

A LITERATURE REVIEW OF THE USE OF GAMIFICATION IN ACCOUNTING EDUCATION

C.M. Queiro-Ameijeiras¹, J. Martí-Parreño², E. Seguí-Más³, L. Summerfield¹

¹Universidad Europea de Valencia (SPAIN)

²Universidad Internacional de Valencia (SPAIN)

³Universidad Politécnica de Valencia (SPAIN)

Abstract

Gamification is a tool that is increasingly used in the field of teaching at all levels of education, from primary to university. Despite the fact that Business Management and Accounting have not remained on the sidelines in studies on the use of game-based learning, the scarcity of such work in this field provides us with only a limited vision of the research that is being carried out in the area. In order to fill this research gap, this paper analyses the academic literature in detail on the use of gamification in accounting education. To this end, an in-depth review of scientific documents retrieved from academic databases has been carried out with the aim of: a) identifying the methodologies used in the research, b) examining the types of games used by researchers, c) establishing the different educational stages where this research is being carried out, d) analysing the samples used, and e) analysing the results obtained in the studies. The results obtained from this review have made it possible to recognise some of the most recurrent work and other research areas in which further exploration can be undertaken within the field of gamification and accounting.

Keywords: gamification, serious games, game-based learning, accounting education, literature review.

1 INTRODUCTION

The use of gamification in the development of values, attitudes and skills related to education in business management has a long way to go. Yet, academic literature does offer us an analysis of the evolution of gamification applied to the business world over the last 40 years [1]. Despite previous research has reviewed the literature on game-based learning and serious games [2], [3], [4], few approaches have centered on the subject of accounting and its different areas. For example, previous work has analysed the effectiveness of games in accounting and business management focused on digital learning [5]. However, in recent years, a wide variety of serious game options can be found for teaching accounting, ranging from adapted board games for adolescents (e.g. *Progression*) [6], to a university level (e.g. *Realgame*, *Monopoly*) [7,8], and even in the training of active professionals with games such as *MG* [9]. Educational games which main objective is precisely to develop accounting skills (e.g. *Business Game*) can also be found [10]. On the other hand, other games exist in which it is possible to move up progressively in knowledge levels, like *Accounting Challenge* [11]. Another approach are educational games designed to encourage a collaborative learning approach as well as utilise a multidisciplinary business or finance and accountancy dimension (*MG*) [12]. In most cases, these games can be played online on the web, but there are also serious games in an app format (e.g. *ACE*) and even some designs that propose alternative reality gamification activities such as *The Amazing Tax Race* [13].

In spite of this increase in the use of gamification in the teaching of accounting, few studies have been carried out that have analysed the current situation regarding research in this field. Therefore, the main goal of this study is to conduct a review of the academic literature on the use of gamification in the area of accounting. More specifically, this research aims to answer the following research questions (RQs):

- RQ1: What methodologies are researchers using in the study of this topic?
- RQ2: What type of games are being analysed?
- RQ3: At which educational levels is this research being developed?
- RQ4: What samples (type and size) are the researchers using?
- RQ5: What are the main results obtained by researchers with respect to the use of gamification in accounting education?

The results of this analysis will not only allow us to identify some of the trends in this field of study, but also establish what gaps in research exist that may provide new opportunities for future studies.

The structure of the paper is as follows: firstly, the methodology is explained. Following this, the results are described. Finally, the main conclusions, study limitations and future areas of research are given.

2 METHODOLOGY

The methodology used is a comprehensive review of the literature. Thus, through an in-depth analysis of the academic literature on the same subject matter, we seek to establish general rules and/or paradigms based on conclusive statements found therein [14].

2.1 Procedure, search strategy and sample

Document retrieval for their subsequent analysis was carried out in July 2019 on the Web of Science (WOS) using the following search strategy: TS= ((GAMIFICATION OR "EDUCATIONAL GAMES" OR "GAME-BASED LEARNING" OR "SERIOUS GAMES") AND (ACCOUNTING*)). With this method, a total of 415 documents were retrieved. The researchers carefully scrutinised the titles and abstracts to verify that all documents met the criteria for inclusion in the analysis. The main inclusion criterion was that research on the use of gamification was central to the study developed in the article. Once this screening process was concluded, the final sample of analysis was reduced to 21 documents. Table 1 shows the basic bibliometric information of the documents analysed.

Table 1. Documents analysed.

<i>Title</i>	<i>Document Type</i>	<i>Source</i>	<i>Year</i>
The small business management flight simulator in an environment of financial indiscipline	Communication/ Conference Proceedings	Simulation in Industry	2003
Analysis of stock management gaming experiments and alternative ordering formulations	Article	Systems Research and Behavioral Science	2004
Learning more, better and faster - Computer based simulation and gaming of production and operations	Article	International Journal Business Performance Management	2005
Understanding foreign exchange risk: An instructional simulation exercise	Article	Issues in Accounting Education	2013
Simulation Game as a Live Case Integrated into Two Modules	Communication/ Conference Proceedings	International Simulation and Gaming Association Conference	2014
Digital game-based learning in accounting and business education	Article	Accounting Education.	2016
PHABRIKA: teaching financial techniques to sell through Serious game	Proceedings Paper	New Advances in Information Systems and Technologies	2016
Deborah game - an innovative serious game to teach accounting history	Communication/ Conference Proceedings	Edulearn 2016	2016
Using a mobile gaming app to enhance accounting education	Article	Journal of Education for Business	2016
Developing soft skills (also known as pervasive skills) Usefulness of an educational game	Article	Meditari Accountancy Research	2016
Improved learning performance due to the implementation of a stock market game - a case study about the possibility of enhancing student skills with game based learning	Communication/ Conference Proceedings	Inted 2016	2016
Is it worth it to consider videogames in accounting education? A comparison of a simulation and a videogame in attributes, motivation and learning outcomes	Article	Revista de Contabilidad	2017
Effectiveness of an accounting videogame in terms of attributes, motivation and learning outcomes	Article	Revista Internacional de Organizaciones	2017

Business simulation game - scenario and gameplay as the key success factors	Communication/ Conference Proceedings	ICERI 2017	2017
Using a simulation enterprise game to develop important abilities in accounting students of a Brazilian higher education institution.	Communication/ Conference Proceedings	INTED 2017	2017
Business simulation game as an educational method for postgraduate studies in management and finance	Communication/ Conference Proceedings	INTED 2017	2017
Simulation Game for Lean Leadership - Shopfloor Management combined with Accounting for Lean	Procedia Manufacturing	7th Conference on Learning Factories CLF 2017	2017
Acquisition of competencies with serious games in the accounting field: an empirical analysis	Article	Revista de Contabilidad	2018
Motivation to Adopt Game-Based Learning (GBL) for Employee Training and Development: A Case Study	Article	Advances in Science, Technology and Engineering Systems	2018
The effect of game-based learning as the experiential learning tool for business and accounting training: A study of Management Game	Article	Journal of Education for Business	2019
The future of 'serious games' in accounting education: A Delphi study	Article	Journal of Accounting Education	2019

As can be seen in Table 1, the document typology is divided into 38.1% proceedings and communications to conferences and 61.9% articles. Figure 1 shows the distribution pattern of the sample. Thus, since 2003 the number of publications was limited to 1 and significant growth is observed in 2016 and 2017 with 6 publications (50% communications and 50% journals). In 2018 and 2019, the number of publications decreased. It should also be noted that in these years, 100% of the publications are exclusively in journals.

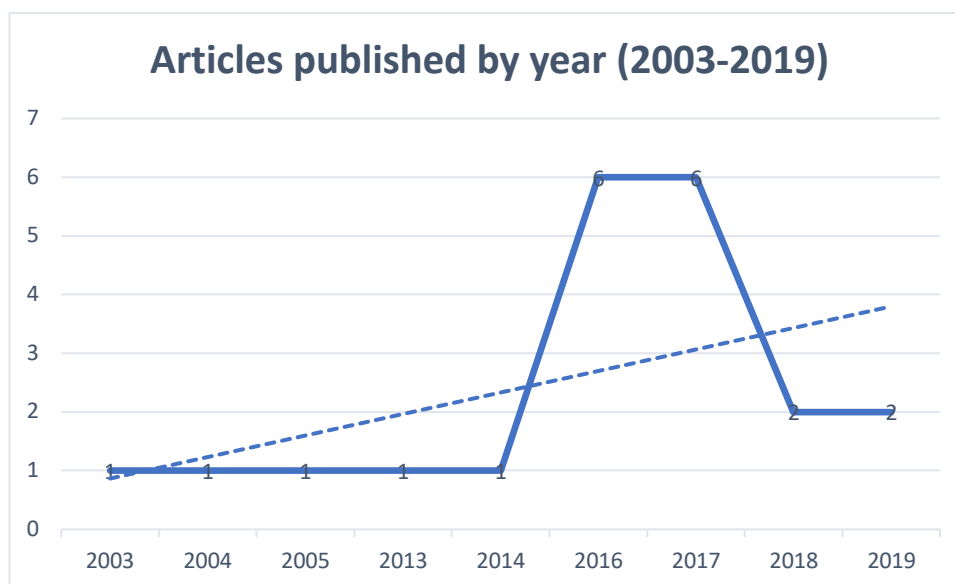


Figure 1. Articles published by year

3 RESULTS

In Table 2 we present a summary of the results obtained in this study. Our first objective was to identify the methodologies implemented by researchers in studies on this theme. The sample showed that 52.38% of the studies adopted a pre-experimental methodology, 28.57% are theory papers and the remaining 19.05% used a qualitative approach. The second of our objectives was regarding the identification of the type of game analyzed. Here it was evident that the most common typology was the simulator, 57.14%, followed by video games and board games 14.29%, with both leisure activities on

campus and apps reaching 4.76%. The remaining studies did not specify a gamification type. The third objective was to establish the educational levels focused on in the studies. Here, 52.38% of the studies were carried out in an undergraduate context, while 14.21% were undertaken in postgraduate education. Furthermore, 9.52% of the research did not specify an educational level, while 23.81% of the studies aimed to improve the skills of active professionals. With respect to the fourth research objective (What samples (type and size) are researchers using?), the results revealed that the most frequent type of sample was that of university students, although samples relating to a business environment had also been adopted. However, only 3 studies used postgraduate level samples. In relation to sample sizes, they were quite heterogeneous, with samples ranging from 12 to 258 cases, note that one sample referred to the number of articles reviewed. Finally, the fifth research objective was to analyse the results given in the research. In this regard, 33.33% of the papers reviewed concluded that gamification is favourable for learning outcomes; 14.29% that game-based learning is a tool for developing so-called soft skills, especially teamwork and decision-making. Also, 9.52% summarised key attributes to gamification as being fun, a challenge and usability. Then, 14.29% sustained that game-based learning contributes to business management by providing a global view of the company or the analysis of factors that induces better management of resources. However, 23.81% of the analysed studies did not present results due to being theory papers.

Table 2. Authors, methodology, game typology, educational level, sample, and results.

<i>Authors</i>	<i>Methodology</i>	<i>Game Type</i>	<i>Educational Level</i>	<i>Sample</i>	<i>Results</i>
Bach (2003)	Theory	Simulator	Business context	N/A	N/A
Barlas & Ozevin (2004)	Pre-Experimental	Simulator	Business context	N/A	Simulation games help to better understand stock management and decision making.
Lainema & Hilmola (2005)	Pre-Experimental	Simulator	Higher Education	40	Students' attitude towards the educational game is positive and engaging.
Van der Laan Smith (2013)	Pre-Experimental	Board Game	Higher Education	63	The game is relevant for understanding content.
Mulenga and Wardaszko (2014)	Theory	Simulator	Higher Education	N/A	N/A
Carenys & Moya (2016)	Qualitative	N/A	N/A	54 artículos	Little research on gamification in the area of accounting.
Freund & Mustaro (2016)	Theory	Simulator	Business context	N/A	N/A
Nunes, Souza, & Cornacchione (2016)	Pre-Experimental	Videogame	Higher Education	17 (pretest) 15 (posttest)	Gamification improves learning outcomes.
Seow & Wong (2016)	Pre-Experimental	App	N/A	242	Students perceive that they learn and recommend its use.
Viviers, Fouche, & Reitsma (2016)	Pre-Experimental	Alternative Reality Game	Higher Education	138	The game develops soft skills, especially time management and decision making.
Dressler, Rachfall, Kapanen, & Foerster-Trallo (2016)	Pre-Experimental	Simulator	Higher Education	44	Gamification improves learning outcomes.
Carenys, Moya, & Perramon (2017)	Pre-Experimental	Simulator/ Videogame	Postgraduate	132	Video games and simulators are complementary.
Carenys, Moya, & Vila (2017)	Pre-Experimental	Videogame	Higher Education	215	Fun, the challenge and commitment are the most valued attributes.

Kujawski & Januszewski (2017)	Theory	Board Game and Excel sheet as simulator	Postgraduate	19	Presents application results based on marks obtained.
Durso, Reginato, & Cornacchione (2017)	Pre-Experimental	Simulator	Higher Education	66	Gamification stimulates soft skills and usability is a key factor.
Kujawski & Januszewski (2017)	Theory	Board Game and Excel sheet as simulator	Postgraduate	N/A	N/A
Blöchl, Michalicki, & Schneider (2017)	Theory	Simulator	Business context	N/A	N/A
Calabor, Mora, & Moya (2019)	Pre-Experimental	Simulator	Higher Education	80	Acquisition of soft and specific skills. Allows you to associate accounting with reality.
Sugahara (2018)	Thematic Analysis	Board Game	Business context	58	The game involves workforce and improves administrative management.
Sugahara & Lau (2018)	Thematic Analysis	Board Game	Higher Education	58	Clear association between objective orientation, challenges and critical reflection.
Calabor, Mora, & Moya (2018)	Delphi Method	Simulator	Higher Education	12	Barriers to the game are the lack of time and ignorance of games. It is motivating and allows gaining another vision of accounting.

4 CONCLUSIONS

As a general conclusion we can highlight that the use of gamification as a teaching tool in accounting has attracted the interest of researchers in distinct fields ranging from the university environment (mostly undergraduate versus postgraduate) to the professional context. However, it is worth noting the scarcity of research that has been carried out to date in the educational stage of Vocational Education and Training, in which a large number of subjects related to accounting are taught. Hence, future lines of research should address this issue. However, the fact that the majority of samples analysed correspond predominantly to university level education suggests an interest in the use of gamification at this particular learning stage. Additionally, the fact that studies on the use of gamification have been found within a business context seems to suggest an acceptance by trainers in the use of such a tool in the field of in-company training. With respect to the main results found by the researchers, it can be concluded that gamification benefits the teaching of accounting mainly due to: 1) students achieving higher levels of satisfaction than with traditional methodologies, 2) the development of those skills required as an accountant, especially decision making and teamwork, 3) the creation of the perception in the students of an approach to the profession, 4) allowing students to be more aware of the application of accounting since they receive immediate feedback on their decisions. On the other hand, the results suggest that research on the effectiveness of gamification in terms of learning outcomes is still scarce. Future studies should explore this key efficacy variable in greater depth, which as can be seen, is currently under-researched in the literature.

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