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Financial Literacy and Playing Intention of Financial Literacy Digital Game

Umi Widyastuti¹ and Usep Suhud²

¹ Faculty of Economics, Universitas Negeri Jakarta, Indonesia.

² School of Business and Law, Edith Cowan University, Australia.

Abstract: This study aims to measure the impact of financial literacy, perceived ease of play (PEOP), and learning opportunity on intention to play a financial literacy digital game. In total, 219 university students in Jakarta and around participated an online survey. Almost 60% of them had experienced playing a digital and/or online game. However, none of them indicated that they had played a financial literacy video/digital/online game. Data was analysed using exploratory and confirmatory factor analyses, as well as structural equation model for testing the hypotheses. As a result, this study advises that intention of university students to play financial literacy digital game is significantly influenced by perceived ease of use, financial literacy, and learning opportunity. Other findings show that financial literacy can lead to affect perceived ease of play and learning opportunity. Recommendation for future study and practitioners are discussed.

Keywords: Financial literacy, financial literacy digital game, perceived ease of play (PEOP), learning opportunity.

1. INTRODUCTION

Financial literacy becomes an agenda of every nation as well as international organisations. Some surveys have been conducted by profit and non-profit institutions to understand and levelling countries in term of financial literacy and knowledge. Regarding this issue, MasterCard (2016) released a report mentioning that Indonesia had improved their rank in Asia Pacific countries. In that report, Indonesia was ranked at the tenth position after Thailand and Sri Lanka. Further, World Bank put Indonesia at the fourth position after Myanmar and Malaysia among Southeast Asian countries (Maierbrugger, 2015). By knowing this, each country might improve their efforts to make financial literacy level of them increase. Even, finance industry, for example, ANZ, Barclay, Citibank, Credit Suisse, and Deutsche Bank involved in these practices as a part of CSR program (Chong, 2013).

To improve financial literacy, practitioners and scholars have used various approaches. For example, Elgin (2014) registered a system that can be used to teach children financial literacy. According to her, the system includes four educational games including ‘a method for learning about money, budgeting, investing, and building a business. Lusardi *et al.* (2015) employed visual tools and narrative. Some others, applied video, digital, and online games (Annetta, 2008; Chang, 2013; Chen *et al.*, 2013; De Grove, Bourgonjon, and Van Looy, 2012).

Nowadays, some popular financial digital online games include D2D Fund, Mindblown Life, Show Business: The Economics of Entertainment, Mad Money, Sand Dollar City, and Fraud Scene Investigator (Leyva, 2013). There are also games dedicated for kids, for instance, The Mint, Financial Football, Rich Kid Smart Kid, HIP Pocket Change, Sense and Dollars, Bizkids, Gen i Revolution, Mad Money, Hands on Banking, and Financial Entertainment (Stachowiak, 2016).

In the Indonesia setting, banking industry used digital and online game to endorse financial literacy. For example, Smart Financial Planning by Bank OCBC NISP, DBS Smart Money by Bank DBS Indonesia, and *Ayo Menabung dan Berbagi* (Let Save and Share) by Bank CIMB Niaga (Marta, 2017).

Digital and online games have been used by game creators and scholars as a medium for education purposes (Mateos, Muñoz-Merino, Kloos, Hernández-Leo, and Redondo-Martínez, 2016; Whitton and Maclure, 2017). Studies on behaviour relating digital and online games have also been explored by prior studies. However, there is a paucity of study focussing on behavioural finance and consumer behaviour relating to financial literacy online or digital game. This study could fill that gap. Therefore, this study aims to measure the impact of PEOU, financial literacy, and learning opportunity as predictor variables on playing a financial literacy digital game.

2. LITERATURE REVIEW

2.1. Theoretical background

2.1.1. *Perceived ease of play and playing intention*

Perceived ease of use (PEOU) is defined as

“the degree to which an individual believes that using a particular system would be free from physical and mental effort” (Davis, 1989).

In this study, PEOU is adapted into perceived ease of play (PEOP), as the degree to which an individual believes that playing financial literacy digital game would not be hindered physically and mentally.

Existing studies showed a significant impact of PEOU on attitude towards behaviour (Hsu and Lu, 2004; Jiang, Peng, and Liu, 2015). Some other studies documented the impact of PEOU on behavioural intention (Chinomona, 2013; Liang and Yeh, 2009). In this study, perceived ease of play is linked to playing intention.

In Taiwan, Chang and Chin (2011) tested impact of perceived enjoyment, perceived innovativeness, perceived usefulness, and PEOU on intention of university students to play a social network game. PEOU, according to these scholars, was one of the predictor variables that had a significant impact on playing intention that kind of game.

A South African study on mobile games was conducted by Chinomona (2013). Involving students in a university, this study used perceived enjoyment and PEOU to predict playing game intention. They found that perceived enjoyment and ease of play significantly affected playing intention.

Further, Liang and Yeh (2009) assessed the impact of ease of use, playfulness, attitude, and subjective norm on intention to play mobile games. Two of the findings they carried out that ease of use had a significant impact on playfulness and intention to play.

A different result was showed by Choi, Shin, and Kim (2016). These scholars focussed on games that could be operated through both PC and mobile by employing quality of service, social impact, instant connectivity, quality of system, perceived usefulness, and PEOU to predict intention of playing games via PC and mobile. The scholars found that PEOU had an insignificant effect on playing intention both using PC and mobile.

Another study showed a contrast finding. Elderly samples were chosen by Q. Wang and Sun (2016) to measure playing intention of a digital game. In their study, they employed perceived usefulness, PEOU, game narrative, attitude towards use, social interaction, and physical condition. One of the findings they mentioned was that PEOU was insignificant to influence digital game playing intention among elderly.

The theories discussed above can be hypothesised as follows:

H₁: PEOU will have a significant impact on intention to play financial literacy digital game

2.1.2. Financial literacy and playing intention

For modern society, *financial literacy* is considered important in making a well decision relating to their behavioural finance to avoid risks that could harm one and others (Cameron, Calderwood, Cox, Lim, and Yamaoka, 2013). Individual financial literacy is defined as:

The ability to read, analyse, manage and write about the personal financial conditions that affect material well-being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future, and respond competently to life events that affect every day financial decision, including events in the general economy (Vitt, 2005, p. 7).

Financial literacy is financial knowledge (Hilgert, Hogarth, and Beverley, 2003). Financial literacy is also

“the understanding ordinary investors have of market principles, instruments, organizations and regulations” (Finra Foundation, 2003, p. 2).

In this study, financial literacy is linked to financial literacy digital game playing intention. However, there is a paucity of study focussing on playing intention relating to this kind of game. For this study, the authors adopt literature on the impact of financial literacy on other behavioural intention. For example, on saving, purchasing insurance products, and investing (Badshah, Hakam, Khan, and Saud, 2014; Zakaria *et al.*, 2016).

Taking place in Pakistan, Badshah *et al.* (2014) measured the impact of financial literacy and risk aversion on short term investment intention. They found that these two predictor variables significantly impacted investing intention.

Another study that used financial literacy to predict behavioural intention was undertaken by Zakaria *et al.* (2016). These scholars employed financial literacy as well as saving motivation and religiosity to predict Islamic life insurance purchase intention. They found that significantly, financial literacy, saving motivation, and religiosity could affect purchase intention.

A different result was presented by Widyastuti, Suhud, and Sumiati (2016). These scholars studied the impact of financial literacy on saving intention among student teachers in Jakarta. They included other predictor variables such as attitude towards saving and subjective norm. They found that attitude and subjective norm had a significant influence on saving intention whereas financial literacy had an insignificant influence on saving intention.

Based on the studies discussed above, the authors hypothesise as follows:

H₂: Financial literacy will have a significant impact on intention to play financial literacy online game

2.1.3. Learning opportunity and playing intention

Learning opportunity is defined as

“the extent which a person believes that using an online educational game can offer him or her opportunities for learning” (Ibrahim and Jaafar, 2011, p. 562).

Learning opportunity was reported to have a significant influence on game preference, usefulness, and playing intention (Bourgonjon *et al.*, 2013; Bourgonjon, Valcke, Soetaert, De Wever, and Schellens, 2011; Ibrahim and Jaafar, 2011). In this study, learning opportunity is linked to playing intention. However, there is a limited study measuring this path.

Ibrahim and Jaafar (2011) conceptualised one’s behavioural intention to play educational games. Employing a modification version of Unified Theory of Acceptance and Use of Technology (UTAUT), they employed performance expectation, effort expectancy, social influence, learning opportunity, and enjoyment as predictor variables. In their paper, learning opportunity was directly linked to playing intention. based on this paper, here is the hypothesis to be tested:

H₃: Learning opportunity will have a significant impact on intention to play financial literacy digital game.

2.2. Theoretical Framework

The figure below shows the theoretical framework to be tested, that is built based on the theories discussed above. In the model, PEOP, financial literacy, and learning are linked to playing intention. Further, the model is modified by adding another two links between financial literacy and PEOP, and learning. The alternative model was not fully supported by prior studies. There is a paucity of study looking at the impact of financial literacy on PEOP and learning opportunity. This is an experiment to see the impact of financial literacy on perceived ease of use and learning opportunities, as well as on playing intention.

3. METHODS

3.1. Sample

Using the Qualtrics survey online system, the survey attracted 453 participants. However, only 219 of them completed the instrument. The participants were university students from several universities. They

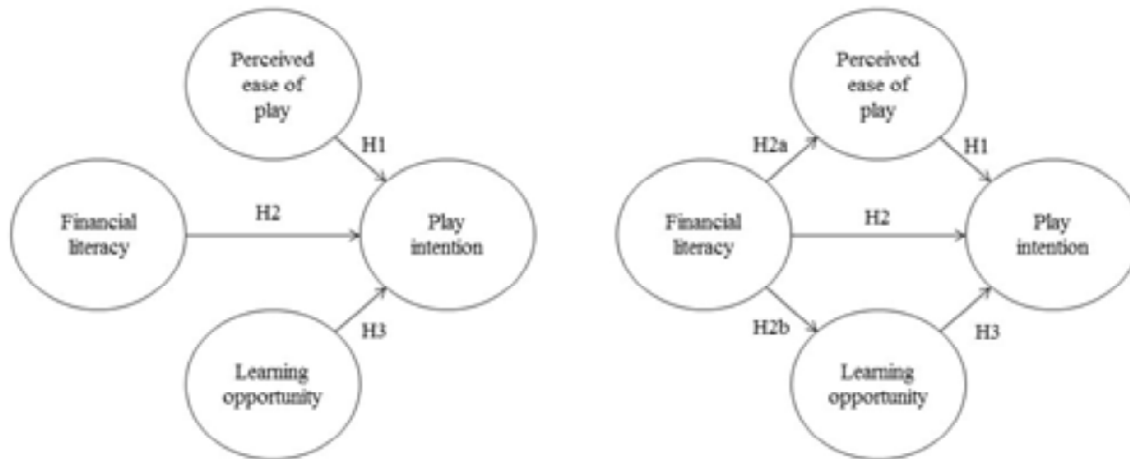


Figure 1: Theoretical framework and the alternative model

were approached conveniently using a personal communication form including WhatsApp, Line, and Telegram. The authors obtained helps from students to distribute the link of the instrument. Therefore, a snowball sampling method was also applied.

3.2. Measures

To measure financial literacy, items from Gachango (2014) were adapted. In addition, items from Lee and Tsai (2010) and PEOU De Grove *et al.* (2012). Learning opportunities were measured using items that were adapted from De Grove *et al.* (2012). Furthermore, eight items to measure playing intention were taken and adapted from studies of H.-Y. Wang and Wang (2008).

3.3. Data Analysis

The quantitative data was analysed in four steps. The first step was exploratory analysis. This test was addressed to observed components of each variable, and which items retained. In this step, the authors employed rotation direct oblimin. The second step was reliability test, to examined Cronbach's alpha scores of each component. Only components with alpha scores greater than 0.6 were included in further analyses. The third step was confirmatory factor analysis. The objective of this test was to intercorrelate all components to obtain a fitted construct. After obtaining the fitted one, conducting the fourth step, which was structural equation model, would be easier. This last step was to examine hypotheses. The authors stated criteria for judging whether a model was fitted. The criteria included a probability score of ≥ 0.05 (Schermelleh-Engel, Moosbrugger, and Müller, 2003), CMIN/DF score of ≤ 2 (Tabachnick and Fidell, 2007), CFI score of ≥ 0.97 (Hu and Bentler, 1995), and RMSEA score of ≤ 0.05 (Hu and Bentler, 1999). As this is a comparative study, a group analysis is applied.

4. RESULTS AND DISCUSSION

4.1. Participants

As presented in the table below, the majority of participants were females (144; 65%). Most of them were in the age of 19 to 22 (82 participants; 88.5%).

Table 1
Profile of participants

<i>Sex</i>	<i>Frequency</i>	<i>Percent</i>
Male	75	34.2
Female	144	65.8
Total	219	100
<i>Year of birth</i>	<i>Frequency</i>	<i>Per cent</i>
>22 years old	20	9.3
22 years old	36	16.4
21 years old	55	25.1
20 years old	52	23.7
19 years old	51	23.3
18 years old	5	2.3
Total	219	100

Gadget and devices the participants had including a smartphone (193; 88.1%), laptop (19; 8.7%), tablet PC (3; 1.4%), computer PC (2; 9%), digital game (1; 5%), and others (1; 5%). Furthermore, 131 participants (59.8%) claimed that they had an experience playing a digital or online game.

Those who played a game (85 participants; 38.8%) said that they used a smartphone to play, 22 participants (10%) used a laptop, 18 participants (8.2%) used a PC computer, four participants (1.8%) used a tablet PC, and 2 participants (0.9%) used a Play Station or other digital game device.

Regarding types of media, they chose for playing the game, 85 participants (38.8%) said they used an application. Further, they experienced playing the game via website and social media. The participants also mentioned that some games were already available on a smartphone, PC, and laptop.

Regarding financial literacy seminar or workshop, 117 participants (53.4%) claimed that they had an experience attending one. Predominantly, 116 participants claimed that they had a seminar or workshop on financial literacy at campus (53%). Eight-teen participants obtained the seminar at high school (8.2%), and 85 participants (38.8%) obtained at other places.

4.2. Exploratory Factor Analysis

In total, results of exploratory factor analysis produced five components or factors. Learning opportunity formed a component with a Cronbach's alpha score of 0.912 and factor loadings ranging from 0.610 to 0.837. Further, financial literacy showed two components including extrinsic and intrinsic factors. Extrinsic factors consisted of three items with a Cronbach's alpha score of 0.888 and factor loadings ranging from 0.853 to 0.928. In addition, intrinsic factors contained four items with a Cronbach's alpha score of 0.766 and factor loadings ranging from -0.508 to -0.860.

Additionally, PEOP survived five items with a Cronbach's alpha score of 0.882. It had factors loadings ranging from -0.757 to -0.843. Furthermore, playing intention had three items with a Cronbach's alpha score of 0.912 and factor loadings ranging from 0.806 to 0.931.

Table 2
Results of exploratory factor analysis

1	<i>Learning opportunity</i>	$\alpha = 0.912$
Le5	Digital games of financial literacy offer opportunities to think critically	0.837
Le4	Digital games of financial literacy offer opportunities to stimulate transfer of various kinds of knowledge other than financial.	0.833
Le3	Digital games of financial literacy offer opportunities to get experiences on how to earn money, invest money, and use some of that money to help others	0.797
Le6	Digital games of financial literacy offer opportunities to encourage entrepreneurial students	0.777
Le2	Digital games of financial literacy offer opportunities to take control over the learning process about finance	0.773
Le1	Digital games of financial literacy offer opportunities to experiment with financial knowledge	0.610
2	<i>Financial literacy – extrinsic factors</i>	$\alpha = 0.888$
Fi6	I balance my saving book carefully	0.928
Fi5	I do regularly check my saving book for inconsistencies	0.897
Fi7	I check the accuracy of each transaction then file them	0.853
3	<i>Perceived ease of use</i>	$\alpha = 0.882$
Pe4	I know how to play a financial literacy game in a classroom setting	-0.843
Pe5	I have the necessary skills to play a financial literacy digital game in a classroom setting	-0.822
Pe2	Learning to play a financial literacy digital game is easy for me	-0.811
Pe3	It is easy for me to play a financial literacy digital game	-0.811
Pe1	It is easy for me to become skilful at playing a financial literacy digital game	-0.757
4	<i>Playing intention</i>	$\alpha = 0.912$
In2	I predict I will play a financial literacy game in the future	0.931
In3	I plan to play a financial literacy digital game in the future	0.899
In1	I intend to play financial literacy digital games in the future	0.806
5	<i>Financial literacy – intrinsic factors</i>	$\alpha = 0.766$
Fi3	I can make informed effective financial choices	-0.860
Fi2	I can use combinations of skills, resources and knowledge to make financial decisions	-0.777
Fi1	I have the ability to discern financial choices and discuss financial issues without discomfort	-0.620
Fi4	I understand financial terms and concepts	-0.508

4.3. Structural Equation Model

Structural equation model was conducted to examine the theoretical framework. The framework achieved a fitness with a probability score of 0.087, CMIN/DF score of 1.238, CFI score of 0.990, and RMSEA score of 0.033.

Three hypotheses were examined. As presented in the table below, the paths had C.R scores of 4.562, 3.589, and 2.306 respectively. All of scores were greater than 1.96 that indicated that they were significant.



Figure 2: Hypothesis testing

Table 3
Results of the theoretical framework testing

			C.R.	P	Results	
H ₁	PEOP	→	Playing intention	4.562	***	Accepted
H ₂	Financial literacy	→	Playing intention	2.306	0.021	Accepted
H ₃	Learning opportunity	→	Playing intention	3.589	***	Accepted

The alternative model below attained a fitness with a probability score of 0.087, CMIN/DF score of 1.239, CFI score of 0.990, and RMSEA score of 0.033.

The alternative model showed good results too. Even when financial literacy was linked to playing intention as well as PEOP and learning opportunity, all hypotheses had C.R. scores of 4.562, 2.306, 3.589, 3.359, and 4.552 respectively. They showed significances and therefore, all the paths were accepted.

Table 4
Results of the alternative model testing

			C.R.	P	Results	
H ₁	PEOP	→	Playing intention	4.562	***	Accepted
H ₂	Financial literacy	→	Playing intention	2.306	0.021	Accepted
H _{2a}	Financial literacy	→	PEOP	3.359	***	Accepted
H _{2b}	Financial literacy	→	Learning opportunity	4.552	***	Accepted
H ₃	Learning opportunity	→	Playing intention	3.589	***	Accepted



Figure 3: Alternative model testing

4.4. Discussion

There are five findings carries out by this current study. The first finding is a significant impact of PEOP on playing intention of digital game financial literacy. This finding is significant with existing studies (Chang and Chin, 2011; Chinomona, 2013; Liang and Yeh, 2009). The easier of play this game perceived by students, the higher intention of them to play a digital game financial literacy.

The second finding is a significant influence of financial literacy on playing intention of financial literacy digital game. This finding is supported by prior studies (Badshah *et al.*, 2014; Zakaria *et al.*, 2016). The higher of financial literacy of students, it will increase their intention play a financial literacy digital game.

The third finding is a significant impact of financial literacy on PEOP and the fourth finding is a significant impact of financial literacy on learning opportunity. As mentioned earlier, there is a paucity of study measuring these two paths. These findings contribute to fill a gap in the field of study of behavioural finance, behavioural digital game, and financial marketing.

The fifth finding is a significant impact of learning opportunity and playing intention of financial literacy digital game. This finding supports the study conducted by Ibrahim and Jaafar (2011). Financial literacy digital game potentially provides knowledge and even new knowledge for players. Those who have a high level of curiosity toward new knowledge would enthusiast playing this kind of game.

5. CONCLUSION

This current study tested the impact of financial literacy, PEOP, and learning opportunity on a financial literacy digital game among university students. There were two research models examined: the theoretical framework and alternative. Findings of this study included a significant impact of

- (a) perceived ease of use on playing intention;
- (b) financial literacy on playing intention;
- (c) financial literacy on perceived ease of use;
- (d) financial literacy on learning opportunity; and
- (e) learning opportunity on playing intention.

This study will be beneficial for authorities and academicians who are involved in financial literacy disseminations. Looking at the findings, financial literacy digital game should be dedicated for those who have a certain level of financial literacy. By including this, both research and dissemination would expect a better result. Moreover, if this game is embedded with a curriculum and treated as a mandatory to play, student players would be more alert to understand the information relating to financial literacy within when they play the game.

Further study can consider exploring the same topic. Financial literacy digital games exist but lack of scholarly intention. Both models tested in this study are also worth to be examined in different settings and groups of samples.

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