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Simulating Teaching and Learning of Accounting Subject through Gamification Approach

Khairina Rosli*, Rafeah Mat Saat, Norhaiza Khairudin

Tunku Puteri Intan Safinaz School of Accountancy, Universiti Utara Malaysia, Kedah, Malaysia

ABSTRACT

In introducing and achieving the learning objective of accounting subject among students, instructors could creatively apply an attention-grabbing approach of teaching - i.e., Gamification. Thus, the purpose of this conceptual paper is to present gamification concept and benefits it can offer as an approach in teaching and learning, particularly in accounting course. Gamification refers to the application of game element in non-game contexts with the aim of getting individuals to involve in a diversity of challenging tasks. Game-based accounting education may help to create a new and interesting teaching and learning environment that switches the 'chalk and talk' teaching method into student centered learning. It also gives impact to students in boosting their motivation to delve into the subject being taught. Theoretically, this paper contributes to the existing literature of gamification in education, and practically, it contributes in increasing the awareness on how the gamification can be used in accounting education and motivate non-accounting students to enjoy learning the subject. Further experimental study will be conducted to investigate how game-based education assists in improving students' understanding of accounting concept, as well as how gamification can stimulate critical thinking and communication skills among students.

Keywords: Accounting, Gamification, Accounting Education, Educational Game, Student Centered Learning

1. INTRODUCTION

Accounting education relates to a discipline that requires student to apply the accounting related theories and practices in practical problems solving activities. Therefore, students need to apply their creative thinking skills during their knowledge development processes and they further need to continuously engage themselves to the understanding and reflections on what they have learnt, in order to produce an actionable learning process. An approach that may offer the opportunities of 'learning by doing' experience is learning through educational games (Allin & Christie, 2002; Kiilli, 2007).

The gamification approach in accounting teaching and learning activities can create a fun and interesting learning environment for the students. For example, a set of buying and selling activities can be presented through interactive games. Students may participate in the selling and buying activities as well as apply their knowledge on accounting theories and practices in order to produce accounting journals and financial statements. In this study, we explore how students can visualize themselves in a business environment through game board and how they could better apply their knowledge to solve accounting transactions through game activities. This study also explores how gamification approach helps students to determine accounting process that need to be produced and how the students can develop their critical thinking skills.

*Corresponding author. Tel.: +604-928 7258; Fax: +6-04-928 7215
E-mail: khairina@uum.edu.my

This study is conducted to explore the behavioral outcomes in education from gamification approach. The next section explains challenges of teaching and learning in accounting, followed by how gamification can contribute positive impacts to students.

2. CHALLENGES IN TEACHING AND LEARNING OF ACCOUNTING SUBJECT

The challenges in teaching and learning of accounting subject lies in the method of conveying the accounting knowledge, cultivate critical thinking skill among students and transfer the accounting concepts in real business settings.

For students, who are new with accounting or even accounting senior students taking advanced accounting courses, they perceive that learning and understanding the accounting concepts can be challenging to them (Moncada, 2014). Students who are taking introductory accounting subject feel anxiety and unconfident with the subject. Some students have initial judgement to accounting subject where they perceive the accounting subject as boring and that they are not concerned to learn it. Additionally, through authors' experience and observation in teaching introductory accounting course to students, we found that students professed that accounting is tough to understand with lots of numbers, debit and credit transaction records and financial statements that are hard for them to understand and prepare. Particularly students from non-accounting disciplines such as Hospitality Management, International Affairs Management and Tourism Management programs in which accounting is a new subject to them. Although an introductory to accounting course is designed to expose the non-accounting students about the basic terms, concepts and processes in accounting cycle, they seem to have difficulty to comprehend and apply the important accounting concepts in business transactions and use it for decision making purpose.

Problem in teaching and learning may also arise due to the approach used in class. Some problems are related to the traditional learning and teaching method whereby lecturer teaches in front of the class using presentation slides while students sit and listen to them. Then, written exercises or assignment questions are given at the end of the lecture session. Some students may not clearly understand how to get the questions done and how to explain their tutorial or assignment answers in class. They might have a tendency to wait for the answers from the lecturer. As a result, this would hinder the students to practice their thinking skills and confidently address the accounting problem in class.

Consequently, lecturers and students might become unsatisfied in fulfilling their respective teaching and learning goals. As the students cannot understand and realize how to relate accounting concepts into the real business environment, some students just quit trying and decide to drop from taking the course. Whereas for the lecturers, they become frustrated and discouraged to teach accounting course with the traditional approach because it is a challenging task to make the students grasp the accounting concepts and transfer the knowledge into the business context.

Wiggins and McTighe (2005) asserted that, students may apply what they have learned in class into the real environment only when they have understood the concept being taught. According to Wiggins and McTighe (2005, p.40):

“Understanding is about transfer, in other words. To be truly able requires the ability to transfer what we have learned to new and sometimes confusing settings. The ability to transfer our knowledge and skill effectively involves the capacity to take what we know and use it creatively, flexibly, fluently, in different settings or problems, on our own”.

Despite of trying to understand the knowledge, learning obstacle may also happen as students tend to just memorize without really understand it. This problem usually arise in accounting, mathematic, chemistry and physic disciplines which require formulas and calculations to be applied in solving problems. Students might be able to give answers to problems if the formulas are given by lecturers, however, they are unable to understand applicable measures when they are required to solve unstructured problems.

Thus, it is important for the lecturers to think of solutions that could support students to transfer their knowledge and use it in diverse business contexts. Educators may use game-based method as a teaching and learning approach in accounting discipline. Prior studies reported that students in today's era prefer to learn in an active and interesting learning environment than in a passive traditional lecture. They like learning approaches that associate with game which can provide them instant response while playing it (Prensky, 2001).

3. GAMIFICATION AND ITS IMPACTS ON TEACHING AND LEARNING

Gamification is a term that refers to the use of game elements in non-game contexts with the goal of engaging people in a variety of tasks such in marketing campaign, business service and customer engagement (Hamari, 2013). Early gamification approach use rewards for players that include points or badges who accomplish certain level. Making the rewards for accomplishing tasks or providing scoreboards motivate players to compete (Fratto, 2011). Another approach is to integrate game mechanic with a business tutorial to drive participation and engagement (Bakker & Demerouti, 2007).

There is a growing interest on gamification in the education field as one of the alternatives to engage and at the same time motivate students during learning process (Kapp, 2014). This is aligned with Muntean (2011) that study on gamification as a tool to increase engagement in e-learning platforms. His study is based on Fogg's Behaviour Model, where the findings posited that gamification mechanics can be used to motivate and trigger desired behaviours on students. Thus, by applying game, either from a simple application of gamification in learning or a more complicated educational game such as simulator that employs huge resources in terms of knowledge, both make education more fun and engaging, without undermining the learning objective.

Researchers have claimed that game-based approach in education has positive impacts on students' learning processes (Dorn, 1989; Rau & Heyl, 1990; Kiilli, 2007). O'Halloran and Deale (2007) emphasized that educational games can increase student's interest, motivation, perseverance, and develop thinking skills. The application of games in classroom has been proved to improve learning and social interactions (Rau & Heyl, 1990; Kiilli, 2007). During the game activities, all students need to participate as players in completing certain tasks. From the activities, students gain understandings on real context and instil moral and ethical implications on their decisions as monitored by instructors and other participants (Dorn, 1989). Furthermore, gamification creates a more appealing learning style (Apostol, Zaharescu & Alexe, 2013). Besides, it makes students to be more motivated to participate in the game and it enhances their cognitive growth, such as factual knowledge, improve problem-solving skills and ability to apply concepts and principles. In addition, it educates players (students) rather than just play the game for entertainment pleasure. Technical subjects such as accounting, which involve complex educational concepts has been asserted to be more understandable to students when an educational game is applied in pedagogical model (Kiilli, 2007). Next section explains how gamification can be blended in accounting subject.

4. GAMIFICATION IN ACCOUNTING COURSE

In an accounting course, students essentially need to understand the accounting technical material and need to consequently be able to apply the accounting technical material in problem solving activities. However, students will have difficulty participating in a discussion relating to the application of technical material if they are lack of solid foundation of accounting concept and critical thinking skills (Cottrell and Robison, 2003). This study therefore examines how students can improve their understanding, communication and critical thinking skills in accounting course through the use of board game in class activities.

In the teacher-centered learning approach where the lecturers delivers knowledge in a classroom in a one-way direction, students tend to be passive learners because they practically rely on learning by listening, memorizing and knowledge repetition. This traditional method of teaching and learning in accounting course less promote physical activities and critical thinking skills. It is believed that enhancement on this approach should be implemented. Advancement of technology may encourage teacher to adopt active teaching and learning strategy as well as using games in accounting subjects (Fratto, 2011).

In order to help students apply their knowledge, this study however, will create a series of accounting transaction tasks in a form of game board, which students will play and apply the accounting concepts in solving the game tasks. A non-computer based game board is chosen because previous study has found that it is the most common type of games used in education (Lean, Moizer, Towler & Abbey, 2006). The approach using game board in accounting course is intended to help the students to 'physically' involve in completing the accounting tasks.

By using the board game approach, students will engage in solving the accounting transaction problems, perform the selling and buying activities with related parties using tangible tools such as fake money, inventory and other assets. Based on the game, the student would then be able to record the accounting transaction and prepare financial reports. Thus, lecturer can develop interest, understanding and critical thinking skills among the students in communicating the accounting course or problem through this approach.

4.1 Methodology

This study explores the implementation of gamification approach in the effort to enhance communication and critical thinking skills among students. The participants of this study are students who enroll in Business Accounting course, which is an introductory accounting course. The course is uniquely designed for non-accounting students who do not possess any accounting background in which they have not learned about accounting during primary education nor prior taking the course.

The study will be conducted using experimental approach (Eriksson, Johansson, Kettaneh-Wold, Wikström, & Wold, 2000; Kirk, 1982). Before implementing the experimental approach, an initial interview will be administered prior to the experimental treatment. Then, immediately at the end of the experimental treatment, an additional interview will be conducted to gather the data and the reflections from the students on the experimentation.

The aim of the experimentation is to adopt gaming approach in accounting course and the manner in which the students can apply the accounting lessons through the board game used in the experiment setting. The experiment will be used to uncover new ways to solve problems and learn accounting courses using gamification approach. The experimental output is expected to assess the implementation of gaming techniques to understand and apply the accounting knowledge that could lead to a better approach in problem solving and critical thinking.

The experiment will not only supply an analytical technique for selecting between decision alternatives but also provide a framework for implementation. The predictions arising from the technique will also supply benchmarks for judging the feedback of results and the identification of new problems and opportunities in the subject area (Doyle & Fenwick, 1975).

4.2 Game Development

In this study, we plan to adapt the concept of Monopoly game board and use it in Business Accounting subject. The board game tasks will be based on accounting equation i.e., $\text{Asset} = \text{Liability} + \text{Owner Equity}$. After each task, students will be required to record the transactions into journals, post to ledgers and prepare account statement. Consequently, students will do reflection regarding their knowledge on a particular topic.

Educational games allows instructor to assess students' knowledge and their competencies when the students play the games (Michaels & Chen, 2005). In accounting educational game, for instance, instructor can assess student understanding of accounting knowledge and their critical thinking skill in completing the game. In addition, communication skills of students may also be evaluated as they participate with other players in the games. In this study, the lecturer (researcher) will gather data during the experimentation through observation and interview. A set of interview questions will be given as a tool to assess understanding, communication and critical thinking skills. This tool provides information of changes on how well the students understand and use the skill strategies over time.

The students' understanding of accounting concepts will be measured using test answer scheme. When the students play the game, researcher will observe and assess their critical thinking skill, for example, "Do the student successfully complete the game?" "Do the student get the right answer for each task given in the game?" Additionally, to evaluate the reflection of the gamification approach in accounting course, interview session will be conducted with the students.

The evaluation of reflection for the result of this study will be done by both the students and the instructors. Reflection will be based on self-regulated theory (Zimmerman, 1998) which consist of three phases: forethought, performance and volitional control, and self-reflection. Forethought phase "refers to influential processes and beliefs that precedes effort to learn and set the stage for such learning" (Zimmerman, 1998, p.2). Performance and volitional control phase "involves processes that occur during learning efforts and affect concentration and performance" (Zimmerman, 1998, p.2). Whereas the self-reflection phase refers to the "processes that occur after learning efforts and influence a learner's reactions to that experience" (Zimmerman, 1998, p.2).

'In action' reflection which is taken place during the course activities, will be based on the observation when students participate in the game and answering the tasks. The communication and critical thinking rubric

assessment currently used in accounting subjects will be used for this purpose. In specific, the in action reflection will be done during week 4-6 of the teaching period.

In addition, 'on action' reflection evaluation of the suitability of the current rubric to evaluate the aspect of communication and critical thinking skills in the implementation of gamification approach will also be examined after the class session for future improvement. An interview will be conducted at the end of the experimentation to understand the reflections by the students on the gamification approach and to explore issues that the participants faced in the experiment. The interview will also highlight the good and bad practices of the game from each participant in order to come out with recommendations for the study.

4.3 Importance of Study

This study is important for improving understanding, communication and critical thinking skills of students on accounting subject through game-based learning. Likewise, the findings of this research may be useful to both students and lecturers.

Students will obtain a clearer view and more hands-on problem solving on business accounting exercises through participation in board game with the guidance of their lecturers. This will further enhance students' knowledge of the importance of understanding and mastering their critical thinking skill so they will make an effort to do their best in completing the course and apply it in business context. This may lead to better interest in learning accounting course and cultivate good learning practice.

The study is expected to contribute to accounting teaching and learning outcome as follows:

- Knowledge: Students will comprehend and use accounting concepts and terminology in the class such as asset, liability, owner's equity, revenue and expenses in completing action tasks in the game.
- Skill: Students will calculate and record accounting transactions in journal and prepare financial statement (i.e., profit & loss statement, balance sheet and cash flow) for a specific period. Students will also be able to develop their critical thinking skills with the use of decision-making tools such as cost variance analysis in analyzing the business performance. Students will be able to utilize learned tools and make decisions using the accounting transaction introduced in the game to maximize their asset and equity position.
- Attitudes/behaviors: The use of game in the course is also expected to instill communication skills, interpersonal skills and teamwork among group members. As stated by O'Halloran and Deale (2007), playing educational games will benefit students to learn about cooperation and competition as well as develop their leadership skills.

This study may also increase lecturer's awareness in identifying interactive solutions using educational games in enhancing students' interests towards their course. This may further be a motivating factor to adopt new measures and strategies in improvement students' skills. Having said that, it is believed that using educational game approach in accounting subject will offer positive impacts in improving teaching and learning of accounting course particularly among non-accounting students.

5. CONCLUSION AND FUTURE RESEARCH

It is hoped that by incorporating board game in explaining accounting problem in class, the students would be able to clearly visualize and understand it, thus help to inculcate critical thinking in solving the problems. This is important in order for a student especially who does not have any accounting background to be successful in learning the subject. It is also hoped that by incorporating games, where the selling, buying and other accounting transactions or questions can be realized 'physically' with related parties, the lecturers can instill interest among the non-accounting students to learn accounting course. It is expected that the approach will be an effective strategy in showing students how to reflect about what they have learned, improve their communication and critical thinking skills as well as to apply accounting knowledge in their daily life. We are looking forward to working on this area of concern and share our findings with our co-lecturers who teach accounting course. With the content of the accounting game board approach, it could be then used in future research as a model to develop an enhanced accounting game using software and further apply technology games in accounting course.

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