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Educating Children on Financial Management Using an Interactive Tool: A Case Study on Product Development Stages for Muamalat Interactive Game

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Abstract

Studies on financial education highlight the need for having children to be exposed on financial management to inculcate sense of responsibility on financial management. The challenge, however is to engage them with the concepts and the same time to deliver the content is engaging and fun manners. The purpose of this study is to highlight key activities involved in the product development of an interactive learning tool, Muamalat Interactive Game. Muamalat Interactive Game (MIG) is a game-based educational tool that i) exposes the players to Islamic banking, investment and social finance instruments ii) promotes inclusive economic development by inculcating the spirit of gift economy. Single case study analysis is adopted in this study on the processes involved for product development of a financial education board game; product conceptualisation, validation and pilot testing to intended users. Descriptive reporting on product conceptualisation and content as well as content and pedagogical validation are provided in the paper. For the pilot testing stage, the learning behaviours of learners are examined from the aspects of Cognitive Knowledge, Affective Behaviors and Technical Skills gained from the pilot testing conducted to the group of 70 secondary children. Learning behaviors of the learners relates to the cognitive ability to identify wealth management vehicles such as real property, share investment and Islamic insurance

products as the players are to accumulate wealth using Shariah-compliant and ethical-based investment vehicles. The affective aspect of the learning is tackled from the engagement on charity-giving as the game instills the willingness to share personal wealth built-up over the rounds of game-playing to the Sadaqah house via donation (*sadaqah*) and endowment (*waqf).* Sadaqah house serves as the communal fund that restores widened economic gap. The players too, gain technical skills of managing personal finance such as planning and recording cash inflows and outflows, budgeting personal expenses, managing debts, calculate tithe (zakat) due, and finally ascertain net wealth. The findings of this case study could be benefit future innovators wanting to learn product development of serious games.

Keywords: financial education, interactive game

1. Introduction

The importance of financial knowledge among children should not be ignored and should instead be applied as early as preschool so that they will grow up to be an individual that can really manages money, thus able to manage their lives better. In fact, financial education should be given as early as preschool age that began four years in order to save and manage money wisely become lifelong habits.
In term of delivery, questions have been raised around the changing learning preferences and the approaches required to meet the needs of generation Y (also called "milennials"). Generation Y, otherwise known as the millennial generation, refers to individuals born between 1982 and 2005 (Howell et al., 2009). There are many studies conducted and found that their learning process is fundamentally different to previous generations (Mangold, 2007; Carver & Candella, 2008; Purdue & Morgan, 2008). According to these studies, they prefer to work in groups with hands-on experiences and enjoy trial and error. Furthermore, they do not highly value reading and listening to lectures as has been in traditional education. They expect the learning process to be creative, interactive and fun.

Millennials have grown up with technology as a central part of their lives, and most have used the internet and computers throughout their education. Because they have grown up in this environment, millennials may require a more interactive and stimulating approach to learning than a traditional teaching approach could offer. One possible approach to making the classroom more interactive and stimulating for the millennial generation is to use games as a teaching tool, either to replace or as a supplement to the traditional lectures. The objective of this study is to highlight key issues and challenges of product development of Muamalat Interactive Game, a serious game interactive learning tool that educates its users on financial management concepts and applications. The experience of the game development from the product conceptualisation and validation stage are highlighted in this single case study.

2. Literature Review

2.1 Financial Literacy

The Federation of Malaysian Consumers Associations' (FOMCA) Consumer Research and Resource Centre found in its survey that many young Malaysians were living beyond their means, were carrying too high personal debts and had too little savings. They were also not budgeting or carrying out financial planning and had low levels of financial knowledge. According to the Finance Ministry, "Malaysian household debt stands at 83% of the nation's Gross Domestic Product, possibly one of the highest in the world and based from Insolvency Department showed that 103,827 bankruptcy cases between 2005 and Nov 2011, with the majority, 32.3% were between ages 35 to 44." - The Star 2013. In the meantime, according to Credit Counselling and Debt Management Agency (AKPK), about 60% of individuals seeking financial help were below age 40, while 15% were those in their 20s and one of the most significant cause of financial problems was the mismanagement of the use of credit cards.

Lusardi & Tufano (2009) found that the less knowledgeable report their debt loads are excessive and they unable to judge their position. Murphy, D.S & Yetmar, S (2010) reported on a survey about the personal financial planning attitudes of MBA students in the USA. Theoretically, knowledge of how financial markets operate should result in individuals making more effective borrowing decisions (Liebermann & Flint-Goor, 1996).

This is generally supported by Scott, (2010) that well developed financial skills are necessary for effective money management. However, the study failed to provide a direct link between personal financial knowledge and actual financial behavior. Carswell (2009) provided evidence of a link between knowledge and behavior, though it varies in how knowledge is measured and what behaviors are addressed. Numerous studies of financial knowledge emphasized college student populations; some for convenience and others as a population of interest (Chen & Volpe, 1998; Ibrahim, D. et.al (2009), Robb, 2010). Chen & Volpe (1998) established a link between financial knowledge and financial decisions, though it was tenuous at best as the decisions were purely hypothetical. Borden et al. (2008) presented findings that questioned the link between knowledge and behavior, as they did not note any significant relationship between financial knowledge and effective financial behavior. They suggested that whereas greater knowledge may improve student intentions towards more responsible behavior, it did not necessarily indicate whether or not students follow through with their plans.

There is some evidence that financial knowledge and financial behavior may be positively related. Hilgert et.al (2003) examined the correlation between financial knowledge and actual behavior among the general population in the United States. They measured knowledge using the 28-question Financial IQ measure that is included

in the Survey of Consumer Finances, which deals with aspects of cash-flow management, credit management, savings, investments, mortgage information, and other financial-management topics. The researchers noted significant correlations between credit management scores and scores on the composite measure of financial knowledge.

2.2 Adoption of Serious Game in Learning

A board game can be defined as a tabletop game that involves counters or pieces moved or placed on a pre-marked surface or "board", according to a set of rules (Wikipedia). The aim of each game can be varies depending whether it is based pure strategy, chance or a mixture of the two. Games are enjoyable and interactive and learners respond natural to this type of learning dynamic. Playing games can be useful for students as they acquire skills, which may not otherwise be taught. It has been accepted that in spite of the element of chance, business games polishes the players' entrepreneurial skills as they learn to deal with incomplete information, predict rival's strategies and understand human psychology (Johnson, 2013).

However, the usage of games as learning tools may not be acceptable to all. Some might considered games as not serious and informal ways in teaching students. Nonetheless, previous studies have shown the effectiveness of games as teaching tools for students (Sandford, et al., 2006; Hays, 2005; Hergeth & Jones, 2003). O'Leary (2005) found that a group of medical students that used Jeopardy group (games) reported significantly higher levels of faculty/student interaction, enjoyment of the class format and engagement in class content. These students described this method as a ''fun and rewarding'' way to conduct a review session. Others have used a commercially available board game in a marketing classroom to improve the students' skills (Hays, 2005). In each of these different disciplines, the students enjoyed the change in class format and felt that the games enhanced their learning.

In study conducted by Kennedy et al. (2004), found that more than 70% of the students who played the interactive board game felt it helped with their learning to counsel geriatric patients. Whereas in Roche et al. (2004) and Patel (2008), the findings revealed that the students enjoyed the subject and more than 60% felt it enhanced their classroom learning. For the purpose of this study, we propose the following research hypothesis: *Students involved in playing a board game will experience greater levels of understanding the subject matter.*

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2.3 Cognitive Knowledge, Affective Behaviors and Technical Skills
Bloom Taxonomy is arguable the most adopted model in education, such as analyzing and evaluating concepts, processes, procedures, and principles rather than just remembering facts. The model contains three categories referrred to as *domains* of educational activities (Bloom, et al. 1956):

- **Cognitive**: mental skills (*knowledge*)
- **Affective**: growth in feelings or emotional areas (*attitude or self*)
- **Psychomotor**: manual or physical skills (*skills*)

The learning behaviours of learners are identified during the learning program design, which at the end of the program will be assessed so that the learners' new skill, knowledge, and/or attitude acquired in the program are measured. This is for

the benefits of learners performance assessment and for learning program future improvements. Figure 1 shows original and revised Bloom's taxanomy:

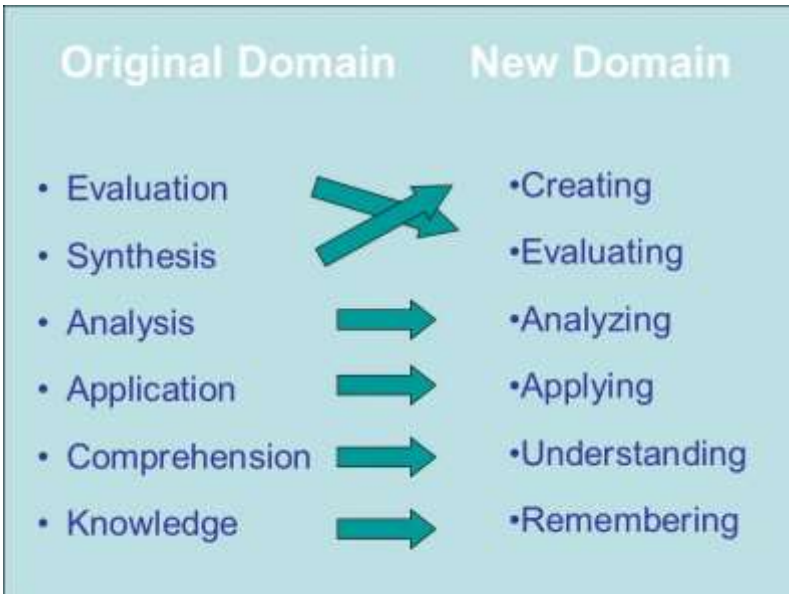

Figure 1: Original and New Domain for Bloom's Taxonomy

Source: http://www.nwlink.com/~donclark/hrd/bloom.html

3. Methodology

Muamalat Interactive Game (MIG) is a game-based educational tool that i) promotes inclusive economic development by inculcating the spirit of gift economy, ii) promotes awareness on managing personal finance that strikes the balance between individual and community wealth, iii) exposes the players to Islamic banking, investment and social finance instruments. MIG is a learner-centred learning tool that encourages experiential learning of learners. In the game, the players are to accumulate the highest amount of wealth in order to contribute to the community. Players are to accumulate wealth using Shariah-compliant and ethical-based investment vehicles. The game instills the willingness to share personal wealth built-up over the rounds of game-playing to the Sadaqah house via donation (*sadaqah*) and endowment (*waqf).* Sadaqah house serves as the communal fund that restores widened economic gap. The players too, gain technical skills of managing personal finance such as planning and recording cash inflows and outflows, budgeting personal expenses, managing debts, calculate tithe (zakat) due, and finally ascertain net wealth.

The use of the game in the context of financial education among children is that the game introduces the cognitive aspects necessary to financial literacy through debt and financial management and basic investment activity. It also provides values and awareness towards philanthropic activities though volunteer giving in a fund known

as "Sadaqah House" in the game. This aspect relates to values or affective domain of learning of the children. The game serves as a tool that will bridge the gap between theory and practices in various aspects; finance, investment and Islamic banking products. The pilot testing engaged the students to learn on financial management concepts and related financial managemetn vehicles and apply the knowledge to transactions simulated through the game.

This paper adopts case study method. The case is on Muamalat Interactive Game. The highlight on the processes involved during the product development of Muamalat Interactive Game Community Edition (CE) was conducted, which spans 6 months. The processes involved are i) Product Development, ii) Product Validation and iii) Pilot Testing. The findings on the case study is reported in the Section that follows.

4. Findings and Discussion

4.1 Product Development

The product conceptualization is led by Dr Syahidawati Hj Shahwan, a fiqh muamalat expert. The team consists of seven members (the authors of this paper). Muamalat Interactive Game Community Edition (CE) is the second variant of the product innovated by the team. The game is innovated to solve the problem of the lack of interactive tool in financial management that too inculcate philanthropic values to the players. Business board game available in the market deals with financial management to a certain extent but fail to engage users on their ethics of creating a balanced economy where personal wealth and public wealth are both important to the win the game.

Figure 1: Prototype Version of MIG CE (2016)

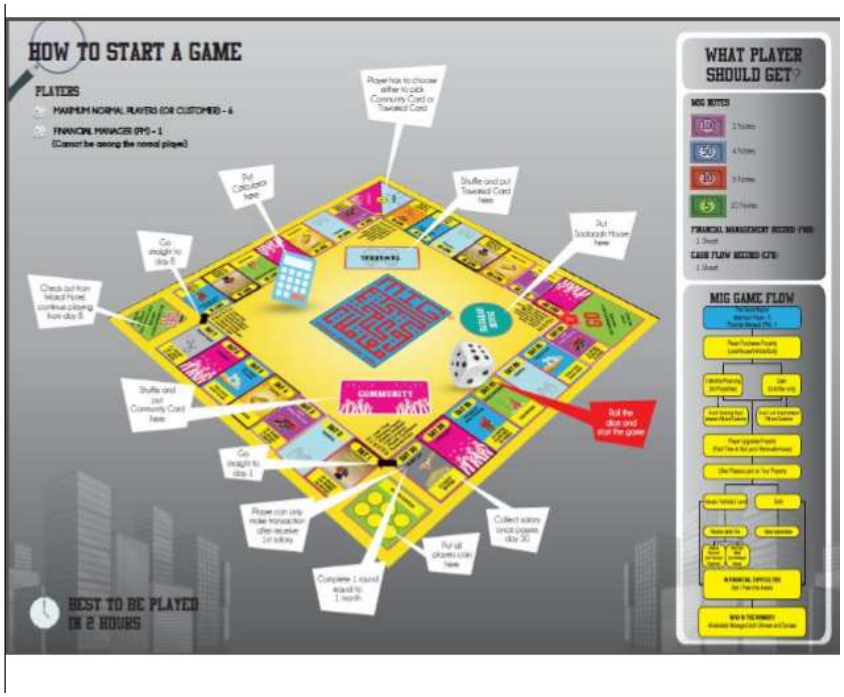

Figure 2: Manual of MIG CE (2016), page 1

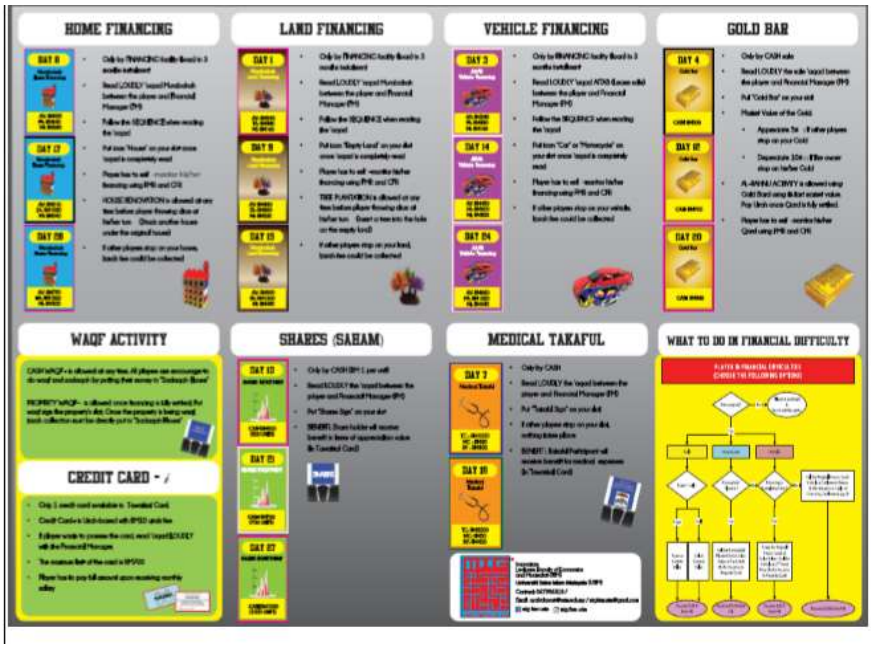

Figure 3: Manual of MIG CE (2016), page 2

4.2 Product Validation

This game features Shariah compliant contracts. Thus it is vital to get the validation of fiqh muamalat experts of whether the concepts are correctly adopted in the game.

After the stage of product conceptualization and content design, content validation session were conducted on 15th August 2016 with five muamalat experts, with majority of them are Shariah Committee in Islamic financial institutions. In addition to Shariah contracts validation, scrutiny on the wordings of the content are done in the session. Input from the session are adopted when editing the content.

Figure 4: Content Validation Session with Fiqh Muamalat Experts and Shariah Committees in Yayasan Inovasi Malaysia

The first stage pilot testing then was conducted with eight staff of Yayasan Inovasi Malaysia on 2nd September 2016. The feedback from the session includes content and design of the product. To increase understandability of the game to users, the group suggested to include game manual on how to play the game, as reported above.

Figure 5: First Pilot Testing Session, Yayasan Inovasi Malaysia

As this game is a serious game intended to be used on promote financial education, validation for pedagogy is necessary. For this reason, the innovators engaged with pedagogy validation team from Universiti Pendidikan Sultan Idris to validate the game on the playability and pedagogical approaches of the game. The validation

exercise team is led by Dr. Maizatul Hayati from UPSI, Dean Faculty of Art, Computer & Creative Industry, helped by five educators majoring economics, Islamic finance and computer science, on 15th September 2016. A full report (confidential) was communicated to the innovation team one week after the validation session.

Figure 6: Pedagogy Validation Session, Universiti Pendidikan Sultan Idris

4.3 Pilot Study with School Children

Pilot study on the intended users, namely school children was conducted on 70 students from a secondary school in Negeri Sembilan, Malaysia. The students are from Form 4 classes (first year of upper secondary). Through playing the board game it is expected for the students to gain knowledge on Islamic banking products and the underlying contracts of the products. The students who learned mathematics and commerce as well Islamic religious study that introduces basic Islamic business ethics.

There are four sessions conducted in playing the board game. The students were divided groups of five (4 players, 1 financial manager). Participation was mandatory and students were not informed of this activity prior to class. However, no prizes were awarded. The gme playing session lasted for 2.5 hours, the time reccomended to play the game. Prior to playing the game, the head of innovation

team, Dr Syahiwati briefed the students on how to play the game and the fundamental information on financial management concepts.

From the pilot session, students proved the content validation by the experts from UPSI that the game has high playability elements. It is easy to follow as the explanations are straight forward, expressed in an easy to understand graphical manual. The students too abled to appreciate the fun element of the game. They compete with each other to invest using the investment vehicles featured in the game. They too, could apply the relatively new concept introduced to them on cash flow management and recording of financial management by writing their cash and assets figure on the cards provided. The session successfully impart cognitive knowledge on financial management. Learning behaviors of the learners relates to the cognitive ability to identify wealth management vehicles such as real property, share investment and Islamic insurance products as the players are to accumulate wealth using Shariah-compliant and ethical-based investment vehicles.

The session too imparted the learning objective of the game that promotes charity. The affective aspect of the learning is tackled from the engagement on charity-giving as the game instills the willingness to share personal wealth built-up over the rounds of game-playing to the Sadaqah house via donation (*sadaqah*) and endowment (*waqf).* Sadaqah house serves as the communal fund that restores widened economic gap.

The learners too translated their knowledge into psychomotor actions; writing and calculating figures. In specific, they gain technical skills of managing personal finance such as planning and recording cash inflows and outflows, budgeting personal expenses, managing debts, calculate tithe (zakat) due, and finally ascertain net wealth. They too interacted well in the group, which too the evident of another form of technical skills, i.e. interactive socially with other group members.

Figure 7: Pilot Testing Session with Intended Users, Universiti Sains Islam Malaysia

5. Conclusion

The paper highlighted key activities involved in the product development for Muamalat Interactive Game. Processes went through by the innovators of the game ensures that the content and pedagogical element of the game are proper before the launch of the game to the mass market. Findings on learning behaviours of learners from cognitive, affective and psychomotor domain shows that game based education could be adopted to impart knowledge, steer behavior and promote certain motor skills as this game did to the students participated in the pilot session. The findings of this case study could be benefit future innovators wanting to learn product development of serious games.

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