The Application of Gamification in Economics Classrooms:
Implications for Initial Teacher Education Curricula

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Abstract

Today's learning environment has become so digitalised that innovative, engaging and creative pedagogical strategies are needed to make learning fun and enjoyable. Research has shown that gamification as a teaching method can be utilised to enhance participation, attention, performance and learner motivation in various subjects and disciplines. Therefore, it is imperative for Economics pre-service teachers to be equipped with suitable active teaching and learning strategies based on digital games to attract the attention of the diverse millennium learners. To understand the importance of gamification as an effective teaching strategy a qualitative study was carried out to review 30 published research on gamification using a systematic literature review. This was complemented with focus group interviews where twenty final-year students were interviewed in four groups of five each. The study found that gamification is a powerful teaching strategy that reinforces motivation and develops learners' creative problem-solving skills. Gamification is very versatile since it can be used online as well as face-to-face learning. Research of this nature is crucial because learners need to learn in a fun, creative and challenging way. It is recommended that teacher education and other education institutions should equip educators with interactive digital teaching strategies which engage, motivate and enhance learner performance.

Keywords: Gamification, Learning Environment, Curriculum, Initial Teacher Education

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Introduction

Research has proved that essential skills such as attention, creativity, critical thinking, self-managed learning, adaptability, problem-solving, and computer literacy are promoted using games in the learning process (Derakhshan & Khatir, 2015; Gozcu & Caganaga, 2016; Ho et al., 2020; Lee, 2023). Several researchers have also agreed on the fact that games that are driven by educational goals are innovative teaching-learning strategies that have been shown to be effective in improving student learning outcomes (Day-Black, 2015). Today's learning environment has become so digitalised that innovative, engaging and creative pedagogical strategies are needed to teach effectively and arouse learners' imagination (Pimentel et al., 2020). Therefore, it is imperative for Initial Teacher Education (ITE) to equip student teachers with active digital teaching strategies. The use of digital teaching games is essential because games increase learner engagement and make learning fun (Andic et al., 2018). Additionally, gamification reinforces extrinsic and intrinsic motivation, which indicates that it is a powerful teaching strategy (Chans & Portuguez Castro, 2021; Manzano-León et al., 2022; Suh et al., 2018). Several researchers have demonstrated that the inclusion of joy and fun in classrooms using learning games enhances learner creativity, decision-making skills, and performance (Lee, 2023).

Furthermore, the strategy is suitable for diverse classes, whether teaching or assessing online or face-to-face (Chans & Portuguez Castro, 2021; Rincon-Flores et al., 2022). Earlier research conducted by Day-Black (2015) reported that gamification is an innovative, engaging, and efficient strategy to deliver learning material in an engaging and interactive manner (Nieto-Escamez & Roldán-Tapia, 2021). Initial Teacher Education should be intentional in reinforcing the use of learning games in the learning environment to enhance learner participation and motivation. Student engagement is really a matter of concern; hence, earlier theories were developed around learner-centredness and social constructivism (Sawyer, 2006). The education environment cannot afford not to adopt a gamification strategy, which has been shown to be effective in improving student learning outcomes (Day-Black, 2015). The proposal is that teacher education should equip preservice teachers with knowledge of gamification.

The learning environment is becoming digital or incorporating digital technologies in all their forms and shapes. This is what Pimentel, Nunes, and Sales Júnior (2020) call a dialectic between society and technologies in the sense that this relationship promotes changes in all contexts. The use of technology should, in the same way, embrace digital techniques towards the production of innovation, promoting different attitudes and options or creating new forms of communication and interaction in classrooms using teaching strategies. Teaching strategies should go beyond the use of PowerPoint and videos and embrace the use of games to make learning more fun and enjoyable (Mortensen & Nicholson, 2015; Pimentel et al., 2020; Roman et al., 2024). Pimentel and colleagues (2020) further explain that the use of games provides intense interaction, multiplying the dissemination of information and the creation of communities of practice in digital social networks. The problem is that the use of games is not fully utilised in the learning environment though research has proved that games improve student participation and performance (Roman et al., 2024).

In their research, Andic, Kadic, Grujic, and Malidžan (2018) and Zourmpakis, Kalogiannakis, and Papadakis (2023) found that most learners enjoy learning that is associated with educational games because games are fun, engaging, entertaining, challenging, stimulate the brain and increase class participation. Another benefit of games in the learning environment

is that they release stress and grant supplementary motivation (Andic et al., 2018; Zourmpakis et al., 2023). More importantly, educational games can make topics which are boring to teach or learn interesting by stimulating learners' cognitive abilities. This is supported by Aibar-Almazán and colleagues (2024), who said that deeper immersion in the game, produces benefits by stimulating various cognitive aspects and enhancing complex skills. Games benefit the teacher and the learners; this is what should happen in the learning environment to achieve desirable outcomes. Games can improve key skills such as attention, creativity, and critical thinking, especially when longer sessions are used. Therefore, it is imperative that educators make use of the influence and continuous progress of technology by developing innovative learning strategies that cater for the requirements and interests of contemporary learners (Zourmpakis et al., 2023).

The use of games can improve several learning skills, which include attention, creativity, critical thinking, self-managed learning, adaptability, problem-solving, and computer literacy (Aibar-Almazán et al., 2024). Furthermore, the utilisation of games enhances learning by stimulating various cognitive aspects and enhancing complex soft skills as well as developing skills such as interaction, cooperation and competition (Aibar-Almazán et al., 2024; Martínez, 2017). This new teaching strategy can improve the dynamics of the learning process, and its benefits in the educational environment have been widely documented (Dahalan et al., 2023).

The current generation of learners needs pedagogical strategies that are interactive and give them a leading role in the learning environment. Hence in recent years, there has been a notable increase in the utilisation of digital games across various educational domains (Zourmpakis et al., 2023). Gamification brings more commitment to learning and improves learner performance (Chen & Liang, 2022). As an example, games like "Kahoot" have become one of the most popular entertainment-based digital learning tools in recent years, with the advantages of being free, easy to use, and effective in terms of improving classroom dynamics (Aibar-Almazán et al., 2024). Games also foster positive relationships among the various groups of students and stimulate the students' intrinsic motivation to learn (Rodríguez-Aflecht et al., 2017) quoted in Aibar-Almazán and colleagues (2024). Chacon and Janssen (2020) in their research found that games promote the development of more complex and sophisticated skills and that prolonged use also allows for a better understanding of the subject knowledge. Additionally, games improve concentration, mental resilience, and absorption of information, which are all important aspects of paying attention to details and increasing cognitive performance (Sotos-Martinez et al., 2023). The improvement in critical thinking skills may be due to the need to confront challenges presented in real-time through the analysis of information, making quick decisions, and evaluating options presented in games (Jin & Ji, 2021).

However, to make the use of games profitable, the teacher needs to state clear goals and objectives, feedback should be prompt, the teacher must ensure cooperation and learner attention and participation should be maintained (Andic et al., 2018). Research has also found that self-made games are better than ready-made games, as they inspire creativity in teaching (Andic et al., 2018). Therefore, teachers should design their own games relevant to the outcome they need to achieve and align them to the content being taught. More importantly, the needs of the learners, cognitive abilities and time management should be taken into consideration when designing these games.

Methodology

This research was carried out with the main purpose of understanding the application of gamification in economics classrooms. Preservice economics student teachers' views regarding the use of games in the learning environment were examined. A qualitative study was carried out to review 30 published research papers on gamification using a systematic literature review. The systematic literature review intends to bring evidence together to answer a pre-defined research question (Pollock & Berge, 2018). A systematic literature review is mainly based on mining essential data useful for answering the outlined research questions from the identified publications (Kitchenham, 2004). Essential phases in systematic reviews include the devising of the research question, the identification of relevant research, data extraction, assessment of the risk of bias, data synthesis, summary and interpretation of the findings (Pollock & Berge, 2018). A rigorous qualitative systematic review can also discover new knowledge, often helping illuminate 'why' and can help a deeper understanding of the phenomenon under investigation (Elliott et al., 2017). The utilisation of a systematic review in this study was prompted by an interest in gamification and a wish to gain knowledge on how preservice teachers perceive the use of games in the learning space and make Initial Teacher Education recommendations. A systematic literature review was complemented with focus group interviews where twenty final-year students were interviewed in four groups of five each.

For ethical reasons, pseudonyms or codenames were used to keep the participants anonymous. Pseudonyms are often used to camouflage participants mentioned in interviews and other textual data collected for research purposes (Heaton, 2022). Participant confidentiality should be adhered to by researchers as an ethical requirement of research (Creswell, 2013; Roberts, 2015). In this research, participants were given letters and numbers as pseudonyms. For instance, pseudonyms like S1 refer to Student Number 1.

Data Analysis

Data analysis includes procedures for analysing data and techniques for interpreting the results of such procedures.

The following four (4) questions were asked to collect data from the participants.
1. What is gamification?
2. Explain how you used games in your lessons during teaching practice. If you did not, explain why.
3. List types of games teachers can use to grab learner attention, increase participation and increase learner performance.
4. Is gamification essential in the learning environment? Explain.

Question 1: Student teachers were asked to give the meaning of gamification.

Researchers view the use of games in the learning space as a didactic teaching strategy aiming at developing students' professional skills, increasing the sense of community, improving how content is learned, and increasing engagement (Chans & Portuguez Castro, 2021). Preservice teachers who participated in this research were asked to define the term gamification. Different views were given.

Participant S7 gave the following response: "These are games used to grab the attention of learners and encourage participation."

Participant S 9 commented: "It is the process or practice of giving learners play time using learning games when teaching is in progress."

Participant S 17 added: "It is the use of games and playing when focusing on a specific thing, for example, teaching in class."

Most of the student teachers have a general understanding of what gamification is all about. This is evidenced by the responses they gave. A sample of the above definitions from the participants indicated that the preservice teachers know about gamification as a teaching strategy. The following section represents responses to the second question.

Question 2: Student teachers were asked how they used games in their lessons during teaching practice.

Several responses were given. The response given by S2 drew the attention of the researcher:

> No, I did not use any games in my class as learners would think that each lesson I would have will turn into a comedy show. I don't want learners to disrespect me and play on top of my head. My lessons were plain, simple and straightforward. The National Curriculum and Assessment Policy Statement (CAPS) document does not say anything about using games in class.

There are other student teachers who gave responses which are like this. This is worrisome because preservice are supposed to be eager to try new and innovative teaching strategies. A 21st-century teacher should be more than willing to work out new teaching strategies. Gamification is an effective teaching strategy for enhancing creativity which should be tried out by young teachers to arouse learner interest. It is sad if young teachers who are technological natives focus on content coverage and do not pay attention to learners' interests, participation and motivation.

S7 responded as follows: "No, the school did not have resources; most of the classrooms are dilapidated. I was given a container with holes inside."

S17 added: "No, I did not use games in my lessons because the school has no resources to cater for games. I also feel like I have not yet been properly trained to be able to create my own games to use in a lesson."

The responses given by participants S7 and S17 are some of the barriers which can hamper teachers from trying new methods, especially methods which require the use of technology in the Global South countries. S17 raised a fundamental factor regarding the lack of training. Teacher education should equip preservice teachers with the necessary skills needed to teach with educational games.

Question 3: Student teachers were asked to name types of games used in the classroom to grab learner attention, promote participation and increase learner performance.

Educational games which student teachers listed included puzzles, quizzes, word searches, flashcards, mystery boxes, five-minute frenzy letter hopscotch, scavenger hunts, map challenges, video games, simulation games and role play. It is encouraging that students have a sound knowledge of the games which they can use in class to make learning and teaching fun and enjoyable. Andic et al. (2018), who conducted similar research, found that educators use educational games like rebuses, anagrams, crosswords, word associations, memory games, quizzes and "Break the Wall". The games listed by participants agree largely with the descriptions in the literature. Some of the responses to Question 4 are listed below.

Question 4: Students were asked questions about the importance of gamification.

S3: "Yes, it makes learning enjoyable, and learners will be relaxed, not stressing about being pointed at when they ask questions because some of them are scared to answer questions in the class."

S13: "Yes, because we have different learners who get to learn in different ways, some lose interest easily, so [we] can help those kinds of learners to keep them entertained in the classroom."

Most of the student teachers are aware of the importance of gamification in the learning environment. S3 and S13 are among the student teachers who gave precise importance to gamification in the classroom. Initial Teacher Education can strengthen this by incorporating gamification in their programs and empowering student teachers with relevant skills.

Results and Discussions

This section presents the main findings and discussions of the study. Student teachers' views on the application of gamification in the economics classroom were also explored. Data analysis clearly indicates that most of the interviewed student teachers know what gamification is all about but are not yet comfortable with implementing the teaching strategy. The analysis shows that student teachers are willing to integrate games into their teaching if they can be trained on how to employ games in their teaching. The need for training is supported by several researchers who alluded that gamification is both a promising but a challenging tool for teachers willing to implement technological game-based innovations in their courses (Sánchez-Mena et al., 2016). Sánchez-Mena and colleagues (2016) go on to say that student teachers might face difficulties when choosing and designing materials for their courses because of their lack of experience. This is supported by Guerrero Puerta (2024), who said that preservice teachers need comprehensive training in gamification. There is a huge gap in initial teacher education programmes, highlighting that future teachers need to be empowered in the use of gamification as an innovative pedagogical strategy. Some participants, such as S17, were right when they pointed out that they needed to be trained to embrace gamification easily as a teaching strategy. This might be the major contributing factor to why students did not teach using games. Furthermore, educators should be given tools to create their own games suitable for the specific content they will be delivering (Andic et al., 2018). Initial Teacher Education is mandated to empower student teachers with gamification skills. The use of games can improve several learning skills, which include attention, creativity, critical thinking, self-managed learning, adaptability, problem-solving, and computer literacy (Aibar-Almazán et al., 2024). The current generation of learners needs pedagogical strategies that are interactive and that give them a leading role in the learning environment. Therefore, class activities should be incorporated with learning games.

Most of the interviewees agreed to the fact that gamification is an important teaching strategy. Although the sample size was composed of only 20 teachers and 30 articles, it gave significant insights for Initial Teacher Education to train student teachers in the use of gamification. The importance of gamification and the need for teachers to adapt the strategy to cater for diverse learners cannot be underestimated. This viewpoint agrees with S13, who explained that gamification is essential because it accommodates learners with different learning styles.

Conclusion

Trainee teachers need adequate training so that they will be able to teach with educational games effectively. Initial Teacher Education (ITE) should integrate gamification into the curricula, and pedagogical activities should include teaching games. Researchers emphasised that games stimulate learner motivation, foster critical thinking, problem-solving skills, imagination, and interest, enhance self-esteem and performance, improve retention of economic concepts and release stress. It is recommended that goal-directed educational games should be employed in the teaching and learning environment because several researchers agree that games provide an atmosphere which motivates and enhances learning performance. More importantly all games used in the learning environment should be aligned to the curriculum or content which will be taught. The learner's level of intelligence and cultural background of the learners should be considered.

References

Aibar-Almazán, A., Castellote-Caballero, Y., Carcelén-Fraile, M. D. C., Rivas-Campo, Y., & González-Martín, A. M. (2024). Gamification in the classroom: Kahoot! As a tool for university teaching innovation. *Frontiers in Psychology*, *15*, 1370084. https://doi.org/10.3389/fpsyg.2024.1370084

Andic, B., Kadic, S., Grujicic, R., & Malidžan, D. (2018). A Comparative Analysis of the Attitudes of Primary School Students and Teachers Regarding the Use of Games in Teaching. *IAFOR Journal of Education*, *6*(2), 5–16. https://eric.ed.gov/?id=EJ1181054

Chacon, J. A., & Janssen, H. (2020). Teaching critical thinking and problem-solving skills to healthcare professionals. *Medical Science Education, 31*, 235–239. https://doi.org/10.1007/s40670-020-01128-3

Chans, G. M., & Portuguez Castro, M. (2021). Gamification as a strategy to increase motivation and engagement in higher education chemistry students. *Computers*, *10*(10), 132. https://doi.org/10.3390/computers10100132

Chen, J., & Liang, M. (2022). Play hard, study hard? The influence of gamification on students' study engagement. *Frontiers in Psychology, 13*, 994700. https://doi.org/10.3389/fpsyg.2022.994700

Creswell, J. W. (2013). *Qualitative inquiry and research design: choosing among five approaches*. 3rd edition. Sage.

Dahalan, F., Alias, N., & Shaharom, M. S. N. (2023). Gamification and game-based learning for vocational education and training: a systematic literature review. *Education in Information Technology*, *29*, 1279–1317. https://doi.org/10.1007/s10639-022-11548-w

Day-Black, C. (2015). Gamification: An innovative teaching-learning strategy for the digital nursing students in a community health nursing course. *ABNF Journal*, *26*(4), 1–6.

Derakhshan, A., & Khatir, E. D. (2015). The effects of using games on English vocabulary learning. *Journal of Applied Linguistics and Language Research*, *2*(3), 39–47.

Elliott, J. H., Synnot, A., Turner, T., Simmonds, M., Akl, E. A., McDonald, S., Salanti, G., Meerpohl, J., Maclehose, H., Hilton, J., Tovey, D., Shemilt, I., & Thomas, J. (2017). Living systematic review: 1. Introduction—the why, what, when, and how. *Journal of Clinical Epidemiology*, *91*, 23–30. https://doi.org/10.1016/j.jclinepi.2017.08.010

Gozcu, E., & Caganaga, C. K. (2016). The importance of using games in EFL classrooms. *Cypriot Journal of Educational Sciences*, *11*(3), 126–135. https://eric.ed.gov/?id=EJ1140747

Guerrero Puerta, L. (2024). Exploring if gamification experiences make an impact on pre-service teachers' perceptions of future gamification use: A case report. *Societies*, *14*(1), 11–26. https://doi.org/10.3390/soc14010011

Heaton, J. (2022). "*Pseudonyms are used throughout": A footnote, unpacked. *Qualitative Inquiry*, *28*(1), 123–132. https://doi.org/10.3390/soc14010011

Ho, P. V. P., Thien, N. M., An, N. T. M., & Vy, N. N. H. (2020). The effects of using games on EFL students' speaking performances. *International Journal of English Linguistics*, *10*(1), 183–193. https://doi.org/10.5539/ijel.v10n1p183

Jin, M., & Ji, C. (2021). The correlation of metacognitive ability, self-directed learning ability and critical thinking in nursing students: a cross-sectional study. *Nursing Open 8*, 936–945. https://doi.org/10.1002/nop2.702 https://doi.org/10.1002/nop2.702

Kitchenham, B. (2004). Procedures for performing systematic reviews. *Keele University*, *33*(2004), 1–26.

Lee, K. W. (2023). Effectiveness of gamification and selection of appropriate teaching methods of creativity: Students' perspectives. *Heliyon*, *9*(10), 1–15. https://doi/org/10.1016/j.heliyon.2023.e20420

Manzano-León, A., Aguilar-Parra, J. M., Rodríguez-Moreno, J., & Ortiz-Colón, A. M. (2022). Gamification in initial teacher training to promote inclusive practices: a qualitative study. *International Journal of Environmental Research and Public Health*, *19*(13), 8000. https://doi.org/10.3390/ijerph19138000

Mortensen, C. J., & Nicholson, A. M. (2015). The flipped classroom stimulates greater learning and is a modern 21st-century approach to teaching today's undergraduates. *Journal of Animal Science*, *93*(7), 3722–3731. https://doi.org/10.2527/jas.2015-9087

Nieto-Escamez, F. A., & Roldán-Tapia, M. D. (2021). Gamification as online teaching strategy during COVID-19: A mini-review. *Frontiers in Psychology*, *12*, 648552. https://doi.org/10.3389/fpsyg.2021.648552

Pimentel, F. S. C., Nunes, A. K. F., & Sales Júnior, V. B. D. (2020). Teacher training in digital culture through gamification. *Educar em Revista*, *36*, e76125. https://doi.org/10.1590/0104-4060.76125

Pollock, A., & Berge, E. (2018). How to do a systematic review. *International Journal of Stroke*, *13*(2), 138-156. https://doi.org/10.1177/1747493017743796

Rincon-Flores, E. G., Mena, J., & López-Camacho, E. (2022). Gamification as a teaching method to improve performance and motivation in tertiary education during COVID-19: A research study from Mexico. *Education Sciences*, *12*(1), 49. https://doi.org/10.3390/educsci12010049

Roberts, L. D. (2015). Ethical issues in conducting qualitative research in online communities. *Qualitative Research in Psychology, 12*(3), 314–325. https://doi.org/10.1080/14780887.2015.1008909

Rodríguez-Aflecht, G., Hannula-Sormunen, M., McMullen, J., Jaakkola, T., & Lehtinen, E. (2017). Voluntary vs compulsory playing contexts: Motivational, cognitive, and game experience effects. *Simulation & Gaming*, *48*(1), 36–55. https://doi.org/10.1177/1046878116673679

Roman, C., Delgado, M. Á., & García-Morales, M. (2024). Embracing the efficient learning of complex distillation by enhancing flipped classroom with tech-assisted gamification. *Education for Chemical Engineers*. https://doi.org/10.1016/j.ece.2024.11.001

Sánchez-Mena, A., Queiro-Ameijeiras, C., Galbis-Córdova, A., Martí-Parreño, J., & Álvarez-Jareño, J. A. (2016). Student teachers' intention to use gamification. In *ICERI2016 Proceedings* (pp. 4488-4494). IATED.

Sawyer, R. K. (2006). *The Cambridge handbook of the learning sciences*. Cambridge University Press.

Sotos-Martinez, V. J., Tortosa-Martínez, J., Baena-Morales, S., & Ferriz-Valero, A. (2023). Boosting student's motivation through gamification in physical education. *Behavioral sciences*, *13*(2), 165.

Suh, A., Wagner, C., & Liu, L. (2018). Enhancing user engagement through gamification. *Journal of Computer Information Systems*, *58*(3), 204–213. https://doi.org/10.1080/08874417.2016.1229143

Zourmpakis, A. I., Kalogiannakis, M., & Papadakis, S. (2023). Adaptive gamification in science education: An analysis of the impact of implementation and adapted game elements on students' motivation. *Computers*, *12*(7), 143–163. https://doi.org/10.3390/computers12070143

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