Malaysian Digital Gamers’ Control Beliefs Towards Intention to Continue Playing Digital Games

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Abstract: Technology acceptance is a neuroscience technique for ascertaining digital games consumer decision-making as mentioned in our previous paper. It calls for a clear understanding of the mind and the thinking of digital gamers. This understanding is important because it allows digital game designers to create games with the right game dynamics to capture a specific market segment. In the past, digital games were produced without giving adequate consideration to the human decision neuroscientific factors which were difficult to identify and measure. Fang & Zhao (2010) paved the way towards the use of technology acceptance to ascertain the degree of emotional flow which motivates a gamer to continue playing digital games. This paper employed snow-ball sampling to collect data used in the analysis to estimate how self-efficacy, resource facilitating conditions and perceived behavioral control influence the intention to continue playing digital games. It was found that digital gamers’ perceived behavioral control towards intention to continue playing digital games was significantly influenced by control beliefs, self-efficacy and resources facilitating conditions.

Key words: Decision Neuroscience - Digital Games - Self-efficacy - Resources Facilitating Conditions - Perceived Behavioral Control - Intention Behavior

INTRODUCTION

Malaysian digital gamers are an exclusive group of enthusiasts who have their own networks. These networks include cybercafés digital gamers network, housewives digital gamers network, public employee digital gamers network, private employee digital gamers network, school children digital gamers network and IHL students digital gamers network. Only a digital gamer can distinguish whether a person is a digital gamer or a non-digital gamer. Thus, the sample reflects a diverse set of Malaysian digital gamer’s population. The wide range of population increases the generalization of the research findings regarding digital games engagement among Malaysians [1,2,3,4,5].

Control Beliefs and Relevant Findings: Perceived behavioral control in this study refers to the digital gamers’ perception of their ability to perform a given behavior. Perceived behavioral control refers to the perceptions of digital gamers’ about the presence or absence of the requisite resources and self-ability required to perform the behaviour [11]. Self- efficacy refers to digital gamers’ beliefs that they have the skills and abilities to successfully play their favourite digital games.
Table 1: Some previous studies related to control beliefs.

<table>
<thead>
<tr>
<th>Source</th>
<th>Technology</th>
<th>Participant</th>
<th>Relevant Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taylor and Todd (1995)</td>
<td>Computing Resource Center</td>
<td>786 business school students</td>
<td>Perceived behaviour control were important determinants of behavioural intention. Behavioural intention significantly affected usage behaviour.</td>
</tr>
<tr>
<td>(Md Nor and Pearson, 2008)</td>
<td>Internet banking</td>
<td>1164 respondents</td>
<td>Perceived behavioral control was established to significantly influence the intention to use Internet banking. Decomposing perceived control behavior revealed that self-efficacy and resource facilitating conditions were two significant factors which influence individuals to use Internet banking.</td>
</tr>
<tr>
<td>Kim and Karpova (2009)</td>
<td>Fashion Counterfeits</td>
<td>336 female college students</td>
<td>Perceived behavioural control is important determinants of intentions to engage in purchasing fashion counterfeit goods.</td>
</tr>
<tr>
<td>Zhou et al. (2010)</td>
<td>Mobile banking user</td>
<td>250 participants from service halls and universities in China</td>
<td>The result of the study indicated that facilitating conditions influence had significant effects on user adoption.</td>
</tr>
<tr>
<td>Hung, Ku and Chien (2012)</td>
<td>physicians support system, Evidence-based medicine (EBM)</td>
<td>224 physicians</td>
<td>Analysis of the DTPB model indicated that a physician intention to use was significantly affected by perceived behaviour control which had the attribute of self-efficacy.</td>
</tr>
<tr>
<td>Wu et al., (2014)</td>
<td>A Massive Multiplayer Online Role-Playing Game</td>
<td>19 volunteering participants were older than 18 years of age. Respondents in Taiwan and the United States were recruited through their personal connections.</td>
<td>The finding suggests that the resources facilitating conditions is significantly related to the perceived behavioral control.</td>
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</table>

According to ref [23] self-efficacy is the self-confidence of an individual in terms of skills or ability to perform the intended behavior. Resource facilitating conditions refers to digital gamers’ beliefs about the availability of resources for facilitating that behaviour. Those individuals who believe that they have the resources to engage in this technology activity (i.e., high resource facilitating conditions) perceive that they have the ability (i.e., perceived behavioural control) to use the technology [16]. Table 1 is summary of some previous studies related to control beliefs.

Intention to continue, in this study, is the intention of digital gamers to continue playing their favorite digital games. Behavioral intention to continue is a measure of the strength of one’s intention to perform a specified behavior continually. If digital gamers’ behavioral intention to continue is strong, the time duration of engagement (actual behavior) in digital game play will be longer [11].

**MATERIALS AND METHODS**

**Sampling and Data Collection:** The study used snow-ball sampling to collect data. Participation in the survey was voluntary [12]. Subjects for this study were digital gamers in Malaysia, ages above 15 and below 55 years old. This age group was chosen because ESA [13] had confirmed that in 2015, over 90% of digital gamers worldwide were in the age group of 15 to 55 years old with an average age of 35. Digital gamers within this age group had the maturity to express their opinion and perception freely without due influence from parents or guardians [12]. Purposive sampling and snowball technique [30,39] was used to recruit the respondents. This technique was necessary because digital gamers had a network of their own. Outwardly, it was difficult to distinguish a digital gamer from a non-digital gamer. Only a digital gamer could identify someone was of his/her kind.

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Table 2: Questionnaire (items of each construct).

<table>
<thead>
<tr>
<th>Construct/Attribute</th>
<th>Items</th>
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| Perceived Behavioral Control| I was able to play my favorite digital games well  
Playing my favorite digital games is entirely within my control  
I have the knowledge to play my favorite digital games  
I would be able to play my favorite digital games because I have the capability in term of skills to play it.  
I would be able to play my favorite digital games because I have the capability in term of resources to play it. |
| Self-Efficacy               | I am confident of playing my favorite digital games even if there is no one around to show me how to play it.  
I am confident of playing my favorite digital games even if I have never played it before  
I am confident of playing my favorite digital games if I have just seen someone playing it  
I have the capability to play my favorite digital games. |
| Resource facilitating condition | The resources needed to play my favorite digital games are available to me  
I could easily get access to the resources that are needed to play my favorite digital games.  
I have enough hardware, software and services needed to play my favorite digital games  
I have sufficient resources to play my favorite digital games |
| Intention to Continue       | I intend to continue playing my favorite digital games in future  
It is likely that I will continue playing my favorite digital games in future  
If given the chance, I predict I will continue playing my favorite digital games in the future.  
I expect to continue playing my favorite digital games in future. |

Fig. 1: Two-step SEM PLS path model assessment

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Questionnaire: The items in the questionnaires for research instrument development was based on the results of preliminary surveys and the results of previous investigative studies on technology acceptance [12,13,14,15,16,18,19,20,21,22,23,24]. All questionnaire items shown in Table 2 (the instrument) were modified and refined so that they were in tune with the context of the study on digital games.

Analysis Procedure: As mention in previous paper [12], data analysis was carried out using the two-step SEM PLS path model assessment shown in Figure 1. The first step assessed the measurement model using PLS algorithm while the second step assessed the structural model using PLS Bootstrapping. Measurement model assessment used (a) Cronbach’ alpha and composite reliability tests to check for reliability (b) Item factor loading, composite reliability and AVE tests to check for convergent validity and (c) Cross factor loading, square root of AVE and bivariate correlation tests to check for discriminant validity. While structural model assessment used (a) Coefficient of determinant R^2 test to indicate what proportion of the variance of dependent variable that can be explained by the independent variables, (b) Path
coefficients $\beta$ test to check the relationship strength between the latent variables of the research model and (c) the p-value is a numerical measure of the statistical significance of a hypothesis test. Data analysis was carried out using the two-step SEM PLS path model assessment shown in Figure 1.

RESULT AND DISCUSSION

The result and discussion of this study based on 450 questionnaires had been distributed. Four hundred and thirty two (432) questionnaires were returned, indicating a 96 percent rate of return. All the respondents were current gamers of digital games. The reliability of the responses was checked for missing data and extreme response. Having removed 10 responses, the data from 422 respondents were used for further analysis.

Digital Games Usage: The samples from this study have shown that a strategy game is the most popular genre played by the respondents (33 %). Most of the digital games played by the respondents operate on PC platform (54 %). A significant number of the respondents started playing digital games before the age of 15 (54 %). About 56 % of the respondents were early gamers, 58 % of the respondents admitted that they were casual gamers and 27 % admitted that they were hard-core gamers. This statistics is consistent with high levels of usage of casual games among the population of digital gamers [25].

Assessment of Measurement Model: Cronbach Alpha provides an estimate for the reliability based on the indicator of inter-correlations for internal consistency. An internal consistency reliability value of above 0.7 is regarded as satisfactory [30]. In this study, the results of Cronbach-alpha coefficients for all constructs are above 0.858, well above the acceptable value of 0.7 for confirmatory research.

The composite reliability takes into account the fact that indicators have different loadings and can be interpreted in the same way as Cronbach’s Alpha. As Cronbach’s alpha tends to provide severe underestimation of the internal consistency reliability of latent variables in PLS path models, it is more appropriate to apply the composite reliability [30]. According to ref [32], an internal consistency reliability value above 0.7 is regarded as satisfactory. In this study, all constructs exhibited the value of composite reliability above 0.904 which are greater than the acceptable level of 0.7. This indicates that the measurement errors have been relatively small [30,32].

The results of cross factor loadings depicted in this study reveal that each item of measurement has a low correlation with other latent variables (attributes or constructs) of the research model except for the related attributes or construct. Therefore, the items for each attributes or construct were loaded on a single factor without large cross loadings on additional factors [30,32].

Assessment of the Structural Models: Assessing the structural model was performed by the Smart PLS algorithm procedure and SmartPLS bootstrapping re-sampling technique. The essential criteria for the assessment of the structural model were (a) the coefficient of determination, $R^2$, (b) path coefficients, $\beta$ and (c) p-value, $p^{***}<0.001$ and $p^{**}<0.01$ [30][31]. Fig 2 displayed the result of structural model.

The coefficient of determination for dependent variable ($R^2$) is the first essential criterion. The $R^2$ measures the proportion of the variance of a dependent variable that is explained by independent variables [31,33]. According to ref [30], the level of explanatory power ($R^2$) having values of approximately 0.670 is considered substantial; the level of explanatory power having values around 0.333 is considered average and the level of explanatory power having values of 0.190 and lower is considered weak. At all times, a two-tailed P-value was used in this research. A two-tailed P-value of 0.01 would mean that there is a 0.01 (or 1% chance) that the two sets come from the same group.

The research finding in this study demonstrated a positive and significant influence of attitude on the intention behavior to continue playing digital games ($\beta=0.440, \ T\text{-value}=3.431, \ p<0.001$). This result is consistent with past studies of [31,33] in IT and agrees with the study carried out by Lee [24], Kebritchi [19], Boyle et al. [10] in the field of digital games. The significant positive effects of attitude gamers’ belief on the intention behaviour to continue playing digital games in the present study may refer to gamers’ belief that playing the digital games would bring the positive consequences. Without a doubt, when individuals judge digital games with positive attitudes, they will be more inclined to play digital games [10,24]. Hence, the influence of attitude does matter.
Fig. 2: Result of structural model

Perceived behavior control yielded $R^2$ of 38.2% and the two antecedents perceived behavior control self-efficacy and resource facilitating condition were found to be significantly related with a significant value of less than 0.001.

It was suggested that self-efficacy positively affect perceived behavioral control. Empirical evidence supports the hypothesis. The self-efficacy had a significant positive influence on the perceived behavioral control ($\beta=0.411$, $T$-value=7.418, $p<0.001$). The $p$-value explains that the self-efficacy is significant to perceived behavioral control.

Resources facilitating conditions positively affect perceived behavioral control. The empirical evidence supports the research study, that resources facilitating conditions has a positive influence on perceived behavioral control ($\beta=0.307$, $T$-value=5.878, $p<0.001$). The finding suggests that the resources facilitating conditions is highly significantly related to the perceived behavioral control. Intention behavior gamer to continue playing digital games yielded $R^2$ of 38.3% is considered average level of explanatory power measurement of the proportion of the variance of a dependent variable that is explained by independent variables as shown in Fig 1.

CONCLUSIONS

The significant positive effect of perceived behavioral control on individuals' intention seems to be an important factor in influencing individuals' intention to continue playing digital games in Malaysia. Perceived behavioral control is associated with having resource facilitating condition (money, technology, knowledge etc.) and self-efficacy (skill, having no inhabition, having dexterity etc.). In Malaysia, digital gamers below the age of 15 have no problem with resource facilitating condition (normally sourced from parents) and with self-efficacy (digital games on mobiles are frequently played by children aged between three years to five years). This explains why the majority of the respondents (around 53%) started to play digital games before the age of 15. As expected, analysis of perceived behavioral control reveals two significant factors that can affect gamers’ perception of his or her ability to play digital games (i.e., self-efficacy and resource facilitating condition) [36,38].

ACKNOWLEDGMENT

We would also like to express our sincere gratitude to UTM ViCubeLab research group and the Information & Service Systems Innovation Research Group (ISSIRG) who has been supportive throughout our research.

REFERENCES


