

Gamification As Teaching Pedagogical Approach: Enhancing Student Learning in Public Administration

Maréve Inge Biljohn^{1,*}

¹Department of Public Administration and Management, Faculty of Economic and Management Sciences, University of the Free State, South Africa

*Correspondence: Department of Public Administration and Management, Faculty of Economic and Management Sciences, University of the Free State, South Africa. E-mail: BiljohnMIM@ufs.ac.za

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Abstract

This paper explores the application of gamification as a teaching pedagogical approach to enhance student learning in the Public Administration curriculum at the University of the Free State, in South Africa. The study purposefully selected students enrolled in a second-year module, presented in the Department of Public Administration and Management at this university. The students developed a board game aligned to the module's learning outcomes. Using a quantitative research design, an open-ended questionnaire was administered to 208 students, and the collected data were analysed using NVivo software. The students acquired skills and learning from their peers beyond the intended objective of the game. The game firstly contributed to students' knowledge of theory across three of the module's four learning outcomes. Secondly, students' development of the game resulted in the development and application of life skills, including creative and critical thinking, communication, and time management. Thirdly, students acquired skills from their peers, such as collective decision-making and task delegation. These life skills are essential for success in both academic and professional settings, and their development is a testament to the holistic nature of the learning experience. The usefulness of gamification for enhancing student learning is influenced by its design and application in achieving learning outcomes. Incorporating game design elements into students' learning could benefit from student engagement on how the game design and student participation could enhance their learning.

Keywords: gamification, higher education, student learning, teaching pedagogy, public administration

1. Introduction

Introduced in the early 2000s, gamification has been widely accepted and used across various fields to support student learning, success and achievement (Humenuik et al., 2022; Irwanto, Wahyudiati, Saputro, & Laksana, 2023). Over the last decade, the application of gamification as a teaching pedagogical approach has gained increasing popularity in higher education (Irwanto et al., 2023; Gupta & Goyal, 2022). Gamification encompasses using game elements in non-game activities to create game-like experiences (Langendahl, Cook, & Mark-Herbert, 2016; Humenuik et al., 2022). Globally, the application of gamification is receiving growing attention as a mechanism for students' improved understanding of learning outcomes in higher education settings (Alomari, Al-Samarraie, & Yousef, 2019). This stems partly from benefits such as introducing objectives that attribute learning with a purpose, fostering skills, promoting student engagement, increasing motivation, optimising learning, and increasing knowledge (Putz, Hofbauer, & Treiblmaier, 2020; Alomari et al., 2019; Dichev & Dicheva, 2017; Krause, Mogalle, Pohl, & Williams, 2015).

Despite its benefits, some studies highlight uncertain outcomes concerning the application and advantages of gamification in educational settings, as well as its purpose for learning engagement (Gupta & Goyal, 2022; Smiderle, Rigo, Marques, Peçanha de Miranda Coelho & Jaques, 2020; Alomari et al., 2019; Hakulinen & Auvinen, 2014; Christy & Fox, 2014). Amongst these findings are firstly that gamification may not be applicable to all types of curricula, and secondly, that negative learner attitudes towards game-based learning may not result in changes in instructional outcomes (Landers & Armstrong, 2017; Thornton & Francia, 2014). Thirdly, whilst each game has its learning potential, this potential may not be relevant to other game contexts (Lainema & Saarinen, 2010). Lastly, gamification does not guarantee an improvement in students' grades or performance (Mekler, Brühlmann, Tuch, &

Opwis, 2017). The selection of appropriate pedagogical approaches is therefore instrumental in determining how student engagement can be integrated into learning and teaching through gamification.

Pedagogical teaching approaches that shift the focus from the teacher or lecturer to “what students do” to learn have become fundamental for improving teaching and learning in higher education settings (Biggs & Tang, 2011). “What students do” as a teaching approach places students at the center of their own learning through the activities they engage in to achieve the intended learning outcomes (Biggs & Tang, 2011). In this context, this paper considers how student participation in the development of a module-specific board game, as “what students do”, contributed to enhancing their learning. Numerous studies consider student participation in the playing of games or game-like experiences in non-game activities to enhance their learning (Sinar et al., 2024; Andrade, 2021). Studies focusing on student participation in the development of games for non-game activities to enhance learning are, however, limited (Naudè & Meier, 2025; Ye, Shi & Liao, 2023). Therefore, with a focus on “what students do”, this paper explores student participation in the development of a module-specific board game as a teaching pedagogical approach to enhance their learning in a Public Administration module at a South African University. The research question posed is: How does student participation in the development of a module-specific board game as a teaching pedagogical approach enhance their learning in a Public Administration module?

The literature review of this paper examines teaching pedagogical approaches, such as “what students do” to learn, learning, and gamification and its value. The gaming context explains the instructions that students followed to develop the module-specific board game. In the methodology, the study population, sample, data collection and analysis methods are described. A survey with 208 second-year students at the University of the Free State captures student learning experiences. This paper concludes with findings that provide a realistic view of students' understanding of the module content and the emergence of life skills as part of their learning experience.

2. Literature Review

2.1 Teaching Pedagogical Approaches – “What Students Do”

High-quality teaching and lifelong learning in higher education require effective student-centred pedagogical approaches (Biggs & Tang, 2011; Alwadeen & Piller, 2022). The concept of pedagogy is embedded in what instructors and teachers do to influence student learning (Langendahl et al., 2016). Pedagogy is further grounded in concepts and theories from which teaching and learning are implemented in practice (Langendahl et al., 2016). Traditional pedagogies are predominantly designed around instruction in lecture halls through the one-directional transfer of information to students (Gupta & Goyal, 2022). For these pedagogies, homework is the most common means to achieve learning outcomes (Gupta & Goyal, 2022). More contemporary teaching pedagogies engage students in the learning process through interactive learning activities such as gamification, and are preferred by students (Kiili, 2005). In this regard, student-centred pedagogies that focus on students' participation in their own learning, have increased in recent years (Mohd, Ali & Abdul-Hafeed, 2024).

Biggs and Tang (2011) distinguish three approaches to teaching, namely “what students are” at level one, “what teachers do” at level two, and “what students do” at level three. In the first teaching approach, “what students are”, teachers present and transmit information to students, while students absorb this information and learn from it (Biggs & Tang, 2011; Biggs, 2012). This first approach emphasises students taking responsibility for their own learning through prescribed reading, note taking and by attending lectures (Biggs, 2012:43; Prosser & Trigwell, 1998). Teachers also distinguish students at this level in terms of mastery of information and performance (Biggs, 2012). With the second teaching approach of “what teachers do”, the focus is still on teachers transmitting information, but the focus is on explaining or elucidating principles and concepts to students. At this level, the emphasis shifts to what the teachers do to relay knowledge to students, who develop a variety of skills to grasp these concepts and principles (Biggs & Tang, 2011; Biggs, 2012). This often involves developing teaching skills and ways to transmit information effectively to students (Biggs, 2012).

Through the third teaching approach of “what students do”, the focus is on the students and to “engage with learning activities and achieve intended learning outcomes” (Biggs & Tang, 2011; Biggs, 2012). At this level, teachers focus on whether activities result in student learning by determining the extent to which learning occurs (Biggs, 2012). Unlike the first two approaches with their delineated teaching focus on transmitting facts, concepts and principles, and the extent to which these are understood, this teaching approach considers two questions - firstly, what the understanding of concepts and principles means in the way that they should be understood, and secondly, the type of teaching and learning activities required to attain such understanding (Biggs, 2012). Given these two questions posed through this teaching approach, Biggs (2012), attributes this level of teaching as contributing to the student-centred theory of

teaching. In this regard, for students to effectively attain learning outcomes, teachers should engage them in learning activities that will help them to achieve this (Shuell, 1986). This consideration takes into account factors such as the context, which is influenced by the way that content is presented, prior knowledge, and students' interpretation and understanding of new information, which is influenced by the way interlinked content is made available (Shuell, 1986). Therefore, when assessing the extent of learning, what the student does is more important than what the teacher does (Shuell, 1986).

2.2 Learning

Learning is described as a process grounded in the creation of knowledge that is informed by the transformation of experience (Kolb in Ajani, 2023). Such knowledge creation is not acquired or transmitted independently, but is an iterative transformation process of creating and recreating knowledge (Junling & Xianyin, 2022; Fernando & Marikar, 2017; Kolb in Ajani, 2023). Therefore, learning occurs when those who engage in learning activities acquire new understandings of knowledge as supported by prior beliefs and knowledge (Dou, Halim, & Saad, 2024; Vygotsky, 1978). Such learning is embedded in interactive activities that could occur between the learner and their socio-cultural environment (Vygotsky, 1978). To enhance student learning, it is apparent that the teaching pedagogical approaches adopted by teachers or instructors should include interactive activities that engage students in assessing their knowledge.

Ajani's interpretation of Kolb's transformative four-stage cycle of learning experiences indicates that learning comprises what learners understand and, in turn, apply from their own reflection (Kolb in Ajani, 2023:145). Active experimentation, as the first stage, involves the introduction of a new concept or learning experience (Ajani, 2023). In the next stage (concrete experiences), learners' participation is instrumental in shaping their learning into concrete experiences (Somnam, Wongtip, & Buaphanngam, 2025; Farhat & Moray, 2024; Ajani, 2023). During this stage, where learning occurs through abstract concepts, learners attach meaning to their learning experiences through problem-solving, role-playing and constructing their own knowledge (Hansuk, Jansoda, & Poonputta, 2024; Ajani, 2023; Ongon, Wongchantra, & Bunnaen, 2021). At the third stage (reflective learning), learners develop a clearer understanding of concepts by (i) relating past and present experiences, (ii) engaging in discussion, analysis and reflection sessions of their learning experiences, and (iii) peer reflection of their learning experiences (Hamamah, Rohmah, Muttaqin, Nurmansyah, & Fadillah, 2025; Ajani, 2023; Nunaki et al., 2023). Lastly, at the fourth stage (abstract conceptualising), the discussion of new learning experiences is centred on relating learning to common or different situations (Ngoc, 2024; Ajani, 2023; Debre, Vakulenko, Savchenko, Lysenko, Kondor, & Kis, 2023). Learning that becomes active and self-directed can be regarded as an important outcome of teachers' instructional methods. These instructional methods should engage students in the learning process, and should be embedded in teaching pedagogical approaches that are student-centred and self-directed.

Self-directed learning has influences from Knowles' Theory of Adult Learning (Moll, 2024; Sinelnikova, Ivchenko, Pistunova, Regesha, & Skazhenyk, 2022) and the Theory of Active Learning (Liu, Tahri, & Qiang, 2024; Mujallid, 2024; Mercat, 2022). During self-directed learning the learner takes control of and manages the situation in which learning takes place. The participation of students in self-directed learning is central to student-centred pedagogies focused on students' active participation in their own learning, and in controlling the learning process (Knowles, 1975; Alwadeen & Piller, 2022; Mohd et al., 2024). In self-directed learning, students create their own learning experiences by planning their learning needs and goals, achieving such goals, identifying learning resources, and evaluating learning outcomes (Skiff & Beckendorf, 2009; Alwadeen & Piller, 2022; Mesaoud et al., 2023). Since the learner takes control of the learning process, self-directed learning yields benefits, including meeting individual learning needs, studying at their own pace, tailoring their learning styles, and gaining a sense of their performance through self-assessment (Boubih, 2022). Emergent from this key role of the learner in the learning process is the fostering of curiosity, the development of problem-solving skills and abilities, the enhancement of time management skills, and increased motivation to engage in deeper learning (Boubih, 2022). Significantly, Tremblay (2003) and Smith (1982) highlight that the effectiveness of self-directed learning depends on the learners possessing specific skills and their ability to "learn how to learn". While this is true, Alwadeen and Piller (2022) present a different view that highlights the role of the teacher in using engaging teaching techniques to develop innate capabilities in students, enabling them to become self-directed learners. Thus, self-directed learning as a learning and instructional method seems to rely on teaching pedagogical approaches where the instructor's focus is more on "what students do" and less on "what students are", or "what teachers do".

Self-directed learning can also occur through collaborative learning, which is grounded in teamwork. Collaborative learning activities include problem-solving, discussion, organising information, reciprocal teaching, writing, and the

use of games (Barkley, Major, & Cross, 2014). Schmutz, Meier & Manser (2019) argue that working in teams improves performance even at the individual level, regardless of assigned responsibilities. Collaborative learning encompasses various pedagogical approaches during which students are directly involved in their education process through active learning (Gapinski, 2018; Smith & MacGregor, 1992). Unlike traditional pedagogical approaches to learning embedded in teacher-centredness and a focus on individual learner performance and competitiveness, collaborative learning results in a positive interdependence between team members (Gapinski, 2018). Emergent from this is a change in student learning from being recipients of information to becoming active participants in the construction of knowledge (Gapinski, 2018). This requires group and individual accountability. While it necessitates skills such as teamwork and social skills, it also contributes to the development of other skills regarded as the benefits of collaborative learning (Smith, Johnson, & Johnson, 2017; McCown, 1994; MacGregor, 1992). These include, amongst others, being responsible for managing individual progress in the educational process, problem-solving, critical thinking, social skills, communication, conflict resolution, trust building and leadership (Gapinski, 2018; Nerona, 2017; Barkley et al., 2014; Johnson, Johnson, & Johnson Holubec, 2013; Griesbaum & Görtz, 2010; Smith et al., 1992).

In contrast to individualistic learning, collaborative learning is grounded in different pedagogical methods, value systems, and levels of student participation (Johnson & Johnson, 2017; Johnson, Johnson, & Smith, 1998; MacGregor, 1992). Barkley et al (2014) contend that it is therefore important that such activities are guided by careful planning in line with the five stages of the learning process. The first stage, *before*, entails preparation for the activity or assignment, and should include a time schedule for submitting tasks (Barkley et al., 2014). The second stage, *beginning*, includes explaining the objectives and communicating expectations (Barkley et al., 2014). Next, the *during* stage focuses on facilitation and monitoring, followed by the *ending* stage, which involves presenting the findings (Barkley et al., 2014). The last stage, *after*, includes an analysis of results, reflection, strengths and weaknesses, as well as possible improvements (Barkley et al., 2014). Some research highlights student challenges associated with collaborative learning activities, which may result in resistance, apprehension, misconception, and uneasiness to adapt to a new way of learning (Barkley et al., 2014; Göl & Nafalski, 2007; MacGregor (1992). This is attributed to a lack of student preparedness and maturity, inequitable participation, poor attendance, and behaviours that negatively affect the group's functioning and collective work, ultimately influencing students' level of participation in the activity (Barkley et al., 2014; Göl & Nafalski, 2007; MacGregor, 1992).

From the preceding discussion it is clear that students are instrumental in their own learning and effectiveness in self-directed learning. Teachers or course instructors play a significant role in supporting and creating a conducive learning environment for students' engagement in learning activities. This role is guided by instructional methods that underpin the teaching pedagogical approaches adopted by course instructors to direct learning. Student-centred teaching approaches that focus on students' engagement in learning activities, for example collaborative learning or "what students do" to achieve learning outcomes, appear to support self-directed learning. Such approaches should structure learning processes by engaging students in interactive activities that stimulate learning and allow them to take control of the learning process. It could therefore be concluded that teaching pedagogical approaches and planning for collaborative learning activities are important determinants of learning and self-directed learning.

2.3 Gamification

Over the past decades, the use of gamification in higher education settings has increased considerably (Varannai, Sasvari & Urbanovics, 2017). This increase is firstly attributed to gamification proving to be an effective learning and teaching strategy (Alsadaji, Al-Fayyadh, Al-Saadi & Mohammed, 2022). Secondly, traditional pedagogical approaches are becoming inadequate for engaging Millennials (born between 1980 and 2000) in learning (Gupta & Goyal, 2018). Unlike Baby Boomers (born between 1946 and 1964) and Generation X (born between 1965 and 1979), research shows that Millennials have a preference towards collaborative learning styles, experiential learning activities, and using technology (Gupta & Goyal, 2018). This stems from Millennials' extensive interaction with technology and new media.

Gamification encompasses using game elements in non-game activities to create game-like experiences, with the aim of making learning more engaging, motivating and supportive (Langendahl et al., 2016; Ortiz, Chiluiza, Valcke, 2016; Landers & Armstrong, 2017). In education, gamification is conceptualised as the use of elements of game design in non-game environments as part of the learning experiences offered to students (Dichev & Dicheva, 2017; Treiblmaier, Putz, & Lowry, 2018). This could involve incorporating game design elements into the learning process (Dichev & Dicheva, 2017). Two approaches are distinguished in game design, namely the instructor's perspective and the entertainer's perspective (Tang & Hanneghan, 2010). From the instructor's perspective, a game is designed with an

emphasis on learning outcomes and the curriculum. In contrast, the entertainer's perspective focuses on making learning fun and memorable.

The usefulness of a game for learning is premised on how the teacher uses it to achieve learning (Becker & Gopin, 2016). Research shows varying results concerning the impact of gamification to achieve or support learning outcomes (Dichev & Dicheva, 2015). Some research reports a positive effect of gamification on learners' performance and retention (Groening & Binnewies; Koivisto & Hamari, 2019). Other studies, however, show no significant difference in the achievement of learning outcomes between environments that use gamification and those that do not (Putz et al., 2020). Research shows that gamification has gained attention in the educational context due to its potential to enhance student motivation and make learning more enjoyable (Dichev & Dicheva, 2017; Holiuk, Kruty, Desnova, Blashkova & Korylchuk, 2022: 110). One shortcoming, however, is the lack of practical guidelines for the efficient integration of game design principles in educational experiences (Dichev & Dicheva, 2017).

In the education context, gamification has been adopted to support learning and address associated behaviours, attitudes and activities comprising student creativity and retention, self-guided study, collaboration, participatory approaches, and exploratory learning approaches (Holiuk et al., 2022; Caponetto, Earp & Ott, 2014). Gamification is known to contribute to motivation and engagement in student learning, fostering productive learning experiences and positive change in student behaviour (Alomari et al., 2019; Dichev & Dicheva, 2017:2; Holman, Aguilar & Fishman, 2013). The use of games in educational settings derives its value from allowing students to learn in a more immersive and deep way compared to classic ways of lecturing or modern instructional media (Thornton & Francia, 2014). This is supported by research showing that gamification's use in higher education positively impacts behavioural and learning outcomes, student performance, motivation and engagement (Bovermann & Bastiaens, 2018; Ortiz et al., 2016).

It is argued that when games are applied for educational purposes, unintended learning often occurs, which might even be of greater value to the learner (Gosenpud, 1990 in Lainema & Saarinen, 2010). Although often unanticipated (Gosenpud, 1990 in Lainema & Saarinen, 2010), such outcomes constitute amongst other the development of lifelong skills of a social and technical nature (Gatti et al., 2019). Some of these skills, such as problem-solving and time management, align with the emergent skills of self-directed learning as a learning method (Boubih, 2022). Moreover, the use of gamification in educational settings has attributes of intrinsic and extrinsic motivation, supports the processing of information, increases students' ability to retain knowledge, and even results in changing learners' behaviour (Gatti et al., 2019; Majuri, Koivisto, & Hamari, 2018; Hamari, Koivisto & Sarsa, 2014). Again, these attributes align with the skills learners develop when applying self-directed learning (Boubih, 2022).

Against this background, it could be deduced that the use of gamification as an activity to enhance student learning appears consistent with student-centred pedagogical approaches with a focus on "what students do". These deductions are based, first, on the interactive nature of the development of a board game by students to enhance learning, as in the case of this study. The second reason is predicated on the fact that the development of the board game allows students to reflect on their understanding of concepts and to adduce meaning to these concepts as a test of its student-centredness (Biggs, 2012). Lastly, aligned with a student-centred teaching pedagogical approach, learning activities should be based on student engagement in interactive activities that will enhance learning. These interactive activities are present in the students' development of the board game because they have to derive information from the learning outcomes. It could further be argued that the use of gamification, where students develop a board game, aligns with the principles of active or self-directed learning. In this regard, the students take control of the learning process through the development of the board game.

3. Game Design Framework

This study was conducted with students in an introductory module to the South African local government context in the Bachelor of Administration Programme at the University of the Free State. The module formed part of this university's undergraduate curriculum for Public Administration. The development of the board game was aligned with the module's learning outcomes, served as the module's assignment, and contributed to a students' final module mark. Students worked in teams of up to 10, and each team had to develop a board game, which was peer-reviewed by the other student groups towards the end of the semester. The peer review of the board games was done by playing and evaluating the games anonymously.

The following instructions for developing the board game were shared with the students. You work for a global company that develops games that assist university students in obtaining a better understanding of particular module learning outcomes. The South African National University of Local Government, which provides training for students pursuing careers in the South African local government sphere, procured your company's services to design and

develop a board game. This board game, titled DOMUNION, will be used as a learning aid for students enrolled in this module next year and should be aligned with the overarching module learning outcomes.

This game illustrates the stages of development of South African local government through the dominion that this sphere of government has gained regarding the areas covered in the learning outcomes of this module. This relates to dominion in (i) the decentralised system of government; (ii) its development as a system of government; (iii) the electoral system, and (iv) respect of applicable environmental factors. As such, the board game should consist of the following:

1. A detailed list of instructions and rules to play the game (developed by your company).
2. A dice (designed by your company).
3. Player pieces (also called munions) for the following roles: mayor, deputy mayor, speaker, executive mayor, deputy executive mayor, municipal official, councillor, and citizen.
4. A board on which to play the game (designed by your company).
5. A game comprising the following levels: Domunion level 1 (DEMOCRATIC DECENTRALISATION); Domunion level 2 (THE SOUTH AFRICAN LOCAL GOVERNMENT SYSTEM); Domunion level 3 (SOUTH AFRICAN LOCAL GOVERNMENT ELECTORAL SYSTEM); Domunion level 4 (ENVIRONMENTAL FACTORS). A munion can only move to the next level once it has mastered the current level.
6. Stacks of cards for each Domunion level.

Guidelines for the development of these stacks of cards included the following. Each level should contain a stack of 15 cards that test knowledge. The back of each card will have a single sentence testing the knowledge of a specific player's munions (mayor / deputy mayor / speaker / executive mayor / deputy executive mayor / municipal official / councillor / citizen) of that level. A correct answer will move the player forward on the board or result in a reward, while a wrong answer will result in a penalty or a player moving back on the board. Additionally, each level should include 15 cards of aspects (also referred to as municons) that threaten the protection of a dominion.

4. Methodology

A quantitative research approach with a survey design was applied to answer the research question: how does students' participation in developing a module-specific board game as a teaching pedagogical approach enhance their learning in a Public Administration module? The selection of a survey design for this study was twofold. Firstly, survey designs have been widely used in educational research and are deemed beneficial for evaluating educational programmes (Creswell, 2012), which applies to the phenomenon under investigation. Secondly, survey designs enable researchers to gather information about a population's opinions, characteristics, beliefs, or behaviours (Creswell, 2012). To this end, this study aimed to determine students' opinions and experiences about how their participation in developing a module-specific board game as a teaching pedagogical approach enhanced their learning.

The target population for this study comprised all 256 undergraduate students enrolled in the second-year module Introduction to South African Local Government in the first semester of the 2018 academic year. From this population, responses from 154 research participants were determined to be representative with a 95% confidence level and 5% margin of error (Yamane's formula). In survey research, Yamane's formula is deemed appropriate where the population is finite (Yamane, 1973). The sampling frame was derived from the list of students enrolled in the second-year module, and a purposive sampling method was applied to select research participants for the study. The general inclusion criteria for research participants were based on students who (i) had registered for the module, (ii) participated in the development of the game, and (iii) could provide in-depth and relevant information regarding the phenomenon under investigation and the research question.-

This study used a self-administered questionnaire to collect data from the research participants. Questionnaires are regarded as one of the most basic methods for data collection in survey research designs (Creswell, 2012). These self-administered questionnaires were distributed to students before the peer-review process of the respective board games. Of the 256 (N) students, 208 completed the questionnaire, yielding a response rate of 81%. This high response rate aligns with the requirements for survey research to have confidence in generalising the findings to a population (Cresswell, 2012). The questionnaire comprised open- and closed-ended questions to elicit students' experiences and perspectives on how gamification enhanced their learning experience. As such, the first section of the questionnaire, probed students' experiences of how the development of this game enhanced their learning and understanding of the

respective four module outcomes. The second section of the questionnaire probed the students' experiences about the value of the game:-

Using quantitative content analysis and NVivo for coding, the data were analysed according to the questionnaire's subsections, aligned with the four module learning outcomes. This involved the systematic coding of qualitative data, such as text or words, to identify themes. In alignment with the learning outcome, data analysis was conducted to assess whether the board game's development helped students better understand the theory, relate it to practical scenarios, study the theory, and prepare for semester tests. Lastly, the data were analysed using patterns regarding questions about the game's value to the students, learning from their participation in the game, and learning from team members.

5. Results and Discussion–

This section presents the study's results according to the subsections of the questionnaire. The first section reports on the extent to which students' participation in developing a module-specific board game enhanced their learning. The second section reports on the value of the game for self-directed and collaborative learning.

5.1 Developing the Board Game Towards Enhancing Student Learning

In this section, the results are based on four questions posed during data collection. These questions are: did your development of the Domunion Board Game assist you in (i) understanding the theory better?, (ii) relating the theory to practical scenarios?, (iii) studying the theory? and (iv) preparing for semester tests? In this section, these results are reported according to the four module outcomes.

5.1.1 Module Outcome 1

For outcome 1, the following results, as illustrated in Figure 1, are presented regarding students' participation in developing the board game to enhancing their learning. Of the respondents, 78.3% were of the view that they understood the theory better, while 21.7% did not. The results indicate that the majority of the students were able to construct their own knowledge, which could be regarded as the foundation for understanding theory. Such construction of own knowledge occurs at level two (concrete experiences) of Kolb's transformative cycle of learning experiences (Kolb in Ajani, 2023). They were also able to develop a clearer understanding of the theory, which occurs at level three (reflective learning) of Kolb's cycle.

More than half (56.3%) of the students were able to relate theory to practical scenarios, while 43.3 % could not. To connect theory to practical scenarios, students should be able to relate learning to common or different situations. This usually occurs at stage four (abstract conceptualising) in Kolb's learning experience cycle (Kolb in Ajani, 2023). The result means that 43.3% of the students may not have achieved abstract conceptualising to relate theory to practical scenarios. Moreover, the instructor's design of the game may not have supported learning at this level.

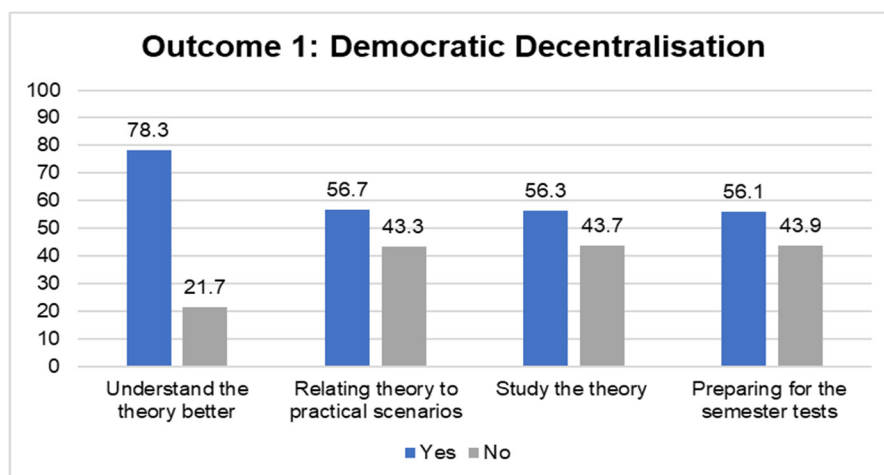


Figure 1. Outcome 1 – Democratic Decentralisation

Regarding the study of theory, 56.3% of the students found the development of the game beneficial, compared to 43.7% who did not. The results could imply that the majority of the students have achieved the ability to construct their own knowledge (stage two of Kolb's cycle), and to reflect on their learning (stage three of Kolb's cycle) to relate theory to understanding. Lastly, 56.1% of students, compared to 43.9% indicated that the development of the game assisted them in preparing for semester tests. Overall, most of the students indicated that their participation in the board game yielded positive results for enhancing their learning of outcome 1.

5.1.2 Module Outcome 2

For outcome 2, the following results, as illustrated in Figure 2, are presented regarding students' participation in the development of the board game, aimed at enhancing their learning. The majority of the students (65.7%) indicated that their understanding of the theory was improved, compared to 34.3% who did not. This could mean that 65.7% of the students were able to develop a clearer understanding of the concepts in outcome 2 through reflective learning (Kolb in Ajani, 2023), which they had to apply during the development of the board game. Further, 47.9% of the students could relate theory to practical scenarios, while 52.1% could not. Based on the transformative four-stage cycle of learning, stage four (abstract conceptualising) requires learners to relate learning to common or different situations (Kolb in Ajani, 2023). The result implies that the majority of the students may not have achieved abstract conceptualising to relate theory to practical scenarios. Seemingly, the development of the board game did not support this stage of their learning process, or students' prior knowledge for constructing knowledge in a practical scenario was not effectively developed.

In terms of studying theory, almost half of the students (49.7%) found the development of the game to be beneficial, while 50.3% felt that it did not benefit them. Studying theory would require students to construct their own knowledge through stage two of the transformative cycle of learning experiences (Kolb in Ajani, 2023). Such construction of their own knowledge is deemed crucial for understanding theory or new concepts in Kolb's third stage (reflective learning). These results could imply that, firstly, students' participation in developing the board game did not allow them to construct their own knowledge and develop a clear understanding of the theory. Secondly, it could mean that the instructor's design of the board game did not support learning to occur at stages two (concrete experiences) or three (reflective learning) of the transformative four-stage cycle.

Regarding test preparation, 50.3% of the students believed that developing the game enhanced their learning, while 49.7% felt differently. The students found the game's development beneficial for better understanding of the theory and in preparation for the semester tests.

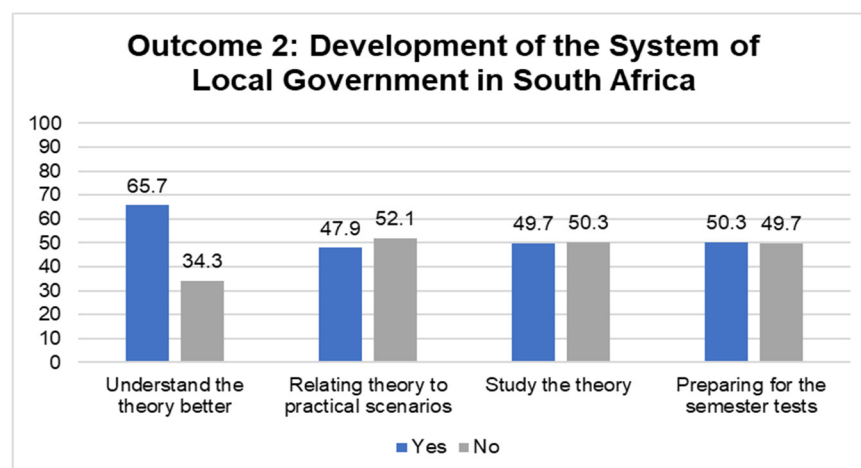


Figure 2. Outcome 2 – Development of the System of Local Government in South Africa

5.1.3 Module Outcome 3

For outcome 3, the following results, as illustrated in Figure 3, are presented regarding students' participation in developing the board game, aimed at enhancing their learning. For 60.8% of the respondents, the game improved their understanding of the theory compared with 39.2%. Similar to outcomes 1 and 2, this could mean that 60.3% of the students were able to develop a clearer understanding of the concepts for outcome 3 through reflective learning (Kolb

in Ajani, 2023). Moreover, this demonstrates that these students were able to effectively apply reflective learning to make sense of the theory in this outcome.

Almost half of the students (47.7%) could relate theory to practical scenarios as a result of developing the game, while 52.3% could not. This is similar to the results for outcome 2. At stage four in Kolb's four-stage cycle of learning (abstract conceptualising), students should be able to link learning to common or other contexts. From the results, the majority of the students were unable to apply abstract conceptualisation to relate the outcome's content to practical scenarios.

Students who felt that the development of the game assisted them in studying theory were in the minority (44%), compared to 56% who felt that the development of the game did not benefit them in studying theory. This could imply that at stages two and three of Kolb's four-stage cycle of learning experiences, students could not construct knowledge or develop a clearer understanding of concepts that would assist them to better understand the theory. As with outcome 2, it could mean that the way the game was designed did not support learning to occur at stages two (concrete experiences) or three (reflective learning) of Kolb's transformative four-stage cycle. Only 42.6% of the students indicated that developing the game enhanced their learning, while 57.4% did not. In terms of the results for outcome 3, it can be deduced that the students found the development of the game beneficial for enhancing their learning in terms of better understanding the theory.

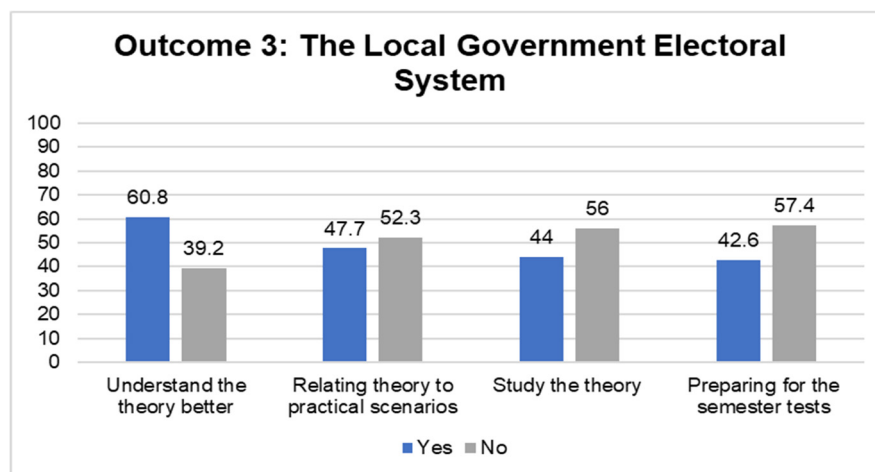


Figure 3. Outcome 3 – Development of the System of Local Government in South Africa

5.1.4 Module Outcome 4

For outcome 4, the results, as illustrated in Figure 4, are presented regarding students' participation in the development of the board game to enhance their learning. The minority of the students (45.4%) stated that the game contributed to their understanding of theory for outcome 4, compared to 54.6% who did not. Only 30.7% of the students indicated that they could relate theory to practical scenarios due to their development of the game, while 69.3% could not. Similar to outcomes 2 and 3, the majority of the students believed that their development of the board game did not support their ability to relate theory to practice. This highlights that the game's design may not have supported their ability to apply abstract conceptualising, which is supposed to enable them to link learning to common or other contexts.

The fact that 37% of the students did not perceive the game as beneficial for studying theory, may suggest that they were unable to construct knowledge or develop a clearer understanding of concepts that would aid them in comprehending the theory more effectively, as required at stages two and three of Kolb's four-stage cycle of learning experiences. As with outcomes 2 and 3, it could suggest that the game's design did not support learning at stages 2 (concrete experiences) and 3 (reflective learning) of the transformative four-stage cycle. To prepare for tests, 33.2% of students believed that developing the game enhanced their learning, while 66.8% held a contrary view. This could imply that the students did not view their development of the game as an aid to prepare for tests. The results further indicate that for outcome 4, across the four areas, the majority of the students did not find the development of the board game beneficial for enhancing their learning. Compared with the results for outcomes 1, 2, and 3, the results for outcome 4 illustrate the poorest performance on whether students' development of the game enhanced their learning.

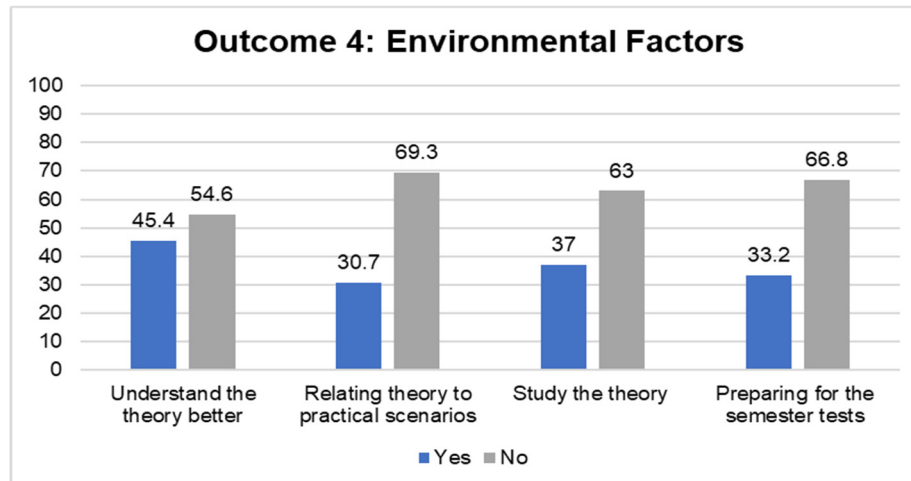


Figure 4. Outcome 4 – Development of the System of Local Government in South Africa

From the above results it is clear that the students experience enhanced learning, specifically in better understanding theory, relating theory to practical scenarios, studying the theory, and preparing for the semester tests only for outcome 1. A notable decrease is visible in the areas the students deemed beneficial for enhancing their learning, with outcomes 1 to 4 declining. For outcome 1, students confirmed that their learning was enhanced across the four areas. For outcome 2, only the two areas of understanding the theory better and preparing for semester tests were prominent. For outcome 3, only the area of understanding the theory better was prominent. In stark contrast to outcome 1, the results for outcome 4 present a completely different picture of students' perception of how their learning was enhanced by the development of the game. The students felt that although they participated in developing a board game, they did not benefit from enhanced learning in terms of understanding the theory better, relating the theory to practical scenarios, studying the theory, and preparing for the semester tests.

From the findings across the four learning outcomes, it can be reasoned that student learning occurred through this board game. In determining the extent to which student learning occurred (Biggs, 2012), the findings indicate that students consistently reported a better understanding of theory better across three of the four learning outcomes, followed by preparing for semester tests with respect to the first two learning outcomes.

5.2 Value of the Game for Students

The second section reports on the value of the game for self-directed and collaborative learning. The questions are: (i) what was valuable for you about this activity?, (ii) what did you learn from your participation in this activity?, and (iii) what did you learn from your team members during your participation in this activity? Such value is consistent with stage three of Kolb's transformative four-stage cycle of learning, during which learners attach meaning to their learning experiences (Ajani, 2023).

5.2.1 Value of the Game

Concerning the value of the game (Figure 5), most students referenced teamwork (108) and understanding and learning the subject (90) as valuable during the development of the board game. Notably, and at the lower ends, themes include stimulating and creative activity (26), knowledge exchange (17), designing the game (16), preparation and revision (12), different perspectives (8), improved communication skills (9), utilising knowledge learned (8) and time management (7).

The two highest ranking themes were teamwork and understanding and learning the subject. This is consistent with the views of Biggs and Tang (2011) and Biggs (2012), regarding student actions to engage with learning activities to achieve the intended learning outcomes. These authors contend that the right type of teaching and learning activities are fundamental for students to gain an understanding of concepts, and further contributes to student-centred teaching (Biggs, 2012). As with this board game, it can be argued that these activities are not only fundamental to support learning, but also influence the extent to which students stay committed to and determine their own learning. In this regard, learning did not occur only from an individual perspective, but also within the team context of collaborative learning. What the students learnt from their team members was considered equally important to them in engaging in the development of the board game. This concurs with the literature on self-directed learning and collaborative

learning, which emphasises the development of skills such as time management, communication, and knowledge construction (Boubih, 2022; Gapinski, 2018). More importantly the findings illustrate that the value students attached to their participation in the game is consistent with stage three of Kolb's transformative four-stage cycle of learning, during which learners attach meaning to their learning experiences (Ajani, 2023).

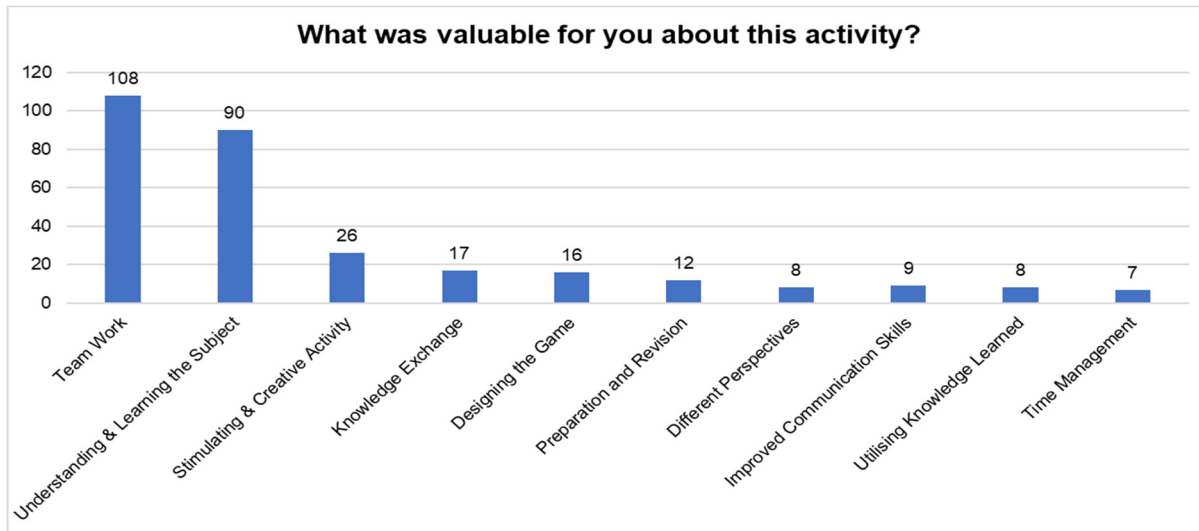


Figure 5. Value of This Activity

5.2.2 Learning Through Participation in This Activity

Regarding the learning that students acquired through their participation in developing the game (Figure 6), the most frequently referenced were teamwork (163), life skills (79), and knowledge exchange (70). Other aspects include understanding and learning the subject (25), learning skills (20), and technical skills (12). The emphasis on teamwork (163) was a recurring theme throughout the data. The prominence of teamwork as an outcome of learning is a testament to the power of collaborative learning, highlighting the importance of cooperation, mutual respect, and open communication in achieving common goals. By working together, students were able to share perspectives, pool their knowledge, and develop a deeper understanding of the subject matter.

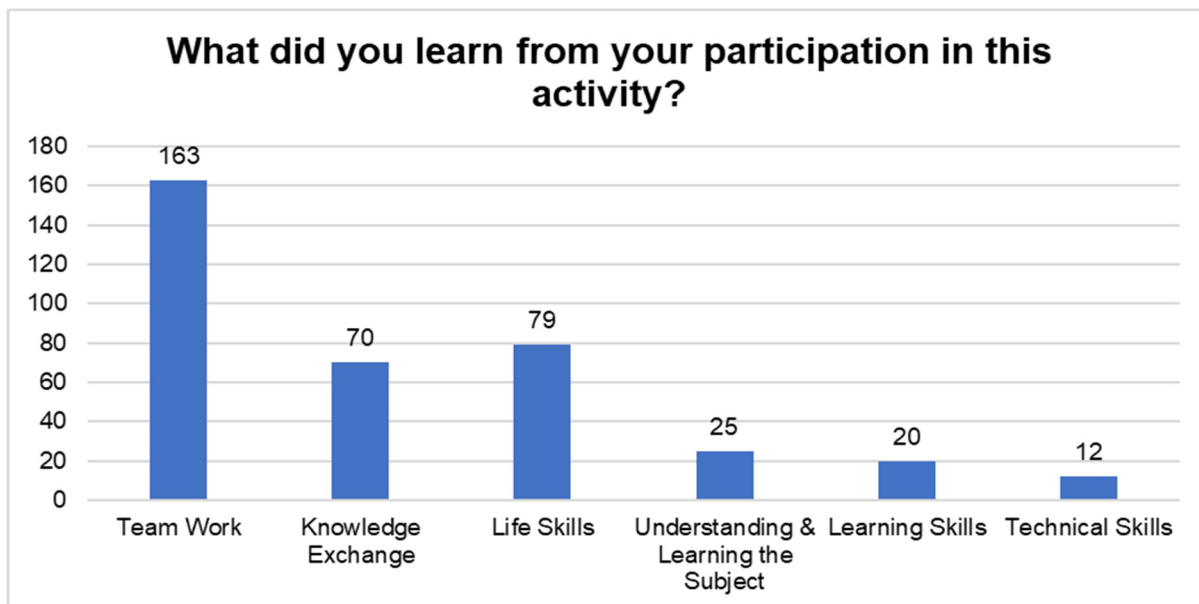


Figure 6. Learning Through Participation in This Activity

The results indicate that life skills (79) represent a significant aspect of the students' learning experience. Patterns emerging in this area include developing different perspectives, communication, time management, patience, compromise, cultural competence, dedication, leadership, organisation, accountability, conflict resolution, self-reliance, and providing assistance. Some of the life skills identified by the students, such as accountability, communication, conflict resolution, and leadership, are also consistent with the literature on the benefits of collaborative learning (Gapinski, 2018; Nerona, 2017; Barkley et al., 2014; Johnson et al., 2013; Griesbaum and Görtz, 2010; Smith et al., 1992). According to the findings, students acquired a wealth of valuable life skills that will benefit them in various aspects of their lives. These life skills are essential for success in both academic and professional settings, and their development is a testament to the holistic nature of the learning experience.

Knowledge exchange (70) was another significant factor in the students' learning experience. This finding suggests that the game development process facilitated the sharing of ideas, expertise, and best practices among students. The patterns that emerged in this category, including creative thinking, utilising knowledge learned, critical thinking, and diligence, demonstrate the depth of learning that occurred. Furthermore, the development of technical skills (12), such as creating educational games and research skills, although less prominent, was still a notable outcome. Being able to create educational games, for example, can help students communicate complex ideas in an engaging and interactive way.

While the development of learning and understanding the subject (25) and learning skills (20) were less prominent, they are still important aspects of the students' learning experience. Emerging patterns in learning skills include creative thinking, utilising knowledge, critical thinking, and diligence, which demonstrate the students' growing mastery of the subject matter. Albeit to a lesser extent, the learning skills (20) identified by the students are consistent with self-directed learning, in which students create their own learning experiences through planning their learning needs and goals, achieving the goals, identifying learning resources, and evaluating learning outcomes (Skiff & Beckendorf, 2009; Alwadeen & Piller, 2022; Mesaoud et al., 2023). The findings illustrate that, beyond the educational context, these skills are essential for situations requiring innovative solutions to solve problems.

The findings show that the students' experience of developing a game was rich and multifaceted. From the patterns and themes that emerged from the data, a deeper understanding was gained of students' learning experience and how it can be replicated or improved in the future. Through "what students do", incorporating game development into educational settings can have a profound impact on students' learning experiences. Through collaborative learning opportunities, students can develop teamwork, life skills, and knowledge exchange, which will help them become more skilled, well-rounded, and empathetic individuals. It is therefore essential to consider how to create such learning experiences to help students develop the skills they need to thrive in an ever-changing world.

5.2.3 Learning from Team Members

Regarding learning from team members, most respondents (85) referenced teamwork. The students' emphasis on teamwork and different perspectives aligns with the literature on the benefits of collaborative learning, which is also deemed necessary for the development of other skills (Smith et al., 2017; McCown, 1994; MacGregor, 1992). To this end, the findings illustrate that teamwork underscores the value of mutual support and collaborative effort in achieving common goals. The next theme, different perspectives (72), aligns with the literature on the benefits of collaborative learning (Smith et al. 2017; McCown, 1994; MacGregor, 1992). The findings demonstrate that learning derived from different perspectives is enhanced by exposure to diverse approaches and viewpoints.

From the data, additional themes were identified, which, while not as predominant, still played a significant role in the students' learning experience. These include members' dedication (30) and the process of resolving team disputes and differences (27), which is consistent with the literature regarding the benefits of collaborative learning (Gapinski, 2018; Nerona, 2017; Barkley et al, 2014; Johnson et al., 2013; Griesbaum & Görtz, 2010; Smith et al, 1992). The findings suggest that observing and participating in team members' dedication to the activity, as well as navigating conflict, provided the respondents with valuable lessons. Other notable patterns that emerged, albeit less frequently, included communication (17), new knowledge and exchange (16), creative thinking (15), patience (12), hard work and focus (11), and time management (11). The patterns of communication, creative thinking and time management are consistent with the literature on the benefits of collaborative and self-directed learning (Boubih, 2022; Gapinski, 2018; Nerona, 2017; Barkley et al, 2014; Johnson et al., 2013; Griesbaum & Görtz, 2010; Smith et al., 1992). The findings suggest that these themes, while less prominent, are no less important, as they contribute to a well-rounded learning experience that extends beyond the immediate goals of the activity.

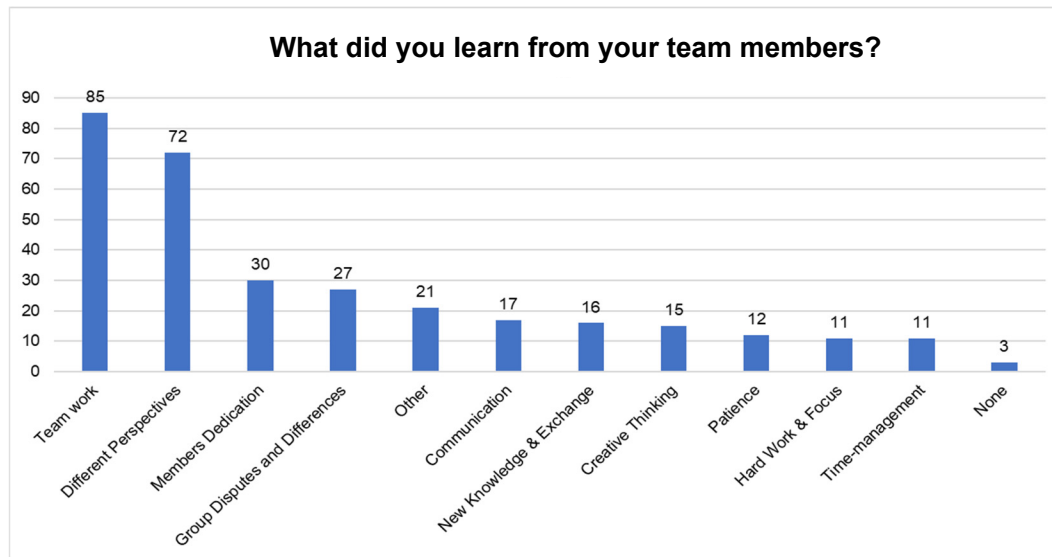


Figure 7. Learning from Team Members

Within the current literature, these findings resonate with the notion that teamwork and exposure to diverse perspectives are fundamental to personal and professional growth. The emphasis on dedication, conflict resolution, and softer skills such as communication, patience, and time management, highlights the multifaceted nature of learning within team settings. As such, the results of this study contribute to our understanding of the dynamics of team-based learning, emphasising the value of collaborative environments in fostering a wide range of skills and competencies essential for success in both academic and professional spheres.

The findings show that what the students learnt from their team members during the development of the board game was fundamental to support their own learning. At the same time it allowed them to stay focused on their own learning. As such, students took control of the learning process, even though this took place in the context of collaborative learning. Moreover, it demonstrates that learning occurs not only in isolation but also through peer learning. Thus, what students learnt from their team members was considered equally important for both developing the board game and their own learning process.

Research shows that in an educational context, gamification does not only support learning, but also addresses associated behaviours, attitudes and activities comprising student creativity and retention, self-guided study, collaboration, participatory approaches, and exploratory learning approaches (Caponetto et al., 2014). From this study, the findings confirm that students' development of a board game contributed to learning skills such as creative thinking, utilising the knowledge learned, critical thinking and diligence, as well as technical skills, including creating educational games and research skills. It could be argued that the continued application of these skills could help develop behaviours and attitudes to support future learning.

6. Conclusion

This paper explored the application of gamification as a teaching pedagogical approach to enhance student learning in the Public Administration curriculum at the University of the Free State, South Africa. The research question was: how does students' participation in the development of a module-specific board game as a teaching pedagogical approach enhance their learning in a Public Administration module? The findings indicate that student learning improved mainly through a better understanding of the theory, as indicated in three of the four learning outcomes. In addition to answering this research question, the teaching approach of "what students do" was applied, utilising gamification as pedagogy to place students at the centre of their own learning. The outcome of this teaching pedagogical approach was that students found developing the game useful for enhancing their learning. It yielded further benefits such as skills that contribute to lifelong learning. By applying this teaching pedagogical approach, where students stay central to their own learning, they take control of their own learning. Such control is embedded in the activities that they undertake to learn and the skills they apply. This research demonstrates that, from both individual and team perspectives, such activities and skills are essential for enhancing learning.

The study found that student participation in developing a board game to enhance their learning was valuable in terms of improving their understanding and learning of the subject. The game contributed to their understanding of the theory across three of the four learning outcomes. This was the most consistent aspect of learning that occurred, followed by preparing for semester tests for the first two learning outcomes. The game was also of value to the students in terms of teamwork. In addition to the intended objective of the game, which was to enhance student learning, their participation led to the acquisition of skills not anticipated as an outcome of the game. These include contributions to learning life skills such as creative and critical thinking, communication, time management and dedication. In terms of learning from team members, skills include collective decision-making and task delegation. The findings show that the student activities to develop this board game ranged from developing life skills to applying them, and learning from their team members.

The findings of this study present a compelling case for the multifaceted value of gamification in self-directed and student-centred learning, extending beyond the classroom and curricula. To this end, this research presents significant findings on the integration of gamification to create an engaging learning environment, that also promotes the acquisition of valuable life skills (communication, time management, and collaboration). The development of learning skills such as creative and critical thinking, utilising knowledge learned, and diligence, as well as technical skills such as creating educational games and research skills, underscores the potential of game development to facilitate a deeper understanding of complex subjects and concepts. Whilst subject knowledge, technical and learning skills, and knowledge exchange were important aspects of the learning process, the development of life skills and teamwork, were the most significant outcomes.

For policymakers and educators interested in using gamification as a teaching pedagogical approach, the development of technical skills and subject knowledge underscores its value in providing students with practical experience. Furthermore, the development and application of life skills, teamwork, and knowledge exchange foster mutual support, collaboration, and communication among students. These skills, along with the ability to work in teams, engage in knowledge exchange, and communicate effectively with others, are essential in a globally interconnected world and for success in the workplace.

The practical implications of this paper are fourfold. Firstly, the future application of gamification should consider how gamification is designed to support formative assessments of student learning. Secondly, the usefulness of applying gamification for enhancing student learning should be premised on how it is designed and used to achieve learning outcomes. Thirdly, incorporating game design elements into the learning process could benefit from student engagement, as the design and their participation in the game should ultimately benefit them. Fourthly, developing more advanced game design elements in learning processes may require institutional support and resourcing to measure its benefits. Further empirical research on the application of gamification in non-game learning environments could enhance how the game is applied with respect to “what students do” to enhance learning. The limitations of this study relate to its context-specific nature, which means that the findings may not be fully generalisable to other contexts. This limitation could be addressed through future research that incorporates broader contexts, thereby enhancing the practical and theoretical understanding of using gamification in student-centred, self-directed, and collaborative learning.

References

- Ajani, O. A. (2023). The Role of Experiential Learning in Teachers' Professional Development for Enhanced Classroom Practices. *Journal of Curriculum and Teaching*, 12(4), 143-155. <https://doi.org/10.5430/jct.v12n4p143>
- Alomari, I., Al-Samarraie, H., & Yousef, R. (2019). The role of gamification techniques in promoting student learning: A review and synthesis. *Journal of Information Technology Education: Research*, 18, 395-417. <https://doi.org/10.28945/4417>
- Alsadaji, A. J., Al-Fayyadh, S., Al-Saadi, S. F., & Mohammed, Z. J. (2022). Gamification in Higher Education: An overview. *Medical Education Bulletin*, 3(4), 555-62. <https://doi.org/10.22034/meb.2022.348675.1062>
- Alwadeen, N. B., & Piller, B. (2022). Enhancing Self-directed Learning Readiness at Elementary Level; a Study from American Schools. *Journal of Curriculum and Teaching*, 11(4), 24-38.
- Andrade, M. S. (2021). Preparing Business Students for the World of Work — Games for Intercultural Skill Development. *Journal of Curriculum and Teaching*, 10(4), 91-101. <https://doi.org/10.5430/jct.v10n4p91>
- Barkley, E. F., Major, C. H., & Cross, K. P. (2014). *Collaborative Learning Techniques: A Handbook for College*

Faculty (2nd ed.). San Francisco: John Wiley & Sons.

- Becker, K., & Gopin, E. (2016). *Selection criteria for using commercial off-the-shelf games (COTs) for learning. Learning, Education & Games, Volume two: Bringing games into educational contexts*. ETC Press.
- Biggs, J. (2012). What the student does: teaching for enhanced learning. *Higher Education Research & Development*, 31(1), 39-55. <https://doi.org/10.1080/07294360.2012.642839>
- Biggs, J., & Tang, C. (2011). *Teaching for Quality Learning at University: What the Student Does*. McGraw-Hill Education (UK).
- Boubih, S. (2022). La classe inversée, potentialités pour le développement de l'enseignement hybride. Conception et évaluation. Thèse de doctorat en Sciences en ingénierie pédagogique et didactique des sciences, spécialité SVT, soutenue le 1er juillet 2022 à la faculté des Sciences de Tétouan, N° d'ordre 30/2022, CED Sciences et Technologies, p221.
- Bovermann, K., & Bastiaens, T. (2018). Using gamification to foster intrinsic motivation and collaborative learning: A comparative testing. *Proceedings of EdMedia+ Innovate Learning* (pp. 1128-1137). Waynesville, NC: Association for the Advancement of Computing in Education (AACE). Retrieved from <https://www.learntechlib.org/p/184321/>
- Caponetto, I., Earp, J., & Ott, M. (2014). *Gamification and education: a literature review. In 8th European Conference on Games Based Learning* (pp. 50-57). Germany: ECGBL. Retrieved from <https://www.itd.cnr.it/download/gamificationECGBL2014.pdf>
- Christy, K.R., & Fox, J. (2014). Leaderboards in a virtual classroom: A test of stereotype threat and social comparison explanations for women's math performance, *Computers & Education*, 78, 66-77. <http://dx.doi.org/10.1016/j.compedu.2014.05.005>
- Creswell, J. W. (2012). *Educational Research. Planning, Conducting, Evaluating Quantitative and Qualitative Research* (4th ed.). Boston, Mass.: Pearson.
- Debre, O., Vakulenko, N., Savchenko, A., Lysenko, L., Kondor, M., & Kis, A. (2023). The Role of Competencies in the Educational Process of Training Future Specialists in the “Labour Training and Technologies” Speciality. *Journal of Curriculum and Teaching*, 12(2), 83-89. <https://doi.org/10.5430/jct.v12n2p83>
- Dichev, C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International Journal of Educational Technology in Higher Education*, 14(9), 1-36. <https://doi.org/10.1186/s41239-017-0042-5>
- Dou, K., Halim, H. A., & Saad, M. R. M. (2024). A Bibliometric Study of Mobile-Assisted Language Learning from 2013 to 2023: Research Themes and Trends. *Journal of Curriculum and Teaching*, 13(5), 431-448. <https://doi.org/10.5430/jct.v13n5p431>
- Farhat, S., & Moray, N. A. A. (2024). Evaluating Employability Skills Integration in a Citizenship Education Textbook. *Journal of Curriculum and Teaching*, 13(5), 49-61. <https://doi.org/10.5430/jct.v13n5p49>
- Fernando, S., & Marikar, F. (2017). Constructivist Teaching/Learning Theory and Participatory Teaching Methods. *Journal of Curriculum and Teaching*, 6(1), 110-122. <https://doi.org/10.5430/jct.v6n1p110>
- Gapinski, A. (2018). Assessment of Effectiveness of Teamwork Skills Learning in Collaborative Learning. *The Journal of Management and Engineering Integration*, 11(2), 1-15.
- Gatti, L., Ulrich, M., & Seele, P. (2019). Education for sustainable development through business simulation games: An exploratory study of sustainability gamification and its effects on students' learning outcomes. *Journal of Cleaner Production*, 207, 667-678.
- Göl, O., & Nafalski, A. (2007). Collaborative Learning in Engineering Education. *Global Journal of Engineering Education*, 11(2), 173 - 180.
- Griesbaum, J., & Görtz, M. (2010). Using feedback to enhance collaborative learning: an exploratory study concerning the added value of self- and peer-assessment by first-year students in a blended learning lecture. *International Journal on E-Learning*, 9(4), 481-503.
- Groening, C., & Binnewies, C. (2019). “Achievement unlocked!” - The impact of digital achievements as a gamification element on motivation and performance. *Computers in Human Behavior*, 97, 151-166. <https://doi.org/10.1016/j.chb.2019.02.026>

- Gupta, P., & Goyal, P. (2018). Gen Y attributes - antecedents to teaching pedagogy. *Vision: The Journal of Business Perspective*, 22(1), 78-87. <https://doi.org/10.1177/09722629177502>
- Gupta, P., & Goyal, P. (2022). Is game-based pedagogy just a fad? A self-determination theory approach to gamification in higher education. *International Journal of Educational Management*, 36(3), 341-356. <https://doi.org/10.1108/IJEM-04-2021-0126>
- Hakulinen, L., & Auvinen, T. (2014). The Effect of Gamification on Students with Different Achievement Goal Orientations. *2014 International Conference on Teaching and Learning in Computing and Engineering, Kuching, Malaysia*, 9-16. <https://doi.org/10.1109/LaTiCE.2014.10>
- Hamamah, H., Rohmah, Z., Muttaqin, S., Nurmansyah, M. A., & Fadillah, A. C. (2025). Enhancing Language Skills and Literacy: A Project-Based Approach for English Teachers in Multimodal Pedagogy. *Journal of Curriculum and Teaching*, 14(2), 183-194. <https://doi.org/10.5430/jct.v14n2p183>
- Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does Gamification Work?—A Literature Review of Empirical Studies on Gamification. *2014 47th Hawaii International Conference on System Sciences*, Waikoloa, HI, 6-9 January 2014, 3025-3034. <https://doi.org/10.1109/HICSS.2014.377>
- Hansuk, S., Jansoda, S., & Poonputta, A. (2024). Utilizing Integrated Think-Pair-Share and SSCS Techniques to Enhance Problem-Solving Skills in Mathematical Set among 10th Grade Students. *Journal of Curriculum and Teaching*, 13(4), 295-303. <https://doi.org/10.5430/jct.v13n4p295>
- Holiuk, O., Kruty, K., Desnova, I., Blashkova, O., & Korylchuk, N. (2022). Problems and Prospects of Formation of Digital Competence of Future Scientific and Pedagogical Workers of Higher Education Institutions Through Gamification: Opportunities Kahoot, Quizlet in the European Union. *Journal of Curriculum and Teaching*, 11(4), 108-119. <https://doi.org/10.5430/jct.v11n4p108>
- Holman, C., Aguilar, S., & Fishman, B. (2013). GradeCraft: what can we learn from a game-inspired learning management system? *Third International Conference on Learning Analytics and Knowledge*, (pp. 260-264). New York, NY: ACM.
- Humeniuk, T., Prosandieieva, L., Voronova, V., Nedzvetska, O., Chernihovets, T., & Solomatova, V. (2022). The Effectiveness of Gamification Elements for the Development of Future Culturologists' Digital Competence. *Journal of Curriculum and Teaching*, 11(6), 113-125.
- Irwanto, I., Wahyudiati, D., Saputro, A. D., & Laksana, S. D. (2023). Research Trends and Applications of Gamification in Higher Education: A Bibliometric Analysis Spanning 2013 - 2022. *International Journal of Emerging Technologies in Learning*, 18(05), 19-41. <https://doi.org/10.3991/ijet.v18i05.37021>
- Johnson, D. W., Johnson, R. T., & Johnson Holubec, E. (2013). *Cooperation in the Classroom* (9th ed.). Interaction Book Company. Edina, MN.
- Junling, P., & Xianyin, L. (2022). A Study on the Influence of Higher Vocational Students' Professional Identity on Learning Gain, Based on the Mediating Effect of Learning Input. *Journal of Curriculum and Teaching*, 11(7), 15-26. <https://doi.org/10.5430/jct.v11n7p15>
- Kiili, K. (2005). Digital game-based learning: Towards an experiential gaming model. *The Internet and Higher Education*, 8(1), 13-24. <https://doi.org/10.1016/j.iheduc.2004.12.001>
- Knowles, M. S. (1975). *Self-directed learning: A guide for learners and teachers*. Chicago: Follett.
- Krause, M., Mogalle, M., Pohl, H., & Williams, J. J. (2015). A Playful Game Changer: Fostering Student Retention in Online Education with Social Gamification. In Proceedings of the second ACM conference on Learning @ scale - L@S '15. <https://doi.org/10.1145/2724660.2724665>
- Lainema, T., & Saarinen, E. (2010). Explaining the Educational Power of Games. In P. Zemliansky & D. Wilcox (Eds.), *Design and implementation of educational games: theoretical and practical perspectives*. New York: IGI Global Scientific Publishing
- Landers, R. N., & Armstrong, M. B. (2017). Enhancing instructional outcomes with gamification: An empirical test of the technology-enhanced training effectiveness model. *Computers in Human Behavior*, 71, 499-507. <https://doi.org/10.1016/j.chb.2015.07.031>
- Langendahl, P. A., Cook, M., & Mark-Herbert, C. (2016). *Gamification in higher education*. Working paper series. Swedish University of Agricultural Sciences, Department of Economics: Uppsala. Retrieved from

https://pub.epsilon.slu.se/13429/7/langendahl_p_a_et al_160602.pdf

- Liu, J., Tahri, D., & Qiang, F. (2024). How Does Active Learning Pedagogy Shape Learner Curiosity? A Multi-Site Mediator Study of Learner Engagement among 45,972 Children. *Journal of Intelligence*, 12(6), 59. <https://doi.org/10.3390/jintelligence12060059>
- MacGregor, J. (1992). Collaborative Learning: Reframing the Classroom. In A. S. Goodsell, M. R. Maher, V. Tinto, B. Leigh, & J. MacGregor (Eds.), *Collaborative Learning: A Sourcebook for Higher Education*. National Center on Postsecondary Teaching, Learning, and Assessment. Pennsylvania State University. University Park.
- Majuri, J., Koivisto, J., & Hamari, J. (2018). Gamification of Education and Learning: A Review of Empirical Literature. *The 2nd International GamiFIN conference*. 21-23 May 2018, Finland.
- McCown, R. (1994). *Key Elements For Cooperative Learning*. *Cooperative Learning Conference*. Duquesne University. Center for teaching Excellence. May 9. Pittsburgh, PA.
- Mekler, E. D., Brühlmann, F., Tuch, A. N., & Opwis, K. (2017). Towards understanding the effects of individual gamification elements on intrinsic motivation and performance. *Computers in Human Behavior*, 71, 525- 534. <https://doi.org/10.1016/j.chb.2015.08.048>
- Mercat, C. (2022). Introduction to Active Learning Techniques. *Open Education Studies*, 4(1), 161-172. <https://doi.org/10.1515/edu-2022-0010>
- Mesaoud, M. N., Boubih, S., Najoui, K., Raissouni, M. R., Assim, E., El Kazdou, H., & Radid, M. (2023). The Contribution of the Flipped Classroom to the Optimization of Alternating Teaching in Morocco. *Journal of Curriculum and Teaching*, 12(1), 288-300. <https://doi.org/10.5430/jct.v12n1p288>
- Mohd, N., Ali, A. F. A., & Abdul-Hafeed, F. (2024). Teachers' Awareness of Student-Centered Pedagogy and Assessment in EFL Context. *Journal of Curriculum and Teaching*, 13(1), 13-23. <https://doi.org/10.5430/jct.v13n1p13>
- Moll, I. (2024). A Psychological Critique of Knowles' Andragogy as a Theory of Learning. *Studies in Adult Education and Learning*, 30(1), 151-170. <https://doi.org/10.4312/as/16396>
- Mujallid, A. T. (2024). Digital Active Learning Strategies in Blended Environments to Develop Students' Social and Emotional Learning Skills and Engagement in Higher Education. *European Journal of Education*, 59(4), 1-2. <https://doi.org/10.1111/ejed.12748>
- Naudé, M., & Meier, C. (2025). A Teacher-directed Approach to Teaching and Learning of Mathematics in Early Childhood Second Language Classrooms in South Africa. *Journal of Curriculum and Teaching*, 14(2), 165-182. <https://doi.org/10.5430/jct.v14n2p165>
- Nerona, G.G. (2017). Enhancing students' achievement and self-assessed learning outcomes through collaborative learning strategies in various engineering courses. *Global Journal of Engineering Education*, 19(3), 231-236.
- Ngoc, N. T. (2024). Develop Tay and Nung Students' Communication Skills with Secondary School Experiential Activities. *Journal of Curriculum and Teaching*, 13(2), 10-21. <https://doi.org/10.5430/jct.v13n2p10>
- Nunaki, J. H., Lettu, F. F., Jeni, J., Sari, R., Sahertian, N. E., Damopolii, I., & Latjompoh, M. (2023). Encouraging Students' Critical Thinking Using Problem-Based Book Integrated Daily Problems and Solutions about Environmental Pollution. *Journal of Curriculum and Teaching*, 12(6), 218-229. <https://doi.org/10.5430/jct.v12n6p218>
- Ongon, S., Wongchantra, P., & Bunnaen, W. (2021). The Effect of Integrated Instructional Activities of Environmental Education by Using Community - Based Learning and Active Learning. *Journal of Curriculum and Teaching*, 10(2), 42-57. <https://doi.org/10.5430/jct.v10n2p42>
- Ortiz, M., Chiluiza, K., & Valcke, M. (2016). Gamification in higher education and STEM: A systematic review of literature. *Proceedings of EDULEARN16 Conference 4th-6th July 2016*, Barcelona, Spain. Retrieved from <https://biblio.ugent.be/publication/8542410>
- Prosser, M., & Trigwell, K. (1998). *Understanding Learning and Teaching: The Experience in Higher Education*. Milton Keynes: Open University Press.
- Putz, L. M., Hofbauer, F., & Treiblmaier, H. (2020). Can gamification help to improve education? Findings from a longitudinal study. *Computers in Human Behavior*, 110, 1-12. <https://doi.org/10.1016/j.chb.2020.106392>
- Schmutz, J. B., Meier, L. L., & Manser, T. (2019). How effective is teamwork really? The relationship between

- teamwork and performance in healthcare teams: a systematic review and meta-analysis. *BMJ Open*, 9(9), 1-16.
- Shuell, T. J. (1986). Cognitive conceptions of learning. *Review of Educational Research*, 56, 411-436. <https://doi.org/10.2307/1170340>
- Sinar, T. S., Zein, T. T., Huszka, B., Yusuf, M., Maharani, P., & Sanjaya, D. (2024). Learning English Literacy through Video Games: A Multimodal Perspective. *Journal of Curriculum and Teaching*, 13(1), 102-118. <https://doi.org/10.5430/jct.v13n1p102>
- Sinelnikova, V., Ivchenko, T., Pistunova, T., Regesha, N., & Skazhenyk, M. (2022). Enhancing the Performance of Andragogic Education. *Journal of Curriculum and Teaching*, 11(1), 245-254. <https://doi.org/10.5430/jct.v11n1p245>
- Skiff, D., & Beckendorf, P. (2009). Self-directed learning: a key ingredient for comprehensive training curriculum. *Pipeline and Gas Journal*, 236, 76-77.
- Smiderle, R., Rigo, S., Marques, L. B., Peçanha de Miranda Coelho, J. O., & Jaques, P.A. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learning Environments*, 7(3), 1-11. <https://doi.org/10.1186/s40561-019-0098-x>
- Smith, B. L., & MacGregor, J. (1992). What is Collaborative Learning? In A. S. Goodsell, M. R. Maher, V. Tinto, V., B. Leigh, & J. MacGregor (Eds.), *Collaborative Learning: A Sourcebook for Higher Education*. National Center on Postsecondary Teaching, Learning, and Assessment. Pennsylvania State University. University Park.
- Smith, K., Johnson, D. W., & Johnson, R. T. (1992). Cooperative and Positive Change in Higher Education. In A. S. Goodsell, M. R. Maher, V. Tinto, B. Leigh, & J. MacGregor, J. (Eds.), *Collaborative Learning: A Sourcebook for Higher Education*. National Center on Postsecondary Teaching, Learning, and Assessment. Pennsylvania State University. University Park.
- Smith, R. M. (1982). *Learning How to Learn: Applied Theory for Adults*. Pearson Prentice Hall.
- Somnam, S., Wongtip, K., & Buaphanngam, S. (2025). The Development of a Literacy Curriculum Using Activity-Based Learning, Digital Curriculum and Spatial Identity to Enhance Literacy Skills of Elementary Students. *Journal of Curriculum and Teaching*, 14(2), 13-26. <https://doi.org/10.5430/jct.v14n2p13>
- Tang, M., & Hanneghan, S. (2010). *A Model-Driven Framework to Support Development of Serious Games for Game-based Learning*. Developments in E-systems Engineering Conference. 6-8 September 2026. London. <https://doi.org/10.1109/DeSE.2010.23>
- Thornton, D., & Francia, G. I. (2014). Gamification of information systems and security training: Issues and case studies. *Information Security Education Journal*, 1(1), 16-24.
- Treiblmaier, H., Putz, L.-M., & Lowry, P. B. (2018). Research commentary: Setting a definition, context, and theory-based research agenda for the gamification of non-naming applications. *AIS Transactions on Human-Computer Interaction*, 10(3), 129-163. <https://doi.org/10.17705/1thci.00107>
- Tremblay, N. A. (2003). *Les courants de l'autoformation*. In *L'autoformation: Pour apprendre autrement* (pp. 90-135). Montréal: Presses de l'Université de Montréal.
- Varannai, I., Sasvari, P., & Urbanovics, A. (2017). The Use of Gamification in Higher Education: An Empirical Study. *International Journal of Advanced Computer Science and Applications*, 8(10), 1-6. <https://doi.org/10.14569/IJACSA.2017.081001>
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Yamane, T. (1973). *Statistics: An Introductory Analysis*. London: John Weather Hill, Inc.
- Ye, S. X., Shi, J., & Liao, L. (2023). An Evaluative Review of Mobile-assisted L2 Vocabulary Learning Approaches based on the Situated Learning Theory. *Journal of Curriculum and Teaching*, 12(3), 19-24. <https://doi.org/10.5430/jct.v12n3p19>

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