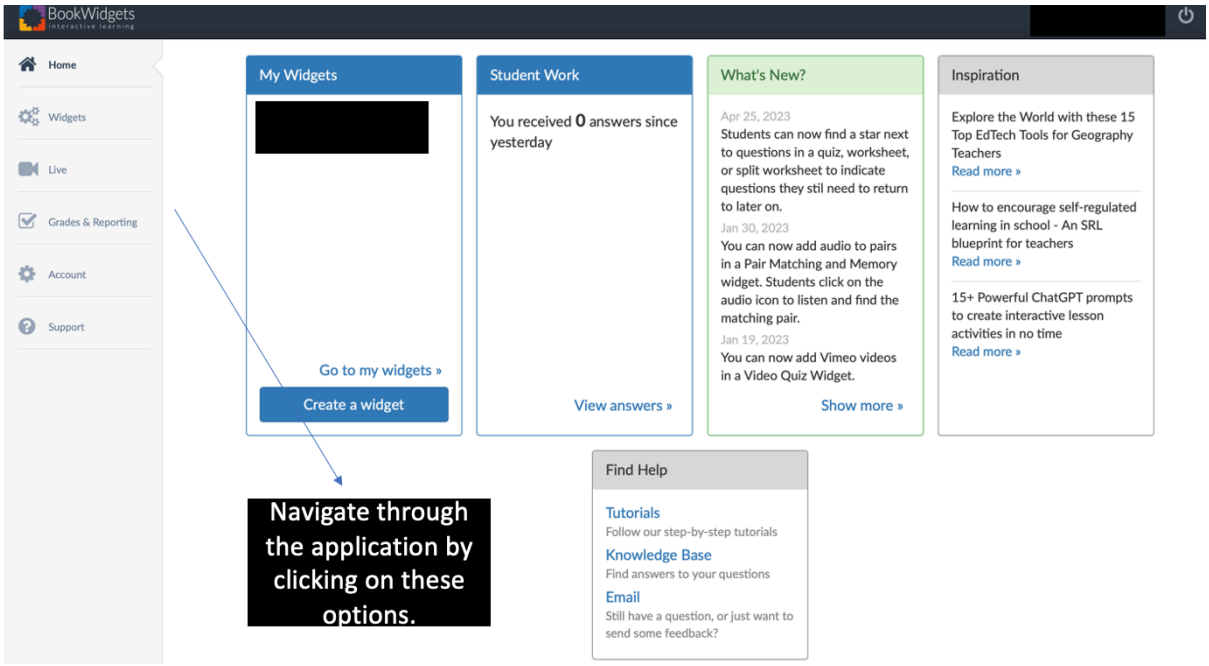
An application that is user-friendly has several positive influences that determines its success. These include enhancing user satisfaction with navigation and extending the users' engagement with the application (Jones, 2021). When analysed from the viewpoint of a teacher, the researcher found that Book Widgets is an easily accessible and user-friendly application that facilitates collaboration across multiple applications, such as Google Classroom, Canva, and Moodle. In addition to being easy to use, Book Widgets is compatible with mobile devices (Figure 5), iPads, and laptops, enabling users to access the content at any time (Daily, 2020).

Figure 5: Example of compatibility with mobile devices



Based on the evidence shown in Figure 6, the application provides an intuitive and simple interface that makes it easy for users to navigate the application quickly and access content easily. Moreover, Book Widgets provides advanced customisation options, allowing teachers to tailor their experience to their students' needs (Burns, 2021). Thus, from the teacher's perspective, the user-friendliness of Book Widgets facilitates student motivation and engagement, since the students can navigate the application with only a few clicks and access content from anywhere at any time. Despite this, Book Widgets require a subscription fee to use the application, therefore, user-friendliness is evaluated as agree rather than strongly agree.

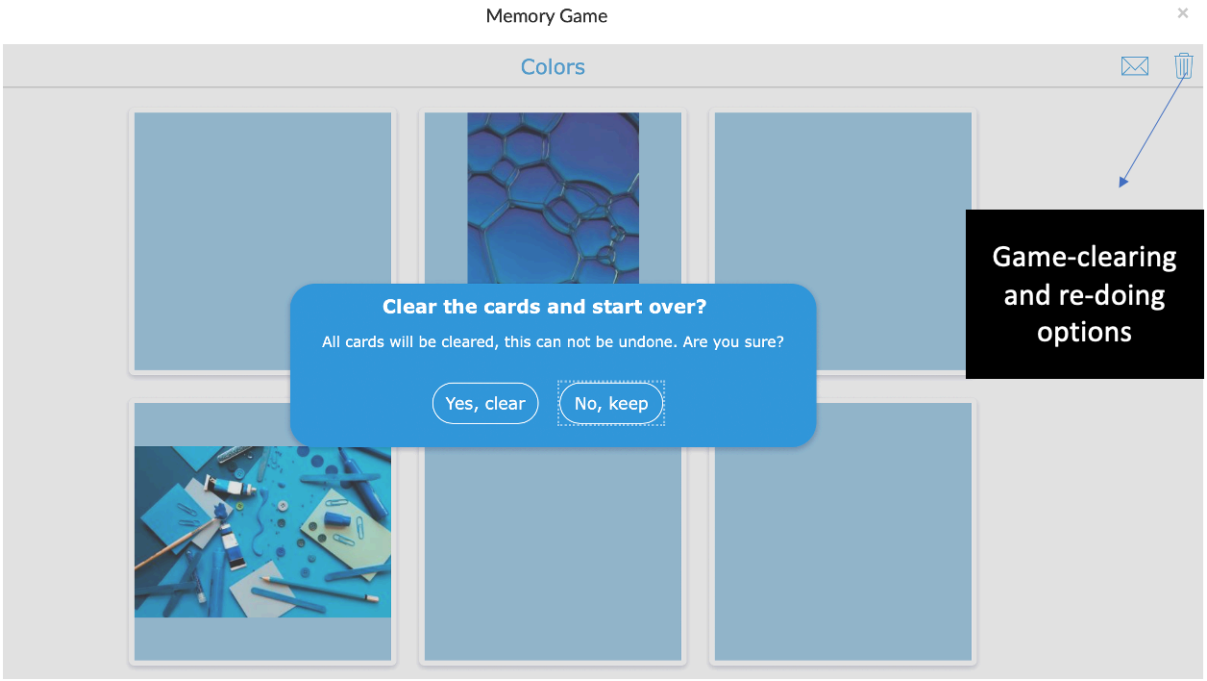
Figure 6: Example of navigation within Book Widgets



4.2.4 Usability

A successful interactive application relies on the usability of the application. Usability has been widely acknowledged in literature as a crucial element for ensuring the success of interactive applications (Maguire, 2001). According to the criteria of sense of control in usability, Book Widgets enable teachers to adjust the font size, background colour, and line spacing for a more personalised reading experience. Figure 7 below, illustrates how Book Widgets enable students to try again, hence the students can improve their performance by repeating the task. It gives students a sense of control over the material and the opportunity to improve their performance by allowing them to try again and become more engaged in the educational process. Having a simple design and game features, Book Widgets allow students to play games by simply clicking on the link provided by the teacher, following the instructions, completing the task, and submitting it. In addition, the simplicity and ease of use of Book Widgets allows students to feel more in control of their learning, rather than overwhelmed by unnecessary steps.

Figure 7: Example of repeat function within Book Widgets



4.2.5 Multiple learning opportunities

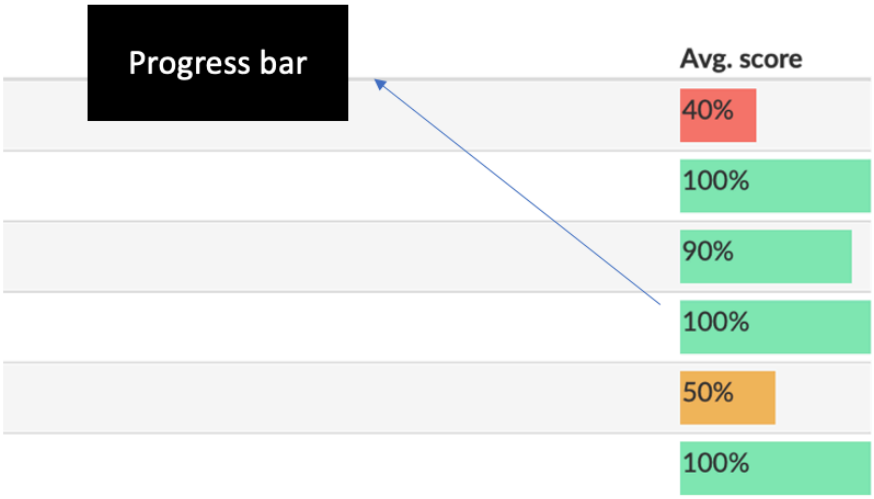
It is essential that students have the option to play again through gamification, as this motivates them to engage in content where they are more likely to retain information and gives them the opportunity to discover new ways to perform better (Koivisto & Hamari, 2014). As shown in Figure 7, the Book Widgets application improves student motivation by allowing students to play games or complete tasks again for improvement by clicking on the trash bin. As a result, this criterion was rated as 'strongly agree' by the researcher since it enhances motivation and engagement by enabling students to reset a game or task more quickly and easily. Consequently, students can gain knowledge from their errors, which aids in the development of a more effective approach.

4.2.6 Game status

In games, status indicators are extremely important because they provide students with a visual representation of their progress, through leader-boards and progress bars. These simple forms of feedback can motivate users to remain focused and motivated to meet their goals (Mazarakis & Bräuer, 2018). Figure 8 below, depicts an example of a progress bar in Book Widgets that displays an application status (reports of students after an activity has been completed). Therefore, this criterion is

considered met, since students can monitor their progress in the application. Comparing one's performance with that of one's peers allows students to identify their progress which motivates them to achieve greater success. As an example, a student who obtained 5/5 on the first quiz but 3/5 on the second quiz, may be able to tell if they need to improve by using the progress bars. Furthermore, leader-boards also provide students with a feeling of accomplishment when they climb up the rankings.

Figure 8: Example of the progress bar in Book Widgets displaying the average score of a task

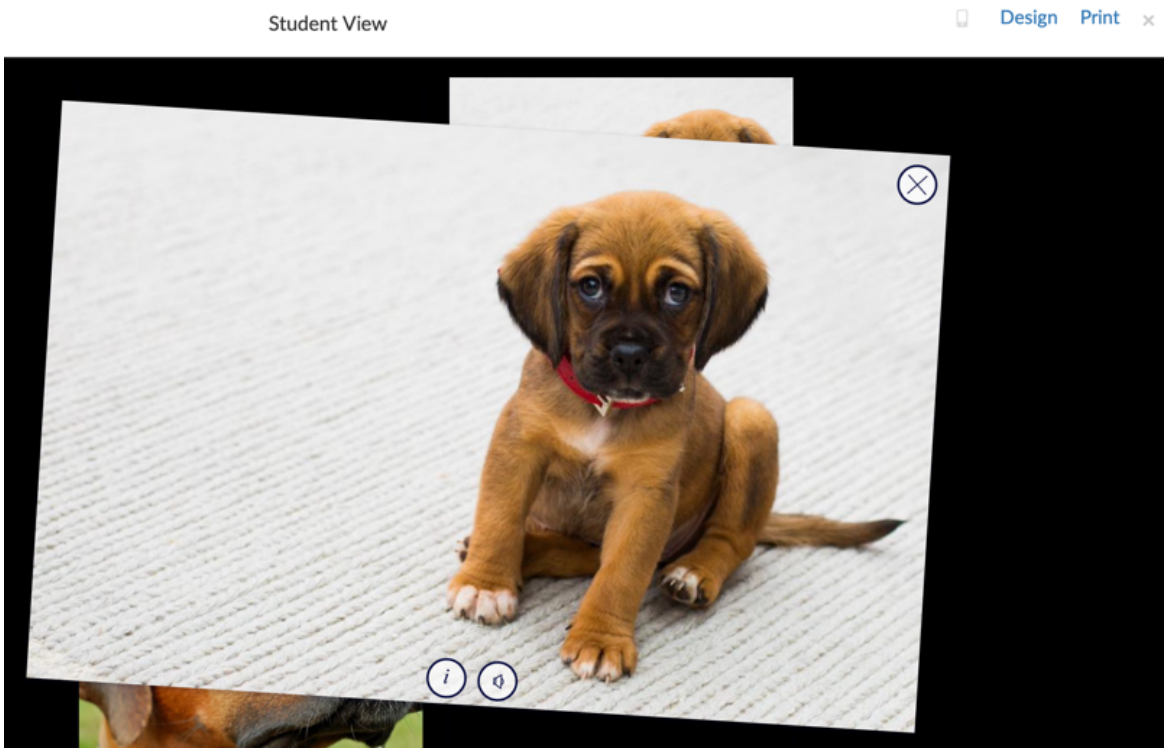


4.2.7 Curiosity (motivation)

In many aspects of human life, curiosity plays a crucial role, and it is an indication that one is intrinsically motivated to learn and discover (Jirout & Klahr, 2012; Litman, 2008; Litman, 2010). Book Widgets provide a multi-faceted environment that stimulates curiosity in students using pictures and video-based activities called digitally mediated systems, for structured gameplay (Gómez-Maureira & Kniestedt, 2019). Figure 9 below, demonstrates how Book Widgets help students explore by providing visual representations of pictures where students can create mind maps and explore ideas associated with the picture. Accordingly, from the viewpoint of a teacher using Book Widgets, the criteria for curiosity are met, since visual stimulation piques students' curiosity. In the section on satisfaction in the ARCS model, Keller (2009) discusses intrinsic motivation. According to the researcher, intrinsic motivation was achieved through curiosity. The researcher discovered curiosity as a motivation construct, since

students took the initiative to explore the picture and used it as a starting point for their explorations.

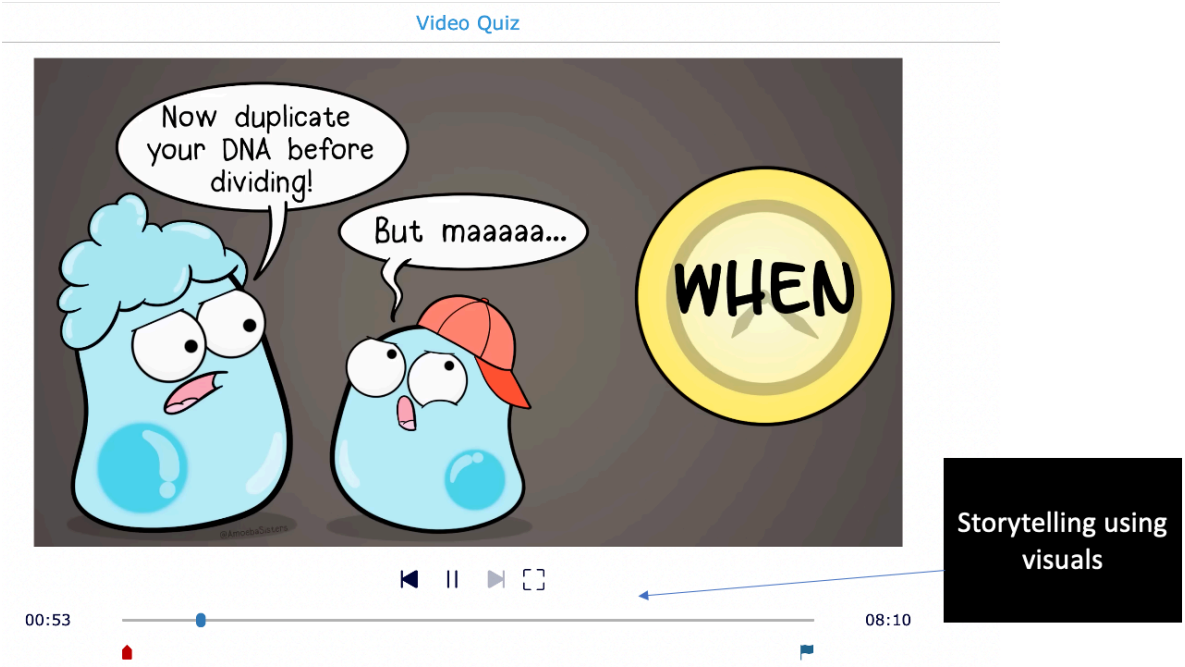
Figure 9: Example of an image in Book Widgets



4.2.8 Engagement through gameplay

ARCS Model of Motivation developed by Keller (2009), defines attention as the quality of gaining and holding a learner's interest and attention. Book Widgets incorporate narrative and storytelling to engage, motivate, and attract students' attention to encourage them to continue learning. As a result, Book Widgets have shown to be a highly engaging and enjoyable way for students to learn, which has been proven to motivate them to engage in more learning activities through games. Figure 10 below, illustrates how storytelling can be utilised to hold students' attention and maintain their engagement through visual representations throughout their gameplay. Thus, the motivation criteria in terms of attention were evaluated as ‘strongly agree’.

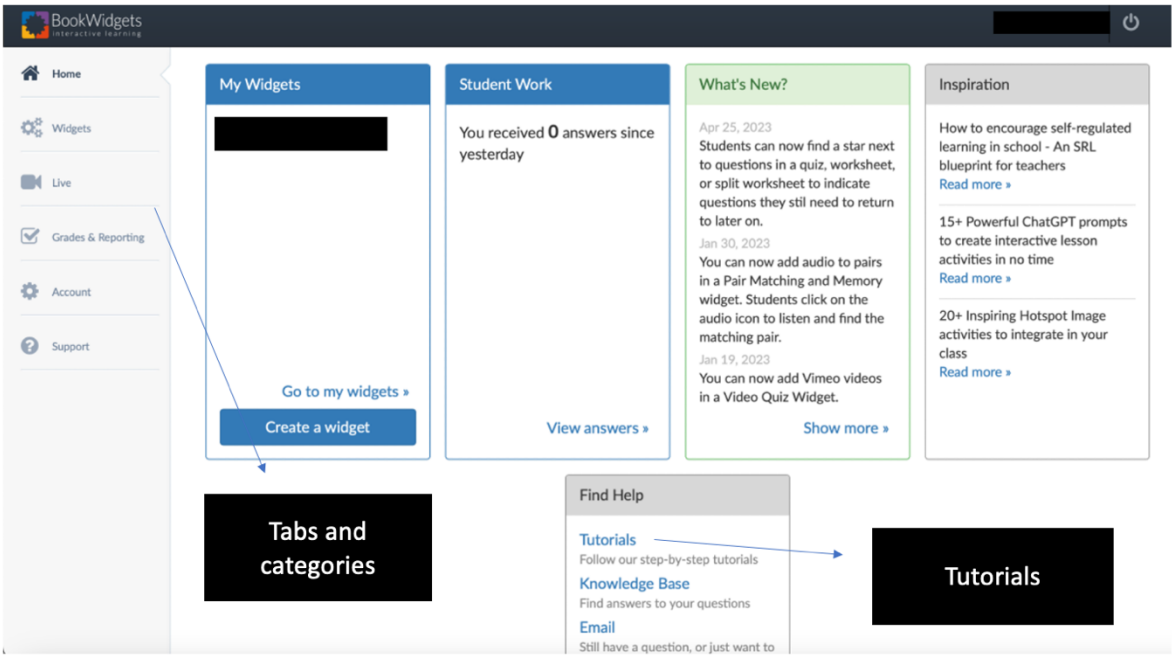
Figure 10: Example of storytelling through a video quiz within Book Widgets



4.2.9 Easy to navigate

When using gamification, navigation is a crucial component as it allows the user the freedom to explore the information within the application (Jones, 2021). The Book Widgets application provides a tutorial that demonstrates how to navigate the application. Additionally, the Book Widgets application contains several components, including extensions and links, which enable the user to explore the contents of the application without being restricted to one area. Based on the evidence shown in Figure 11 below, the application's home page displays an overview of its tabs and categories, allowing the user to locate the information they need quickly and efficiently. Therefore, from the perspective of the teacher, Book Widgets provide an easy method of navigation and assist students in completing tasks, such as clicking on a link and being taken directly to the activity where they want to participate. This motivates students to complete tasks as the navigation is clear and easy to understand. Therefore, the Book Widgets application was evaluated as ‘strongly agree’ in terms of easy navigation.

Figure 11: Example of a homepage displaying tabs and categories within Book Widgets



4.2.10 Game app meets the needs of students

A gamification application is essential to meet the needs of students and keep them engaged in the learning process (McCarthy, 2016). By providing elements such as badges, points, levelling up and game replays within the gameplay, students are more motivated to engage in tasks to gain rewards, which encourages students to explore and learn more. With Book Widgets, students are provided with engaging and valuable learning opportunities through the application's elements that can assist students in reaching their learning objectives and fostering a positive attitude toward learning, thus contributing to their educational needs. As a result, the criteria ’Use of the game app is relevant to the purpose and student needs’ was met.

4.2.11 Sound and visuals

Background music, sound effects, animations as well as various colours, images, and shapes play an important role in motivating students and keeping them engaged in the learning process. Each of these elements contributes to the student's ability to retain information and encourages an enjoyable learning experience (Buljan, 2021). As per Figure 12 below, Book Widgets provide a wide range of music, sound effects, animations, and colours throughout the application's games. Additionally, teacher instructions can be recorded, and widget features can be customised according to

each classroom's needs and preferences. Consequently, the visuals (Figure 13) within Book Widgets provide students with an engaging and enjoyable learning experience, motivating them to continue learning. As a result, the sound and visual criteria were evaluated as strongly agree.

Figure 12: Example of animations, colours, and sound effects in a video quiz

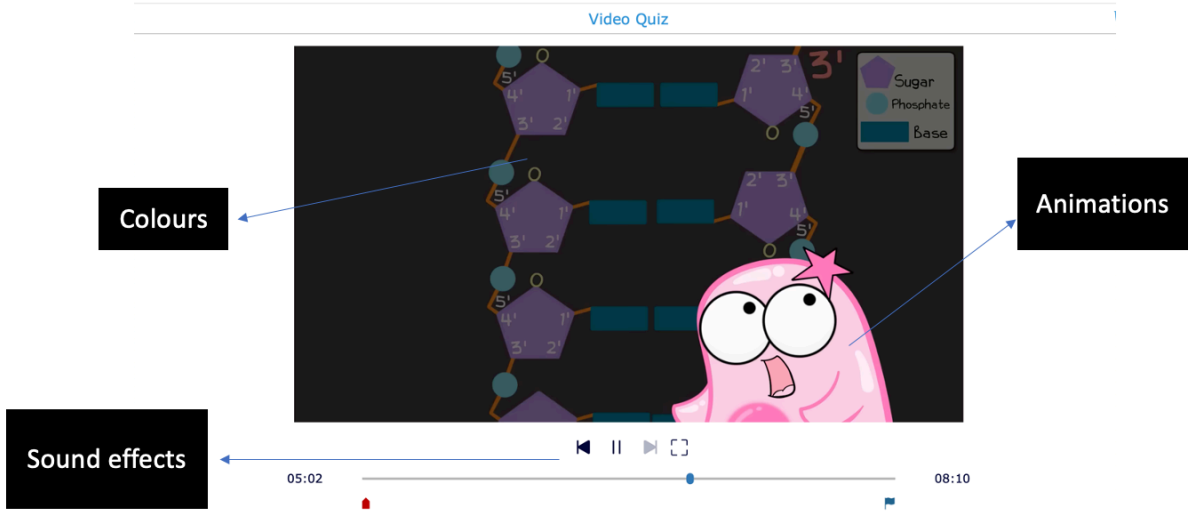
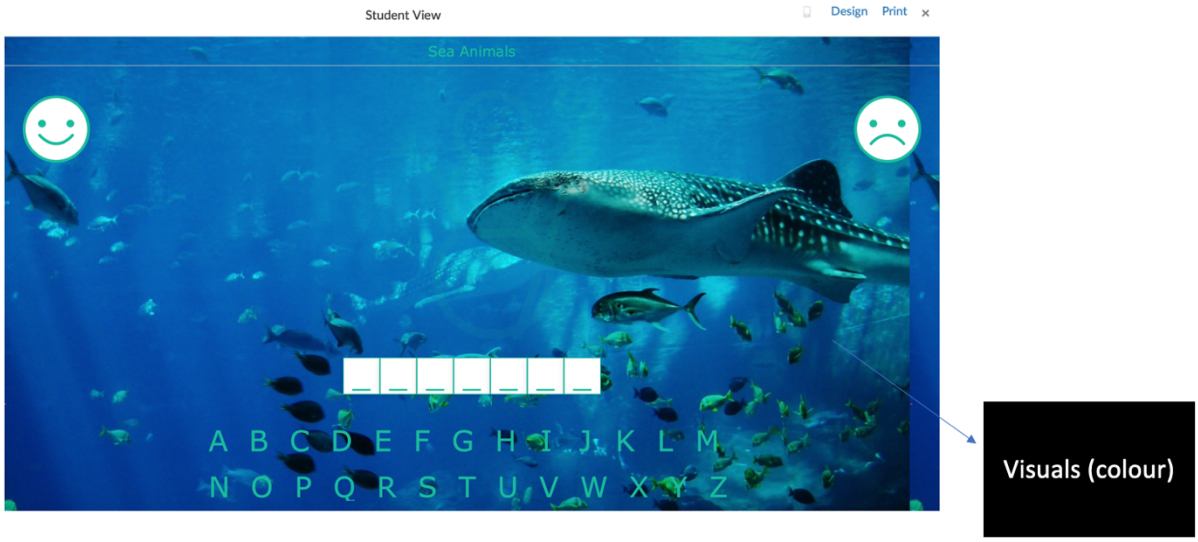


Figure 13: Example of visual representations within Book Widgets



4.2.12 Compatibility

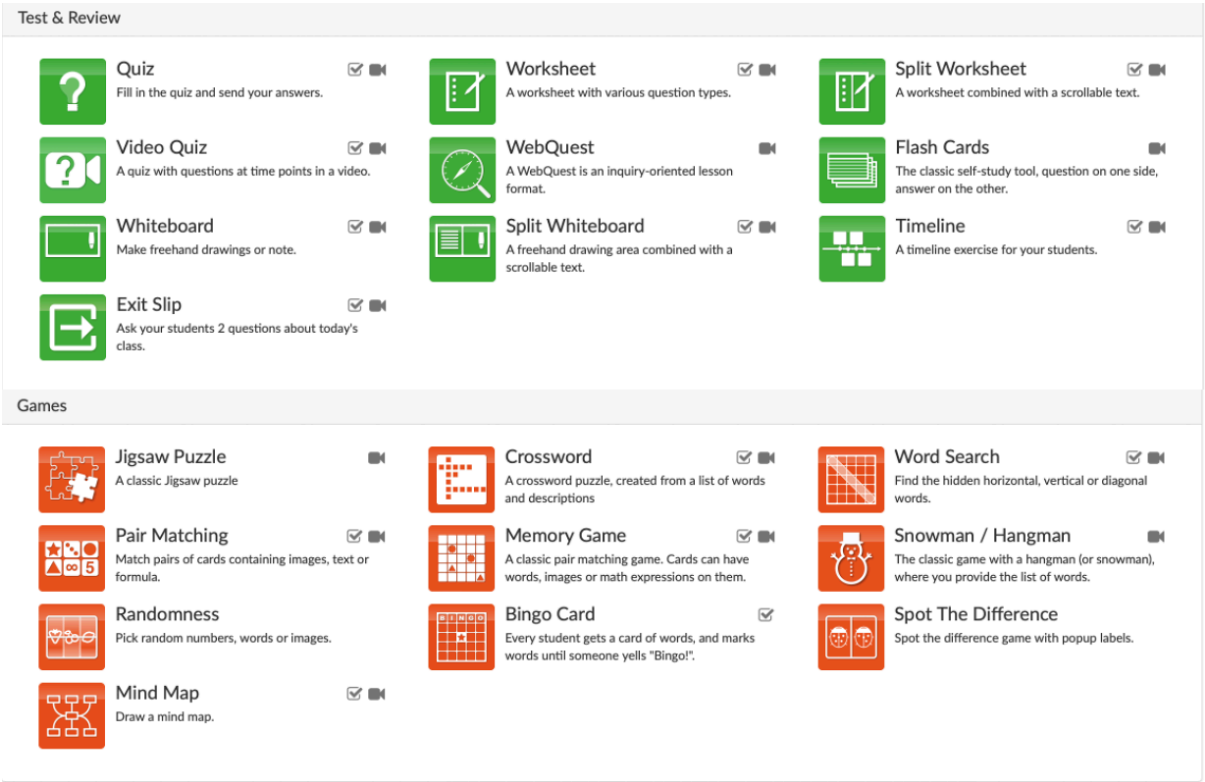
Based on Book Widgets compatibility, widgets have become popular due to their compatibility with a variety of well-known and easy-to-use platforms, including Google Classroom, Canvas, Moodle, digital whiteboards, and any electronic device (Daily, 2020). Book Widgets are easily accessible through various devices, such as

smartphones, laptops, and tablets. As a result, they are an ideal choice for modern classrooms or anywhere else. With the Book Widgets compatibility, the screen size can be adjusted to meet the device's needs (see Figure 5), making it more convenient for teachers and students to access the tools they need at any time. Also, compatibility plays a significant role in the user-friendliness criterion. Therefore, the compatibility criteria were rated as ‘strongly agree’.

4.2.13 Components

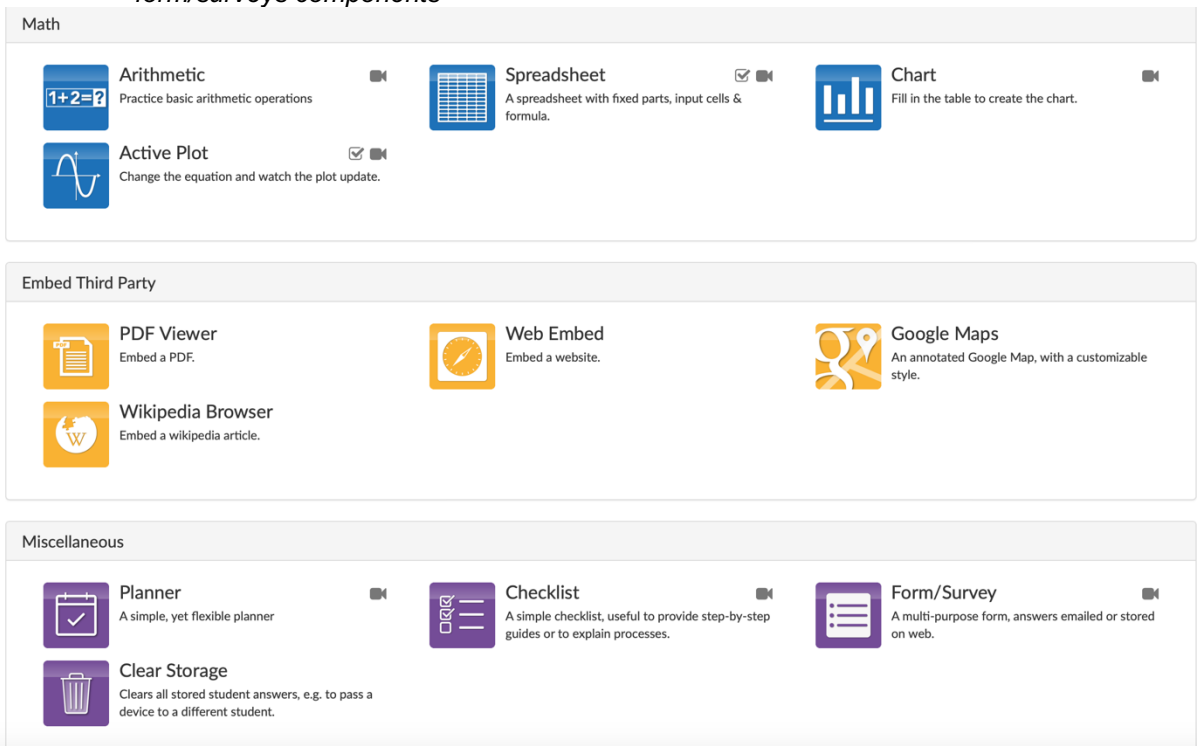
Gamification components are critical to the success of gamification since these components allow instructors to modify content in a manner that enhances student performance and encourages student engagement in the learning process (Wang et al., 2022). As shown in Figure 14 below, Book Widgets offer more than 40 different activity templates based on games, such as crossword puzzles, bingo sheets, and memory games. As an example, the memory game widget demonstrates that recognising a pair of terms provides a better representation of the relationship between them than simply memorising them.

Figure 14: Example of components within Book Widgets



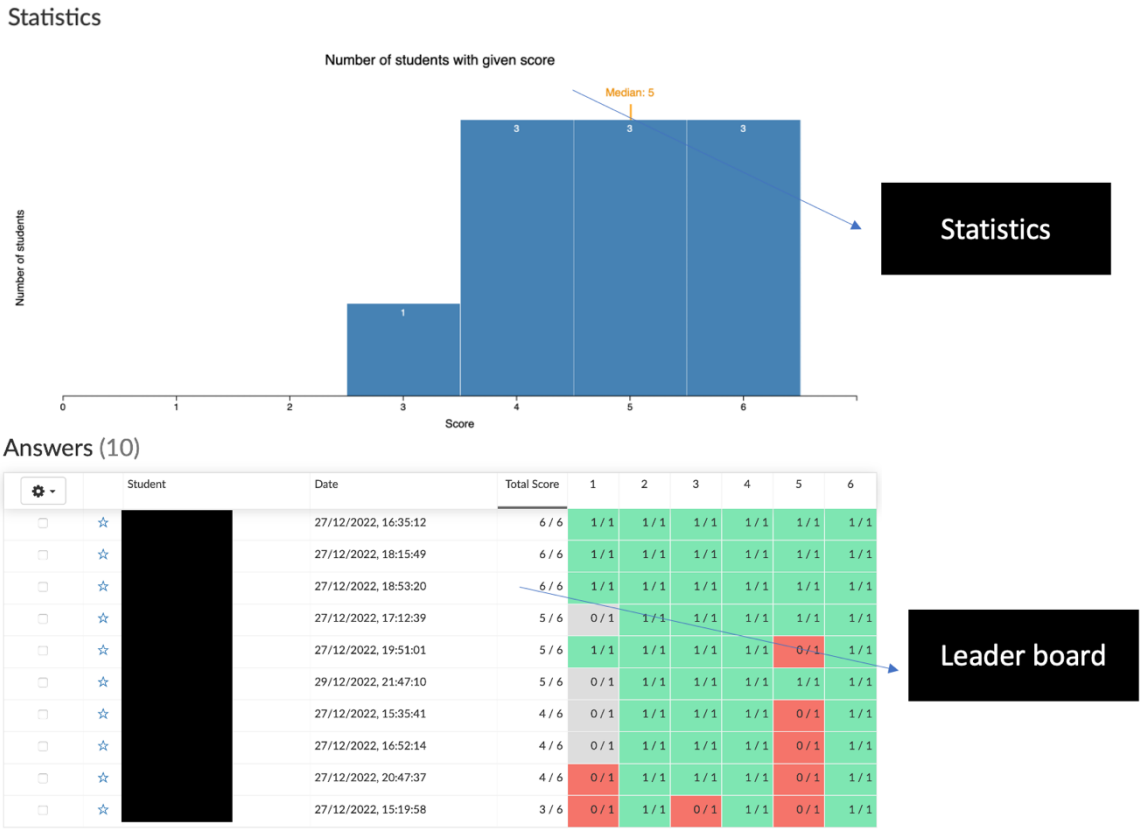
In addition to math activities and embedding third-party applications, there are planners, checklists, and forms/surveys included in the application, as illustrated in Figure 15, below. Several other components were also included, such as exit sheets, video-based activities, and storytelling tools that can be integrated into seven different application tools to conduct activities in any subject area and entertain students.

Figure 15: Example of Math, embed third-party components as well as planners, checklists, and form/surveys components



Furthermore, Book Widgets contain components designed to motivate and engage students, such as badges, points, sound effects, and animations. As can be seen in Figure 16 below, Book Widgets include status report components that provide students with feedback on their progress through leader boards and statistics. Thus, the component's criteria were evaluated as ‘strongly agree’.

Figure 16: Example of a leaderboard and statistics within Book Widgets

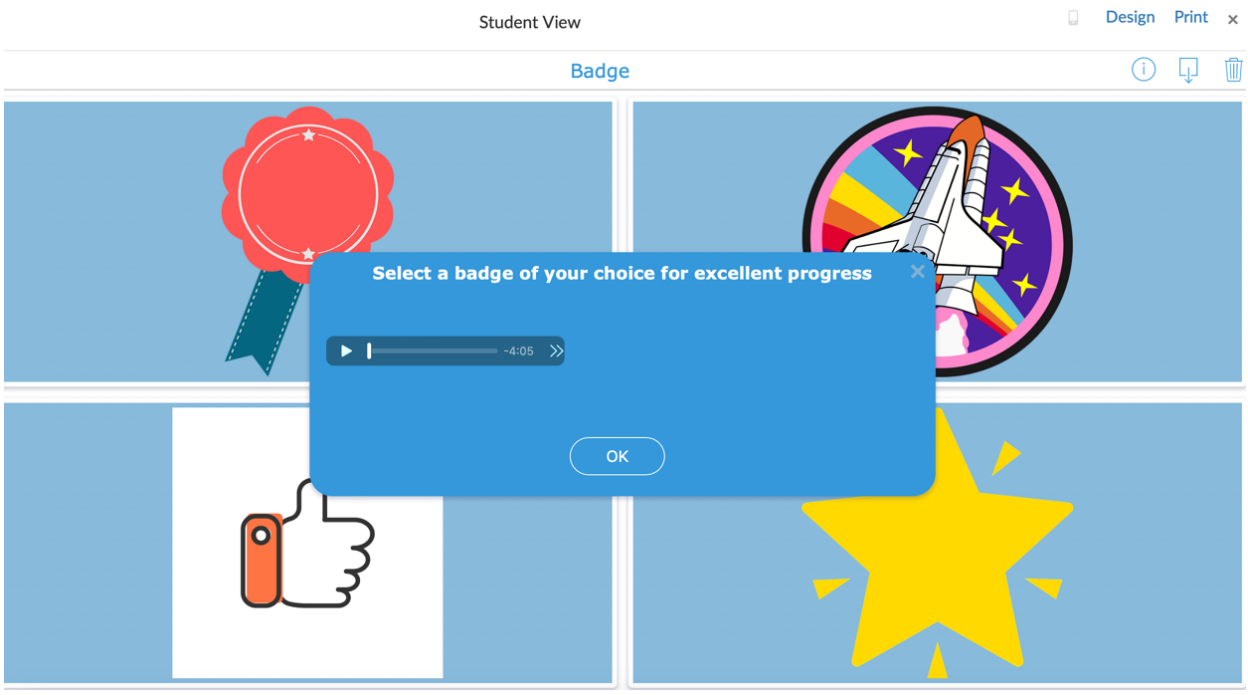


4.2.14 Badges

The effectiveness of utilising badges as incentives has been proven in motivating users to increase their frequency of accessing an application, extend their usage duration, and enhance their engagement within the application (Johnson et al., 2016; Lewis et al., 2016; Looyestyn et al., 2017; Seaborn & Fels, 2015). As part of Book Widgets, badges are used to reward students for completing tasks, which promotes student involvement and motivates them to learn. Using the bingo component of the application, teachers can create badges that reward students for completing tasks or continue to demonstrate progress by directly rewarding them. As illustrated in Figure 17 below, teachers can create a variety of badges and allow students to select one. This can be accomplished by sharing a link that allows students to select their preferred badge. As a result, students are not automatically awarded badges for completing tasks; rather, the teacher evaluates the student's work and then awards a badge based on their achievement. By rewarding students for completing tasks or for making progress, it supports them in the learning process, as it motivates them to learn

more and do better. Accordingly, badges in the Book Widgets application were evaluated as meeting the Badges criteria.

Figure 17: Example of badges selected by the teacher for student selection



4.2.15 Improvements to the application

According to criteria 15: 'What can be changed to improve the application?' was not evaluated on a five-point Likert scale; it was evaluated based on the researcher's opinion. Based on the question, the researcher stated, *"As a user of the Book Widgets application, I would make the application free to use for easy access. I would add an additional element which enables teachers to create student groups for gameplay to improve engagement".* According to the researcher, if the application was free, more users would access to it, thereby expanding its reach. Further, the researcher points out that an important component of the application that would enhance student engagement would be the ability for teachers to create student groups. According to Ku et al. (2013), the creation of student groups can be beneficial to the implementation of gamification, as positive team dynamics can contribute to higher levels of teamwork satisfaction and can increase student performance.

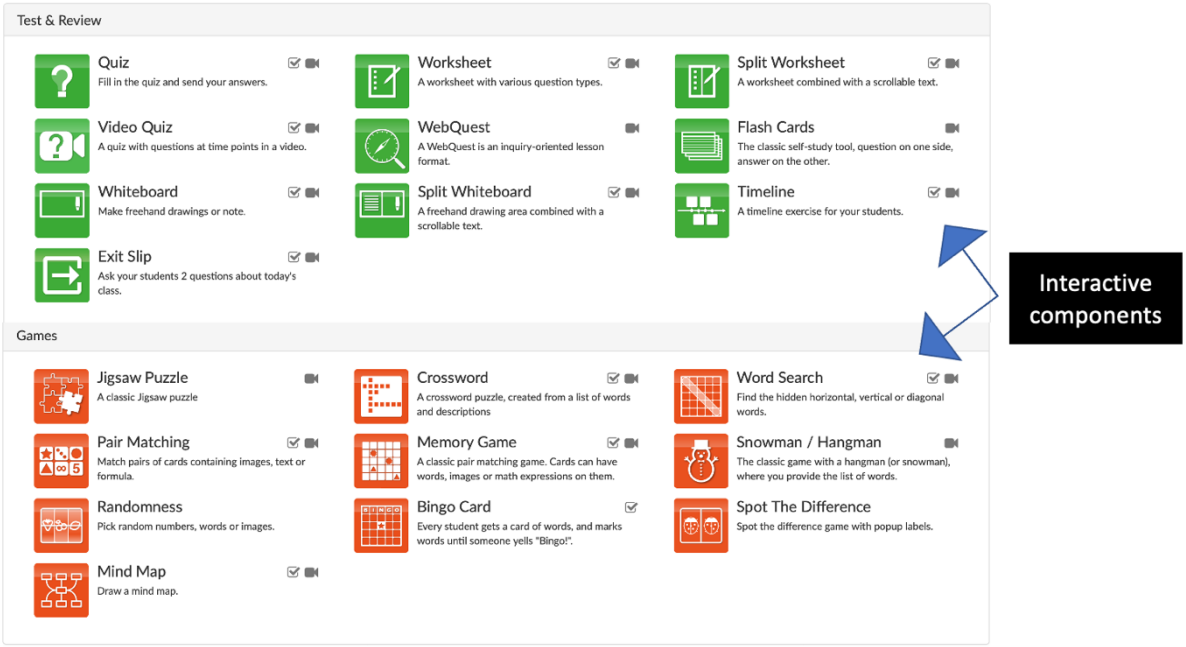
4.2.16 Best gaming elements

As a result of criteria 16: "What do you like best about this application's gaming components?" was not evaluated based on a five-point Likert scale; but based on the researcher's opinion. In response to the question, the researcher indicated that *"In addition to offering a variety of gaming elements, Book Widgets offer other elements that motivate learners and enhance learning. Therefore, I like the points and badges learners can earn because it motivates them to do better".* As discussed by Deterding, Sicart et al. (2011); Hamari et al. (2014), gamification utilises reward structures such as points and badges to motivate certain behaviours among students, since points and badges can also be used to track and reward student achievement. Therefore, the researcher believes that points or badges earned for completing tasks motivated students to learn more, creating a sense of accomplishment, and encouraging the student to continue playing.

4.2.17 Recommendations for the application

Using criteria 17: "Would you recommend this gaming application?" was not evaluated based on a five-point Likert scale, but on the researcher's opinion. In response to the question, the researcher stated, "*Yes, Book Widgets would be highly recommended because of the great gamification elements it offers, such as flash cards, quizzes, hangman, spreadsheets, and video-based activities, all of which can be used to motivate and support learners in the classroom".* The researcher found that the Book Widgets application, as shown in Figure 18 below, provides students with features that promote student engagement, such as interactive components that enable them to practice the material and test their knowledge. Furthermore, the application supports learners in the classroom and rewards students with badges and points for their progress, thus encouraging and motivating them.

Figure 18: Example of interactive components within Book Widgets



As a result of the evaluation of Book Widgets using the gamification evaluation rubric (Altanis et al., 2018), the Book Widgets application met all 14 criteria, thereby indicating that it is a gamification-compatible application that can be utilised to motivate, engage, and promote student participation. Along with the 14 criteria, Book Widgets can be improved by making it freely available to all users and allowing teachers to create student groups. Thus, from the perspective of a teacher as a researcher, it can be highly recommended for students to use, with badges representing one of its most valuable elements. The next section will discuss the student's responses to the Book Widgets application when used as a gamification tool.

4.3 Analysis of Participant Responses

The following section will analyse the findings obtained from semi-structured interviews conducted with participants using an interview schedule (Appendix 2). Participants' responses will be analysed using a five-dimensional analysis based on the five dimensions of the gamification taxonomy framework: ecological; social; personal; fictional; and performance. There are 10 participants in the semi-structured interviews, all of whom are females between the ages of 10 and 11. As mentioned in Chapter 2, to facilitate easy reading, the elements for each dimension will be in bold font and the components will be in italics.

4.3.1 Ecological dimension

The participant responses were presented in conjunction with the gamification elements within the ecological dimension of the gamification taxonomy framework. The elements include chance, imposed choice, economy, rarity, and time pressure.

- **Chance**

As part of the ecological dimension, the element of chance is prominently emphasised when students receive bonus points, since chance provides motivation and a sense of reward for students' efforts. Although points, badges, medals, and awards are considered part of the acknowledgment element of the performance dimension, the bonus points, in this instance, were awarded to students based on the probability or progressing well or exceeding expectations in terms of their efforts and not based on luck or randomness. Like the work of Ortiz-Rojas et al. (2019), it is perceived that bonus points awarded in Book Widgets are part of the chance element because they were meant as incentives to motivate students to work harder and to do their best, and they have been observed to stimulate students intrinsically. It was mentioned by several of the 10 participants that *bonus points* were an element of Book Widgets that could motivate them to learn more, thus giving them the chance to progress. Participant 5 stated, *"…I feel excited to play games on Book Widget to learn more and get higher points"*, emphasising the effect of *bonus points* on motivating student learning as a probability of progressing. Participant 3 mentioned *"I work hard just because I just want to earn more bonus points"* thus, earning *bonus points* contributes to students' motivation to work hard to earn points.

While the other participants pointed out that receiving *bonus points* does not affect their motivation since they are motivated to learn more regardless of whether they receive bonus points or not. Participants 1 and 8 stated:

"Uh, I would want to learn more and get more knowledge, so I would try it again, even when it doesn't have bonus points, but if it has bonus points, that's good for me." (Participant 1)

"…if there's no bonus points, I wouldn't have a problem with it because it's okay if I don't have bonus points, I will keep on playing and learning…" (Participant 8)

Participants 1 and 8 further indicated that *bonus points* were a nice incentive but not a motivating factor. Playing was more important for them for the purpose of gaining knowledge and understanding of the content. Meanwhile, Participant 10 stated: "*I feel happy because when you earn bonus points it's like feels like you're getting like you like did something that's extra and you get like a like a present word"* emphasising that earning *bonus points* gave them a sense of accomplishment and acknowledging that they earned *bonus points* for extra effort.

Overall, some participants were motivated by *bonus points* to learn more, whereas other participants were not concerned about earning points as a motivational factor to play and learn more on Book Widgets. In this instance, the chance element is demonstrated through *bonus points*; even though this is not the typical chance element, students were motivated to learn more through *bonus points* when they perceived that the probability of progress was possible.

- **Imposed choice**

The imposed choice element involves judgment, choice, or paths that are influenced by extrinsic motivation. There is evidence of imposed choice in the Book Widgets application when students make decisions based on advancing or examining the task or situation at hand. In accordance with the findings of the study, out of the 10 participants, only three responded to the imposed choice element, two indicated that they would learn more and then reconsider playing the game, while the third stated otherwise. The participants said:

"I would go study to get more knowledge and then, and then go and try it again until I get it correct." (Participant 1)

"I would, uh, see my mistakes that I would learn them or study them, and then I'll do the quiz again." (Participant 3)

It appears that participants 1 and 3 have made a choice to study and attempt the task again with the aim of improving or advancing their performance. This indicated that the students were determined to make a *choice* that stimulated their extrinsic motivation to advance, whereas Participant 9 mentioned, *"I would try again. If I got less again, I would study, then try again".* In this situation, the student chose to play again before attempting to study and then tried to do the task again to see if they got

a lower score; if so, they would make a *judgment* based upon their previous results to study and then attempt to score higher.

Ultimately, all three participants made a *choice* and determined what they wanted to do and where they wanted to go based on their task or situation, which stimulated their extrinsic motivation to increase their knowledge. Therefore, students were able to gain a sense of control by incorporating a sense of *choice* into their assignments and educational experiences (Hill & Brunvand 2018).

- **Economy**

As an extrinsic motivation element, the economy is a function of the market, transactions, and exchanges in which the reward is provided as a trading point for reaching a certain level or milestone in the game. It is evident that the economy element is present in Book Widgets, which provide learners with *badges* and *points* that provide extrinsic motivation to learn (Toda, Oliveira, Shi et al., 2019). Among the 10 participants, only two provided clear evidence to support the economy element. According to Participant 1, *“Uh, if I, if I win, um, a metal badge or anything, I would feel more entertained. And if, if I don't, at least, at least I got more knowledge”,* emphasising that receiving medals or badges amuses them, whereas if they are not rewarded, they are still motivated to learn more. As a result, this response appears contradictory, considering that this element stimulates extrinsic motivation, and the student should be motivated to reach a certain level or milestone in exchange for receiving badges, medals, or awards. In contrast, Participant 5 responded: *"That's because then I can get like more, um, awards. Awards, um, and, and like, and more badges I learn more and it tells me, and it tells me that I can like go to the next level and I am actually doing well",* this participant acknowledged that they are learning more as a result of moving to the next level and in exchange, receiving awards such as badges.

Accordingly, Participant 5 serves as an example of how the *economy* is employed in the Book Widgets application, since this participant viewed reaching the next level as a trading point in earning badges as a form of reward. This resulted in the student being extrinsically motivated to learn and earn an award to reach the next level as the student acknowledged their achievements. Moreover, badges, medals, and awards are considered part of the acknowledgment element of the performance dimension (Toda, Valle et al., 2018). However, Participant 1 does not perceive badges as an

extrinsic motivation to receive a reward in exchange for achieving a certain level, but rather intrinsically motivated by entertainment and gaining knowledge.

- **Rarity**

According to Dignan (2011), rarity refers to the accumulation of limited items that are motivated by extrinsic factors. Regardless of how difficult the task may initially appear; students are motivated to collect limited items in order to accomplish a specific goal. As such, the rarity element is not apparent in the Book Widgets application.

- **Time pressure**

Time pressure refers to the deadline for completing a task, and learners are pressured to compete by using clocks or timers. Based on the responses of the 10 participants, four were able to provide clear evidence demonstrating that time frames are present in Book Widgets. In the Book Widgets application, time pressure has been shown to be an effective motivator for students as Participant 3 mentioned, *"I am motivated to complete the task because I want to be on time".* The use of timers has also been demonstrated to be a method for students to manage their time to accomplish their tasks as quickly as possible. Participant 10 noted, *"Timeframes help me to manage my time, and complete my tasks quickly".* As a result, students perceive the deadline for completing tasks as an extrinsic motivation (Toda, Oliveira, Shi et al., 2019).

Although participants agree that *timeframes* motivate them to complete tasks (Participant 10), they also feel stressed (Participant 1), sad, or defeated (Participant 2) when they fail to finish on time. Participant 1 mentioned, *"Timeframes motivates me to finish the task, but I would feel stressed to complete the task".* Timeframes can be a double-edged sword in this case due to their ability to motivate students and cause them to feel pressured to perform, resulting in a sense of failure or stress. Whereas Participant 2 stated, *"If I do not finish or time up, I feel sad, and defeated",* suggesting a sense of demotivation due to a fear of losing (Daugherty & MacLin, 2007).

An overall effect of time pressure in the ecological dimension is to stimulate extrinsic motivation. This study found that some participants were motivated and felt pressured by *timeframes* to compete and accomplish tasks. This, in turn, resulted in improved performance. Additionally, some participants experienced *timeframes* as a demotivating factor.

4.3.2 Social dimension

The results were formulated from the data in combination with gamification elements within the social dimension of the gamification taxonomy framework. The elements include competition, cooperation, reputation, and social pressure.

- **Competition**

As a means of stimulating extrinsic motivations, competition involves conflict, scoreboards, player versus player, or leaderboards. Due to the inclusion of player vs player and scoreboards in the Book Widgets application, students are motivated to participate as well as encouraged to succeed through competitions. Out of 10 participants, two provided evidences concerning the competition element. As claimed by Participant 5, *"It looks like a competition and in a competition, I really want to win, so then I'll actually try my best".* This statement emphasises that where there is a competitive element, such as scoreboards, it motivates students to do well and exert more effort than they may have otherwise (Dicheva et al., 2015). Furthermore, participants expressed disappointment when they scored less than their peers or lost a game, as illustrated in Participant 3's response*, "I feel disappointed if I lose, but I say to myself, okay, maybe next time I would win…"* indicating that through disappointment, students are motivated to learn and improve on their performance in the future.

Competition has been demonstrated to be effective when the number of points, badges, or levels are earned to reach a certain level (Toda, Oliveira, Klock et al., 2019). Since points, badges, and levels are all components of the performance dimension that promote extrinsic motivation among students (Toda, Oliveira, Klock et al., 2019), in this context, competitions were used to encourage students to improve their own skills and knowledge, rather than only achieving a specific goal. Thus, students were extrinsically motivated to win, and this competitive spirit contributed to their ability to challenge their peers and strive for higher levels of achievement. Ultimately, this fostered strong extrinsic motivations for learning.

- **Cooperation**

Cooperation can be described as teamwork or group work that stimulates intrinsic motivation in students. Therefore, learners need to cooperate to achieve a specific goal (Shi et al., 2014). Cooperative activities in Book Widgets are perceived as fun

and motivating, as implied by the student's statement, *"playing with friends"* (Participant 6) emphasising that they enjoyed playing with friends. Supporting the response of Participant 6, Participant 7 stated, *"…I like playing with my friend because I want to see if I am smart or not"* suggesting the main motivation of the participants was to gain a sense of accomplishment by comparing their skills with those of their friends. As a result, the participants demonstrated a high degree of *cooperation* (Williams et al., 2006).

Even though only two of the 10 participants demonstrated cooperation, this provided sufficient evidence to prove that Book Widgets offer cooperative activities that motivate students intrinsically. Through collaborative activities, students are effectively engaged and motivated to accomplish a task, which, in turn, motivates them intrinsically to achieve a specific goal (Butko, 2022).

- **Reputation**

According to Toda, Oliveira, Klock et al. (2019), reputation is demonstrated in students' desire to achieve certain levels within a game to reflect their skills. Through the social interaction between the students, peer pressure motivates the student to achieve a particular goal (Toda, Oliveira, Klock et al., 2019). Book Widgets leveraged the element of *reputation* in order to motivate and encourage students to succeed in achieving their objectives. One of the 10 participants indicated that the reputation element contributed to their engagement in learning activities. As evidenced by Participant 8's response, *"Yes. It like keeps me motivated and seeing who will win".* In this sense, social interaction was viewed as a motivating factor that encouraged students engaged in the learning activity to reach a certain level of performance.

Furthermore, *reputation* contributed to fostering a sense of competition among the students, which, in turn, led to greater engagement and commitment to the learning process. Thus, Book Widgets promoted intrinsic motivation among students using the reputation element.

- **Social pressure**

In terms of social pressure, *peer pressure* and *guild missions* are factors that contribute to intrinsic motivation. Consequently, the Book Widgets application incorporates social interaction to motivate learners to achieve a specific goal (Toda,

Oliveira, Klock et al., 2019). Of the 10 participants, two indicated that the social pressure element contributed to their engagement in learning activities. As mentioned by Participant 8, *"... it encourages me more that she can do this, I can do that so we can see if she is winning or I am winning". Peer pressure* was perceived to motivate and encourage students to engage in certain activities and attain certain goals. Participant 8's response contributed to the factors of *reputation* and *social pressure* that led to the high level of *cooperation* shown by the students. A further demonstration of *peer pressure* can be found in the response of Participant 5, *"When I, when like, uh, there is a timer and when I always win and also when I play, when I, when I play with my friends, it's like, um, uh, play with my friends, like trying to beat, beat them".* This indicates that students felt *pressure* to keep up with their peers and compete against them as a result of the timers. In this example, *peer pressure* had a significant impact on the engagement of the students.

In many cases, *peer pressure* serves as a motivator for students. As part of the Book Widgets initiative, the integration of *peer pressure* is considered a means of supporting student learning and increasing students' engagement (Fuad & Akbar, 2022). As a result, in using the Book Widgets, participants agree that social pressure stimulates intrinsic motivation and encourages them to engage in activities and achieve specific goals.

4.3.3 Personal dimension

The responses of the participants were presented in conjunction with gamification elements within the personal dimension of the gamification taxonomy framework. The elements include novelty, objective, puzzle, renovation, and sensation.

- **Novelty**

Among the elements of novelty new features, changes, updates, or surprises are being discovered. In Book Widgets, novelty plays an important role in motivating students to participate by adding new features that contribute to a more enjoyable experience. There was evidence of the novelty element in Book Widgets from three of the 10 participants. This can be seen in Participant 7's response, *"Well, it makes it more fun and, uh, it makes like, it makes me more motivated".* In support of Participant 7's response, Participant 8 stated, *"Yeah, it like helps me learn and it makes it a little bit*

more fun and like it encouraged me to play more and study more". As such, it indicates that discovering *new features, changes, updates, or surprises* encourages playing and learning. Hanus and Fox (2015) suggest that users are more likely to engage when they are presented with new content and information. According to Participant 10, *"...makes me want to learn more and it helps me with like studying because like when I am in school sometimes like I am I can be a visual learner. And so, this is just like helps me with it with the real school too".* This further illustrates that the features of Book Widgets motivated the students to learn more and as a result, increasing their engagement in the classroom.

In general, intrinsic motivation refers to the desire to explore new things and new challenges, assess one's capabilities, observe, and acquire knowledge (Boulet, 2016). Thus, participants were stimulated by intrinsic motivation when exploring Book Widgets' new design features as they intended to gain knowledge.

- **Objective**

Objectives are a set of milestones and missions that must be achieved to activate intrinsic motivation. In Book Widgets, the objective element is present as it interacts with the economy element from the ecological dimension and the acknowledgement element from the performance dimension. Participant 5 stated, "*That's because then I can get like more, um, awards. Awards, um, and, and like, and more badges I learn more and it tells me, and it tells me that I can like go to the next level and I am actually doing well".* Demonstrating a continuation of learning, the student appears to have a positive experience and attitude towards earning rewards and acknowledges that receiving rewards can contribute to achieving the *next level*.

Due to the intertwining nature of the objective, economy, and acknowledgement elements, these elements support each other to create a potential finding in teachers using gamification to determine the true nature of their motivation and engagement, rather than just looking at the specific element itself. In this case, as students achieve specific objectives or missions, they become more engaged and motivated (Toda, Valle et al., 2018). As a result, Book Widgets enhance intrinsic motivation among students using objective elements.

- **Puzzle**

Puzzles are used to stimulate a student's intrinsic motivation through cognitive tasks, challenges, or even actual puzzles. Quizzes or challenges, for example, can serve to provide students with puzzles in the learning environment (Toda, Oliveira, Klock et al., 2019). In Book Widgets, the value of puzzles through quizzes, are evidenced by three of the 10 participants. Participant 1 stated, *"Quiz keeps me focused… it is more like a game than like a quiz or something. So, I try to get, get better and better every time".* The participant highlighted the role of the *quiz* in Book Widgets as motivating students to learn as well as enhanced engagement.

Based on responses from Participants 4 and 8, combined with the timer, it appears that the *quiz* motivates learners to learn more and strive to complete the tasks before the timer expires.

"It makes me more excited to finish the task faster on a quiz." (Participant 4)

"…if I know that there is a timer I would study and know what the answer would be there, so I can answer it quickly and complete it before the timer." (Participant 8)

In the *quiz,* timers were used as contributing factors to the student's motivation to complete the task. Clocks or timers are part of the time pressure element of the ecological dimension; thus, puzzles and time pressure interact in Book Widgets. Therefore, the students were motivated both intrinsically and extrinsically; the timers contributed to extrinsic motivation and the *quiz* motivated the students intrinsically by keeping them focused and motivated to learn.

- **Renovation**

According to Lee and Hammer (2011), renovation is characterised by aspects of renewal, boost, or extra-life that motivate on an intrinsic level. If learners fail the first trial, they are given a second chance. In Book Widgets, students do not have access to renewals, boosts, or extra lives during gameplay, however, they can redo the task if they are unsuccessful the first time or receive low scores. This is evident in Participant 3's response, *"I would, uh, see my mistakes that I would learn them or study them, and then I'll do the quiz again".* Renovation plays a critical role in the ecological dimensions'-imposed choice element, in which the student can retake the quiz to gain additional knowledge and learn from their mistakes. Furthermore, Book

Widgets allow students to achieve a personalised learning experience by giving them a *second chance*, which motivates them to learn more, as mentioned by Participant 9, *"I would try again. If I got less again, I would study, then try again… It motivates me. Book Widgets makes me want to learn more",* emphasising on the ability of a *second chance*, motivates students and ultimately results in improved learning outcomes.

Although Book Widgets do not offer aspects of renewal, boosts, or extra-life, they allow students to try again if they fail, motivating them intrinsically. Based on the evidence provided by two of the 10 participants, the renovation element was observed in Book Widgets.

- **Sensation**

Toda, Oliveira, Klock et al. (2019) demonstrate that the sensation element is present when the senses are stimulated through sound, visual, or tactile stimulation. In Book Widgets, *animations, colours, and background sounds* demonstrate the sensation element. All 10 participants provided evidence of the sensation element. As mentioned by Participant 6, *"Animations make me want to learn more because it makes the game so fun and, and so good… Yeah, because the games are really fun…the colours, chips and the music is so relaxing". e*mphasising how *animations* depicted in Book Widgets motivate, entertain, and relax students as they learn, thereby contributing to engagement and participation. *Colour, sound, and animation* are crucial components in maintaining learners' engagement and participation (Figure 5). Engaged learners are more likely to participate throughout the lesson. Students mentioned, "*animations make me want to learn more"* (Participant 5), suggesting *animations* as a component in keeping them engaged in the learning process.

As with *animations*, participants noted that *colours* play an important role in motivating and entertaining their learning experiences. According to Participant 1, *"Colour makes me want to learn more…I feel like I want to get more knowledge and makes me feel more entertained because of different colours…."* asserting that *colours* enhance learning, thereby increasing student engagement and enjoyment. Additionally, Participant 8 stated, *"Colours encourages me to learn more, and get my attention…colours looks good and beautiful to me",* emphasising the fact that colours in Book Widgets facilitate learning and maintain students' attention during the learning process. Book Widgets enable students to view different colours through pictures and

videos, as described in Participant 7's response*, "Colours that are shown on pictures and videos motivates me to learn more".* Using Book Widgets for teaching, can effectively engage students and strengthen their understanding of the material (Buljan, 2021) through visuals like *colours*. In addition, Participant 4 mentioned, *"The colours help me like to relax and relieve stress".* Considering *colours* as a means of relaxing and relieving stress, reveals that colour can be a powerful tool for influencing how students feel.

Several participants noted that the *background sound* in Book Widgets helps them to remain focused, motivated, and entertained. According to Participant 3, *"Uh, the background music keeps me focused…when I make mistakes, I can easily correct them and the music keeps me so focused",* assuring that *background sound* helps students stay focused, also reduces anxiety, and it assists them in staying motivated throughout the lesson. In addition to helping students stay focused, the *sound* of the *music* also blocks out distractions as mentioned by Participant 4, *"…the music and sounds help me stay relaxed so I don't stress when doing school work… Uh, because of the music I do not hear noise from outside*". Consequently, *background sound* enhances student learning and helps them stay focused and engaged in the learning process as it blocks out distractions.

Like Participants 3 and 4, Participants 2, 9, and 10, indicated that *background music* encourages them to study, keeps them relaxed since it improves focus and concentration, and reduces stress levels.

*"The background music is pretty, and it encourages me to learn, and makes me relaxing." (*Participant 2)

"The background sound helps me relax and not think too hard." (Participant 9)

"..Usually, I like put on some music to soothe me out of stress." (Participant 10)

A combination of animations, colours, and background sound presented in Book Widgets stimulates intrinsic motivation in students as a result of their interest in the visuals and audio presented. This helped to create a more enjoyable learning environment for students, thus increasing their engagement and motivation to learn.

4.3.4 Fictional dimension

Participant responses are presented in conjunction with gamification elements within the fictional dimension of the gamification taxonomy framework. The elements include narrative and storytelling.

- **Narrative**

The narrative element incorporates implicit decisions that stimulate intrinsic motivation through the sequence of events within the game; the narrative stimulates learners' imagination (Palomino et al., 2019). The narrative element is an integral part of the Book Widgets application, and it contributes to student learning in terms of motivation, engagement, and participation. Although students have not specifically mentioned the narrative element as part of the fictional dimension, it is implied or incorporated in some of the other elements. As narrative refers to the sequence of events, students had levels to complete, making choices to repeat and see their progress as they proceeded, all forming part of the narrative of the game. This is evident in the level, imposed choice and progress elements.

- **Storytelling**

The purpose of storytelling is to stimulate learners' intrinsic motivation for learning in each environment by using text or *audio stories* (Palomino et al., 2019). Storytelling plays an integral role in Book Widgets through *audio, text,* and *voice* (Figure 5). Of the 10 participants, four emphasised that *audiobooks* give instructions of what and how tasks should be completed, as mentioned by Participant 2, *"Well, audiobook explain to me how, and what tasks on Book Widgets means before I complete the task".* The use of *voice instructions and audiobooks* also contributes to student learning, since they make it easier for students to understand the questions. Participant 5 stated, *"Audiobook helps me to understand the game better because I may not have played the game before, so I have to listen to the instructions first and play the game",* emphasising the importance of listening to instructions. Participant 8 mentioned, *"…Audiobook helps me understand the game better, and know what to do before I get frustrated by the questions…*", suggesting *audiobooks* can be beneficial in helping to understand the instructions and playing the game as it can reduce frustration during the game.

Furthermore, Participant 9 reported, *"Yes. If there was no audio, I would probably not know how to play".* This implies that the use of *audiobooks* as instructional materials is crucial for students to understand how to play the game. It can otherwise, lead to students becoming demotivated.

The participants were intrinsically motivated to learn as instructions were provided via audiobooks or voice, which helped them during gameplay. Additionally, participants felt more confident when audio instructions were provided rather than only written instructions (Shah, 2020). This indicates that audio aids can be beneficial for gamification and can help motivate students.

4.3.5 Performance dimension

The responses of the participants were presented in conjunction with gamification elements within the performance dimension of the gamification taxonomy framework. The elements include acknowledgment, level, progression, points, and stats.

- **Acknowledgment**

In gamified applications, the acknowledgment element consists of badges, points, medals, trophies, and awards. In the Book Widgets application, the acknowledgment element played a prominent role, since it was often associated with other gamification elements. A variety of extrinsic motivational tools were mentioned, including badges, points, medals, trophies, and awards. According to the responses of five of the 10 participants, these components provide extrinsic feedback to compliment a player's specific actions (Toda, Valle et al., 2018). Participant 5 mentioned, *"…I want to play and learn more, then I can get more awards and more badges…".* This implies a sense of motivation to continue interacting with the application. According to Participant 4, *"Earning a badge makes me feel good about myself that I can do it",* emphasising the rewards received and acknowledging the feedback as a motivating factor. It has been proven that earning *badges* motivates students to take part in more learning activities using Book widgets, as indicated by Participant 9, *"…The more I earn badges, the more I think and need to learn more. So, I earn more badges. I, uh, study more".* It appears from these sentiments that the *badge* system was successful in providing motivation and recognition to students.

However, other participants indicated that earning badges is not of much importance to them if they gain more knowledge. The participants stated:

"I feel like, oh, I feel great when I earn a badge, but it's like, I don't really care about like, the badges or stuff to make me want to play and like, learn." (Participant 2)

"Um, I want to earn it because like, it, it makes me feel way better than I am and like, okay… If you earn a badge, it is okay, but if I didn't get the badge I would still like, learn a lot." (Participant 3)

Overall, some participants perceived *badges* as an extrinsic feedback mechanism that contributed to their desire to learn more and motivated them during their learning experience on Book Widgets. Other participants, however, are not concerned about earning badges so long as they gain more knowledge.

- **Level**

A level element can also be described as a skill level or a character level. In the ecological dimension, the level element contributes to the economy element in the sense that as students' complete certain tasks, they gain an opportunity to proceed to the next level, and as they advance in the level, they can carry out more challenging tasks (Toda, Oliveira, Klock et al., 2019). As a result, it is related to an extrinsic hierarchical layer where new benefits are provided as the student progresses through the environment. Among the 10 participants, one gave evidence concerning the level element and indicated that within the Book Widgets, levels play an important role in the learning process, according to Participant 5, *"Yes. Because, because then I, I learn more and it tells me, and it tells me that I can like go to the next level and I am actually doing well",* suggesting that the presence of levels encouraged the student to keep progressing. This motivated the students to continue learning and gave them a sense of accomplishment (Chou, 2015).

Book Widgets has shown to extrinsically motivate students through the level element, as students found that progressing to a new level motivated them to learn more.

- **Progression**

Progression elements may also be referred to as progress bars, steps, or maps, providing an extrinsic sense of progress that allows students to locate themselves in an environment (Toda, Oliveira, Klock et al., 2019). In Book Widgets, progress bars

were used as a motivational tool by students to locate their progress and determine whether they needed to make improvements. Of the 10 participants, three provided evidences concerning the progression element. Participant 3 stated, *"Progress bar motivates me because I would fail in the first time, and second time, maybe better the third time…. It will help me to see my mistakes better, and correct them",* pointing out that adjustments are needed to improve performance.

According to Participants 4 and 5, the progress bar in Book Widgets motivates them to improve their learning and correct their mistakes. Participant 4 stated,

"Progress bar motivates me to learn more so that I can get better in my grades." (Participant 4)

"…when I see a progress bar on book widget I am motivated to learn more and get better next time…" (Participant 5)

In addition, progress bars were used to extrinsically motivate students, thus contributing to student engagement and motivation, as well as to assist them in tracking their progress and understanding their mistakes. In terms of student performance, the progress bars had a positive effect, as they allowed students to visualise their progress and make the necessary adjustments in order to achieve their objectives.

- **Points**

Points can be referred to as scores, experience points, or skill points, and are used to provide extrinsic feedback to students. Moreover, all gamified applications, such as Book Widgets, rely on the concept of points as a fundamental component (Dichev & Dicheva, 2017). In the ecological dimension of chance, bonus points have been described as associated with luck, randomness, probability, or fortune as a source of intrinsic motivation. However, in this context, points were used for feedback as a measure of performance against peers. From the 10 participants, one demonstrated that points were present in Book Widgets. As Participant 8 stated, *"I feel like angry a little bit and sad that I didn't win, but I will try again before, before studying so I can learn more and know what to do and like that so I can get a higher score".* It was emphasised that the experience was *'intensely competitive'* and the student felt the need to focus because they feel angry if they fail.

Extrinsic motivation refers to motivation driven by external rewards. As seen in the participant responses, points extrinsically motivated students so that they continue to perform a task without regard to whether it is inherently rewarding to them. In this regard, students were motivated to learn more to score higher and win. Thus, Book widgets have proven to be a valuable tool in motivating students to actively engage in the learning process.

- **Stats**

The stats element is also known as information, Head Up Display (HUD) and data, and it refers specifically to information obtained through the learning environment (extrinsic), such as how many tasks have been completed by the learner (Dignan, 2011). Book widgets are equipped with a stats element that automatically shows graded scores (Figure 16). This facilitates the tracking of the student's progress and motivates the student to continue learning. While no indication was provided in the interviews, there is no supporting evidence.

4.4 Discussion

In the literature, it has been demonstrated that gamification in teaching and learning can be used to increase student engagement and participation as well as motivate student learning (Limantara et al., 2019). Consequently, in this study, the researcher sought to determine if Book Widgets could be used as a gamification tool to support teaching and learning. The findings were triangulated utilising a gamification evaluation rubric to evaluate elements from the perspective of the teacher, as the researcher and the responses from the student interviews highlighting gamification elements within the taxonomy in relation to the Book Widgets application. Following the semi-structured interviews, the participant responses were presented in conjunction with the gamification elements within the dimensions of the gamification taxonomy framework. The findings were presented *verbatim* under each element, and the findings from the semi-structured interviews were then used to support the evaluations in the gamification evaluation rubric.

For the purpose of evaluating the elements within Book Widgets, an evaluation rubric utilising a five-point Likert scale gamification evaluation form (Appendix 1) was adopted using 14 criteria based on common design features as well as three questions

regarding the improvements of the Book Widgets application supported by the researcher's opinion. A thorough evaluation of Book Widgets revealed that all 14 criteria were met, however, the application could be further improved by adding a free subscription so that more users can benefit from the gamification value of an application such as Book Widgets. As indicated by the researcher, Book Widgets' points and badges were the most effective in motivating students to learn. Additionally, the researcher also pointed out that Book Widgets are highly recommended since they provide interactive games, such as flashcards, quizzes, hangman, spreadsheets, and video-based activities. In the evaluation from a teacher's perspective, gamification elements proved to be effective in engaging and motivating students as well as increasing student satisfaction with learning, using Book Widgets. Thus, it can be concluded that the elements within Book Widgets created a true gamified environment that contributed to supporting teaching and learning.

In order to support the findings that were obtained from the gamification evaluation rubric (Altanis et al., 2018), semi-structured interviews were conducted with the students to gain their perspectives. From the student interviews, the researcher was able to gather information on how students used the application for learning activities. This allowed the researcher to determine whether the gamification elements assisted students in learning as well as motivation, engagement and promoted participation in the classroom. According to participants' responses, gamification elements, such as points, badges, timers, and progress bars within Book Widgets motivated students intrinsically and or extrinsically to perform better during learning activities. The participants were drawn to the measurable progress and competitive aspects associated with points, while badges were attractive to participants seeking recognition or a sense of accomplishment. The integration of both these elements catered to a wider range of students, providing diverse rewards that resonate with different motivational triggers. It was also found that students were more engaged in the classroom due to elements such as animations and sound effects, which attracted their attention and enhanced classroom participation. It was observed that progress bars and leader boards encouraged students to learn more by fostering a sense of competition among peers. It has been demonstrated that peer pressure through competition and cooperative learning, can be effective in motivating students on both an intrinsic and extrinsic level. Additionally, students found storytelling to be effective

in motivating them to learn more, as they found audiobooks that provided in-game instructions to help them understand the game more effectively. The new design feature in Book Widgets has also improved the learning experience of students significantly, since they have highlighted the fact that it makes learning enjoyable and fun.

Further, the study explored common gamification elements in Table 3, adopted a gamification evaluation rubric (Appendix 1), and utilised the gamification taxonomy framework, all of which have a common basis in relation to gamification elements. As a result, all three elements worked well together, as the common gamification elements in Table 3 provided information on the value of common elements, such as rewards and achievements. A gamification evaluation rubric provided criteria to follow for evaluating the gamification elements within Book Widgets and a gamification taxonomy framework provided a framework for analysis of the responses from participants when using gamification elements in Book Widgets. By using of all three elements, the researcher was able to explore most of the gamification elements in the Book Widgets and gained a greater understanding of how gamification elements are utilised in Book Widgets to promote motivation, engagement, and participation.

4.5 Chapter Summary

As part of this chapter, the findings of the study were presented in a detailed evaluation of the elements within the Book Widgets application. This was done using a gamification evaluation rubric and an analysis of participant responses from the semi-structured interviews. The Book Widgets application was evaluated from the perspective of a teacher using the gamification evaluation rubric. As per the criteria in the evaluation rubric, the researcher gave ratings using a five-point Likert scale and evaluations in support of the researcher's perspective as well as screenshots taken directly from the application as evidence. A presentation of the results from the semi-structured interviews was made based on the gamification taxonomy framework and a presentation of the participants responses. The findings were presented in the actual words of participants under each element. Participants' responses were analysed using the gamification taxonomy framework dimensions, namely ecological, social, personal, fictional, and performance.

5. CHAPTER 5: CONCLUSION, INTERPRETATION, AND DISCUSSION

5.1 Introduction

In this chapter, a comprehensive overview of the study is presented, encompassing an exploration of its objectives, problem statement, literature review, framework, and methodology. The researcher further provides a condensed yet thorough summary of the study's findings, elucidating its significance, drawing insights from lessons learned, acknowledging inherent limitations, and formulating thoughtful recommendations for future research endeavours. The summary of the study's findings has been carefully crafted to directly address the research questions delineated in Chapter 1 as:

Sub-research questions

1. What are the gamification elements that are used in Book Widgets?
2. How do the gamification elements in Book Widgets motivate student learning?
3. How does the Book Widgets application improve engagement and participation in the classroom?

The study also addressed the main research question that was presented in Chapter 1 as:

How can Book Widgets be used as a gamification tool to support teaching and learning?

5.2 Overview of the Study

This study was conducted to investigate Book Widgets as a gamification tool for teaching and learning of Grade 5 students. As students have become accustomed to online learning due to the COVID-19 pandemic, teachers face a major challenge when teaching due to a lack of engagement and participation. Therefore, students have lost interest and motivation in certain aspects of learning as they return to school using the same traditional methods of rote learning. As a result, this study examined how elements of the Book Widgets application can be integrated into classroom instruction to increase motivation, engagement, and participation and ultimately, support teaching and learning.

In recent years, technological developments have increased the importance of the use of gamification elements in the classroom as a teaching and learning method (Koivisto & Hamari, 2019). As shown in the literature review, the use of gamification elements goes beyond traditional methodologies that are poorly aligned with the interests and needs of students in the 21st century (Ghavifekr et al., 2016; Tan & Tan, 2020; Wang et al., 2022). As a result, gamification has proven to be highly effective in motivating students to learn more and is promoting engagement in the classroom environment. Accordingly, this study explored the effectiveness of Book Widgets based on a gamification evaluation rubric. Using a gamification evaluation rubric, the researcher evaluated the elements within Book Widgets in order to determine whether they could provide students with motivation, engagement, and participation. A subsequent investigation was conducted to examine the gamification elements of Book Widgets while the students were using the application and analysed the responses from the students in accordance with the gamification taxonomy framework. In this study, the gamification taxonomy framework was utilised to identify the gamification elements in Book Widgets and to provide a structure against which the research is described.

A qualitative case study was utilised to conduct semi-structured interviews with a sample of ten (10) Grade 5 students from a private school in Riyadh, Saudi Arabia, who agreed to participate in the study. Using the qualitative method, this study examined participants' views and perceptions regarding the use of elements in Book Widgets.

5.3 Summary of the Findings

Valuable information was gained for the purposes of this study using the gamification evaluation rubric and from the responses obtained from the semi-structured interviews. The information addressed both the problem statement and the research questions. Accordingly, this section summarises the findings of the current study in response to the research questions.

5.3.1 Gamification elements in Book Widgets

The gamification elements present in Book Widgets were researched through a gamification evaluation rubric and the elements were evaluated according to the 14 criteria listed in the rubric and the three questions based on improvements and

recommendations. Based upon the study's evaluation of the Book Widgets application, it was found that the application included a variety of gamification elements, including training and instructions, curiosity, and compatibility, which facilitated the creation of a gamified learning experience as well as encouraged motivation and participation. It demonstrates that teachers do not need to use different applications to encourage engagement and promote participation; they can rather take advantage of a variety of activities within one application, such as Book Widgets, to support teaching and learning. The findings from the gamification evaluation rubric highlighted both the strengths and weaknesses of gamified systems. While the Book Widget application effectively utilised game mechanics, feedback mechanisms, progress tracking, and social interaction, there were areas that required improvement. If the gamification application is free of subscription fees and includes an element in which teachers can create student groups, it will further enhance the effectiveness of the application. Although the researcher identified two areas for improvement, it was also found that the application met all the criteria and was successful in engaging students as well as motivating them to participate in learning activities. This demonstrates the effectiveness of the application and its potential as a gamification tool for enhancing teaching and learning. Thus, the gamification evaluation criteria confirmed that Book Widgets provide a variety of gamification elements that support teaching and learning. Accordingly, the researcher believes that the application fulfils the criteria for gamification tools that effectively support teaching and learning.

5.3.2 Gamification elements in Book Widgets to motivate student learning

There are various ways in which gamification elements are used in Book Widgets to motivate students to learn. To determine the impact of the gamification elements in Book Widgets on the motivation of the students, the gamification taxonomy framework was used to analyse the responses of the participants. It has been evidenced through the findings of this study that intrinsic motivation as well as extrinsic motivation, can be seen when gamification elements are used in Book Widgets. The analysis in Chapter 4 proved that most participants were positively influenced by the gamification elements in Book Widgets. The responses confirmed that participants were motivated during learning activities. Firstly, because of the intertwined nature of the elements in the Book Widgets, some participants were motivated intrinsically, while others were motivated extrinsically by the same activity. Also, some participants found inherent

satisfaction in the activity, while others were driven by external factors such as the desire for recognition or rewards. Badges are an example; some participants do not care that the element exists, whereas others are motivated by it, however, the bottom line is that this gamification element promotes motivation to continue learning. Second, the findings confirmed that students were extremely attentive when using gamification elements such as timers within Book Widgets. One of the comments made by participant 10 was *"Timeframes help me manage my time",* demonstrating their motivation to complete tasks on time. Third, students confirmed that the colours, animations, and background sounds of Book Widgets attracted their attention, which contributed to their motivation to learn more. Finally, the findings indicated that elements designed for motivation, such as reward systems, feedback mechanisms, and level advancements, indeed encouraged and motivated students to engage in more learning activities. Participants' responses confirmed that their experience with gamification elements motivated them to learn more, which contributed to them gaining knowledge through certain activities. Therefore, the research conducted for the purposes of this study indicated that gamification elements could be used to an extensive extent to motivate students to learn more. The incorporation of gamification elements within Book Widgets has the potential to add value to classroom activities by motivating student learning.

5.3.3 Book Widgets application to improve student engagement and participation

In the literature, Book Widgets were highlighted for their ability to create interactive activities for students to enhance their engagement and participation by playing crossword puzzles, bingo sheets, quizzes, memory games, and video-based activities. Throughout this study, participant's responses repeatedly indicated that the interactive activities offered by the Book Widgets increased their engagement and participation in the learning process. The findings showed that gamification elements in Book Widgets improved student engagement and participation significantly. As the study revealed, games such as quizzes improved students' engagement and focus during the learning process. Therefore, Book Widgets are beneficial in keeping students engaged and maintaining their participation in diverse learning activities. In addition, participants indicated that gamification elements, such as novelty, colours, animations, and sounds were effective and entertaining, thus proving that these elements kept

them actively engaged during learning. This study concluded that using Book Widgets is beneficial for improving student engagement and participation, and interactive activities are more effective for engaging students than traditional methods. Considering the gamification elements explored, Book Widgets can improve student engagement and participation in the learning process.

5.3.4 Book Widgets to support teaching and learning

As a result of the technological advancements of today, the new generation has been dreaming of an enjoyable and efficient learning experience (Facer & Selwyn, 2021). Thus, the real challenge is to move away from traditional teaching methods to innovative methods that will motivate students, encourage engagement, and promote participation. In this study, Book Widgets were evaluated and found to be an effective gamification tool for teaching and learning. The researcher examined the gamification elements within Book Widgets and found that these elements promoted practical teaching practices and attracted learners' attention, thereby motivating learners to learn more, and enhancing their engagement and participation. The application facilitates practical teaching practices, boosts learners' confidence, motivates students to learn, and encourages student engagement and participation. The Book Widgets application is accessible on a mobile device, making it portable and easy to use at anytime and anywhere. Furthermore, Book Widgets enhanced students' confidence in the classroom by creating an environment conducive to both teaching and learning. Thus, this study contributes to the knowledge gap by confirming Book Widgets as a gamification tool to contribute to supporting teaching and learning.

5.4 Significance of the Study

The use of gamification tools, such as Book Widgets, proved to be an effective method for capturing learners' interest and motivating them to learn more. Therefore, this study addressed the problem that today's teachers face when teaching, due to the impact of COVID-19 on our students. Consequently, this study contributed to the field of research by providing teachers with a deeper understanding of gamification elements and how they can be evaluated to be used to motivate, engage, and promote learning activities. This study also provides teachers with information regarding the specific Book Widget application and what it entails, and that incorporating the gamification

elements of Book Widgets into the learning environment is an effective method to motivate students and inspire them to continue learning. Thus, this study is significant in two ways.

In this study, the researcher found that the findings were of practical significance for teachers. As seen in the evaluation of the Book Widgets application as a gamification tool, the study can help teachers better understand their students' needs and adapt their teaching strategies more effectively in a way that incorporates gamification tools like Book Widgets. The result of this study will be useful for teachers who are interested in exploring the Book Widget application to create interactive activities in the classroom to motivate and promote engagement and participation.

The results of this study may also be useful in helping students better understand their own learning processes and develop more effective learning strategies using the variety of gamification elements such as those evidenced in the Book Widget application. The Book Widget application was found to be more appealing to students since it offers a variety of games and allows them to explore the digital world. This study contributes to the students' understanding of how the Book Widget application motivates them and makes lessons more engaging and enjoyable.

The study also provides theoretical significance for readers who wish to conduct research into the integration of other gamifications tools into education. This study filled a knowledge gap on how a gamification tool, such as the Book Widget application, can motivate and engage students in the classroom. Additionally, this study contributed to the understanding of gamification in education.

5.5 Reflection on my Lessons Learned

In this study, the researcher used an interpretivist paradigm as the ontological and epistemological foundation of the research. This methodology enabled the researcher to incorporate all possible realities and perceptions in the integration of gamification elements within the Book Widget application for supporting teaching and learning in Grade 5. Additionally, qualitative data was gathered primarily through semi-structured interviews. The qualitative approach used to collect the research data was beneficial to this topic in several ways. The researcher obtained rich and detailed data from the

participants to gain a better understanding of their views and perceptions on using a gamification tool such as Book Widgets as part of their learning activities in the classroom. As opposed to a quantitative approach that would not otherwise have permitted participants to provide detailed personal perspectives, only numerical data. Using a qualitative approach allowed the researcher to establish a rapport and sense of trust with participants, which improved the quality and extent of data collected, considering the participants were young and in Grade 5. In this study, the researcher learned that asking fewer questions, as opposed to more questions, led to better data as opposed to overburdening participants who will end up providing low-quality responses, considering the participants were between the ages of 10 and 11. Moreover, the researcher developed simple English skills in order to construct questions in the interview schedule in accordance with the language level of the students, considering that they are in Grade 5. In addition, interviews enabled the researcher to clarify and follow up on participants' responses, improving the validity and reliability of the data. The researcher also found that the process of conducting interviews allowed for the customisation of the questions and topics of the interview schedule according to the participant's needs and interests, thereby improving the quality of the data collected.

To evaluate the appropriateness of Book Widgets as a gamification tool, the researcher used a gamification evaluation rubric to evaluate the elements within Book Widgets. Using the evaluation rubric, as opposed to the elements collected from literature review (Table 3) or the gamification taxonomy (theoretical framework), gave the researcher confidence as it was developed and tested by other researchers as an evaluation tool. The gamification evaluation rubric further assisted in evaluating the performance of elements within Book Widgets against 14 criteria. By evaluating the gamification elements using the evaluation rubric, the researcher gained an in-depth understanding of other elements of gamification that are not included in the taxonomy and helped the researcher gain a more holistic view of gamification.

This study made use of the gamification taxonomy framework in order to give the study a clear and consistent structure. The value of using a framework in the study contributed to reducing confusion and inconsistency regarding the gamification elements. In hindsight, the researcher discovered that it was an important component

of communicating the findings of the research study to others, including supervisors, reviewers, and readers. Furthermore, using the gamification taxonomy framework for analysing the responses from the interviews, provided a structure for the data rather than relying solely on the participants' original responses. Consequently, the framework contributed to synthesising and refining the participants' responses in a way that supported the research questions.

While many studies have been conducted on gamification, very few have been conducted on the elements within gamification tools, such as Book Widgets. Throughout this study, the researcher found that gamification goes beyond simply being a method of teaching students to engage in learning through play. The researcher found that gamification could also be used by teachers to motivate students to participate in learning activities, as the elements contribute to the enhancement of learning activities. Prior to conducting this research, the researcher was unaware of the importance of gamification elements in motivating students, engaging them, and encouraging participation in educational settings. Thus, through this research, the researcher was able to identify how gamification elements can be used to enhance the teaching and learning process using gamification tools such as Book Widgets. Furthermore, through the findings of this study, the researcher learned that students were motivated by elements in the Book Widgets to perform better and learn more, either intrinsically or extrinsically. There are some elements that will increase intrinsic motivation for one student, while the same element may increase extrinsic motivation for another. In this regard, one student found that earning bonus points motivated them intrinsically to learn more. However, other students found that progress bars motivated them extrinsically as they were able to monitor their progress and could improve, therefore motivating them to learn more. In addition, the researcher learned that gamification elements were responsible for generating excitement in students, which increased motivation and promoted engagement in learning activities. Finally, the results of this study demonstrated that the implementation of gamification elements in gamification tools, such as Book Widgets has a positive effect on the teaching and learning process. Further, this illustrates the power of gamification tools, such as the Book Widgets, to engage and motivate students in their learning and ultimately, supported the teaching and learning process.

5.6 Limitations

For this study, the researcher acknowledges the following limitations that could have had an influence on the results. For example, the shortened research timeline may significantly influence the study's results. The need to expedite the study beyond the original plan impacted various aspects of the research process. Firstly, the accelerated schedule restricted the depth and thoroughness of data collection, impeding the researcher's capacity to gather a comprehensive set of information. Additionally, the condensed timeframe influenced participant selection, limiting it to a single grade level. This limitation had repercussions for the generalisability of the study's findings, as a more diverse participant pool is typically preferred for robust and broadly applicable results. Furthermore, the time constraints prevented the full utilisation of the gamification tools within Book Widgets. Consequently, the researcher was unable to explore all the gamification tools to their maximum potential due to the abbreviated duration of the study. In contrast, the language barrier, given that the participants' primary language is Arabic, not English, constrained the researcher's capacity to comprehend the participants' responses thoroughly. Additionally, the language barrier impacted how comfortable participants felt in expressing themselves, thereby affecting the openness of their responses. In turn, this resulted in fewer participants confirming the presence of certain gamification elements in Book Widgets. On the other hand, the sources of educational information based on the gamification elements within Book Widgets made it difficult to gather valuable information regarding the elements. As a result, the researcher was required to explore the application from a teacher’s perspective first, in order to evaluate the elements of Book Widgets using the gamification evaluation rubric before it could be used as a gamification tool by the students. Nevertheless, the results of the evaluations were beneficial and sufficient to the study since they were able to support the study's claim that Book Widgets as a gamification tool, have the potential to support teaching and learning.

5.7 Recommendations

Based on the findings of this study, the researcher recommends that the creators of Book Widgets consider a free subscription option so that more teachers can find ways to integrate Book Widgets into their classrooms. Teachers should consider adopting Book Widgets in their classrooms as it has been proven to encourage student

participation and engagement in learning activities. The Book Widgets application allows teachers to create engaging and interactive lessons and activities that can be accessed from any device. This makes it possible for students to access learning materials from anywhere at any time through one application and to collaborate with one another in a more meaningful way.

The researcher recommends that students prepare themselves for the integration of a gamification tool like Book Widgets to support the learning process. Additionally, students should utilise the engagement and participation elements of Book Widgets to enhance their learning experience. Moreover, they are expected to take the initiative to make full use of the Book Widgets application to maximise their learning opportunities.

The researcher recommends that sponsors should incorporate the supply of essential resources, including computers and laptops, as well as learning materials like comprehensive user guides and video tutorials. Additionally, sponsors should provide tools that enhance the overall teaching and learning experience with the Book Widgets application. To support teaching and learning in the classroom, sponsors should facilitate training and development programmes that help teachers improve their knowledge and skills by incorporating the elements of the Book Widgets application.

The researcher recommends that more studies be conducted to examine gamification elements within Book Widgets or other applications at other grade levels. Additionally, it is recommended that further research can be conducted to explore other teaching methods and techniques, with a particular focus on comparing them to gamification elements. Finally, research should be done to investigate the barriers associated with the application's development and design.

In terms of the methodological recommendations, the researcher suggests encouraging future researchers to broaden participant demographics to improve the generalisability of findings. For instance, incorporating both male and female participants is advisable, considering that this study focused exclusively on females. It is recommended to advocate for longitudinal studies to assess the sustained effects of implementing the Book Widgets application over an extended duration. Additionally, proposing the adoption of a mixed-methods approach that integrates qualitative and

quantitative methodologies is advised. This approach can yield a more comprehensive understanding of the application's impact, allowing for an exploration of both statistical patterns and nuanced user experiences. The researcher also recommends considering the exploration of a different theoretical framework in future studies.

5.8 Chapter Summary

In this chapter, an overview of this study based on the objectives, problem statement, literature review, framework, and methodology were given. Further, a summary of the study's findings, the significance of the study, reflections on the lessons learnt, limitations and recommendations were provided. According to the findings of this study, the gamification elements in Book Widgets met all the criteria as a gamification tool. Using the Book Widgets application, this study demonstrated that the elements could be utilised to create an enjoyable and fun learning environment that motivates students to engage and participate in learning. Gamification elements within Book Widgets have been useful in supporting learning and teaching. On the one hand, it gives teachers the opportunity to use a variety of tools in the creation of activities that motivate students, catch their attention, and increase their engagement and participa tion. On the other hand, Book Widgets created an enjoyable and fun learning environ ment that motivates students to develop their knowledge by providing them with a variety of fun and engaging learning elements. Furthermore, the Book Widgets application provides significant assistance to teachers in the development and standardisation of students' proficiency to effectively perform learning activities. Additionally, this study has provided teachers with a deeper understanding of the elements of gamification and how they can be utilised to improve the teaching and learning process, as opposed to them not being aware that Book Widgets contain gamification elements that can facilitate teaching and learning by enhancing the learning process. It has been further demonstrated that Book Widgets is an effective gamification tool that can contribute positively to supporting the teaching and learning process. However, despite the limitations of the study in terms of collecting sufficient data, the findings substantiated this study considerably when it came to answering the research questions. The current study can conclude by stating that the research demonstrates Book Widgets as a gamification tool to support teaching and learning in Grade 5.

6. REFERENCES

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APPENDIX: 1
Game Evaluation Rubric (Game Title): Book Widgets application

Game evaluation rubric was adapted from the following source:

Altanis, G., Retalis, S., & Petropoulou, O. (2018). Systematic Design and Rapid Development of Motion-Based Touchless Games for Enhancing Students' Thinking Skills. *Education Sciences*, *8*(1), 18. https://doi.org/10.3390/educsci8010018

A\A	Criteria & short description	Level of agreement				
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	**Instructions and training:** The game provides detailed pre/in-game instructions.					✓
2	**Playability and usefulness:** The game's features are functional and playable.					✓
3	**User-Friendliness:** In terms of accessibility and ease of use				✓	
4	**Usability (Sense of Control):** The games are easy to use and fulfil the following characteristics: Sense of control, Minimal number of controls, No need for precise positioning, and Game elements moved slowly					✓

	enough to allow the player to react.					
5	**Motivation (allow you to play again):** The ability to play again motivates you to play this game again, so you can improve your scores.					✓
6	**The game provides an application status (Reports):** The leaderboards and progress bars provide clear and accurate reports/information regarding the players' status.					✓
7	**Curiosity (Motivation):** In order for us to keep playing, the game enhances our curiosity.					✓
8	**Motivation (attention):** The game is highly engaging during gameplay.					✓
9	**(Easy to Navigate):** The game world was simple and visible enough, easy to navigate.					✓
10	Use of the game app is relevant to the purpose and student needs.					✓
11	**Sound and Visuals:** The background music, sound effects, animations, and different colours, images,					✓

	and shapes all encourage gameplay.					
12	**Compatibility:** The game application is compatible with other applications.					✓
13	**Components:** The gamification application provides a variety of games and other useful features.					✓
14	**Badges:** This gamification application offer a variety of colourful badges.					✓
15	If you could change anything about the game to improve the application, what would it be?	As a user of the Book Widgets application, I would make the application free to use for easy access. I would add an additional element which enables teachers to create student groups for gameplay to improve engagement.				
16	What did you like the most about the gaming elements in this application?	In addition to offering a variety of gaming elements, Book Widgets offer other elements that motivate learners and enhance learning. Therefore, I like the leaderboard system and badges that learners can earn because it motivates them to do better.				
17	Would you recommend this gaming application to others?	Yes, Book Widgets would be highly recommended because of the great gamification elements it offers, such as flashcards, quizzes, hangman, spreadsheets, and video-based activities, all of which can be used to motivate and support learners in the classroom.				

APPENDIX: 2
Interview Schedule:

NOTE: These questions are designed for learners in Grade 5 who are approximately 10 years old.

SRQ2: How do the gamification elements in Book Widgets motivate student learning?

1. How do you experience the new design features on Book Widgets? Does it encourage you to keep on learning?
2. When working on Book Widgets, how do the music, background sound and sound effects encourage you to complete the task?
3. When completing tasks on Book Widgets, how do the animations, different colours, images, and shapes make you want to learn more?
4. When you score lower than your classmates in the hangman game on Book Widgets, how do you feel? Would you like to try again or first learn more and then try again?
5. Do you get motivated when you have to challenge your friend in a quiz on book widgets? Explain your answer.

SRQ: 3 How does the Book Widgets application improve engagement and participation in the classroom?

6. How do you feel about randomly earning bonus points for participating in a task on Book Widgets? If there are no bonus points, will you try it again?
7. Does having a certain amount of time to complete a task on Book Widgets help you manage your time and motivate you to finish it by hand? Why?
8. As a Book Widgets participant, what drives you to engage in tasks to keep earning points?
9. What keeps you focused and engaged when playing the randomness game on Book Widgets? What are the moments that encourage you to remain engaged?

10. Do you think listening to the game story via audio on Book Widgets helps you understand the game better? How does it encourage you to participate and learn more?
11. When completing a task on Book Widgets, what makes you feel determined to earn badges, medals, or awards? Do you want to keep on / continue learning more if you earn badges, medals, or awards?
12. How does being able to track your progress via the progress bar on Book Widgets help you to improve what you are learning? Please explain your answer. You can even give examples.

APPENDIX: 3
Consent forms

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

LETTER OF CONSENT

December 2022

Dear Principal

REQUEST FOR PERMISSION FOR STUDENTS TO PARTICIPATE IN A SEMI-STRUCTURED INTERVIEW FOR A RESEARCH PROJECT

ENTITLED:

"Book Widgets as a gamification tool to support teaching and learning in Grade 5"

I am writing to request permission to conduct a research study at your institution. I am currently enrolled for a Master's degree at the University of Pretoria, under the supervision of Dr Kimera Moodley and Dr Mari van Wyk. I am undertaking a research study on the topic, "**Book Widgets as a gamification tool to support teaching and learning in Grade 5**". The aim of the study investigates how gamification elements can motivate students and promote engagement and participation through the Book Widget application.

Would you allow me to conduct this study at your institution? I require 10 Grade 5 students as participants that will be interviewed. The semi-structured interview will contain questions related to how they are learning using the Book Widget application. Students who volunteer to participate will be given an accent form to sign consenting to the interview process.

The interview process should take no longer than 45 minutes. The interview responses will be reported anonymously and confidentiality will be maintained. The findings of this study will only be documented in my dissertation, published in an article, and presented at conferences.

During the semi-structured interviews, Covid-19 protocols will be followed by wearing masks covering the nose and mouth and maintaining a 1.5m distance between the researcher and participant(s).

Should you agree to participate, please read the following:

- I consent that data from this study can be used for research purposes.

I acknowledge that:

- I have been informed that participation is voluntary, and students are free to withdraw from the interview at any time without explanation or prejudice and to withdraw any unprocessed data previously supplied.
- I have been informed that the confidentiality of the information collected will be safeguarded.

LETTER OF CONSENT FOR PRINCIPAL PERMISSION FOR STUDENTS TO PARTICIPATE

Voluntary Participation in the research project entitled:

"Book Widgets as a gamification tool to support teaching and learning in Grade 5"

I, _____, (Full names) the principal of

_____ (school name) hereby

Please tick the appropriate block

Give Consent ☐

Do not give consent. ☐

to allow my school to participate in the above-mentioned study introduced and explained to me by Sabeehah Anver Allie, currently a Master's student at the University of Pretoria.

Furthermore, I declare that I understand the aim of the research study and the purpose of collecting data through face-to-face interviews and that the responses and information collected will be used for analysis purposes only and that details of my school and my students will always be kept confidential and anonymous and will not be mentioned at any stage during the research study.

_____ _____

Full names Signature

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School Stamp

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

LETTER OF CONSENT

December 2022

Dear Parents/guardians

REQUEST FOR PARENTAL PERMISSION FOR CHILD TO PARTICIPATE IN A SEMI-STRUCTURED INTERVIEW FOR A RESEARCH PROJECT ENTITLED:

"Book Widgets as a gamification tool to support teaching and learning in Grade 5"

My name is Sabeehah Anver Allie and I am currently enrolled for a Master's degree at the University of Pretoria, under the supervision of Dr. Kimera Moodley and Dr. Mari van Wyk. I am undertaking a research study on the topic, "**Book Widgets as a gamification tool to support teaching and learning in Grade 5**". The aim of the study investigates how gamification elements can motivate students and promote engagement and participation through the Book Widget application.

The purpose of this letter is to provide you (as the parent of a prospective research participant) with information that may impact your decision regarding whether or not to let your child participate in this research study. I will explain the study to you and answer all your questions. Be sure to read the information below before deciding whether or not to allow your child to participate. In the event that you agree to let your child participate in this study, this form will be used to record your consent.

What is my child going to be asked to do?

If you allow your child to participate in this study, they will be asked to share their experiences learning with the Book Widget application through the completion of an anonymous semi-structured interview. This interview should not take more than 45 minutes to complete.

Note: Participants will be audio recorded.

Audio recordings of your child will be made if you choose to participate in this study. Audio recordings will be stored securely and will only be accessible to my supervisors and I.

Does my child have to participate?

No, your child's participation in this study is voluntary. At any time, your child may withdraw from participation or decline to participate. If they withdraw or refuse to participate, their relationship with the University of Pretoria will not be affected. The study is optional for your child and you can change your mind later without penalty.

How will your child's privacy and confidentiality be protected if s/he participates in this research study?

Your child's privacy and the confidentiality of his/her data will be protected by the researchers and the personal information of participants will not be shared, disclosed, or published in this study. The researchers will ensure the protection of participants from physical, emotional, and social harm.

Whom to contact with questions about the study?

Prior to, during, or after your participation, you can contact the researcher **Sabeehah Anver Allie** at **+27 74 022 1311** or send an email to **sabzvilla@gmail.com** for any questions.

NOTE: Include the following if the recording is optional:

_____ My child MAY be **audio** recorded.

_____ My child MAY NOT be **audio** recorded.

During the semi-structured interviews, Covid-19 protocols will be followed by wearing masks covering the nose and mouth and maintaining a 1.5 m distance between the researcher and participant(s).

LETTER OF CONSENT FOR PARENTAL PERMISSION FOR CHILD TO PARTICIPATE

Voluntary Participation in the research project entitled:

"Book Widgets as a gamification tool to support teaching and learning in Grade 5"

I, _____, (Full names) the parents/guardian of _____ (school name) hereby

Please tick the appropriate block

Give Consent ☐

Do not give consent. ☐

to allow my child to participate in the above-mentioned study introduced and explained to me by Sabeehah Anver Allie, currently a Master's student at the University of Pretoria.

Furthermore, I declare that I understand the aim of the research study and the purpose of collecting data through face-to-face interviews and that the responses and information collected will be used for analysis purposes only and details of the school and my child will always be kept confidential and anonymous and will not be mentioned at any stage during the research study.

_____ _____

Signature of Parent(s) or Legal Guardian Full name of child

_____

Signature of Researcher Date: _____

Ms S Anver Allie
Student Researcher
University of Pretoria
Sabzvilla@gmail.com
+27 74 022 1311

Dr K Moodley
Supervisor
University of Pretoria
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(012) 420 2855

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

LETTER OF ACCENT

December 2022

Dear Student

REQUEST FOR STUDENT TO PARTICIPATE IN A SEMI-STRUCTURED INTERVIEW FOR A RESEARCH PROJECT ENTITLED:

"Book Widgets as a gamification tool to support teaching and learning in Grade 5"

I am Sabeehah Anver Allie from the University of Pretoria. I am doing a Master's study to understand how I can teach better using Book Widgets. My research is about finding out how parts of gamification can help you as a learner participate and learn more. I am asking you to take part in the research study because you have experience learning with Book Widgets.

For this study, I will ask you some questions about your experiences learning with Book Widgets. Would you be willing to answer a few questions for me so that you can help me complete my research work? All the questions will be about Book Widgets, and you just need to answer them honestly. I will keep all your answers private and will not show them to anyone other than my supervisors Dr. Kimera Moodley and Dr. Mari van Wyk from the University of Pretoria.

During the semi-structured interviews, Covid-19 protocols will be followed by wearing masks covering the nose and mouth and maintaining a 1.5m distance between the researcher and participant(s).

You should know that:

- You do not have to be in this study if you do not want to. You will not get into any trouble with the University of Pretoria, your teacher, or the school if you say no.
- You may stop being in the study at any time.
- Your parent(s)/guardian(s) were asked if it is okay for you to be part of this study. It is still your choice whether or not to take part.
- You can ask any questions you have, now or later. If you think of a question later, you or your parents can contact me or my supervisors.

Sign this form only if you:

- have understood what you will be doing for this study,
- have had all your questions answered,
- have talked to your parent(s)/legal guardian about this study, and
- agree to take part in this study

Learner Signature	Printed Name	Date
_____	_____	_____

Ms S Anver Allie
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