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MAINTAINING STUDENT ENGAGEMENT AND MOTIVATION IN MANAGEMENT ACCOUNTING COURSE: OV GAME FOR STUDENTS

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ABSTRACT

Nowadays game-based learning or gamification has become an important tool in education system to uphold student engagement and motivation. Therefore, this study looks at the use of Overhead (OV) Game to evaluate the student's motivation, performance and learning in management accounting courses in UiTM Kampus Seremban. Data for this study was collected through a questionnaire from 85 students consisting of degree and diploma students from Faculty of Administration Science and Policy Studies at UiTM Kampus Seremban. A descriptive 20-items questionnaire was used, and the data was then analysed using the SPSS statistical package. A 5-point Likert scale ranging from 1 to 5 was used to record the responses for the OV Game to obtain a more quantifiable result. Overall, the study demonstrated that the introduction of game-based learning into management courses stimulated learning and improved performance. The study also reported high perceptions towards perceived usefulness of the games and had a positive impact on the academic results.

Keywords: Engagement, Game-Based Learning, Motivation, Performance, OV Game

1. INTRODUCTION

The accounting academician and education has been impacted profoundly by Covid 19 pandemic. At the beginning, many of the accounting educators or academicians struggled to explore the new approach, style or techniques to deliver their knowledge and thoughts. Despite facing a lot of uncertainty and constraint this pandemic provides an opportunity to all academicians to become creative and innovative to ensure that their students can grasp the subject matter via the use of technology and internet even though without the physical presence in class or at the university.

Present studies revealed that students feel comfortable using digital learning orientation such as computers, the internet, and other communication technologies which will improve their innovative behaviour in the learning process and also maintaining students' attention throughout the learning session (Jääskä et al., 2022; Mozie et al., 2022). Digital games for learning are fast becoming a popular trend in educational technology and many people believe digital games to be decisive teaching tools currently (Ash, 2012; Becker, 2007). The effectiveness of learning via digital games reassures teachers about the use of games in the classroom as a complement to traditional teaching (Vinter et al., 2022). Gamification has become more enjoyable, encouraging user experience and the ability to play online with broadband and wireless networks as use of smartphones and tablets as new delivery platforms (Simões et al., 2013). Furthermore, students who use gamification in learning demonstrated positive behavioural, attitude, and psychological changes, as well as improved

engagement, motivation, active participation, information acquisition, focus, curiosity, interest, academic performance, and learning outcomes (Lampropoulos et al., 2022). The introduction of mixed reality technologies enhanced user interfaces in game consoles with new ways of interacting with the players (Shi & Shih, 2015; Simões et al., 2013).

Therefore, the study is to explore the use of management accounting games and their effects in terms of motivation, learning strategy, features, contents and performance to undergraduate students taking cost and management accounting subjects.

1.1 Gamification and Game Based Learning

What precisely is meant by gamification varies widely. Ariff et al. (2022) stated that gamification uses the game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems. Plass et al. (2015) define it as involving the use of game elements, such as incentive systems, to motivate players to engage in a task they otherwise would not find attractive. In addition, a game was defined as any interactive digital activity, including simulations, in which students participated using any of a variety of devices, such as desktop computers, laptops, tablets, game consoles, and mobile devices (Ash, 2012). Hence, gamification involves redesigning the learning activities and rules of play to make the education process more interesting and engaging.

Many studies have revealed that the gamification and game-based learning has contributed to the improvement of performance, learning outcomes, reduction of failures rate, encouraging teamwork and oral communication skills among students (Guardia et al., 2019; Subhash & Cudney, 2018). In addition to that, it can show students other enjoyable and useful methods of education. Gamification and game-based learning tools can also support students' motivation, engagement, and learning during apparently uninteresting learning activities (Barrio et al., 2015)

This is also consistent with Bulut et al. (2022) contended that in their research that students enjoyed the activity very much and demanded the inclusion of the game design workshop to the curriculum as a lesson. Their finding proves that game-based learning is an important tool to be used in the lessons, especially for teaching subjects that are considered difficult to understand. Martínez-Jiménez et al. (2021) stated that with the use of tests, game rules, temporal limitations, punctuation, and many other elements of the game, teachers transform their classrooms into playful environments to stimulate motivation, action, and positive feedback of students.

In this context, there are numerous applications which are available to be used during pandemic such as Socrative, Quizizz, Google Forms, Brainscape, Cerebritis and others that seem in favour of the evolution towards learning methodologies that are more active and innovative. Therefore, in this study we are focusing on the use of OV game via google form to evaluate the student's motivation, performance and learning in management accounting courses. In this paper the three research questions are stated below:

(1) Does the use of OV game in management accounting course affect student engagement and motivation?
(2) Does the use of OV game in management accounting course affect student performance?
(3) Does the use of OV game in management accounting course affect student learning?

1.2 Theory In Game Based Learning

Common theory which is always related with game-based learning and gamification is the goal-setting theory (Landers, 2015). Based on this theory, there are four factors that connect the goals situated with the individual's performance. The individuals' commitment

towards their goal; the response or reaction they receive for their work and effort; the difficulty of the tasks they perform; and the situational constraints that relate to their tasks, such as time limit or role overload (Locke&Latham , 2002). In this context, the goal should be straightforward, objective, specific, make sense, and not too tricky to effectively increase students' performance and engagement.

Kalogiannakis et al. (2021) in their systematic review of literature underpinned several theories related to gamification and game-based learning and how those theories can be linked to motivation. One of the well-known theories is self-determination theory (SDT). Ryan and Deci (2000) stated that SDT posits around three basic psychological needs that all individuals have and strive to fulfil, relatedness, autonomy, and competence. These needs are connected and enhance intrinsic motivations because of interest and enjoyment, and extrinsic motivation for example people willing to participate due to a reward or incentive.

Another theory related to this is motivation. Rao (2016) outlined the definition of motivation contains three essential elements, namely, need, motive or goal that triggers action, a selection process that directs the choice of action and the intensity of effort that is applied to the chosen action. In essence, motivation governs behaviour, attitude and performance, selection, direction and level of effort.

1.3 Introduction to OV Game

This game is introduced to help students to learn and understand how to calculate the overhead absorption rate (OAR) in easy and fun ways. The objective of the game is to enable students to identify overhead costs incurred in manufacturing companies, a cost centre and an appropriate basis used to apportion the overhead cost. Therefore, a well-known manufacturing company in Malaysia is chosen as a case study for the OV game. This will help students to have better understanding as we are using a real business setting.

The benefits of the game are as follows:

(1) It provides opportunity for students to be familiar with overhead cost terms and terminology through games;
(2) Students will have a better understanding on how to identify the overhead costs, the
cost centre and the basis use to apportion the overhead cost; and finally
(3) Students will be able to compute overhead absorption rate more accurately.

Students can choose to play this game individually or in a group of 3 to 4 persons using google form. The time given to complete this game is 1 hour. There are four tasks given to be completed by the students as shown below:

Task one:
Each individual/group must read the case study and then identify the relevant costs item that might arise in each cost centre (pictures). In each cost centre, there are about 5 to 11 items (small pictures) that represent various types of costs. they are required to choose and tick the relevant item (picture) that might arise in the above cost centre. Each picture can be used more than once in each cost centre if necessary.

Task Two:
Next the student must match the item (small pictures) with suitable overhead costs that can be accumulated to the cost centre.

Task Three:
Each group/individual must calculate the costs incurred in each cost centre in OAS TEMPLATE by choosing the appropriate basis available. At this stage students should be able to choose an appropriate basis based on cause-and-effect relationship to

allocate the overhead costs to the cost centre. they must upload and submit the answer via google form.

Task Four:
Final task each group/ individual must compute the overhead absorption rate in CC1, CC2, CC3 and CC4 using an appropriate basis.

2. SCOPE AND METHODOLOGY

Data for this study was collected from 85 students consisting of degree and diploma students from the Faculty of Administration Science and Policy Studies at UiTM Kampus Seremban. The questionnaires were collected through Google Form application to ease the data analysis process. The google link has been forwarded to the students once they completed the OV game. A 5-point Likert scale ranging from 1 to 5 was used to record the responses for the OV game to obtain a more quantifiable result. The scales are represented as 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. A descriptive 20-items questionnaire was used, and the data was then analysed using the SPSS statistical package. Cronbach's alpha was used to test the reliability and the subscales of the questionnaire. All the scales had acceptable internal consistency of 0.960. Descriptive statistics were used to identify mean, standard deviation, and percentage of responses to the OV Game usefulness, perceived motivation, learning strategy and performance.

3. RESULT AND DISCUSSION

3.1 Students' Engagement and Motivation

Of the 85 students, twenty seven percent of the respondents were degree students and 72% were diploma students. Significantly, the students' perceived usefulness towards the OV game were reported at a high mean score of 3.89 (Table 1). In the context of digital game-based learning usefulness appears to be important predictors for students' acceptance (Bourgonjon et. al, 2010). Students' acceptance of the game is vital to be considered as the major step towards implementing the games so as to improve the learning process. The main distinguishing features and content of the OV game is classification of cost and calculation of the overhead absorption rate (OAR) and preparation of overhead analysis sheet. The OV game is carried out in parallel with the course outcomes and its features and content was developed to enhance the students' understanding on the subject matters. Most of the respondents (88%) agree that the content of the OV game is useful and the game adds value in their learning process (92%). 96% of students claimed that the game was well designed, colourful and attractive. Over 85% of the students agreed that the accounting game is different from the traditional teaching method and hoped that the other courses could also adopt an online game-based learning. Our result was consistent with Ariff et.al (2022) who found that mobile application has met the aim of providing a fun and entertaining method in learning the financial accounting subject. It was perceived as an acceptable and appropriate way to teach in higher education and helps learners to practice real life situations and challenges (Lee & Felix, 2019; Whitton, 2007).

Analyses on the students' perceived motivation in regard to the effects of the OV game on the fulfilment of basic psychological needs, however, showed a moderate mean score of 2.92. Only twenty five percent of the students agree that the design of OV game is appealing and highly motivating to use and 39% reported as neutral (neither agree nor disagree). The OV game approach seemed to enable students to understand and clearly identify their level of understanding in preparing the overhead analysis sheet (mean = 3.00). When the students are able to understand how to prepare the overhead analysis, there is a sense of achievement which is associated with enjoyment. However, only 21% claimed that they enjoyed playing the game. Most studies yielded a positive result of the relationship between gamification and

students' motivation. However, our result consistent with study done by Hanus & Fox (2015), showed that the gamification method has no positive effects over students' motivation. Caution is needed in interpreting these findings as it is a subjective judgement and more contributing factors yet to be explored. It is worth noting that the game was adapted for educational purposes, distinct from entertainment-oriented video games, while they are often enjoyable. Lampropoulos et al. (2022) highlighted that the academicians should follow proper educational strategies and approaches, take students' knowledge, interests, unique characteristics, and personality traits into account in teaching and learning activities. As it is a so-called instructional game, we need to design and include game features that could sustain self-directed interest so as to engage the students or end up with a dull game. Furthermore, the game demonstration and instruction should be clear to enable students to be fully immersed in the game (Huang et al., 2013). Additionally, a narrative environment in the game could also foster players' intrinsic motivation to continuously participate in the game playing (Dickey, 2007).

Table 1. Percentage, mean score and standard deviation for each item.

Usefulness (average mean score:3.89)	***DA***	***N***	***A***	***Mean***	***S.D***
The content of the OV game is useful to me	12	0	88	3.8941	0.8595
The tools for the OV game are well designed, colourful and attractive	4	0	96	4.0588	0.5199
The time given to complete the OV game is appropriate	19	0	81	3.6941	1.0121
The content of the OV game given added value	8	0	92	3.8941	0.7241
The approach of this accounting game is different from the traditional teaching method.	12	0	88	3.8824	0.8509
I hope that other course can also adopt online game-based learning	13	0	87	3.9176	0.9156
Motivation (average mean score: **2.92)**					
This OV game will increase my understanding in preparing overhead analysis sheet	34	46	20	2.9059	0.9079
This OV game will clearly identify my level of understanding in preparing overhead analysis sheet	29	47	24	3.000	0.9258
The design of OV game is appealing and highly motivating to use	36	39	25	2.9765	1.0233
I enjoy playing this OV game	47	32	21	2.8118	1.0059
Learning (average mean score: **2.98)**					
I think critically before giving answer in the OV game	28	42	29	3.0824	0.9662
I am well prepared for the OV game	49	36	14	2.6824	0.8892
I refer to notes or textbook in answering some question	26	35	39	3.2353	0.9593
I can better understand classification of costs	36	39	25	2.9294	0.9485
I am much clearer about different basis of apportionment of overhead	29	47	24	3.0471	0.9989

I am better able to understand of using cause and effect relationship in order to make apportionment of overhead to cost centre	31	46	24	2.9765	0.9126
I can know more about the importance of accurate overhead cost to be assigned to product cost	34	48	22	2.9412	0.9431
Performance *(average mean score:* 3.41)					
I am able to understand in preparing overhead analysis sheet	2	67	31	3.3647	0.7692
I would recommend OV game to my peer	7	48	60	3.4353	0.8084
Overall, I am satisfied with OV game	31	45	38	3.4235	0.7618

3.2 Students' Learning

The survey also showed the effects of the OV game on the students' perceived learning by using the OV game. It showed a mixed result. The results revealed a moderate mean score of 2.98 in regard to the perceived learning. In our investigation, only 14% of the survey participants reported that they are well prepared for the OV game and 39% refer to notes or textbooks in answering the questions. 29% reported that they think critically before giving an answer in the OV game. There was an average mean for the items that include the students' perception on their level of understanding on the important elements in the overhead topic such as the classification of cost, basis of apportionment, apportionment of overhead cost. 31% percent agreed that they are able to understand how the overhead analysis should be prepared. This findings in line with Vinter et al. (2022) who asserted that the importance of analysing the learning processes solicited by the games they might use in class and their appropriateness with regard to the cognitive resources available to the student.

3.3 Students' Performance

On top of that, the students' final test scores for the overhead topic were also analysed in order to determine the impact of the game on the students' academic achievement. It showed that the OV game had a positive impact on the students' achievements on the overhead topic (Figure 1). This is consistent with Berns et al. (2016) who reported positive effects of a gamified tool on students' academic results. Our result showed that the students performed well for the test although their initial motivation was moderate. Albeit the game was perceived as exceptionally not motivating yet the learning would occur without the student acknowledging it. According to SDT, gamification should be capable of increasing intrinsic motivation, however it depends on the implementation of the game and the contextual factors. Upon analysing the previous studies, we found several possible reasons regarding the motivational aspect of the games. Perhaps this is due to the fact that the topic or the subject matters is quite challenging for the non-accounting students. Consistent with Ding et al., (2017) ; Hamari et al., (2015) who reported that game-based learning that are complex and challenging are those with positive outcome. Further added by Whitton (2007) that individuals may not find games intrinsically motivational, but they will use them for learning if they are perceived as the most effective way to learn.

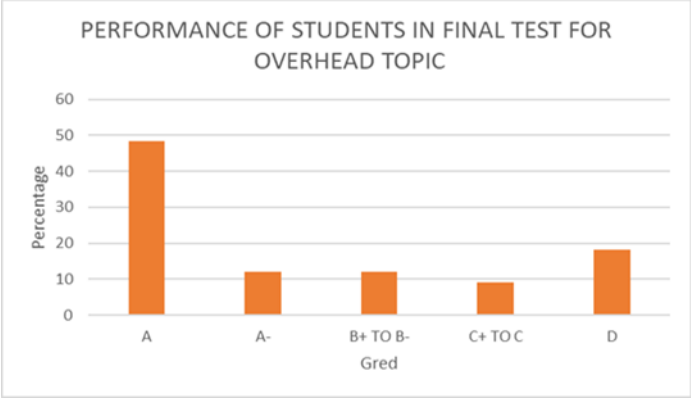

Figure: 1 Performance of Students in Final Test in Overhead Topic

4. CONCLUSION AND FUTURE RESEARCH

Our study demonstrated that the introduction of game-based learning into management courses stimulated learning and improved performance. The data from this study reported high perceptions towards perceived usefulness of the games and had a positive impact on the academic results. However, not all students find that the game affects their intrinsic motivation. Despite the lack of intrinsic motivation, the games not only improved the students' academic performance, but showed high willingness for the students to learn through the educational game if they find it as a useful means to learn.

While the findings of this study are able to identify the game's perceived usefulness, motivation and learning performance, some limitations need to be acknowledged when interpreting the results. First, the subjects who participated in this research were non-accounting students and most of them have no basic cost accounting knowledge. In other words, the research findings of this research may not be generalised to students in other programs or universities. Second, most of the data were self-reported, thus the findings were entirely from the students' perspectives. Future research in this area could be carried out to look into the game features or elements that were considered motivational to increase student engagement.

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