

Review Article

Application of Gamification Elements, Theories and Techniques for Efficient Accounting Teaching: A Systematic Literature Review

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Abstract

Developing qualitative human capacity of accounting remained a challenge to our modern tertiary institutions, this is primarily due to a lack of adequate practical support staff, poor remuneration of the staff, and employment of unqualified lecturers. these challenges can be minimized by paradigm shift from lecturer centered to student centered pedagogy. The adoption of gamification elements/theories/techniques seems promising. This study systematically reviewed some related articles on the use of gamification elements/ theories/ techniques to curtailed the challenges. PRISMA was used in four databases (Web of Science, EBSCO, Taylors & Francis, and Scopus), coupled with google scholar. 44 related articles were retrieved and after inclusion/exclusion criteria, 18 articles were considered in the study. According to the findings of the study, gamification elements/theories/techniques have a substantial impact on students' motivation to learn, which leads to engagement and, eventually, improved knowledge retention and understanding, with *leaderboard*, *points*, and *self-determination* as the most effective element, technique, and theory.

Keywords: Accounting, Gamification, Systematic Literature Review.

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Introduction

Looking at the contemporary teaching determinants, accounting teaching processes remain a challenge (Fajczak-kowalska & Misztal, 2021). The important of accounting got across all human activities, specially to businesses, been the process for recording, reporting and evaluating economic occurrences and transactions that affect business organizations and the general economic status of a Nation (Ndinechi & Obidile, 2013). As a professional course, the training and education of accountants in Nigeria has largely been conventional and narrow-minded in nature (Asuquo & Akpan, 2014) vis a vis lecturers centered. The need of the accounting profession to effectively and continuously meet new challenges confronting it and adapt its services to changing conditions and circumstances has become a necessity to the survival of the profession and the society (Okolie, 2013) and can only be achieved from the grass-root (University level).

According to a survey in (Ugwu et al., 2020), Shortage of qualified accounting lecturers, insufficient supporting staff for practical works, poor remuneration of staff, employment of unskilled lecturers of accounting education, and insufficient research and training facilities for staff and students, are the main challenges facing tertiary institutions in developing quality human capacity in accounting, while poor office conditions, inadequate classrooms facilities, lack of instructional materials, and poor maintenance of existing tertiary institutions are the main challenges facing tertiary institutions in developing quality human capacity in accounting. However, these challenges can be minimized by paradigm shift from lecturer centered to student centered pedagogy (Jamiu & Yakubu, 2020). By shifting to Students' Centred Learning, the quality of accounting education students will improve, especially in terms of greater motivation, a better retention of knowledge, increase in learning skills and a deeper understanding of the subjects taught which could easily be achieved through Gamification.

Gamification is term as the application of game elements and game design techniques in non-game context. This has been one of the concepts frequently applied across both physical and remote interventions for behavioral changes (Rajani et al., 2021). Some example of game elements includes Leaderboard, Badges as reward, Goal settings, Progress bar, sharing progress, and levels. Several researches have worked and shown the important of gamification elements and techniques in education (Marti-Parreno et al., 2021), (Miller, 2013), (Subhash & Cudney, 2018), and (Landers et al., 2017).

The aim of this research work is to explore some of the gamification elements, theories and techniques that are applied for effective accounting teaching and learning.

Methodology

Search Strategy

The research embraced Systematic Review Literature. Existing databases such as EBSCO, Web of Science (WoS), and Google-Scholar were cogitated to search for existing literatures, using keywords such as (“*Gamification*” OR “*Gamify*” OR “*Gamified*” OR “*Games-element*” OR “*Games-technique*”) AND (“*Accounting*”). The choice of the databases was in line with field of study. An iterative search strategy to

narrow our search scope to specific journals and repeat the procedure was used. The approach was also carried out with various journals dedicated to the parent field, Gamification Applications and Accounting.

Selection Criteria

In the selection process, this research conformed the Methodical Analyses and Meta-Analyses (PRISMA).

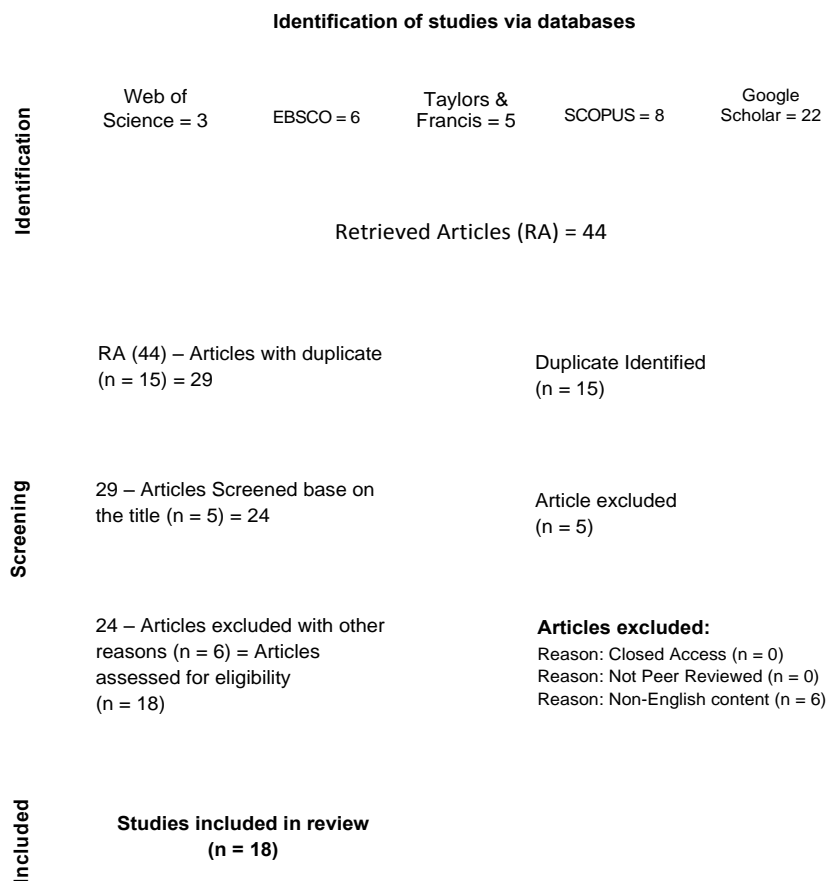


Figure 1 Systematic literature review flow-diagram guided by PRISMA

Figure 1 above illustrate the flow diagram for the point of interest in the inclusion/exclusion criteria guided by PRISMA. At the initial, identification stage, 44 articles were retrieved from the most prominent multidisciplinary databases (WoS (3), EBSCO (26), Taylors & Francis (5), and SCOPUS (8)) then Google Scholar (22). At the beginning of the screening stage, apart from removing duplicates, two writers examined the headings and abstracts alongside the inclusion conditions during the screening step. By relating the insertion/elimination principles from the assessment plan to the titles and related abstracts, the authors decided whether or not to incorporate any of the articles in the systematic review literatures. The decision to include or exclude any of the articles was coded in an excel sheet introduced from the records under a designated column. We

recovered full-text copies of the findings for the subsequent selection phase for titles and abstracts that met the inclusion criteria. Following that, all of the writers examined the full-text papers individually to determine their relevance to the search criteria and the research objective. Any squabbles were settled through a WhatsApp conversation and face-to-face exchanges. At end of all scrutinizing processes, eighteen (18) articles were considered relevant and included in the review. Table 1 shows the distributions of included articles according to the databases implored in the study.

Table 1. Distribution of included articles

Database	Number of Articles
WoS	2
EBSCO	5
Taylor & Francis	2
SCOPUS	5
Google Scholar	4
Grand Total	18

As shown in the PRISMA diagram, eleven (15) articles were found to be duplicated, five (5) articles were eliminated based on their title while six (6) articles were removed (non-English content). Finally, twenty-five articles were included.

Data Extraction

In the data abstraction phase, the closing phase of PRISMA of the study, 18 findings were included and the following content was extricated from the studies. The abstraction is in line with the research objectives:

- Article
- Participants
- Gamification elements/ Theories/ Techniques reflected (GT-Tech)
- Key finding (s)
- Challenges

Results and Discussion

Eighteen articles were considered in this review, data extractions were based on the criterial set above. Table 2 displays the executive summary of the research findings which in turn answered the aim of this research as to determine the most adopted gamification elements, theories or techniques (GT-Tech) used in enhancing teaching and learning of accounting (financial, management, cost, etc.) forms of education in higher institutions.

Table 2. Executive summary of findings

Article	Participants	G-Tech	Key finding (s)
(Ortiz-Martinez et al., 2022)	232	Kahoot (Leaderboard)	Gamification application leads to better academic results
(Oliveira et al., 2019)	118	Goal-setting theory (Specific goals, better performance) and self-determination theory (autonomy, inner motivation)	curiosity, leadership, initiative, persistence, adaptability, collaboration and critical thinking as skills were developed in the considered students.
(Silva et al., 2019a)	816	Concentration, clarity, feedback, challenge, autonomy, social interaction, and perceived learning	Increased in students' motivation to learn.
(Selamat & Ngalim, 2021)	150	Play exposition, choice information, and engagement reflection	The adoption of gamified teaching concept (Putra Salamanis) aids the students in knowledge retention and understanding
(Silva et al., 2021b)	816	Landers' theory, self-determination theory, flow theory, and planned behavior	It is observed that Motivation and Attitudes influenced perceived learning
(Reginato et al., 2022)	167	Goal settings	Application concept of accounting is more effective using gamified concept.
(Creel et al., 2021)	Not specified	Points, leaderboard, and progress	Gamification in classroom has positive benefits in students' knowledge understanding
(Lopes et al., 2019)	175	Leaderboard, points, and progress	The use of game-based learning methods improved students learning ability
(Lompoliu, 2020)	CREBIT app	Points and progress	The application has the potential of engaging students in learning Accounting.
(Ahmad et al., 2017)	233	Progress and points	Accounting on the block's board game (AOTB) was found useful in enhancing students' knowledge and understanding of accounting.
(Jamaluddin et al., 2020)	50	Progress and points	There exists positive motivational level of the students.

Article	Participants	G-Tech	Key finding (s)
(Zhao, 2019)	Quizizz App	Feedback, leaderboard	The study found that, Quizizz has a positive impact on students' engagement and learning outcomes in accounting classroom.
(Faresqi, 2021)	UBAYA App	Avatar, badges, reward, points, challenge and leaderboard	The application is projected to be more motivational to students in learning and understanding of accounting.
(Ayoup, 2021)	22	Points, leaderboard, and progress	Accounting learning is more palatable using gamified method (Kahoot!) than traditional methods.
(Abd-Rahim et al., 2021)	35	Autonomy, challenge, engagement, and levels	<i>Bicycle Accounting Classification game</i> is effective in financial accounting learning participation, excitement, and understanding.
(Hussin et al., 2019)	105	Progress, points, leaderboard, levels, and challenges	ComAcc as one of the Gamification apps improved teaching and learning process based on the factor of attention, relevance, confidence, and satisfaction.
(Abdul-Razak et al., 2019)	73	Challenge, levels, Points, leaderboard, and progress	Smart Costing Kit game was found to be more effective, motivating, and engaging than traditional teaching method.
(Zeni et al., 2019)	64	Challenge, Points, leaderboard, levels, and progress	FUNancial.S.Battle improved learning performance and overall experience of the students

Several gamification elements were implemented with the goal of improving accounting teaching and learning, as seen in Table 2 and Table 3. *Reward, levels, leaderboard, feedback, fun & play, and engagement* are all included. The rest of the elements are championed by the *leaderboard*, which has a frequency of 9 with about 47%. This is possible because every student is agitating and competing to be the best among his or her peers, which increases the rate of student engagements, and serves as a factor for commitment to learning. *Levels* received a frequency of 4 (approximately 21%), followed by *feedback* and *engagement* with a frequency of 2 (10.5%) each, and finally *reward* and *fun & play* with a frequency of 1 (5.3%) each.

In the other hand, reasonable number of gamification techniques (*goal settings, progress, challenges, social interaction, and points*) were also used. As shown in Table

3, *points* with frequency of 10 and about 37% appears to be the most populous techniques used. This implies students' persistence and commitment toward learning in order to earn more and more points which in turn lead to knowledge retention and engagement. *Progress* has a frequency of 9 (33%) which shows its significant towards students' engagement to learn, *challenges* have 6(22%), followed by *goal-settings* and *social interaction* with 1(3.7%) each.

Table 3. Adopted Gamification element(s)/theory (ies)/technique(s)

S/N	Element (s)	Freq.	Techniques	Freq.	Theory	Freq.
1.	reward	1	goal settings	1	Goal-setting theory	1
2.	levels	4	progress	9	self-determination theory	2
3.	Leaderboard	9	challenges	6	Landers' theory	1
4.	feedback	2	social interaction	1	flow theory	1
5.	fun & play (exposition, choice information)	1				
6.	Engagement (Concentration and clarity)	2	points	10		
8.	Total	19		27		4

Furthermore, Table 3 display the basic theories that foster gamification adoption in education, which are *goal setting theory*; *self-determination theory*; *landers' theory*; and *flow theory*. Self-determination theory seems to be prominent among others theories. This study categorically quoted the theories below;

- Goal-setting theory

“States that goal setting is essentially linked to task performance. It states that specific and challenging goals along with appropriate feedback contribute to higher and better task performance.”

- Self-determination theory

“Suggests that people are motivated to grow and change by three innate and universal psychological needs. This theory suggests that people are able to become self-determined when their needs for competence, connection, and autonomy are fulfilled.”

- Landers' theory (also known as Theory of Gamified Learning)

“States that contextualizes GL as an intervention that identifies, extracts, and embeds GA's into learning where GA's, instructional content, and students' behaviors and attitudes (B/A's) work together to affect learning.”

- Flow theory (also known as Optimal Experience Theory)

“Sates that as a learner proceeds through a task, one's flow state is likely to be preserved if the task difficulty increases to match the developing skills.”

Conclusion

The idea behind this study was to systematically reviewed related literature on the essence or application of gamification elements/theories/techniques adopted to enhanced teaching and learning of accounting. Several elements that significantly contributed to the effective teaching and learning of accounting were revealed in the study, this includes; *reward; levels; leaderboard; feedback; fun & play; and engagement*. Likewise, techniques which are *goal settings, progress, challenges, social interaction, and points*. Finally, theories applicable for the betterment of knowledge delivery. The theories include; *setting theory; self-determination theory; landers' theory; and flow theory*. These findings would contribute to the academic literature and to educators who are interested in introducing gamified strategies to transform the classroom and address a professional skillset better aligned with the current demand.

Further study will consider the most effective gamification strategies among its elements, techniques, and theories.

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