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GAMES FOR LEARNING IN ACCOUNTANCY EDUCATION: A SYSTEMATIC LITERATURE REVIEW

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─Abstract ─
Background: Games for learning (educational games) are viewed as instructional strategies requiring students to engage in competitive activities with predetermined rules and conditions. Various studies propose beneficial effects of games for learning and predict their increased future use. The elements of games for learning contribute towards making them pedagogically sound and teachers and higher education lecturers have increasingly become interested in using them to enhance traditional teaching and learning environments.
Aim: This paper documents a systematic review of empirical and theoretical articles on the use of games for learning in teaching and learning in order to determine how games for learning could contribute towards Accountancy Education.
Method: Articles listed in digital academic databases were systematically reviewed according to: (i) the timespan as 2011-2017; (ii) the document type as journal articles; (iii) the keywords as "educational games AND student curiosity;" "educational games AND engagement;" "educational games AND skills" and "educational games AND active learning." Although the authors prefer the use of the construct of *games for learning* instead of *educational games*, the literature still related to educational games.
Conclusions: The study concludes on: (i) how enjoyable do students experience games for learning; (ii) how games influence, shape, and enrich learning; (iii) how

students gain, process and assimilate information from games for learning; (iv) the limited availability of information on how games for learning stimulate students' curiosity for learning; (v) how students engage with one another to develop skills while engaging with games for learning; and (vi) the need for further research to assess the effectiveness of games for learning.
Recommendations: (i) The decision to use games for learning in teaching and learning should be based on a well-grounded theory of learning, as well as on the skills required for the learning area; and (ii) games for learning should be employed as learning tools, and not as stand-alone instruction.

Key Words: *Educational games, Games for learning, Higher education, Pedagogy, Active learning, Curiosity, Engagement, Skill*
JEL Classification: A19, I29, M49

1. INTRODUCTION

Being a higher education teacher, a lecturer, implicates that you teach the so-called Millennials, and the new silent generation, Generation Z (also referred to as Post-Millennials, the iGeneration, or the Homeland Generation) [1] . These technology-driven students do not want to be taught in traditional ways. Many researchers address the topic of alternative teaching methods and they suggest that games for learning, video or digital games, and role-playing games should be incorporated as teaching and learning tools for a new generation of students entering the higher education arena. Some researchers argue that games could enhance teaching and learning and that the use of games in classrooms motivates students and assists students with the construction of knowledge (Bhuiyan, Peng & Mahmud 2015). A game for learning (educational game or serious game) is defined as "a system in which players engage in an artificial conflict, defined by rules, that results in quantifiable outcomes" (Salen and Zimmerman, 2004 as cited in Bhuiyan *et al.*, 2015). Using games, particularly digital games, in teaching and

[1] The Millennial generation refers to students born between 1980 and the late 1990s. No exact period can be limited to Generation Z, but these students were typically born round about the same time that the world-wide-web was created. They were born between the mid 1990s to the early 2000s, with birth dates from the late 2000s to early 2010s. Because the Generation Z was born in this digital era, they are assumed to be comfortable with the use of technology and social media (Jones, Jo, & Martin, 2007).

learning aligns with the characteristics of Millennial and Generation Z students, as well as with the notion of "student-centered education" (Carenys & Moya, 2016).

The question this paper addresses is how games for learning may contribute towards student engagement, active learning and skills development, and how they could enhance teaching and learning at higher education level. In order to address this question, the authors followed the systematic literature review process according to Kichenham (2004).

2. SYSTEMATIC LITERATURE REVIEW METHODOLOGY

A review earns the adjective *systematic* if it is based on a clearly formulated question, identifies relevant studies, appraises their quality, and summarises the evidence through a clear method (Khan *et al*., 2003). It is the explicit and systematic approach that distinguishes systematic reviews from traditional reviews and commentaries. Whenever we use the term *review* in this paper, it refers to a *systematic literature review*. The purpose of this review is to addresses the framed research question through systematic and explicit methods to identify journals; select publications pertinent to the question; critically appraise the publications; analyse the data reported in the publications; and report on the combined results. As main contribution, this review aims to address how games for learning could engage accountancy students in an enjoyable, yet cognitively stimulating learning environment.

2.1 Electronic sources

Two research platforms, available to the North-West University in South Africa, provided access to international databases as digital information resources:

i. Scopus (Science Direct forms part of it)
ii. Emerald Insight.

We purposely applied broad search terms to the digital libraries as we were concerned about the omission of pertinent work. Grabinger and Dunlap (1995) are of the opinion that when investigating students' active engagement in the classrooms, skill development should be included as a factor for learning to be unforgettable (Silberman, 1996). Enjoyment and stimulation should be investigated with curiosity (Amory *et al*., 1999). Flowing from this, we included the following search terms for our review: Education* Games; Education* Games* Engagement; Education* Games* Skills; Education* Games* Active learning; Education* Games* Curiosity; Education* Games* Accountancy; Educational Games* Engagement; Educational Games* Active learning; Educational Games* Curiosity; Educational Games* Accountancy; and

Educational Games* Skills. As our searches for games for learning resulted in the same search results as educational games, we chose to use this encompassing concept which includes digital, video, board, game-based learning and serious games (Oblinger, 2006).

Games for learning (educational games) are explicitly designed with learning in mind, or they result in incidental or secondary educational value (McFarlane, Sparrowhawk & Heald, 2002). Games for learning are games that assist people to learn about certain issues, expand concepts, reinforce development, understand a historical event or culture, or assist them to learn a skill as they play (Oblinger, 2006). When learning is contextualized with content relating to and typical of the target audience, it is more likely that the content will be accepted and assimilated (Kiili, Ketamo & Kickmeier-Rust, 2014; Prensky, 2003).

2.2 Justification for selecting specific articles for this review

The authors of this paper scrutinized the titles, abstracts and conclusions of the identified articles to determine which ones could be included or excluded on the basis of relevance to the research problem, objectives or questions of the current study. Probing the databases resulted in the hits as indicated in Tables 1 and 2.

Table 1: Number of articles retrieved from Scopus as research database

	Key search terms	Time frame (1995-2017)	Subject area: Business, Management and Accounting (1995-2017)	Time frame (2011-2017)	Business, Management and Accounting (2011-2017)	Refined search by abstract (2011-2017)
1	Education* Games	18886	787	11658	493	28
2	Education* Games* Engagement	1221	46	972	40	1
3	Education* Games* Skills	3496	113	2281	113	4
4	Education* Games* Active learning	601	33	393	19	1
5	Education* Games* Curiosity	82	2	60	1	1
6	Education* Games* Accountancy	3	3	3	2*	0
	Total:	24289	984	15367	668	35

§ Search results from 2005 included due to limited studies
§ Search terms in Scopus refer to titles, abstracts and keywords of published articles

Table 2: Emerald Insight as research database

	Key search terms	Number of articles Identified	Number of articles identified by relevance to subject area	Refined search by abstract (2011-2017)
1	Educational Games* Engagement	40	14	9
2	Educational Games* Active learning	26	4	4
3	Educational Games* Curiosity	2	2	1
4	Educational Games* Accountancy	2	1	2
5	Educational Games* Skills	36	8	5
	Total:	106	29	21

§ No new sources due to an overlap of sources already identified
§ Search terms in Emerald Insight refer to titles, abstracts and keywords of published articles

The authors encountered overlap of articles between Emerald Insight and Scopus. The search term, educational games, was therefore also used for the search on Emerald Insight. Search terms (1-5) were identified from abstracts of published articles. All the identified references of the articles were exported to Endnote™ X7 (an electronic reference manager system) and grouped in distinct sub-groups according to a per-search-term-per-database basis. A series of publication exclusions reduced the number of hits as the results identified the same articles (Kichenham, 2004). We included only published articles, and each article was evaluated on a case-by-case basis to determine whether its information was timely and relevant. A maximum time frame of five to ten years is ordinarily placed on the age of references to be included. This is usually determined by the amount of information available (Cronin, Ryan & Coughlan, 2008).

3. THE REVIEW PROCESS

This section describes the identified articles, the process in terms of the research question; keeping the search terms in mind.

3.1 Games for learning and skills

Games for learning focus on a diverse range of skills and knowledge; including entrepreneurial and leadership skills (Faria, 2001). Playing games for learning could assist in developing skills where these skills are embedded in the game (Whiteley & Faria, 1989). Four of the articles listed in Table 1 relate to the current research question, while one article was excluded due to its focus on general game

pedagogy. Two of the articles did not focus on skill development, but on skills required for gameplay and general pedagogy.

Table 3: Games for learning and skills (Emerald Insight)

Author	**Methodology and Objectives**	**Findings**	**Type of Game**
Yucel, Zupko, and Seif El-Nasr (2006)	The authors examined how video games could be used during a class contact session. They developed a course on game design in order to introduce middle and high school female students to IT and assist them in acquiring basic IT skills.	Games are useful in acquiring practical skills, as well as in increasing perception and stimulation and developing skills during problem-solving, strategy assessment, media and tools organisation and obtaining intelligent responses.	Video
Author	**Methodology and Objectives**	**Findings**	**Type of Game**
Gamlath (2009)	The authors compared performance levels across two games and examined the relationship between game performance and academic achievement. The objective was to determine whether game performance was due to skills or luck.	Students, with the same level of competency, learned through trial and error. Also, skills employed during the playing of the game are not the same as the skills being assessed by conventional forms of academic evaluation.	Simulation
Saxena Arora (2012)	A cross-sectoral case study approach during gameplay of a strategic organisational game where after assessment of student learning outcomes were analysed with the aim to determine	Educational games prepare students to connect to the corporate world through the transfer of knowledge, skills, attitudes and job-related qualities in order to perform well in the workplace.	Simulation

	how games for learning could prepare students for the corporate world.		

None of these listed articles refer to Accountancy Education, but the conclusions suggest that games for learning, when pedagogically sound in design, as well as created in collaboration with the gaming industry, could contribute towards the development of students.

Table 4: Education, games and skills (Scopus)

Author	**Methodology and Objectives**	**Findings**	**Type of Game**
Reese and Wells (2007)	A mixed method design gathered data from students who played a game which was designed to improve their conversation skills.	Students expressed the opinion that the game was fun and the game assisted them with communication outside of class.	Card game
Author	**Methodology and Objectives**	**Findings**	**Type of Game**
Zapalska and Brozik (2008)	A literature review on the use of games and simulations in classrooms argued on the pervasiveness and pedagogical benefits of games for learning.	Games and simulations contribute to the learning; particularly in transferring learning from the conceptual base to its ultimate application. Games could facilitate learning of both specific domain knowledge and concepts and cognitive skills like decision-making, problem-solving, as well as interactive learning.	Literature review

Hromek and Roffey (2009)	This literature review article has two objectives: (i) it reviews the theoretical and practical literature on the use of games to facilitate social and emotional learning; (ii) it argues that games are a powerful for developing social and emotional learning in young people.	Games provide the potential for transformative learning through social interaction, social connectedness, cooperation and collaboration, and encompass features that encourage student well-being and resilience.	Literature review
Bodnar and Clark (2017)	Three groups of sophomore-level students compared non-games, games, and games-plus instructional methods during a mixed-method research design.	The use of game-based pedagogy within classes could enhance oral and written communication skills.	Card games; Simulation and Power Point

From the four identified articles (Table 4), the authors conclude that games for learning could actively engage students in accountancy classrooms in an enjoyable and stimulating way. It is essential that playing games should be fun for learning. Gameplay in classrooms is highly motivating and they also develop language and improve communication skills. However, lecturers are responsible for creating authentic learning experiences. This requires commitment to the concept of interactive learning and a deep interest in making the classroom learning authentic. Simply adding a game or simulation to a learning opportunity does not guarantee deep learning (Zapalska & Brozik, 2008).

3.2 Games for learning and engagement and active learning

During the initial process of identifying articles for this paper, the keywords of "engagement" and "active learning" were used separately in the searches of Emerald Insight and Scopus. The authors determined that "engagement" and "active learning" were listed as complimentary outcomes gained from the use of

games for learning. The articles listed in Table 5 relate to using games during formal classroom-based teaching and learning.

Table 5: Educational games, engagement and active learning (Scopus)

Author	Methodology and Objectives	Findings	Type of Game
Whitton (2011)	A mixed method research aimed to determine games characteristics and to provide depth to the model developed for attaining engagement while learning with games.	In order for a game to engage learners and add to learning, games should be so engaging that one loses track of time. The context and content should be relevant.	Video games
Cornacchione Jr (2012)	The authors experimented with different games and technology in an effort to support and improve the learning process and experience of MBA students. An exploratory survey study gathered the data.	Role players should be motivated to obtain the most from the learning opportunity. Students understand that specific game-based experiences are relevant and meaningful to their development.	Digital business games and Simulations
Haley (2012)	Introduction to (i) the Insurance Pricing Game and how it could be used in the classes to introduce students to potential challenges in the workplace; (ii) teaching students how to "demonstrate various challenges faced by insurers in their effort to predict losses" (2012:119).	The author indicated that: (i) the game taught and engaged students on several instructional points; (ii) students became involved in class; and (iii) the game was received positively in the early rounds of gameplay.	Computer game
Wang and Chen (2012)	Empirical study on the use of game-play activities to motivate students and facilitate the learning of programming concepts.	Positive results on learning could be expected when the learning is enhanced through gameplay, but the empirical	Computer game

Author	Methodology and Objectives	Findings	Type of Game
		study remains inconclusive.	
Bhuiyan *et al*. (2015)	In an experimental design approach with a control group addressed the question: "Is the Innov8.0 supply chain management game-based teaching more motivating than traditional teaching methods?" (2015:84).	The study indicated the game as an effective tool to motivate and engage students; and to assist students in the process of understanding difficult concepts and scenarios.	Computer game (INNOV8.0 game)
Børgesen, Nielsen, and Henriksen (2016)	The literature review aimed to establish if business games could "take centre stage" in the formal teaching of a particular course curriculum.	Games cannot replace the formal process of learning, but could act as a major tool during informal learning: "Business games offer a great opportunity to engage participants in interactive, collaborative explorations and to develop shared frames of reference" (2016:18).	Business game (The EIS simulation)
Carenys and Moya (2016)	A systematic literature review on digital game-based learning used four international databases. One of their three objectives relates to this study: To provide insight in reaching learning outcomes when games for learning are used as a learning tool.	Games are useful tools, but concerns remain on their effectiveness in the process of acquiring knowledge, e.g. if an instructor is not better at facilitating the learning process. When appropriately used, games for learning could positively influence "cognitive,	Digital games

Author	Methodology and Objectives	Findings	Type of Game
		behavioural and effective learning outcomes" (2016:644).	

Twenty-three articles from this grouping as listed in Tables 3, 4 and 5 could not be included in this study. The articles mostly related to the design of serious games or educational games.

Table 6: Games for learning, engagement and active learning (Emerald Insight)

Authors	Methodology and Objectives	Findings	Type of Game
Walker (2008)	A game was used to motivate students to actively partake in the class, reinforce learning and to bring in a fun element into an instructional class environment.	Learning styles influenced motivation and engagement of students. The majority of the students reacted positive to playing the game.	Question and answer game; PowerPoint and Cards
Pillay and James (2013)	A qualitative aimed to determine if games could be used as a pedagogical device to meet the specific learning needs of highly cross-cultural teams.	Games are innovative pedagogical devises that can engage and manage students that often lack engagement in traditional passive learning environments.	The well-known pasta game (where pasta and a view pieces of string are used to construct an arched bridge and a tower)
Spires and Lester (2016)	A mixed-method research with the main objective to determine how such a community of inquiry could be	The teachers were part of the game and supplemented the gameplay. Students were engaged in the	Crystal Island: Uncharted Discovery

Authors	Methodology and Objectives	Findings	Type of Game
	created (university and elementary schools)	gameplay and indicated that the game was very interesting, engaging and motivational. Playing the game positively contributed to mastering content knowledge and problem-solving skills were gained.	
McConville *et al.* (2017)	An empirical study was conducted over a period of three years. The main purpose of this study was to determine the effectiveness of role-playing games for learning certain skill needed in a complex society.	The authors found that role-play games can easily be used as an active learning technique to support the teaching of "complex socio-technical knowledge" to students.	A Board-game (Role-playing game)
Mercer *et al*. (2017)	A mixed method approach investigated games designed by students with the objective of influencing sustainable behaviour of scholars.	University students were involved in designing of games. Feedback indicated that games could influencing student sustainability behaviour, as well as learning about sustainability. The games were engaging, taught new knowledge, and provided a framework to contextualise knowledge.	Board games and Card games

Eight articles identified in § 3.2 did not relate to gameplay, but to the making of games, and to the incorporating of certain design elements aimed at student engagement. The games discussed above all aimed at informal learning activities.

This body of literature advises that they should be played concurrently with formal education, like the presentation of the relating theory. Only one article linked to Accountancy Education and two to Business-studies Education. This observation identifies a gap in the research literature on the use of games for learning in Accountancy Education.

3.3 Games for learning and curiosity

The authors aimed to determine how games for learning could enhance students' curiosity of subject content and heighten their interest on topical aspects. None of the articles identified in § 3.2 provided information on involving curiosity with games for learning.

3.4 Education and games (Scopus)

On scrutinizing the included literature on the use of games as educational tools, the attitude of the role-players towards the use of games in learning environments strongly emanated. In spite of the Scopus search resulting in 28 articles, only four related to the current research question. The findings are available in Table 7.

Table 7: Education, and games for learning (Scopus)

Author	Methodology and Objectives	Findings	Type of Game
Koh, Kin, Wadhwa, and Lim (2012)	A survey was used to investigate the use of games in learning and challenges teachers encountered during adoption of games. Factors therefore included the level of teaching, teaching experience and teachers' perceptions of adopting games for learning.	The respondents indicated that: (i) students had a positive attitude towards games for learning; (ii) teachers believed that games could contribute towards better learning outcomes; cognition, psychomotor skill, and affective learning; (iii) students enjoyed games as part of the teaching and learning environment.	Computer games; Serious games; Online games; Off-the-shelf games and Board games

Author	Methodology and Objectives	Findings	Type of Game
Horta, De Alimeida, Monteiro, and Monteiro (2015)	During a mixed method approached, participants played a digital game. The objective was to propose that games for learning grabbed student's attention; making their learning subtle and flexible.	Gameplay part of learning leads to active participation; which subsequently leads construction of their own knowledge.	Computer game
Mayer, Kortmann, Wenzler, Wetters, and Spaans (2014)	A mixed method approach included literature review and students playing serious games. The objective was to evaluate how an applicable game to study field contributed to deeper learning.	Serious games contribute to student engagement and overall enjoyment of the learning experience.	Serious games
Crocco, Offenholley, and Hernandez (2016)	A large-scale study involved undergraduate courses. Faculty were trained in game-based pedagogy and created analogue game-based lessons. Professors taught one section of a course using games and another section of the course without games. Students in the game-based and control groups were given attitude surveys about the subject at the beginning of the semester, a post lesson survey after the game or regular lesson, and a post-lesson quiz with	Enjoyment correlated with improvements in deep learning in both the game and non-game classes. Games increased reported enjoyment levels, especially in subjects where students reported much anxiety about learning, and this increase in enjoyment correlated positively with improvements in deep learning and higher-order thinking. These results may have particular impact on non-traditional students.	Board games; Card games; Roleplaying; Quizzes and Problem-solving games

Author	Methodology and Objectives	Findings	Type of Game
	separate questions to assess surface learning and deep learning.		

The majority of the articles identified from the Scopus search were not used. The focus of these articles is on the creating of games for learning and not the use of games for learning in classrooms. However, the four relating articles suggested that using games for learning is a pedagogic strategy which could engage students and enhance their learning. Table 7 suggests that while games can improve factual knowledge, games for learning contribute towards substantial increase of students' knowledge, as well as improvement of cognitive skills.

3.5 Games for learning and Accountancy Education (Emerald Insight)

There is growing consensus among accounting professionals that graduates do not meet the standards of potential employers in the globalised business environment (Viviers *et al*., 2016). The authors expanded the search terms in order to address the posed research question in depth. They added the search *accountancy,* hoping to find articles on in the ever-increasing emphasis on the twenty-first century focus on soft skills in the workplace, as well as on the role that teaching and learning play in developing soft skills (Kyllonen, 2013). The expanded search resulted in two papers of which the one was excluded as its application was on gambling and not on teaching and learning. Viviers *et al*. (2016) addresses the posed research question posed of how games for learning contribute towards student engagement, active learning and skills development, and how they enhance teaching and learning at higher education level, concludes that both the quantitative and quantitative findings indicated that games for learning were perceived to be useful in encouraging accounting students to apply the broader spectrum of pervasive skills that professional accounting bodies require. They also posit that, besides from touching on the usefulness of similar teaching methods for developing pervasive skills, future studies should focus on the actual benefit of games for learning in order to put forward reliable assessment instruments and criteria to measure the effectiveness of pervasive skills development.

4. DISCUSSION

The authors used a method of content analysis to analyse and cluster the games for learning aspects listed in findings columns of Tables 3 to 7 in order to address

the current research question. Table 8 depicts how these aspects are grouped according to seven clusters as three main categories: (i) the aspects relating to games for learning in the Accountancy classroom, (ii) the transitional stage between classroom teaching, and (iii) the aspects influencing the Accountancy workplace requirements for games for learning. The clusters relating to games for learning in Accountancy classrooms related to (i) the outcomes of games for learning, pedagogies for games for learning; (iii) the types of learning which should be considered during the use of games for learning; and the objectives for using games for learning in Accountancy classrooms. Three aspects relate to the transitional stage between the classroom and the future boardroom involvement of students: (i) the contextualization of knowledge; (ii) the narrowing of the gap between learning and business; and (iii) students' propensity to use games for learning. The category relating to the Accountancy workplace requirements for games for learning comprised two clusters: (i) workplace-related skills; and (ii) workplace-related attributes of students which should be addressed through games for learning.

Table 8: Content analysis of the characteristics of games for learning from the systematic literature review

Games for learning in the Accountancy classroom			
Outcomes of games for learning Attitude Cooperation and collaboration Decision making Increased perception Learning of difficult concepts or scenarios Mastering content knowledge Motivation New knowledge Obtain intelligent responses Social interaction Stimulation Well-being Written communication	**Pedagogies for games for learning** Cognitive skills Construction of own knowledge Enjoyment Exploration Facilitate learning process Innovative Interesting Learning as fun Learning environment Learning experience	**Types of learning** Engagement Affective learning Informal learning Interactive learning Involvement Learning through trial and error Problem-solving strategies Strategy assessment Transformative learning	**Objectives for games for learning** Active participation Communication inside of classroom Communication outside of classroom Deep learning Developing of soft skills Different skillsets possible through learning with games Higher-order thinking skills Meaningful learning for development Positive attitude Specific domain knowledge

From the classroom to the boardroom
Contextualising of knowledge Narrowing the gap between learning and business Propensity to use games for learning

Accountancy workplace requirements for games for learning	
Workplace-related skills Acquiring practice skills Consecutiveness Organisation skills	**Workplace-related attributes** Resilience Job-related skills Transfer of knowledge

Perform better in the workplace Psychomotor skills Shared frames of reference Sustainability of behaviour Teamwork	Complex socio-technical knowledge

5. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

Games for learning are not merely about creating games for students to play, it is rather concerned about designing learning activities that can incrementally introduce concepts, and guide them towards an end goal.

The study concludes on: (i) how enjoyable do students experience games for learning; (ii) how games influence, shape, and enrich learning; (iii) how students gain, process and assimilate information from games for learning; (iv) the limited availability of information on how games for learning stimulate students' curiosity for learning; (v) how students engage with one another to develop skills while engaging with games for learning; and (vi) the need for further research to assess the effectiveness of games for learning. It also provided a clustering of aspects relating to games for learning as they impact on teaching and learning in classrooms, how they contribute towards transitioning students from the classroom to the boardroom; and how games for learning contribute towards Accountancy workplace requirements as professional bodies increasingly require.

The authors recommend that: (i) The decision to use games for learning in teaching and learning should be based on a well-grounded theory of learning, as well as the skills required for the learning area; (ii) games for learning should be employed as learning tools, and not as stand-alone instruction; and that the contextualization of game content for games for learning are important aspects to take into account during the use of games for learning in Accountancy Education.

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