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Kampus Sungai Petani

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IMMERSIVE LEARNER'S USABILITY AND EXPERIENCE THROUGH VMMBG DURING COVID-19 PANDEMIC: AN EVIDENCE OF A HIGHER EDUCATIONAL INSTITUTION

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ABSTRACT

In Malaysian Higher Education Institutions (HEIs), digital educational game-based learning is still in its infancy. Educators are urged to use digital games to build and develop educational innovation in order to accomplish learning goals while also boosting learners' motivation, enjoyment, engagement, and experience during the Covid-19 pandemic. This study, therefore measured learners' usability and experience through Virtual Money Mine Board Game (VMMBG) in the Personal Financial Planning (PFP) course at the Faculty of Business and Management, UiTM Melaka Branch, Melaka City Campus. The VMMBG was played via the Google Meet platform, and nine groups were formed. The MEEGA+ Model elements were used to assess the usability and player experience with VMMBG. The data from the 55 undergraduate students participating in the PFP course was analysed using SPSS. According to the findings, operability was the most essential factor for game players, while aesthetics, learnability, and accessibility piqued their interest and motivated them to complete the difficult tasks on the digital platform. Players found VMMBG, as well as the game's rules, characteristics, and features, to be entertaining and enjoyable. To conclude, VMMBG has proven to be a versatile learning tool for students seeking particular information, engagement, and academic success in the PFP course. Educational games in higher education institutions should be linked to learning objectives to assist learners' knowledge acquisition, cognitive and and soft skill development.

Keywords: educational online games, digital, usability, player experience, learning, virtual, higher educational institutions (HEIs)

INTRODUCTION

The growth of digital technology has had an impact on the traditional education system at higher education institutions (HEIs) transforming face-to-face classes into virtual platforms (Bordoloi, Das & Das, 2020; Bisht, Jasola & Bisht, 2020). Due to Covid-19 outbreak, online learning is becoming a feasible option for learners obtaining specific knowledge and participating in the educational process (Basuony, EmadEldeen, Farghaly, El-Bassiouny & Mohamed, 2021; Chen, Landa, Padilla & Austin, 2021). In Malaysia, delivering contemporary technology-based education among HEIs has been a challenge during the pandemic crisis. When shifting completely to online learning, educators and learners are having difficulty to learn due to diverse learning styles, a lack of self-confidence, poor internet access, and an undeveloped instructional design.

To achieve the course learning outcomes, Malaysian education systems have started to re-design and re-assess learning activities in response to these new learning challenges (Sia & Adamu, 2020). In this regards, all educators are urged to develop educational innovations in order to create positive learning environment by merging with digital technologies in order to motivate and encourage learners to achieve better learning outcomes and experiences (Basuony et al., 2021). Motivation, entertainment, engagement and experience are the crucial learning outcomes for educational innovation of the HEIs (Bawa, Watson & Watson, 2018; Sia & Adamu, 2020).

Education innovation encompasses a wide range of instructional techniques and delivery systems, particularly online board games (Bawa et al., 2018; Chen et al., 2021). Online board game focuses on learners' interests and it is a novel learning method that emphasises the impact of engagement and learning outcomes in a virtual context (Ahmed & Sutton, 2017; Fjaellingsdal & Klockner, 2020; Johnson & Kim, 2021; Kapralos, Fisher, Clarkson & van Oostveen, 2015). Notably, online board games can manage large groups of new-generation learners at the same time, individually or groups, transforming each learner into a proactive, collaborative, reflective, critical, creative, and inventive problem solver (Ahmed & Sutton, 2017; Johnson & Kim, 2021).

Previous research has found that online board games improved players' literacy skills and knowledge in a variety of areas, including engineering, computer science, education, architecture, and graphic design (Ahmed & Sutton, 2017; Bawa et al., 2018; Johnson & Kim, 2021; Kapralos et al., 2015). These studies concluded that online board games and a variety of perceptual, cognitive, behavioural, emotional, learning motivation, entertainment, enjoyment and experiences are inextricably linked. Although there is a growing interest and value in online board games, there is no indication that the learners' usability and experience, in particular from the Malaysian HEIs setting, can be derived from the experience of the learning. Therefore, this study reports learners' usability and experience when virtual money mine board game (VMMBG) was introduced in a Personal Financial Planning course among undergraduate students.

LEARNERS' USABILITY AND EXPERIENCE THROUGH VMMBG

Educational games involve enjoyment, playing, engagement and serious learning (Ahmed & Sutton, 2017). In the field of education online games supports players and teams in improving academic performance, engagement and responsibility for learning, information and learning

acquirements, engagement and sustainability, and creative thinking and innovation development (Gibson & Douglas, 2013; Wong, 2018). To evaluate these outcomes, MEEGA+ Model (Model for the Evaluation of Educational Games), a well-known evaluation model is adopted for assessing game quality in terms of learner usability and experience after playing educational games (Petri, Van Wangenheim & Borgatto, 2016). According to this model, usability is a degree to which a product (educational game) can be utilised by specific users (students) to achieve specific goals with effectiveness and efficiency in a certain context such as aesthetics, learnability, operability, and accessibility (Petri et al., 2016).

The player experience is a quality element that encompasses the student's profound participation in the gaming activity, including its sense of learning, sensations, joys, and interactions with the game, surroundings, and other players. In this study, we measured learners' confidence, challenges, satisfaction, and social interaction, fun, focused attention, relevance and perceived learning. To our knowledge, the MEEGA+ Model has been extensively studied in the field of software engineering and computer education games, with a focus on learners' usability and experience (Petri et al., 2016; Petri, Von Wangenheim & Borgatto, 2017). Therefore, this current study extends to a new knowledge by assessing the usability and experience of learners in a Personal Financial Planning course through VMMBG.

The Virtual Money Mine Board Game (VMMBG) is an educational game-based learning tool that is an expansion of the conventional Money Mine Board Game. VMMBG was designed to facilitate the knowledge acquisition of undergraduate students enrolled for Personal Financial Planning (PFP) course. This project was created by faculty members from the Faculty of Business and Management at the UiTM Melaka Branch, Melaka City Campus. PFP provides a framework for financial planning by concentrating on managing and organising personal financial resources. This course assists students in long-term financial resource protection, investment planning for growing resources, and financial future survival. At the completion of this course, students must be able to analyse existing and future financial plans for individuals and families, as well as conduct self-directed learning skills linked to decision-making on personal financial concerns and planning. This course fosters students' collaboration abilities in activities linked to personal financial planning throughout the learning process.

To support Education5.0's flexible and meaningful learning experience, VMMBG discovered substantial educational innovation to address students' poor PFP assessment scores, as well as low attention and interest in calculating topics. More significantly, VMMBG is designed to increase new learners' enjoyment and engagement in a competitive learning environment, as well as to supplement virtual instruction delivery during the Covid-19 pandemic. All items in the PFP, such as annual car insurance, bonus, cash in hand, clothing (current value), computer (current value), family vacation per year, income tax monthly payment, zakat, monthly electricity bill, car monthly instalment, investment, housing loan payment monthly, and life insurance were virtually transferred through VMMBG. Figure 1 illustrates the features and development of VMMBG.



Figure 1. Product Development of VMMBG

MATERIALS AND METHODS

VMMBG was held via Google Meet and involved 55 students who had registered for Personal Financial Planning in Semester October 2020-February 2021. They represented a Bachelor of Business Administration in Finance and a Bachelor of Business Administration in Human Resource Management. We opted to run the game entirely using the Google Meet platform due to the Covid-19 pandemic. Nine groups were formed, each including four to five players as well as a coordinator. A coordinator was selected to oversee the game and help participants in addressing any issues that arose. The project leader conducted a briefing session to kick off this activity. Starting with any player, each player tosses the dice in turn (by clicking the 3D Dice app). The player with the highest number is the starter, and the HOST advances the player's token the number of spaces indicated by the dice. If the token lands on a "DECISION" card spot, the player will activate the Wheel Spinner app, and the HOST will read the "DECISION" on the card depending on the spinner number. Following the end of the game, each player was requested to complete a questionnaire in order to collect user input on usability and player experience.

To measure players' feedbacks after playing VMMBG, this study adopted the items developed by Petri et al. (2016) using MEEGA+ Model items: a) players' usability (aesthetics-2 items; learnability-three items; operability-2 items; accessibility-2 items); b) player experience (confidence-1 item; challenge-3 items; satisfaction-4 items; social interaction-3 items; fun-2 items; focused attention-3 items; relevance-4 items; perceived learning-4 items). Students' reactions were rated on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The levels of usability and experience of players have been analysed using the Social Sciences Statistical Package (SPSS) 26.0. The results have been based on descriptive analysis of demographics and items used to measure player usability and experience (percentage, mean and standard deviation-SD). This survey was developed using Google docs, and the students were reacted online.

RESULTS AND DISCUSSION

The sample involved of 33 females (60.0 percent) and 22 males (40.0 percent), with the majority respondents were from Finance (35 respondents, 63.64 percent) and Human Resource Management represented 20 respondents (36.36 percent). Table 1 show the findings for the means and SD values of each component. The operability of VMMBG had the most influence on their ability of players to play rapidly, followed by aesthetics (board graphics, text type, and colour), learnability, and accessibility, with mean scores ranging from 3.80 to 4.40. The mean player experience scores, which ranged from 3.70 to 4.50, are shown in Table 2. It suggests that participants were pleased with the VMMBG after they realised it was connected to their learning activity. It also implies that VMMBG, as well as the game's rules, characteristics, and features, were enjoyable and entertaining. Overall, total SD for usability components was between 0.5 and 0.7, while the total SD for player experience components was between 0.6 and 0.7. Figure 2 shows the activities of VMMBG.

Table 1. Mean and Standard Deviation (SD) Values for Usability and Player Experience

Usability	Mean	SD	Experience	Mean	SD	Experience	Mean	SD
AES	4.3545	0.69836	CON	4.4909	0.69048	FUN	4.5273	0.64131
LE	4.2636	0.54309	CHA	3.6727	0.66818	FOC	4.1394	0.66261

OP	4.5000	0.68718	SAT	4.3364	0.60900	REL	4.4667	0.59257
ACC	3.8455	0.73202	SOC	4.4242	0.60673	PER	4.4667	0.63376

*Total Mean (Usability-4.2409; Player Experience-4.315538); Total SD (Usability-0.665163; Player Experience-0.63808)

*AES-Aesthetics; LE-Learnability; OP-Operability; ACC-Accessibility

*CON-Confidence; CHA-Challenge; SAT-Satisfaction; SOC-Social Interaction; FOC-Focus Attention; REL-Relevance; PER-Perceived Learning



Figure 2. VMMBG Activities

CONCLUSION

The need for digital literacy among today's learners is increasing and Malaysian HEIs have responded by developing new curricula to teach students digital literacy abilities (Bordoloi et al., 2020; Bisht et al., 2020). Digital games are another way of helping students to understand things too hard in a traditional classroom by having visual, auditory, physics and learning difficulty. VMMBG can serve as an accessible learning tool for students obtaining knowledge, engagement and performance on Personal Financial Planning learning objectives during the Covid-19 pandemic. The findings show that usability components (aesthetics, learnability, operability, and accessibility) and experience (confidence, challenge, satisfaction, and social interaction, fun, and focused attention, relevance, perceived learning) satisfied learners' behaviours, competencies, cognitive, and social demands, such as teamwork, intellectual skills, problem solving, leadership, and communicative abilities. VMMBG, on the other hand, appears to be a more successful learning approach, validating the goals of enhancing academic achievement, sustaining engagement, encouraging transformative mindsets, and developing creative thinking and innovation in learners (Ahmed & Sutton, 2017; Fjaellingsdal & Klockner, 2020; Johnson & Kim, 2021; Kapralos et al., 2015). Educational games at HEIs, therefore, must be aligned with learning goals and clearly demonstrate that learning can be assessed and completed through experiential, project-based, competency-based learning techniques.

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