Journal of Education and Learning Technology (JELT)
ISSN 2720-7730 Volume 7 Issue 2 2026 pp 100 - 113
Available online at: https://noyam.org/journals/jelt/
DOI: https://doi.org/10.38159/jelt.2026727

Using gamification to enhance the learning experiences of teacher education students in co-taught classrooms

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ABSTRACT

The purpose of the article is to explore whether gamification can enhance the learning experiences of first-year teacher education students in co-taught classrooms. Gamification is a pedagogical strategy that uses digital games in educational settings to improve students' skills, class engagement, and motivation, and to optimise their learning experiences. Gamification is well-suited for university-level subjects, because student-centred strategies address a more culturally varied and technologically advanced learning environment. Although gamification is becoming more popular, little research has been done on how it affects first-year student teachers in co-teaching environments with more complicated instructional dynamics. To achieve the study objective, the researchers employed an interpretivist paradigm with a qualitative exploratory design to capture rich experiences and perceptions of student teachers and lecturers on gamification in learning at a university of technology in South Africa. Five first-year student teachers were purposefully chosen to participate in the study. The data that were gathered from semi-structured interviews were analysed thematically. The findings show that gamification in co-teaching may enhance learning experiences by fostering critical thinking and subject content mastery, and improving engagement and motivation. The effectiveness of gamification in co-teaching relies on several critical factors, including collaboratively designed games that are engaging, clear integration with the curriculum, alignment of instructional styles, coordinated teaching efforts, and the coherent alignment of gamification strategies with the specific objectives of a subject or module. The study proposes that lecturers receive training in gamified teaching methods, particularly regarding co-teaching. Additionally, gamification strategies and outcomes must be disseminated in departments to encourage interdisciplinary cooperation.

Keywords: Gamification, Co-teaching, Technology, Student success, Teacher Education

INTRODUCTION

Gamification in education has emerged as a significant trend all over the world and offers a significant opportunity to improve educational experiences, also in South Africa.[1] Gamification refers to the process of incorporating game features into non-gaming environments to improve user engagement,

[1] J. H. Stoltz, Byron Bunt, and Sukie van Zyl, "Leveling up Learning: Enhancing Self-Directed Learning in Computer Applications Technology with Classcraft," *Education Sciences* 15, no. 2 (February 4, 2025): 180, https://doi.org/10.3390/educsci15020180.

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PUBLICATION HISTORY - Received : 9th September, 2025 | Accepted: 2nd February, 2026 | Published: 11th March, 2026.
TO CITE THIS ARTICLE –Lenong, Brigitte and Gregg Alexander. "Using gamification to enhance the learning experiences of teacher education students in co-taught classrooms." *Journal of Education and Learning Technology* 7, no.2 (2026): 100 - 113. https://doi.org/10.38159/jelt.2026721
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motivation, and the overall gaming experience, while encouraging fun and enjoyment.[2] Scholars have found that gamification can enhance the process of teaching and learning at universities.[3]

In the evolving landscape of higher education, the integration of innovative pedagogical strategies has become essential to meet the diverse needs of students.[4] Universities are adapting to modern digitisation, embracing rapid technological advancement,[5] and employing gamification to make learning more engaging and effective.[6] For example, when gamification strategies have been employed in e-learning environments, the benefits have been improved engagement and motivation.[7] Koval et al. studied the effect of digital gaming tools on the development of computer science students' skills and reported great interest in implementing technologies and readiness to use these technologies in professional activities in the future.[8] Alonso-Sánchez et al. investigated a gamification technique for teaching family engagement and educational programmes to Master's and Bachelor-level students. They found that students liked the gamification experience and preferred it to traditional education because it improved learning, academic achievement, involvement, and motivation. They suggest that higher education teachers include gamification in their instructional practices.[9] Several studies report favourable outcomes of gamification at higher education institutions, such as improved learning and better academic performance, participation, and motivation of students.[10] These findings provide a strong basis for advocating for the use of gamification in educational settings. Gamification has gained traction for its potential to transform traditional learning environments into dynamic, student-centred spaces.[11] This means that university-level subjects are a good fit for gamification because student-centred approaches involve more technologically sophisticated and culturally diverse learning environments. To keep students interested and engaged, lecturers can employ instructional techniques such as gamification.[12]

However, despite its growing popularity, there is little empirical evidence on how gamification impacts, specifically, first-year student teachers in co-taught classrooms where instructional dynamics are complex. Moreover, sustaining student engagement and equal participation while implementing gamification within co-taught classrooms may be a challenge. Thus, this article investigates whether gamification can enhance the learning experiences of first-year teacher education students in co-taught classrooms, where collaborative instruction is delivered by two lecturers.

The paper starts by reviewing research on gamification in higher education, including its advantages and disadvantages. It then discusses the theoretical underpinnings and research methodology that were applied and the study findings. Conclusions and suggestions for further research will be derived from this discussion.

LITERATURE REVIEW

Thanks to technological improvements, higher education now has more digitalised learning settings and, when education becomes more digitally transformed, using games improves learning and helps

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[2] John Dah et al., "Gamification Is Not Working: Why?," *Games and Culture* 20, no. 7 (November 30, 2025): 934–57, https://doi.org/10.1177/15554120241228125.

[3] Chih-Chien Wang, Shu-Chen Chang, and Yu Han Yu, "Using Gamification to Enhance Learning: A College Course Case Study," *Entertainment Computing* 54 (June 2025): 100942, https://doi.org/10.1016/j.entcom.2025.100942.

[4] Jenni Majuri, Jonna Koivisto, and Juho Hamari, "Gamification of Education and Learning: A Review of Empirical Literature.," *GamiFIN*, 2018, 11–19.

[5] Pingalan Gejandran and Norazilawati Abdullah, "Developing a Model to Explain Teacher Effectiveness: The Mediating Role of Gamification," *Cogent Education* 12, no. 1 (December 31, 2025), https://doi.org/10.1080/2331186X.2025.2521154.

[6] Promethi Das Deep et al., "Gamification Techniques and the Impact on Motivation, Engagement, and Learning Outcomes in ESL Students," *RAIS Journal for Social Sciences* 8, no. 2 (2024): 32–42.

[7] Gejandran and Abdullah, "Developing a Model to Explain Teacher Effectiveness: The Mediating Role of Gamification."

[8] Tetiana Koval et al., "Application Of Gamification In Higher Education: Training Of Early Childhood And Primary Education Teachers In Ukraine," *Environment. Technology. Resources. Proceedings of the International Scientific and Practical Conference* 2 (June 22, 2024): 183–87, https://doi.org/10.17770/etr2024vol2.8051.

[9] José Alexis Alonso-Sánchez, Juan L Núñez Alonso, and Elisa Santana-Monagas, "Gamification in Higher Education: A Case Study in Educational Sciences," *TechTrends* 69, no. 3 (May 18, 2025): 507–18, https://doi.org/10.1007/s11528-025-01056-2.

[10] Gejandran and Abdullah, "Developing a Model to Explain Teacher Effectiveness: The Mediating Role of Gamification."

[11] Majuri, Koivisto, and Hamari, "Gamification of Education and Learning: A Review of Empirical Literature."

[12] Georgios Lampropoulos and Kinshuk, "Virtual Reality and Gamification in Education: A Systematic Review," *Educational Technology Research and Development* 72, no. 3 (June 19, 2024): 1691–1785, https://doi.org/10.1007/s11423-024-10351-3.

achieve academic requirements.[13] Gamification has become a buzzword in the field of education and has been adopted to promote learning and strengthen engagement.[14] Therefore, gamification is one of the concepts associated with engaging experiences through the use of digital learning environments in higher education. Gamification is a teaching strategy that maximises students' learning experiences by utilising digital games in the classroom to improve knowledge and skills.[15] Its core mechanisms include rewards, competition, and exploration; crucial components include challenges, awards, points, levels, leaderboards, and badges.[16] It is important to recognise that classical gamification components enhance engagement and create opportunities for extrinsic motivation; however, they do not appear to foster lasting satisfaction, which may result in students disengaging from these games.[17] It seems that the current generation of students experiences a desire to be instantly rewarded for their learning experiences and for achieving academic success.[18]

Gamifying learning environments can offer many benefits. It is essential to embrace and incorporate technology-enhanced learning in the framework of education,[19] particularly in higher education environments, where gamification presents considerable opportunities for both educators and learners, including enhancing the attainment of learning objectives, improving performance on assessment tasks, and increasing success rates. Additionally, this teaching method fosters and enhances a range of skills, such as teamwork, leadership, oral communication, the capacity to engage in unfamiliar situations, and the ability to generate innovative ideas and solutions that are relevant across various contexts.[20]

Tailored gamification can effectively enhance learning outcomes at educational institutions by outlining student interests and readiness levels for gamification. Hmoud et al. investigated elements, specifically, points, badges, and leaderboards, that affected the uptake of gamification at Jordanian and Palestinian colleges.[21] They discovered that gamification adoption in e-learning platforms is positively affected by elements such as IT infrastructure, management support, financial resources, collaboration, communication effectiveness, and positive attitudes towards technology. Alonso-Sánchez et al. explored young people's gaming interests relevant to educators and assessed the online education tools market for primary and preschool education. Their findings indicate varied student interests and readiness for gamification, identified effective platforms for teacher training, and revealed the necessity for a thorough understanding of gamification to enhance teacher training and develop educational game content.[22] Silva et al. investigated the use of quiz platforms in four courses at Porto Accounting and Business School and found that these tools greatly increased student enthusiasm and engagement, and established an interactive learning environment. Moreover, gamification can be effectively implemented in everyday educational practice, with minimal resources, making it highly suitable for wide-scale use.[23] By embracing innovation in teaching, such as adopting gamification, universities could boost academic achievement and promote critical thinking, adaptability, and lifelong learning abilities, thereby preparing students to flourish in a complex, globalised society.[24]

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[14] Majuri, Koivisto, and Hamari, "Gamification of Education and Learning: A Review of Empirical Literature."
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[19] Lampropoulos and Kinshuk, "Virtual Reality and Gamification in Education: A Systematic Review."
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[23] Paulino Silva et al., "Integrating Digital Tools to Enhance Learning Experiences in Higher Education," in *International Conference in Information Technology and Education* (Springer, 2024), 410–17.
[24] Xu Li et al., "A Gamification-Based System of Driving Training and Its Evaluation," *Multimedia Tools and Applications* 84, no. 18 (July 20, 2024): 20145–60, https://doi.org/10.1007/s11042-024-19844-y.

Gamification in Higher Education

Effective gamification necessitates a robust technological infrastructure and lecturers who are capable of integrating gamified elements in their teaching practices.[25] Students are familiar with technology, they crave technology, and use technology to obtain information from various online sources.[26] Therefore, it might be easier for lecturers to use technology effectively in the classroom to engage students, as the students are familiar with technology. Gamification is the technique of using game elements, such as incentive systems, to encourage players to participate in a task they otherwise would not find appealing.[27] Gamification involves awarding points such as badges and challenges in non-game contexts, thereby increasing motivation and encouraging self-directed exploration.[28] It also enhances student participation, the educational process, and the employability of graduates.[29] While gamification is used in most university settings, introducing gamification in universities offers both opportunities and challenges.[30]

Some findings in relation to gamification report the positive effects of the approach, which can effectively enhance learning and engagement.[31] Gamification has been applied in several subjects, including mathematics, science education, social studies, and language learning, to develop critical thinking skills.[32] Gamification can also create a learning experience that is both fun and engaging, and can help meet the education demands, enrich the educational process, improve learning achievement and assist in the materialisation of digital transformation.[33] In a research study involving 132 students pursuing a macroeconomics course as part of their Business Administration and Management qualification, it was discovered that enhanced active learning through gamified experiences led to the increased skill levels needed by the digital workplace of the twenty-first century.[34] Furthermore, gamification elements support student achievement because they are motivating, engaging and interactive, and offer opportunities for collaborative learning.[35]

Additionally, gamification retains students' interest and enables them to learn simultaneously; lecturer feedback does not make them feel they have failed.[36] Thus, implementing gamification can augment students' active learning and improve lecturers' teaching strategies. Another advantage of gamification, according to Lampropoulos and Kinshuk, is that it improves and develops students' curiosity, imagination, focus and interest, while also bringing about positive change in their attitudes, behaviour, mentality, and social and emotional development.[37] The benefits of using gamification at universities include the improvement of skills, creativity, and responsibility in the classroom.[38]

However, other researchers argue that gamification can be superficial, especially when game-like elements are added to the learning experience without completely integrating them into the

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[25] Li et al., "A Gamification-Based System of Driving Training and Its Evaluation."
[26] Stoltz, Bunt, and van Zyl, "Leveling up Learning: Enhancing Self-Directed Learning in Computer Applications Technology with Classcraft."
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[37] Lampropoulos and Kinshuk, 'Virtual Reality and Gamification in Education: A Systematic Review'.
[38] Kevin Fuchs, "Challenges with Gamification in Higher Education: A Narrative Review with Implications for Educators and Policymakers," *International Journal of Changes in Education* 1, no. 1 (November 8, 2023): 51–56, https://doi.org/10.47852/bonviewIJCE32021604.

curriculum. The other negative point is that gamification may not be suitable for all learning styles, because of students' different preferences, some may prefer structured or exploratory gamification. Also, gamification can create a culture of competition that may not be conducive to collaborative learning and may discourage some students from participating.[39] Lecturers encounter obstacles when they use gamified methods, such as negative student reactions, time constraints, lack of technical expertise, shortages of financial resources, the need to spend time creating, selecting and implementing games, and self-perceptions regarding the applicability of games to real-world scenarios.[40]

Fuchs examined the application of gamification in higher education and concluded that, to harness the benefits of gamification, educators must design game mechanisms carefully to promote collaboration, select suitable activities, and consider diverse learning styles. Fuchs emphasises the need for thoughtful integration of gamification and the importance of evaluating its impact on pedagogical goals in higher education.[41] This finding shows that the broad implementation of gamification in university classrooms may encounter obstacles relating to both internal and external sources, much like those experienced by other educational institutions. Thus, university lecturers need to be fully equipped to implement gamification in their classrooms.

Gamification, therefore, goes beyond merely having students compete for game elements such as points, badges, challenges and leaderboards.[42] To enhance engagement in learning, gamification demands more in-depth consideration than just the fundamental design of basic game features; it should include additional design aspects such as meaningful learning, student-centred approaches, challenges, personalisation, varying difficulty levels, opportunities for choice and autonomy, applications of extrinsic rewards, social interaction and community building, team-based cooperative play, and the approach of viewing failure as an opportunity to learn in safe environments.[43] Moreover, contextual factors, including the grouping of students, the content being taught, and the surrounding environment, should be taken into account by university instructors when they implement gamification as an effective teaching strategy to enhance student learning, motivation, achievement, and engagement. Essentially, engagement refers to the intentional efforts of students to devote time and energy to taking part in learning activities.[44] The following section discusses gamification in a co-teaching environment.

Gamification in a Co-teaching Environment

Co-teaching is a collaborative instructional approach that leverages the expertise of two or more educators to enhance student learning outcomes.[45] Co-teaching, according to Lenong, is an instructional approach in which two or more professionals collaborate to plan, instruct, and monitor the progress of a diverse or blended group of students, both within and outside the classroom. Effective co-teaching could improve the effects of gamification in education by combining collaborative and diversified instructional strategies.[46] However, the success of gamification in co-teaching is dependent on good collaboration among co-teachers, a shared educational goal, and equal job allocation. Misalignments can upset the dynamics of student rivalry and collaboration; therefore, proper design is required. Careful planning, reflection and communication are required to navigate potential threats and

[39] Fuchs, 'Challenges with Gamification in Higher Education: A Narrative Review with Implications for Educators and Policymakers'.
[40] Lester et al., 'Drivers and Barriers to the Utilisation of Gamification and Game-based Learning in Universities'.
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define gamification terminology.[47] Hence, the collaborative structure of co-teaching may support synergies with gamification in educational environments.

Ricci and Fingon found that faculty role modelling in teacher education programmes improved preservice teachers' knowledge, confidence, and collaborative skills. Role modelling is a powerful pedagogical tool, and its impact is maximised when it is coupled with structured reflection and opportunities for preservice teachers to interrogate and adapt observed practices.[48] However, sustaining student engagement and equal participation while implementing gamification in co-taught classrooms may be a challenge.

Socially, gamification can enhance collaboration skills and peer learning, as well as foster collaboration and teamwork, social awareness, and communication skills among students.[49] In the field of education, gamification is seen as a teaching strategy that creates an interactive relationship between elements of game design and the learning atmosphere, to enhance student engagement to foster their curricular, cognitive, and social skills, and drive them towards active learning, self-empowerment and problem-solving. This view positions gamification as a revolutionary and transformative technique, and stresses its capacity to combine game design with the learning environment to improve engagement and skills development. However, poorly designed or excessive use of gamification can lead to students experiencing stress. Therefore, the success of the implementation of gamification depends on the thoughtful integration and collaboration of lecturers.

In order to enhance language learning results, Cotoc and Mudure-Iacob propose utilising digital pedagogy to create a digital escape room for students from a variety of backgrounds. The exercise promotes cooperation, dialogue, and the use of cross-cutting abilities.[50] By using this digital environment as a formative assessment session, lecturers can create a lively micro-community of practice and encourage a light-hearted setting. While these activities can promote transferable skills, in reality, participation levels vary, and some students may disengage or feel excluded.[51] Furthermore, Avellán et al. evaluated the effectiveness of co-teaching Baroque culture to fourth-year students and the applicability of the Jesuitical education paradigm in contemporary classroom settings. This study demonstrates how co-teaching can enrich disciplinary learning by exposing students to multiple perspectives and fostering dialogic engagement.[52]

The studies cited show that the effectiveness of gamification depends on careful design that ensures that learning is enhanced by taking place in collaborative educational settings. They imply that a pedagogical framework is validated by collaborative, interdisciplinary teaching, improving experiential interaction with cultural heritage, and embracing current controversies. Consequently, these skills can be strengthened through co-teaching; therefore, it is important for institutions to evaluate their teaching to ensure that gamification is strengthened. This finding suggests that gamification through co-teaching, in which lecturers collaborate to generate social, collaborative gamification, or which encourages students to collaborate to improve their learning experience, can boost the efficacy of teaching and learning. In collaborative classrooms, gamification could be a useful tool to change the perspectives of both lecturers and students and enhance teaching and learning. Therefore, when co-teachers plan, deliver instruction and assess students through gamification, it can be an effective way to enhance student learning. The dynamics of integrating gamification in co-teaching and learning can help student teachers improve the learning environment by encouraging active participation and sustained motivation.

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[51] Gejandran and Abdullah, "Developing a Model to Explain Teacher Effectiveness: The Mediating Role of Gamification."

[52] Elisa María Pérez Avellán, Henar Pizarro Llorente, and María Eugenia Ramos Fernández, "Co-Teaching in a Jesuit College: A Case Study in the Humanities," *International Studies in Catholic Education*, June 18, 2024, 1–14, https://doi.org/10.1080/19422539.2024.2363314.

THEORETICAL FRAMEWORK

The study was guided by transformative learning theory, developed by Jack Mezirow.[53] Mezirow created a theory in the mid-1980s that distinguishes between instrumental and transformative learning in the classroom. To combat oppressive education, psychological constraints and ideological domination, Mezirow maintains that transformative learning necessitates a fundamental change in viewpoint and behaviour. Additionally, Mezirow linked transformative learning to Habermas's critical theory, which places a strong emphasis on communicative learning and the dialogical process.[54] Mezirow's transformative learning process involves individuals changing problematic frames of reference to make them more inclusive, reflective, and emotionally capable of change.[55] This process challenges individuals' worldviews and enables them to construct a path for change. The support provided by social, cultural, and material environments plays a crucial role in this process, leading to truer and more justified beliefs and opinions. It takes open, voluntary communication with others to understand transformative notions, which promotes objectivity and critical thinking.[56] Congenital–rational, communicative–social and affective–emotional skills are developed through transformative learning, which boosts practice and confidence.[57]

According to the discussion above, first-year students at the university of technology who were involved in this study were experiencing a critical phase of their academic and personal growth. A gamified learning experience that incorporated Mezirow's theory could increase student engagement and result in genuine, long-lasting change in their professional identities, conduct, and ways of thinking. By incorporating the notions of Mezirow's transformative learning theory into gamified experiences, first-year teacher education students were expected to engage in deep, meaningful learning that influenced not only their academic comprehension but also their identities, beliefs, and future professional behaviour. On a personal level, transformative learning can be viewed as a paradigm change that could involve high levels of learning for first-year teacher education students at the University of Technology.[58] Because transformative learning is socially and environmentally influenced, gamification can craft safe, inclusive spaces that allow for experimentation without fear of failure and celebrate diverse perspectives, particularly when scenarios are drawn from various cultures or disciplines. Also, gamification has the potential, particularly in teacher education, to dispel myths and foster a deeper understanding and to become a transformative tool in education.

METHODOLOGY

This section describes the research design, methodology, data gathering tool, and sample used to gather the data. The research utilised an interpretivist approach embedded in a case-study design. This method facilitated an in-depth review of new or ambiguous phenomena while preserving the holistic and significant characteristics of real-life situations, such as the application of gamification to improve the learning experiences of teacher education students in co-taught classrooms at a university. Case studies are often employed for exploratory purposes for unknown phenomena, which aids in the generation of theory.[59]

The study followed a qualitative research methodology to explore whether gamification could enhance the learning experiences of first-year teacher education students in co-taught classrooms. The university of technology where the study was carried out provided a useful perspective on how gamification works in an academic environment that is enhanced by technology.

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The population of a research study includes the targeted group from which the study aims to collect information.[60] In this research, the targeted group was five first-year teacher education students pursuing Bachelor of Education degrees at a university of technology. The researcher applied a purposive sampling technique, which served as a straightforward and cost-effective approach to identify participants for preliminary data collection.[61] A limitation of convenience sampling is that it fails to yield results that can be generalised, because it is impossible to determine whether the sample accurately represents the population.[62] The first five-year teacher education students were purposefully selected to take part in the study, and data were collected from them through individual semi-structured interviews.

The teacher education students were part of the lessons for which lecturers employed gamification, and they worked collaboratively in class. Additionally, the student teachers worked on creating game-like activities to learn the content of education-based modules. Semi-structured interviews were audio-recorded and transcribed verbatim. Data from the semi-structured interviews were analysed thematically. Consent to participate was obtained from student teachers, and participation in the study was entirely voluntary. Participants were informed about the study's aim and objectives. Ethical clearance from the review board was acquired.

Procedure

To enhance student engagement and learning, gamification was introduced in a first-year module at a South African university of technology. The intervention targeted specific lesson objectives after the content had been presented in a collaborative classroom setting. Lecturers collaborated in the co-planning process by deciding how to deliver the content using two co-teaching approaches: one teaches, one observes, and one teaches, one assists. During the planning stage, the co-lecturers also developed strategies to assess students' knowledge through game-based learning. The focus of the intervention was social collaborative gamification, which involved students working in teams to discuss strategies and solve challenges related to the lesson content. Students were divided into teams and participated in various activities that promoted problem-solving and creative skills, such as team-based quizzes, competitions, group projects, and Kahoot! games. These activities created opportunities for communication and interaction among students. To boost motivation, incentives were used to reward participation and achievement. After each activity, students received feedback to help them track their progress. Overall, students' active involvement in these gamified activities contributed significantly to their formative assessment.

PRESENTATION OF FINDINGS AND DISCUSSION

Since there has been little research on how gamification improves the education experience for first-year student teachers, it was important to explore whether gamification could enhance the learning experiences of first-year teacher education students in co-taught classrooms. The semi-interview discussions focused on participants' perceptions and experiences. The semi-structured interview discussions focused on a question that solicited the participants' perceptions regarding gamification: How has gamification improved the first-year student teachers' classroom learning? The first five-year students were enrolled at a university of technology in its Bachelor of Education programme.

The findings are organised according to four themes derived from the study: influence of gamification on co-taught classroom participation, integrating gamification into lessons, gamification in co-teaching, and improving gamification in co-taught classrooms.

[60] Jacqueline Bloomfield and Murray Fisher, "Quantitative Research Design," *Journal of the Australasian Rehabilitation Nurses' Association* 22, no. 2 (September 7, 2019): 27–30, https://doi.org/10.33235/jarna.22.2.27-30.

[61] Bojana Lobe, David Morgan, and Kim A. Hoffman, "Qualitative Data Collection in an Era of Social Distancing," *International Journal of Qualitative Methods* 19 (January 1, 2020), https://doi.org/10.1177/1609406920937875.

[62] Gabriel Andrade, "The Ethics of Positive Thinking in Healthcare," *Journal of Medical Ethics and History of Medicine*, December 28, 2019, https://doi.org/10.18502/jmehm.v12i18.2148.

Influence of Gamification on Co-Taught Classroom Participation

The first-year student teachers were asked to explain how gamification influenced their participation in co-taught lessons. The participants indicated high motivation, enjoyment and participation during gamified lessons. The following excerpts from participants illustrate how gamification influenced their participation in co-taught classrooms:

Student A: It made learning more engaging and interactive.
Student B: Learning was interesting and fun.
Student C: Gamification boosted my motivation and made learning interactive and fun.
Student D: I learned a lot of content from the games; it made the subject content easy.

The comments of the first-year students clearly show that gamification influenced their participation by increasing student participation and sustained attention, which are crucial for effective learning. Gamification can make participation in lessons enjoyable, fun, and interesting. First-year students realised that the goal of the games was not solely entertainment but served clear academic purposes. This reflects research that demonstrates that gamification can enhance understanding and retention by contextualising knowledge in interactive challenges to solve real-life problems.[63] Gamified learning supports application and acquisition of content by making complex topics more accessible and understandable. Gamification elements support student achievement: they are motivating, engaging, and interactive and offer opportunities for collaborative learning.[64] This proves that gamification can enhance the student learning experience.

Integrating Gamification into Lessons

First-year students were asked to indicate if gamification was well integrated with learning objectives. To avoid distraction or superficial engagement, gamification must be thoughtfully designed to align with learning objectives. When game-like aspects are incorporated in the learning process, but they are not fully integrated into the curriculum, gamification can be superficial.[65] The students commented as follows:

Student C: Yes, and it enhanced understanding of the subject matter.
Student E: Yes, the games were linked to the content objectives; they were not just for entertainment, they helped me remember key concepts of the subject.

For gamification to enhance learning, understanding, and retention by contextualising knowledge, the game-based activities must be aligned with the objectives of the subject content. The remarks of Students C and E demonstrate the well-established advantages of skilfully planned gamification for improving understanding of the subject matter and closely linking gaming activities to learning objectives, both of which are essential for attaining significant educational outcomes. Students realise the value of gamified activities when game mechanics are purposefully linked to learning objectives, which boosts motivation and promotes meaningful learning. This relationship makes learning both fun and meaningful, which increases engagement and academic success.

Gamification in Co-Teaching

Gamification could be employed in collaborative classrooms to enhance learning. According to the reflections of first-year students, gamification in co-teaching has positive results. The following are the students' comments on gamification and co-teaching.

Student D: Having multiple lecturers in the classroom to present game-based learning created variety and made the lesson more dynamic.
Student B: I got to learn more from different perspectives.

[63] Lampropoulos and Kinshuk, "Virtual Reality and Gamification in Education: A Systematic Review."
[64] Hojjat Dehghanzadeh et al., "Using Gamification to Support Learning in K-12 Education: A Systematic Literature Review," *British Journal of Educational Technology* 55, no. 1 (January 8, 2024): 34–70, https://doi.org/10.1111/bjet.13335.
[65] Fuchs, "Challenges with Gamification in Higher Education: A Narrative Review with Implications for Educators and Policymakers."

Student E: Having multiple lecturers made the lesson using gamification simpler and more efficient because one would administer the game and the other one would support and make sure it is accessible to the students, or assist those having technical difficulties.

Co-teaching encourages a deeper appreciation of personal and sociocultural factors and awareness of emotional, moral, and social aspects.[66] The lecturers had to co-plan, co-deliver, co-assess, and co-reflect to implement gamification and enhance teaching and learning. Hence, co-teaching may be seen as a determining instrument to gather and share knowledge, expertise, and build a learning environment.[67] The comments above highlight how co-teaching can diversify instructional methods and keep students engaged through varied presentation styles and pacing. Additionally, using gamification in the classroom with two or more lecturers enhances students' knowledge and develops critical thinking by bringing complementary perspectives and areas of expertise. In co-taught classes, role division promotes equitable access, facilitates more seamless facilitation, and lowers technological distractions, all of which improve overall learning effectiveness.

However, Student C commented that 'It was confusing, because each lecturer had a different style'. This remark highlights a prevalent issue in co-teaching settings, which is that inconsistent expectations or teaching styles can cause first-year students to experience cognitive dissonance. This demonstrates that students may become confused if teaching methods are not synchronised, which could reduce the positive impact of gamification.

Improving Gamification in Co-Taught Classrooms

The first-year students were asked if they could redesign one of the gamification activities in co-taught classrooms, and how they would change or improve gamification.

Student A: Focus on engagement and allow students to challenge themselves.
Student C: Accuracy of the speed and accuracy of the game

Student A emphasised the need to focus on engagement by allowing students to challenge themselves. This highlights the importance of designing gamified activities that are sufficiently stimulating and that encourage self-driven improvement. Research shows that games and challenges can be incorporated in non-gaming environments through gamification, which boosts motivation and promotes independent learning.[68] In turn, Student C referred to the accuracy and speed of the game, thereby suggesting a focus on the mechanics that govern how the game operates. This reflects a desire for precise, fair, and balanced feedback systems in gamification, including the timing and correctness of responses. These remarks imply that successful gamification in co-taught classrooms should combine well-balanced game mechanisms with interesting, student-centred tasks. To maximise the pedagogical benefits of gamified learning environments, co-taught classrooms must improve the effectiveness of gamification by using challenging and engaging game designs, transparent performance feedback, coordinated teaching collaboration, aligned instructional styles, increased learner agency, and clear curricular integration.

RECOMMENDATIONS

Based on the study findings, the following recommendations are made:

- To foster critical thinking and subject mastery and offer instant feedback, lecturers must ensure gamified activities are in line with curricular objectives.

[66] Frances Maureen Schnepfleitner and Marco Paulo Ferreira, "Transformative Learning Theory – Is It Tıme to Add A Fourth Core Element?," *Journal of Educational Studies and Multidisciplinary Approaches* 1, no. 1 (March 6, 2021): 40–49, https://doi.org/10.51383/jesma.2021.9.

[67] Sima Zach and Simcha Avugos, "Co-Teaching in Higher Education: Implications for Teaching, Learning, Engagement, and Satisfaction," *Frontiers in Sports and Active Living* 6 (July 22, 2024), https://doi.org/10.3389/fspor.2024.1424101.

[68] Li et al., "A Gamification-Based System of Driving Training and Its Evaluation."

- We propose that lecturers should receive training in gamified teaching methods, particularly in co-teaching.
- Gamification strategies and outcomes must be disseminated within departments to encourage interdisciplinary cooperation.
- Further research should explore effective co-teaching approaches for game-based learning, how to enable students to select challenges or game paths that align with their interests and strengths, and how to increase ownership of learning.

CONCLUSION

Gamification, when thoughtfully integrated into co-taught classrooms, holds significant promise for enriching the educational experiences of first-year teacher education students. It offers a pathway to transformational, inclusive, and engaging learning and prepares students not only for academic success but for their own roles as innovative educators in the future. The findings reflect the documented benefits of gamification, including enhanced engagement, enjoyment and motivation, and better learning outcomes, provided the gamified strategies are pedagogically sound and appropriately implemented. When games are thoughtfully embedded in curriculum objectives and provide immediate feedback and challenges that promote critical thinking and mastery of content, gamification enhances both learner understanding and motivation. Gamification in co-teaching can lead to enhanced engagement, richer learning through multiple perspectives, and improved lesson delivery as a result of complementary lecturer roles. However, to prevent misunderstandings brought about by different teaching philosophies, these advantages rely on co-teachers working together and aligning. Clear communication and role descriptions are necessary for successful gamification in co-teaching to optimise its dynamic and encouraging potential. When teachers work together to incorporate game mechanics into their lessons, they establish welcoming environments that support students' academic and personal development.

LIMITATIONS

The study focused only on first-year students at a university of technology in South Africa; therefore, the results cannot be generalised to other institutions of higher learning.

Conflicts of Interest

The author declares that they have no conflicts of interest in this work.

Funding

The study was financed by the Scholarship of Teaching and Learning at the Central University of Technology, Free State, South Africa.

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