GAMIFICATION IN ENTREPRENEURSHIP AND ACCOUNTING EDUCATION

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ABSTRACT

Accounting is one of the knowledge that is essential for an entrepreneur. However, learning accounting is perceived as unexciting and hard to understand especially for those who do not possess any accounting background. The purpose of this paper is to study how entrepreneurship and accounting knowledge can be applied in education using board game to cultivate understanding on these concepts as well as to stimulate critical thinking and problem solving skills. An experimental method was conducted in which an educational board game on merchandising topic was used in a class setting comprising of 49 non-accounting students as the participants. Data was collected through questionnaire surveys that were given prior and after the experiment and followed by an interview session. The results show that game-based accounting education aids in generating an interesting teaching and learning environment on business accounting course that focuses on student centred learning. Most respondents agreed that learning business accounting through game activity encouraged them to think critically as they play to complete the game tasks. T-test result shows that there were significant differences between the scores before the game activities and the scores after the game activities for critical thinking skill. With regards to the mean scores, critical thinking skill mean score had increased after playing the game. Furthermore, majority of the respondents agreed that using games help them to comprehend the business accounting knowledge better. This paper contributes to the existing literature of using games in business accounting and practically, it benefits in increasing the awareness on how educational games can be applied to nurture entrepreneurship and accounting education.

Keywords: Entrepreneurship, Accounting Education, Educational Game, Student Centred Learning, Gamification.

INTRODUCTION

Entrepreneurship is the concept of capturing business plans, transforming them into products or services, and bringing the concept to the market. The key elements for entrepreneurship include risk taking, pro-active, and innovation (Iscenco & Li, 2014). Additionally, knowledge in areas related to entrepreneurship such as accounting, financial management, taxation issues, credit management, and development of business projection are essential for an entrepreneur. However, many people open up their businesses while possessing limited knowledge on these particular areas which in turn might jeopardise the business operations (Winarno & Wijijayanti, 2018). Thus, to create awareness on the importance of being knowledgeable and successful entrepreneur, critical entrepreneurial skills and related accounting knowledge should be developed among young generation starting from their early childhood

education and continuously embedded in higher education level (Bahador & Haider, 2017; Olokundun et al, 2018). Like other areas in education, entrepreneurship teaching and learning are also moving towards enhancing its content and methods whilst increasing the efforts to make entrepreneurship lessons more effective (Mason, 2011).

Nevertheless, students have difficulty in applying their entrepreneurial knowledge and related accounting concepts in business situations which is important in the business decision making process. Some students perceived that business accounting is hard to understand. The fact that accounting relates to lots of figures, debit and credit recording, and preparation of financial statements are considered as cumbersome to them. They cannot relate how to apply accounting in the real business environment. Some students quit trying and end up dropping the course. It is a challenging task to make the students understand how accounting can be useful in entrepreneurship decision-making.

Therefore the aim of this paper is to investigate how entrepreneurship and accounting skills education can be delivered in a stimulating approach by using gamification. In this study, we apply entrepreneurship and accounting educational game and allow the participants to visualize themselves in a business environment using a board game. We explore how they could better apply their knowledge to solve business accounting transactions and develop their critical thinking skills through game activities which is seen an important knowledge for a successful entrepreneur.

LITERATURE REVIEW

Studies have shown that using gamification approach in students' learning processes can boost students' interest, motivation, perseverance, and thinking skills (Fratto, 2011; Kiili, 2007). Gamification approach can also improve learning and social interactions as students need to collaborate with other players in completing the structured tasks (Kiili, 2007; Nitkin, 2012). Apart from making learning more interesting, gamification approach also promotes students to be more motivated to participate in the game and it enhances their cognitive growth, such as factual knowledge, increase problem-solving skills and ability to apply concepts and principles (Apostol, et al., 2013).

In accounting education in particular, review of previous literature revealed that there are lack of academic studies that stressed on the effect of gamification and its benefits. Only a limited number of studies have established their efforts in adopting active learning and teaching strategy using games in accounting subjects (Fratto, 2011; Moncada & Moncada, 2014; Nitkin, 2012; Shanklin & Ehlen, 2007).

Moreover, as technology is progressing in education, most of the studies focus on building digital games such as computer games, video games and mobile phone game applications (Hamari, et al., 2016). In such digital games, students get the convenience to play the games anytime and most of all, with mobile game, it can be played in any place. However, it is argued that board game is also important and has its own strength in teaching and learning accounting subjects. Previous study has shown that using game boards in teaching accounting is an effective way to illustrate the accounting cycle (Shanklin & Ehlen, 2007). As students play the board game, they can have face-to-face interactions with other players and instructors, thus enhancing the students' engagement to the financial accounting course. Further to this, the hands-on learning approach in the class simulation tends to speed the learning process and keep students' interest high on those areas that they perceived as very difficult concepts (Shanklin & Ehlen, 2007). One of the critical problems related to the traditional learning and teaching method

is that students have difficulties to clearly understand the accounting transaction stated in the tutorial or assignment questions. Consequently, this hinders them to apply their thinking skills and fluently address their problems in class. They tend to wait for the solutions for their assignments and tutorials from the lecturer. Apart from that, some students do not even attempt to do their homework or tasks at all. In other cases, some students are merely shy in explaining their answers in class and have difficulty in answering the "how" and "why" questions. Hence, using educational board games in accounting courses allow students to improve their understanding, critical thinking and social skills as they learn, discuss and ask questions to complete the game tasks together.

Therefore, to bridge the aforementioned gaps, this study is conducted to contribute to the existing literature of using board games in accounting and entrepreneurship education.

METHODOLOGY

This research employs the experimental approach. The participants in this research were the students from Business Accounting course, a course that is designed specifically for students from non-accounting disciplines. The students were from business management programmes such as Hospitality Management, International Affairs Management and Tourism Management programmes. The aim of the experiment was to adopt a gaming approach in which the students can develop their interests to learn entrepreneurship and accounting lessons by using a board game. In this study, we developed MyAccount Game that represents a merchandising business run by a group of entrepreneurs (the players). As the players play the business game, they were required to prepare accounting records and determine the business income.

Surveys were conducted on 49 participants before and after the game experiment to acquire further feedback on the gamification approach. The items in the survey instrument were adopted from rubrics that were developed to assess critical thinking and problem solving skills. The reliability analysis result of the instrument's item shows the Cronbach's alpha value of more than 0.70, indicating that the items were reliable to measure the skills.

In addition to the survey, interview was employed to obtain further information on students' reflection regarding their experience and perceptions in using gamification approach. The interviews were also conducted to understand how they improve critical thinking and decision making skills after playing the game. Both the quantitative and qualitative data were analysed and discussed in the findings section.

RESULTS AND DISCUSSION

A descriptive analysis was conducted to understand the demographic of the respondents. Demographic data shows that majority of respondents were in the age of 19 years old and 60% were female. Most of the respondents were in the first semester and enrolled in business programme. The result of skewness and kurtosis shows the data was normally distributed. Further analysis was conducted using independent sample t-test to identify the differences on critical thinking and problem solving skill before and after the respondents play the game.

Table 1 presents the results of the independent t-test to compare score of critical thinking and problem solving skills, before and after the gamification approach was employed in teaching and learning. The findings show that Levene's test for equality of variance was not significant, indicating the equal variance has not been violated. Besides, in the t-test for equality of means

result, there was a significant difference between before and after gamification treatment towards students' critical thinking and problem solving skills (Sig. 2 tailed=0.000).

Table 1
SKILLS BEFORE AND AFTER PLAYING GAME

	Levene's Test for Equality of Variance				T-test for Equality of Means		
Variables	**Response**	**N**	**F**	**Sig.**	**T**	**Mean**	**Sig (2 tailed)**
Critical Thinking & Problem Solving Skills	Before	49	4.588	0.035	-3.168	26.00	0.000
	After	47			-3.648	29.46	

The results also reveal that the mean score after the gamification treatment for critical thinking and problem solving skills was higher (Mean=29.46) than before the gamification approach took place (Mean=26.00). This demonstrates that critical thinking skill mean score had increased after playing the game.

The result is aligned with Zichermann & Cunningham (2011) that stated the process of game-thinking and game mechanics can engage students with the topic and increase problem solving skill. Behavioural and cognitive engagements are prerequisites of student's learning and participation in class as these engagements would enhance their thinking and understanding of the subject (Li et al., 2004). Using games as a teaching approach is proven in increasing the students' engagement, both in cognitive and behaviour (Hew, et al., 2015). Next section discusses in detail about students' reflections after playing the game.

Students' Reflections

The collected qualitative data were coded and analysed using thematic analysis (Patton, 2002). Data coding was performed to identify the themes and categories of qualitative data. From the analysis, two themes emerged under the perspective of critical thinking and problem solving skills. The first theme is "*Instant problem solving activities*" and the second theme is "*Thinking under pressure*".

With regards to the first theme "*Instant problem solving activities*" theme the students felt that by playing the games, they were able to learn how to get the answers for the accounting problems immediately. Interactions with lecturers and discussion with team members on the game tasks enable them to learn how to quickly solve the problems. Below are the respondents' quotes with regards to this theme.

"It is better than tutorials sessions because we have to solve the game right at that point of time. We will learn how to solve the problems right away."

"We need to do a lot of critical thinking to solve the problems and the interaction with the lecturer is very important. When I ask question, the lecturer ask me back some questions that make me start to think critically."

"If just learning in class using slides it will be very boring. If we play game like this, we will directly know how to solve the problem and how to put it into the right accounts."

The second theme is "*Thinking under pressure*". Under this theme, the students felt that they need to get the answers in the game session therefore they must think how to solve the problems and finish on time. This situation makes them anxious and also they must think quickly to solve the problems. The quotes pertaining to this theme are as follows:

"It makes me feel anxious because we need to finish on time and at the same time we have to make sure that the answers are correct."

"We have to think critically to make the best decision in order to win the game where we need to think which decision gives more profit."

As the game is played in groups, the outcome shows that students have enhanced their participation and collaboration as well as their critical thinking and problem solving skills in giving answers.

CONCLUSION, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

Board games can be used to promote understanding on entrepreneurship and accounting concepts in business accounting education. Particularly in the context of higher education, it is important to integrate real business issues and challenges into entrepreneurship pedagogy to ensure that the students, as the potential entrepreneurs, are well equipped with related essential skills.

Important implication of this study can be reflected from the increase of critical thinking and problem solving skills mean scores before and after respondents play the game. Thus, it is recommended that educators apply educational games into their teaching to encourage active learning among students and provide them the opportunity to experience business activities as an entrepreneur. In addition to that, it can help to stimulate critical thinking, problem solving and entrepreneurial skills which are significant in becoming a successful entrepreneur. This may help educators to prepare the future entrepreneurs in facing the real business challenges.

Another vital implication of using educational games can be drawn from the participants' reflections after playing the game. The findings suggest that using educational games which incorporate business transactions and accounting practices in teaching, creates an interesting and effective approach to motivate student's engagement in entrepreneurship learning. It is therefore recommended that instructors apply the approach in teaching and learning process where the instructors can act as facilitators who help explain the rules and method of the game as well as monitor the students to be able to complete the game tasks in the stipulated class session. Instructors may also embed other game elements such as rewards, points, challenges in task, game theme and story in an educational game to create an exciting teaching and learning experience that focus on student centred learning environment.

This study used experimental study among students in classroom. Future studies could be extended by using inferential statistical analysis to investigate the relationship of other important skills such as communication and scientific skills on entrepreneurship and accounting knowledge through gamification approach. Further study could also analyse the effect of the constructs, develop and validate a gamification model in a more real and non-experimental environment.

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