

Ads in gaming apps: Experiential value of gamers

Abstract

Purpose- Even though there is a noticeable market value in the mobile gaming apps industry, there has been limited research examining experiential value of gamers in respect to in-game ads in gaming apps. This study fills the void in the literature by examining factors associated with “experiential value of gamers through ads in gaming apps” as well as investigating its antecedents (cognitive and affective involvement) and consequences (positive word of mouth and intention to continue playing the mobile game).

Design/methodology/approach- A total of 600 valid responses from gamers was used to test the model fit, measurement and structural models, conditional probabilistic queries, and nonlinearity.

Findings- This study found that experiential value of gamers through ads in gaming apps is a second-order factor of four constructs: escapism, enjoyment, social affiliation and entertainment. Most of the structural paths between cognitive/affective involvement and dimensions of experiential value are supported. Surprisingly, only social affiliation and entertainment values predict positive word of mouth and intention to continue playing the mobile game, in a nonlinear way.

Originality/value- This study is the first to introduce “experiential value of gamers through ads in gaming apps”. The findings have important implications for companies to develop brand and communication strategies by leveraging specific advertisement formats and present their ads to the right audience in the right gaming apps and at the right time.

Keywords: apps; experiential value; in-game advertising; mobile gaming industry; involvement; word of mouth communication; continuance intention

1. Introduction

In recent years, the global games market represents a prospering sector with high growth potential and high market value. The revenue generated by smartphone and tablet gaming applications is expected to represent 42% of the market globally (Molinillo *et al.*, 2018), which is far better than the PC gaming segment with US \$46.1 billion. People from all socio-demographic groups play digital games (Herrewijn and Poels, 2013) and almost 65% of the total time people spent online is on smartphones and tablets while the time people spent on gaming apps accounts for 32% of the total mobile time (King and Delfabbro, 2019). Not

surprisingly, with the trend of increasing time spent on gaming apps, companies' expenditure on mobile gaming apps advertisements is increasing accordingly. About 75% of iOS and 90% of Google Play revenue came from mobile gaming apps and academic research is turning its attention to in-game advertising (Kim and Shute, 2015) as a new marketing communication channel.

When brands develop in-game advertisements, the key to success is to ensure the advertisement is integrated with the game as seamlessly as possible (Huffpost, 2017). In other words, this means the design of the advertisement should have the same development approach as the game itself on the experiential value of the gamer. Ads in gaming apps is crucial for game developers, as it is the source of their profits (Tang, 2019) for both free of charge and freemium gaming apps. Rutz *et al.* (2019, p. 185) highlight that "in-app advertising is one of the key marketing innovations that allow mobile app publishers to monetize ongoing user engagement". Further, apps sell data related to users' behaviour such as how many seconds a particular ad is viewed and gamers' flow experience after ad viewing. In-app gaming ads help mobile apps to target gamers based on their personalisation criteria (Cheung and To, 2017, Pfiffelmann *et al.*, 2020). The data extracted from gamers' behaviour towards gaming ads is beneficial for advertisers, gaming apps, and business partners.

Gaming apps mainly advertise other games and apps (free, paid, and freemium). By "ads in gaming apps" we refer to those that give rewards, points, or credits after viewing the ads. An example of ads in gaming apps is shown in Appendix A (before viewing) in which some points or credits are given after viewing an ad (Appendix B). Another example, shown in Appendix C (after viewing), is to view an ad to reduce the time of unlocking a bonus in a gaming app. Albeit gamers are not disrupted with this type of ads, they have the authority to click on the ads anytime and there is no ad clutter (the extent of intrusiveness of the ads and its excessive amount in gaming apps) and ad avoidance (referring to all actions taken by gamers which reduce their exposure to ad content) which makes it a unique type of advertising strategy (see Appendices A, B, and C). Nowadays, gaming apps provide a platform where all gamers can create or join groups and do private or group chatting. This type of in-game multifaceted communication is valuable to developers and companies to examine gamers' experience and the extent to which user-generated content is created and shared.

In one hand, some gamers show resentment towards ads in games (Verberckmoes *et al.*, 2016). On the other hand, most mobile companies struggle to monetize apps profitably (Appel *et al.*, 2019). Recent research identified two approaches for monetizing apps: selling

advertising space and selling a paid version (Freemium strategy) (Gu *et al.*, 2018, Appel *et al.*, 2019). We argue that these approaches are not beneficial for gaming apps and a good strategy for monetizing this type of apps is through gamer engagement strategy. This strategy emanates from a perceived experiential value without ad clutter and ad avoidance. Therefore, it is necessary to examine what is the nature of this experience and how it is conducive to beneficial outcomes.

Lewis and Porter (2010) conducts a study on the effect of advertising schema congruity on perceived sense of realism. Chaney *et al.* (2018) examine the impacts of in-game advertising stimuli on brand recognition and brand recall. In addition, Ghosh (2016) study the impacts of in-game advertising on gamers' implicit and explicit memory. Previous research also considered the importance of social setting (Herrewijn and Poels, 2015) and perceived congruity (Verberckmoes *et al.*, 2016) on in-game advertising. Aforementioned studies are not in app context and none of them considered the "*Experiential Value of Gamers through Ads in Gaming Apps*" (hereafter, EVGAGA).

Even though there is a noticeable market value in the mobile gaming apps industry, there has been paucity of research to examine experiential value of gamers in respect to gaming apps. However, an extensive literature review (Okazaki, 2008, Tseng-Lung and Feng, 2014, Geetika *et al.*, 2017, Wagner *et al.*, 2016, So *et al.*, 2009, Mathwick *et al.*, 2001, Lynda *et al.*, 2007, Wu and Liang, 2009) showed that no research so far has attempted to investigate factors associated with experiential value of gamers through ads in gaming apps. There are few studies on the impacts of in-game ads. In addressing the deficiency in the literature related to the gaming apps industry, the aim of the current study is to fill the void in the literature by defining the concept of EVGAGA, and examining its antecedents (in terms of involvement) and consequences (positive Word of Mouth and Intention to Continue Playing the Mobile Game) (hereafter, WOM and ICPMG). Additionally, this research is expected to identify the most influential experiential motives associated with gamers through ads in gaming apps. Therefore, the main goals of this research are:

- To understand the concept of EVGAGA.
- To investigate the antecedents and consequences of EVGAGA.
- To examine the most influential experiential motives associated with gamers through ads in gaming apps.

The rest of the article's organization is noted below. We initially briefly describe the EVGAGA concept and its underpinning theories. Then, the proposed hypotheses are

presented. The methods applied for structural model and hypothesis testing are subsequently provided. The findings and discussion of the results follow, along with a conclusion and managerial implications.

2. Literature review and hypothesis development

2.1. Typology of experiential value and underpinning theories

The theoretical framework of this study is rooted in personal involvement theory of Zaichkowsky (1994) and value theory of Holbrook (1999). Zaichkowsky (1994, p. 59) indicate that “personal involvement inventory is a context-free measure applicable to involvement with products, with advertisements and with purchase situations”. According to her theory, the meaning of the “involvement” concept does not differ across aforementioned domains as it is contingent upon the stimulus object. To conceptualise involvement concept, Zaichkowsky (1986) considered involvement as having main characteristics related to stimuli and situation. In addition, Geetika *et al.* (2017) highlight the importance of user involvement in the form of passive or active participation to boost value in experience. Grewal *et al.* (2009) state that companies started to redefine their value as a way to compete with their competitors through offering enjoyable, memorable, engaging and meaningful experiences to customers. Hence, experiences have become a new offering to users. In line with Zaichkowsky (1994), current study considers the motivational state of involvement and attempts to examine the extent to which users’ involvement with ads in gaming apps would shape their experience and would result in consequences (positive WOM and intention to continue playing the mobile game). Therefore, this study applies personal involvement theory and considers the stimuli as those in-game ads in gaming apps which provide rewards, points, and credits.

Limited studies have attempted to measure the development of experiential value in mobile gaming environments. Mathwick *et al.* (2001) proposed four sources associated with consumer experiential value in a retail environment based on the typology suggested by Holbrook (1999) known as “value theory”. These four sources include “playfulness” (enjoyment and escapism), “aesthetics” (entertainment and visual appeal), “service excellence” and “customer return on investment” (efficiency and economic value).

Furthermore, in the online gaming environment, Koo (2009) developed a theoretical model indicating escapism, enjoyment, aesthetics (visual appeal, entertainment) and social affiliation as experiential motives affecting gamers’ experiential value. The mobile games’ playing experience has theoretical ambiguity and it is a multidimensional variable consisted

of perceived emotional, social, hedonic, and functional values (Ravoniarison and Benito, 2019). In selecting the most relevant factors associated with EVGAGA, this study examined the most relevant theoretical models in experiential value (Okazaki, 2008, Tseng-Lung and Feng, 2014, Geetika *et al.*, 2017, Wagner *et al.*, 2016, So *et al.*, 2009, Mathwick *et al.*, 2001, Lynda *et al.*, 2007, Wu and Liang, 2009). Hence, the current study applies the value theory of Holbrook (1999) and proposes a value landscape framed by five dimensions which include escapism, enjoyment, social affiliation, visual appeal and entertainment. Next section elaborates these dimensions and provides reasoning of choosing them in more details.

2.2. EVGAGA

Das and Varshneya (2017) identified escapism as the extent to which digital gaming is being regarded as an escape from daily routine and relief from boredom by providing fun activity without leaving your comfort zone or experiencing a risky endeavor without endangering yourself. Building upon these studies, escapism value in the present study is identified as a situation where an individual uses an online or gaming environment as a channel to alleviate feelings of depression, to escape from everyday hassle and pressure, or perhaps provide an illusion of freedom or validity.

In the mobile entertainment context, digital games including mobile gaming are often associated with escapism. This can be explained in two ways. First, digital games are viewed as cutting edge virtuality that presents something unreal but believable and only exist in a world of fantasy within the virtual reality of a game. Second, playing and gaming are perceived to be removing oneself from the routine of the real world, i.e. work or responsibilities, for a while that helps individuals experience belonging, achievement of an impossible task that leads to feelings of euphoria, thus, relaxing and relieving stress. Hence, it is entirely different from an individual's ordinary life in the real world (Gray *et al.*, 2018). Additionally, Liu and Chang (2016) also suggested escapism as the most influential factor that is correlated with experiential motives. Based on the aforementioned studies, it is essential to examine the role of escapism in EVGAGA.

According to Teng (2018), enjoyment exhibits the degree to which gaming in an online game is perceived to be enjoyable, exciting, fun, and pleasurable. This intrinsic enjoyment occurs on a self-initiative basis, actively engaging without other concerns for real-world considerations (Babin *et al.*, 1994). The findings of Liu and Chang (2016) show that social interaction, diversion, and shared identity are three of the most influential elements which could intensify gamers' perceived enjoyment in a gaming environment.

Enjoyment plays a significant role in affecting gamers' experiential value since it is related to the playfulness of gaming apps. Online games including mobile gaming apps are perceived as a type of entertainment-oriented technology and individuals play games for entertainment and enjoyment (Kircaburun *et al.*, 2018). Gamers' perceived enjoyment is the focal points in the online entertainment context (Vashisht and Chauhan, 2017) and the primary driving factor influencing their behavioural intention towards online gaming apps. Similarly, Wu and Hsu (2018) suggested that perceived enjoyment notably influence user intention to play games and this successively affects the actual behavior of gamers. In addition, Varshneya and Das (2017) suggested that the major enjoyment experience is derived from the process of socialization. Moreover, socializing without personal interaction makes gamers daring in their interactions as a result gaining excitement. Therefore, the present study considers enjoyment as an essential factor in examining the EVGAGA.

Social affiliation in an online gaming environment is defined as the capacity of an online game to provide opportunity for gamers to exercise the extent of their social requirements with other online gamers, an online gaming environment being artificial can be designed to allow play and social interaction many gamers cannot otherwise achieve (Kircaburun *et al.*, 2018). Kim and Shute (2015) suggested that gamers' enjoyment might arise from interactions with other gamers whether through chat facilities in the game or through playing the game itself. Similarly, Reer and Krämer (2019) indicated that social association among gamers plays an important role in online entertainment, since it helps gamers to accomplish complex goals and evolve in the game while providing the facility of gaining the respect of real opponents based in the real world. In addition, the authors also highlighted that gaming apps allow gamers to act anonymously enabling them to establish their own social identities. In other words, gaming apps indirectly provide a platform for gamers with low self-confidence to build a virtual life for themselves in the online environment.

Visual appeal is a reactive source of aesthetic value (Greussing and Boomgaarden, 2018). The aesthetic dimension is associated with all harmony and pleasure that individuals are capable of experiencing (Faiola *et al.*, 2011). According to Greussing and Boomgaarden (2018), visual appeal is related to attractiveness, design and beauty of appearance that has impact on consumer experience. In regard to the retail environment, visual appeal refers to those salient visual elements, which include color, interior design, graphic layout as well as photographic quality (Lee and Tsai, 2010). While in the online environment, visual appeals

refers to how a website is demonstrated in terms of underlying visual aspects which include words, colors, and pictures (Cyr *et al.*, 2018).

Overmars and Poels (2015) claimed that the relative appeal of visual stimuli is significantly related to consumers' experiential value which in turn affects their perceived usability and satisfaction. Similarly, Bae (2016) also indicated that favourable visual appeal will lead to feelings of satisfaction which in turn increase intention to repurchase. Besides, researchers have shown that visual appeal and perceived usability or liability is judged dependently between each other meaning that what is beautiful and attractive is perceived to be interesting and usable (Bhandari *et al.*, 2018, Sonderegger and Sauer, 2010). Furthermore, Bhandari *et al.* (2018) highlighted that as aesthetic appeal improves, user enjoyment of the websites will increase accordingly. From the gaming world's perspective, the visual appeal of graphics add realism to the gaming experience. Hence, it is essential to examine the role of visual appeal in shaping EVGAGA since it is closely related to their satisfaction and the perceived usability of the gaming apps.

The online gaming industry is primarily concerned with entertainment (Reer and Krämer, 2019) since playing online games is mainly seen as a leisure oriented activity (Gray *et al.*, 2018) and gamers play online games to gain good experience (Wu and Hsu, 2018). Okazaki (2008) claimed that it is vital for practitioners to ensure that mobile games are designed not only to be visually stimulating but also gratifying and being aesthetically attractive since it will directly affect gamers' experiential value and satisfaction. Besides, Vilnai-Yavetz and Rafaeli (2006) highlighted that positive entertainment value will lead to feelings of pleasure and service satisfaction which in turn increase the intention of users to reuse that service. Additionally, Reer and Krämer (2019) pointed out that a high level of entertainment could decrease the disparity between user's expectation and the actual performance. Hence, the present study proposes that entertainment is associated with EVGAGA.

2.3. Cognitive and affective involvement

Grounded in personal involvement theory, cognitive involvement (hereafter, CI) refers to the level of individual relevance of message implications in terms of the product or service's functional performance (Park and Young, 1986). According to Park and Young (1986), Affective Involvement (hereafter, AI) reflects the extent of individual relevance of a message in terms of emotion to an individual's stimulus to represent an ideal or real personal image to others. In other words, CI emphasizes individuals' rational processing activities and the

accomplishment of idealization states. In contrast, AI emphasizes individuals' accomplishments of specific emotional states which demonstrate moods and feelings aroused by an object (Soni, 2017). In a review paper, Geetika *et al.* (2017, p. 341) indicate that "scholars argued about the importance of customer involvement in the form of passive or active participation to enhance value in experience". They also consider involvement as a possible internal antecedent of experiential value (P. 349).

Nikhashemi and Valaei (2018) indicated that both affective and cognitive processing constitute parts of the experiential formation. Referring rational processing, the authors identified the inner state of incoming stimuli to the individual. Rose *et al.* (2011) suggested that consumers will review incoming stimulation based on past, current, and potentially future experiences. Chatzakou *et al.* (2017) stated that individuals' emotion reflects their response to an online stimulus, while the stimulus would be the elements of the online platform to which an individual is exposed. At the same time, the author also suggested that the consequence of emotional and cognitive transforming is the evolvement of beliefs and attitudes in an individual.

Additionally, findings by Sullivan *et al.* (2012) showed that AI has a significant positive impact on aesthetic value while CI influences on escapism value. The study revealed that affective consumers tend to assess perceived experience and products through non-economic benchmarks such as escapism and aesthetic values. Hence, they are more willing to trade economic value or efficiency for visual appeal or experience that makes them feel as they are "getting away from the real" and forgetting real-life problems. In contrast, cognitive consumers will conduct a complex and rational decision-making process and they are more concerned with the value that such products and services could deliver to them which directly affects their experiential value. Therefore, the current research hypothesizes that cognitive and AI are significantly related to all dimensions of EVGAGA (schematically shown in Figure 1).

H1: CI is positively associated with EVGAGA.

CI is positively associated with **H1a:** Escapism value; **H1b:** Enjoyment value; **H1c:** Social affiliation value; **H1d:** Visual appeal; **H1e:** Entertainment value.

H2: AI is positively associated with EVGAGA.

AI is positively associated with **H2a:** Escapism VGAGA; **H2b:** Enjoyment VGAGA; **H2c:** Social affiliation VGAGA; **H2d:** Visual appeal VGAGA; **H2e:** Entertainment VGAGA.

2.4. Positive WOM

Nikhashemi and Valaei (2017) stated that WOM is probably the oldest media tactic in which the opinions or information about services, brand or product are developed and spread to others non-commercially. Consumers view information expressed by words-of-mouth with less skepticism as compared with those company-initiated marketing efforts. Positive WOM is viewed to be more vital in a services context since services are physically intangible, harder to standardize, and involve greater credence characteristic as compared to tangible products (Aroean *et al.*, 2018). Hence, positive WOM will be invaluable when services are highly intangible and hard to evaluate. Libai *et al.* (2010) claimed that the opinion and experience of the words-of-mouth sender will carry much greater weight than other sources of information since there is a higher degree of similarity between sender and receivers and there is not any financial motive on the part of another party.

The intention of positive WOM communication is often associated with trust (Nikhashemi and Valaei, 2017), customer satisfaction (Jung and Seock, 2017), quality, and positive experiential value (Varshneya and Das, 2017). The study by Limbach *et al.* (2019) found that the in-game advertising has impacts on consumers' implicit (and not explicit) brand knowledge. According to Geetika *et al.* (2017) customers will encounter a psychological tension which stimulates them to share experiences with others when they get involved in an experience. Additionally, consumers who deduce hedonic value from experiences have a tendency to deliver WOM more frequently since it gives them a sense of heightened fulfillment (Arnold and Reynolds, 2003). Kara and Kucukemiroglu (2015) indicated that the content of WOM will vary depending on the experiential value emanated from an experience. Given the importance of positive WOM to service providers and game developers, it is essential to investigate the relationships between experiential value and WOM communication in the gaming app industry.

H3: EVGAGA is positively associated with positive WOM.

H3a: Escapism VGAGA is positively associated with positive WOM.

H3b: Enjoyment VGAGA is positively associated with positive WOM.

H3c: Social affiliation VGAGA is positively associated with positive WOM.

H3d: Visual appeal VGAGA is positively associated with positive WOM.

H3e: Entertainment VGAGA is positively associated with positive WOM.

2.5 ICPMG

Drawing on psychological ownership and schema theories, the findings of Mishra and Malhotra (2020) indicate that the nature of in-game ads is intrusive to gamer's attitude towards game. The determinants proposed in studies examining continuance intention consist of two categories: cognitive and affective factors (Lee and Kwon, 2011). Cognition-oriented factors are associated with mental processes of knowing such as perception and judgment which are found to have effects on IT service continued usage. For example, driving forces such as perceived value, security, perceived usefulness, perceived ease of use, conformation and perceived usability all fall into the cognitive category. Recently, research on continuance intention has changed its emphasis from cognitive elements to affective elements. Affective forces are related to specific emotions and feelings i.e., perceived enjoyment, pleasure, playfulness, and arousal (Nikhashemi and Valaei, 2018).

Prior studies validated the effect of perceived enjoyment (Hsiao *et al.*, 2016, Lee and Tsai, 2010) and perceived playfulness (Hsiao and Chen, 2016) on users' continuance intention. Additionally, Okazaki (2008) showed that efficiency, escapism, intrinsic enjoyment, economic value, perceived novelty and perceived recklessness have significant relationships with gamers' perceptions toward experiential value and subsequently affect their intention to download games. However, on the other hand, Liu and Li (2011) claimed that perceived enjoyment does not impact on continuance intention directly, but it is significantly related to attitude. Research is limited on the experiential values of gaming apps, and to address the inconsistencies in prior research, the current study postulates the following hypotheses, as schematically shown in Figure 1.

H4: EVGAGA is positively associated with ICPMG.

H4a: Escapism VGAGA is positively associated with ICPMG.

H4b: Enjoyment VGAGA is positively associated with ICPMG.

H4c: Social affiliation VGAGA is positively associated with ICPMG.

H4d: Visual appeal VGAGA is positively associated with ICPMG.

H4e: Entertainment VGAGA is positively associated with ICPMG.

Figure 1: Theoretical framework (Insert here)

3. Research method

Since the population of Malaysian gaming apps users are unavailable in this research, this study used purposive sampling, as a non-probability sampling approach (Barratt *et al.*, 2015). This research purposely considers the experienced mobile apps users to understand how gamer experience is perceived after viewing in-game ads and the extent to which it is conducive to their positive WOM and continuance intention to play the gaming app.

Individuals who play mobile gaming apps through their smartphones or tablets are selected as the target population. The prerequisite of having experience in playing mobile games is set to avoid any possible bias and ensure reliability and validity. In addition, the measurement items were adapted from prior research which is a methodological norm in measuring latent variables in social science (Westland, 2015). Measurement items of CI and AI were adopted from Zaichkowsky (1994). Measurement items of escapism and entertainment (So *et al.*, 2009), enjoyment and social affiliation (Koo, 2009), and visual appeal (Mathwick *et al.*, 2001) were adopted from previous established researches. Measurement items of positive WOM were taken from Tuškej *et al.* (2013) and the items of continuance intention to play the gaming apps were adopted from Bhattacharjee (2001) (see Appendix D for the list of measurement items).

Before analyzing the data, several steps are taken to avoid any common method bias (CMB). For example, Harman's "one factor test" (Podsakoff *et al.*, 2003) indicates that CMB is no threat to the results, as the findings of principal component analysis demonstrated that the total variance is 40.19% which is below the threshold of 50%. In addition, following Bagozzi's guidelines (Bagozzi *et al.*, 1991), the highest correlation between constructs is 0.748 (correlation between social affiliation and enjoyment, shown in Table 3a), therefore, CMB is not a concern in this research.

Furthermore, 607 responses were received from Malaysian gamers. The respondents are Malay, Chinese, and Indian as cultural citizens of the country. Using SPSS software version 23, this study treated the missing values applying "expectation-maximization algorithm" (EMA) (Little, 1988). Seven responses were removed and a sample size of 600 cases was considered for further analysis. Acceptable responses were recorded through Qualtrics online questionnaire. The data were collected within a month from private universities (Sunway University, Taylor's University, Monash University, and Multimedia University) through email and only those respondents who answered "Yes" to the preliminary questions of "Do you regularly play mobile games?" and "Have you experienced

watching in-game ads which give rewards, points, or credits while playing mobile games?” were considered for data analysis. The examples of appendices A and B were also included in the online questionnaire after the latter question to ensure the validity of the responses. The game used by this study is a vehicular combat game called “World of Tanks Blitz” which is a famous free-to-play massively multiplayer mobile game provided for different platforms such as iOS and Android. To assess the sample size efficiency and estimate the power analysis in terms of “inverse square root” and “gamma-exponential” methods, the guidelines of Kock and Hadaya (2018) were used. According to aforementioned researchers, the “minimum sample size in PLS-SEM”, with the minimum absolute significant path coefficient in the theoretical framework (see Figure 2), with Beta=0.218 (the CI → Escapism path coefficient), and the significance level of P=0.01, a sample size of 332 cases (according to the “inverse square root” approach) or a sample of 311 cases (according to “gamma-exponential” approach) is required to have high power level of 99% (see Appendix E). Therefore, the sample size of 600 is sufficient for further analysis.

A 7-level Likert scale was anchored on “1: strongly disagree” and “7: strongly agree”. Sample data is summarized in Table 1. To analyze the measurement and structural models, SmartPLS 3.2.4 (Ringle *et al.*, 2015) and WarpPLS 6.0 (Kock, 2017) were used to apply “Consistent PLS” (PLSc). The former is applied to examine the measurement model checking the validity and reliability as well as analyzing the structural model for conducting the predictive relevancy, bootstrapping, and multi-group analyses. The latter software is used to examine the level of model fit and other advanced analyses such as nonlinearity and Conditional Probabilistic Queries (hereafter, CPQ).

Table 1: Sample information (N= 600) (Insert here)

3.1. Measurement model

Prior to examining the structural model, we ensured that the model is reliable, valid, and has a good fit. Shown in Appendix F, several indices are assessed and the results indicate that the theoretical model has a good fit. To estimate the measurement model criteria, Alpha, composite reliability, rho_A, AVE, and discriminant validity are assessed. Shown in Table 2, the AVEs are greater than 0.5 and all factor loadings, composite reliability, rho_A, and Cronbach’s alpha values are greater than 0.7, meeting the threshold. The VIF values are below the threshold and there is no multicollinearity amongst the variables. Figure 2 schematically shows the measurement model.

Table 2: Reliability and validity (Insert here)

Figure 2: Measurement model (Insert here)

To examine the discriminant validity between latent variables, Table 3a tabulates the Fornell-Larcker criterion (Fornell and Larcker, 1981). The findings demonstrate that this criterion is met as the correlation between the latent variables is lower than the square roots of AVEs (diagonal values). Furthermore, according to Henseler *et al.* (2015), the Heterotrait-monotrait ratio is the most valid criterion for examining the discriminant validity. Tabulated in Table 3b, all values are below 0.9, establishing discriminant validity between constructs.

Table 3a: Fornell-Larcker criterion (Insert here)

Table 3b: Heterotrait-monotrait ratio (Insert here)

4. Results

4.1. Structural model

The R^2 (0.593 and 0.575) and Q^2 (0.467 and 0.477) values of positive WOM and ICPMG suggest high predictive relevancy of the proposed model with large effect sizes. Table 4 shows the results of hypothesis testing for direct relationships. The structural paths between CI and dimensions of EVGAGA indicate that the relationship between CI and enjoyment (Path coefficient: 0.103; T-value: 0.695), and entertainment (Path coefficient: 0.202; T-value: 1.436) is rejected. There was also no relationship between AI and visual appeal (Path coefficient: -0.011; T-value: 0.690). Surprisingly, only social affiliation and entertainment values predict positive WOM and ICPMG.

Table 4: Results of hypothesis testing-direct effects (Insert here)

4.2. Additional advanced analysis

4.2.1. Findings of Multi Group Analysis (MGA)

Several studies fail to report the heterogeneity in data which leads to erroneous interpretations (Becker *et al.*, 2013). PLS-MGA, parametric test, and Welch-Satterthwait test are applied to examine the extent to which structural relationships differ across different demographic variables: degree of attachment to game, gender, ethnicity, income, and education. The PLS-MGA results indicate that there is no significant difference across gender

and education groups. The relationship between Enjoyment → ICPMG is stronger (P-value = 0.950) for those having high level of attachment to games. The relationships between Entertainment → Positive WOM (P-value = 0.003) as well as Social affiliation → Positive WOM (P-value = 0.009) is stronger for “below RM3000” (around US\$1000) income group and the path between Escapism → Positive WOM is stronger (P-value = 0.985) for “RM3000 to RM6999” income group. The relationship between Social affiliation → ICPMG (P-value = 0.026), Visual appeal → ICPMG (P-value = 0.020), as well as Visual appeal → Positive WOM (P-value = 0.046) is stronger for Chinese ethnic group. The significance level of the P-values of these relationships were also similar across parametric and Welch-Satterthwait tests.

4.2.2. Findings of CPQ

This research also computes complicated probabilities by CPQ applying compositions of latent variables, logical and relational operators which is rooted in Bayes’ theorem. Previous research (Kock, 2017) indicate that conditional probabilities is not evaluated through path coefficients, and assessing them will contribute to the relevant literature in terms of the extent to which gaming app users behave in mobile environment. In current research, after examining multiple queries detect highest probabilities, four queries were found with the greatest percentage as follows: 1. What is the probability that positive WOM is high after gamers play the gaming apps, if the level of CI and AI is high? 2. What is the probability that positive WOM is high, if the level of escapism, enjoyment, social affiliation, visual appeal, and entertainment is high? 3. What is the probability that ICPMG is high, if the level of CI and AI is high. 4. What is the probability that ICPMG is high, if the level of escapism, enjoyment, social affiliation, and entertainment is high? Surprisingly, the findings of CPQ indicate that the conditional probabilities of these four queries are 70%, 90%, 60%, and 94.7%, respectively (See Table 5).

Table 5: Results of conditional probabilistic queries (Insert here)

4.2.3. Findings of nonlinear relationships

Several correlations amongst variables in behavioral researches are nonlinear and, according to previous research (Kock, 2015b), most of the “multivariate statistical analysis” approaches have linear presumptions. Using a nonlinear VB-SEM software, the current research also examines which relationships in the proposed model have nonlinear nature. Warp3 algorithm is applied to identify the “warped” relationships. This algorithm abates the number of

instances of “Simpson’s paradox” as well (Kock, 2015a). Interestingly, in addition to the positive linear relationships between entertainment and positive WOM as well as social affiliation and ICPMG (see Table 4), the findings also imply that these relationships are warped, as illustrated in Figures 3 and 4. For example, to consider the nonlinear association between entertainment and positive WOM (as shown in Figure 3), the S-curve demonstrate that the inflection tip is around -0.35 “Standard Deviations” (SD) from the mean value. The initial U-curve stretches from -2.68 to -1.91 SD from the mean value, where the minimum degree of entertainment value is shown in the U-curve. It can be construed that an increase in entertainment value results in a decrease in positive WOM. After that (the second U-curve), an increment to entertainment value results to a boost in positive WOM. The S-curve from Social affiliation → ICPMG relationship (as schematically shown in Figure 4) demonstrates that the initial U-curve stretches from -2.51 to -1.76 SD from the mean value, where the minimum level of social affiliation is obtained for the U-curve. This indicates that an increase in social affiliation results in a decrease in ICPMG. Furthermore, the second U-curve demonstrates that an increment in social affiliation leads to an increase in ICPMG. Aforementioned results highlight the potential boundary conditions of entertainment and social affiliation values in positive WOM, and ICPMG.

Figure 3: Nonlinear relationship between entertainment and positive WOM (Insert here)

Figure 4: Nonlinear relationship between social affiliation and ICPMG (Insert here)

5. Discussion and conclusion

This study is the first of its kind to define and gauge the concept of EVGAGA and the findings showed that this concept is comprised of four constructs: escapism, enjoyment, social affiliation and entertainment. Contrary to the study by Sullivan *et al.* (2012), the findings suggested a significant relationship between CI and escapism value. According to previous research (Gray *et al.*, 2018), gamers who focus on CI have high tendency to engage in and enjoy the process of thinking. Gamers with higher need for cognition tend to evaluate advertising information more thoroughly. Since escapism is an emotional value that derives from arousing feelings or affective states, such intense information processing behavior could significantly boost the perceived escapism value that gamers experience from the ads in gaming apps. Hence, in-apps advertisements that mainly deliver escapism value instead of logical argument and beneficial consequences might be valued by gamers with high cognitive processing style. Mathwick *et al.* (2001) and Mulcahy *et al.* (2018) claimed that perceived

enjoyment value is significantly reduced among cognitive processing style and goal-oriented shoppers. Hence, gamers with higher cognitive processing needs would perceive lesser enjoyment value from ads in gaming apps that are emotion-based, since they tend to value the actual beneficial consequences derived from the ads more (Green *et al.*, 2006).

In contrast to previous literature which found an insignificant relationship between CI and visual appeal value (Sullivan *et al.*, 2012), the results showed that these variables are positively associated, perhaps due to the nature of ads in gaming apps in which the gamers receive rewards, points, and credits while viewing the adds. According to Nikhashemi and Valaei (2018), cognitive states refer to everything that goes on in an individual's mind regarding to the acquisition, processing, retention, and retrieval of information. The findings revealed that gamers with higher cognitive processing needs might appreciate the visual appeal value of ads in gaming apps. In addition, contrary to the study by Nabi and Krcmar (2006), this research found an insignificant relationship between CI and entertainment value. Cognitive gamers tend to focus on performance attributes and the capabilities of achievement of certain task (Kozhevnikov *et al.*, 2018) instead of the entertainment value of the ads in gaming apps. Indeed, entertainment is derived from hedonic instead of utilitarian value. Hence, cognitive gamers who are driven by utilitarian or functional value would appreciate usefulness and actual beneficial consequences of the advertisement instead of its entertainment value (Smith and Colgate, 2007). Therefore, contrary to our hypothesis, even providing gamers with rewards, points, and credits when viewing the in-app ads will not give them high enjoyment value.

In line with Varki *et al.* (2003), the results showed a positive relationship between CI and social affiliation value. Social association among gamers plays a significant role in online gaming context, since it helps gamers to accomplish complex goals and evolve in the game. Therefore, cognitive gamers who are stimulated by utilitarian value would appreciate the social affiliation value derived by the ads in gaming apps, since it helps them in making more friends and completing complex goals in the game.

Referring to the relationship between AI and experiential value, the results supported the positive association between AI and escapism value. Mathwick *et al.* (2001) indicated that escapism value emanates from a state of psychological immersion in which an individual could escape from daily trepidation, restraints and responsibilities within a period of time. Subsequently, affective gamers tend to value narrative advertising that evokes an individual's affective and emotional response through storytelling and drama since these advertisements could help them to escape from daily routine and provide relief from boredom. Thus, this

study concludes the existence of a positive direct relationship between AI and escapism value of gamers through ads in gaming apps.

In line with previous studies (Green *et al.*, 2006; Sherry, 2006) the significant relationship between AI and enjoyment value is substantiated. Nabi and Krcmar (2006) conceptualized enjoyment as an attitude with affective elements, in other words, enjoyment is affectively driven. Hence, when gamers become emotionally involved with a gaming app, they will perceive higher level of enjoyment as they will be distracting from personal concerns which allows them to foster a sense of connection with the games and the in-app ads.

Even though previous researchers (Reimann *et al.*, 2010) postulated a relationship between AI and aesthetic value, this relationship is not supported in the gaming apps context. Mathwick *et al.* (2001) viewed visual appeal as a dimension related to attractiveness, design and beauty of appearance that has impact on consumer experience in the retail shopping context. This study concluded that affective gamers perhaps do not appreciate the visual appeal value derived from the in-app ads in gaming apps. This could be due to the nature of those in-game ads (as shown in appendices A, B, and C) that provide gamers with rewards, points, or credits after watching the ads. Therefore, it appears that the gamers mainly prefer to receive those benefits to redeem them rather than appreciating the visual appeal of ads.

This study also found a positive association between AI and entertainment. Affective gamers value the entertainment experience instead of the capability of the online environment to facilitate the achievement of a particular task (Argasiński and Węgrzyn, 2018). Indeed, entertainment is driven by hedonic value such as searching for fun, fantasy and relaxing. Hsu and Chen (2018)'s study on the website gamification showed that both hedonic and utilitarian features positively impact on user experience. Hence, gamers who are hedonically and emotionally motivated, would perceive an entertaining value through in-app ads in gaming apps, perhaps due to the received rewards, points, or credits. The results also showed that AI positively influences social affiliation of gamers. Affective gamers value the social group when they participate and engage in an online community including gaming apps.

The studies on the impacts of experiential value and positive WOM are limited. Surprisingly, only social affiliation and entertainment are associated with positive WOM. This indicates that gamers will have positive interactions with other people or groups as well as feeling more entertained and share this experience after receiving the benefits of watching in-game ads.

While the study by Vashisht and Chauhan (2017) and Wu and Hsu (2018) found a positive relationship between enjoyment and continuance intention, the results of this research, in line with Liu and Li (2011), suggest no relationship between these constructs. Furthermore, contrary to the study by Young *et al.*, (2017), the results indicate no relationship between escapism and ICPMG. Perhaps, this is due to the nature of in-game ads which resonates ad clutter amongst gamers even if they receive rewards, points, or credits. Inconsistent with the findings of Bae (2016), the results of this research also suggest no significant relationship between visual appeal and ICPMG. It appears that the visual appeal of ads graphics is not relevant to ICPMG.

Consistent with Vervoort (2018), this study finds a positive relationship between social affiliation and ICPMG in spite of the fact that gamers value the social group and continue playing the games. In line with Reer and Krämer (2019), the results indicate the importance of entertainment value on ICPMG. It appears that gamers still feel the fantasy and relaxing experience after receiving the benefits of viewing the ads.

6. Managerial implications

Mobile gaming is performing as the most lucrative segment with the highest potential growth (Valaei *et al.*, 2020). Due to the “persuasive power of advergames”, it has received great attention in the literature of mobile apps (Catalán *et al.*, 2019, p. 503). Advergames are used as brand promotion strategy (Vashisht *et al.*, 2019) mainly in the form of interstitials. Research on the implication of interstitial mobile gaming ads is in its infancy and user behaviour towards this type of ads needs more investigation in the app environment in general and gaming apps in particular.

The findings of this study implied that in-game ads that provide users with rewards, points, or credits after watching the ads, not only is a good strategy for gaming companies, but also has positive benefits. Nowadays, the gaming apps metrics for developers are resorted to the number of downloads, the average time of using these apps (stickiness), and contents being generated in online communities (Liao *et al.*, 2020). However, the findings showed that the positive EVGAGA is related to positive WOM communication and continuance intention to play gaming apps (mainly their social affiliation and entertainment values). Therefore, companies and ads agencies should follow this strategy to reduce the ad avoidance and ad clutter. Users show more tolerance towards in-app ads when the purpose is for providing information or user assistance (Tang, 2019). It is likely that users show more tolerance if the in-game ads in gaming apps are for informational purposes or suggestions for downloading

similar games based on user preferences, thereby stimulating in-app purchases and generating more revenue for gaming apps.

In addition, gaming apps facilitate a platform where all gamers can create or join online gaming communities and partake in private or group chatting. This type of in-game multifaceted communication is valuable to developers and companies to examine gamers' experience and the extent to which user-generated content is created and shared. The findings showed that a good strategy for monetizing the gaming apps is through gamer engagement strategy. Therefore, companies can develop brand and communication strategies by leveraging specific advertisement formats (for instance, choosing ad background colors which stimulates social affiliation and entertainment) and present their ads to the right audience in the right gaming apps and at the right time.

According to Microsoft's Massive, mobile advertising through gaming apps has been found to increase brand recommendation by 23%, purchase intention by 24%, and overall brand rating by 32% (Khan, 2017). Nam and Kim (2020) indicate that the number of user ratings have strong impacts on both mobile game revenue and the number of downloads in South Korean gaming companies. Several companies consider in-game advertising as their pure business model (Landoni *et al.*, 2019). The main revenue streams of such business model is generated by game users (Landoni *et al.*, 2019). Therefore, according to the findings of this study, if ad agencies and game developers formulate a user engagement approach, chances are that positive outcomes will be reached.

In this study, we calculated many complicated probabilistic queries from which four conditions showed the greatest conditional probability. The findings of CPQ are beneficial for scholars, practitioners, and managers (Kock, 2017). The results showed that with 90% probability, positive WOM is high, if the level of escapism, enjoyment, social affiliation, visual appeal, and entertainment is high. With 94.7% probability, ICPMG is high if the level of escapism, enjoyment, social affiliation, and entertainment is high. In addition, the nonlinear nature of entertainment and social affiliation values sheds more light on our existing knowledge of how an overemphasis on these values may have a negative result. Therefore, managers and CTOs or CIOs should consider the potential boundary conditions of entertainment and social affiliation values in positive WOM and ICPMG.

Finally, given the growing recognition of creating and providing experience-based perceptions of value, past findings have strongly advocated the importance of further academic study related in this topic (Khan, 2017; Vashisht and Chauhan, 2017). The findings of this study are valuable to brands and organizations to make better decisions when they

plan to place advertisements in gaming apps. By understanding factors associated with EVGAGA, organizations could leverage specific advertisement formats and present their ads to the right audience in the right game apps and at the right time to develop competitive positioning that help cultivate long term loyalty and engagement with gamers.

7. Limitations and future research

Future studies should investigate how the proposed relationships vary across demographics particularly age groups. More investigation is required to evaluate the impacts of types of games on EVGAGA. It is likely that EVGAGA would be different across adventure, arcade, role-playing, and strategy gaming apps. In addition, types of in-game ads could also have different impacts on EVGAGA. More research should be conducted on how EVGAGA is different across advergames (Catalán *et al.*, 2019), and static as well as dynamic in-game ads.

This study examined the impacts of EVGAGA on positive WOM. Future research should consider negative WOM as well as eWOM. Furthermore, other antecedents and consequences of EVGAGA should also be elaborated. Further investigation is also required to examine EVGAGA in other countries considering the fact that some hypotheses are rejected and some relationships are supported with 90 percent of probability. Finally, data were collected from gamers from private universities and even though the sample size of this study is sufficient and effective to detect power, it should not be generalised to the whole population.

Appendix A: Example of game A before viewing an ad

Appendix B: Example of game A after viewing an ad

Appendix C: Example of game B after viewing an ad

Appendix D: Measurement scale

Appendix E: Sample size efficiency

Appendix F: Model fit and quality indices

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Figure 1: Theoretical framework

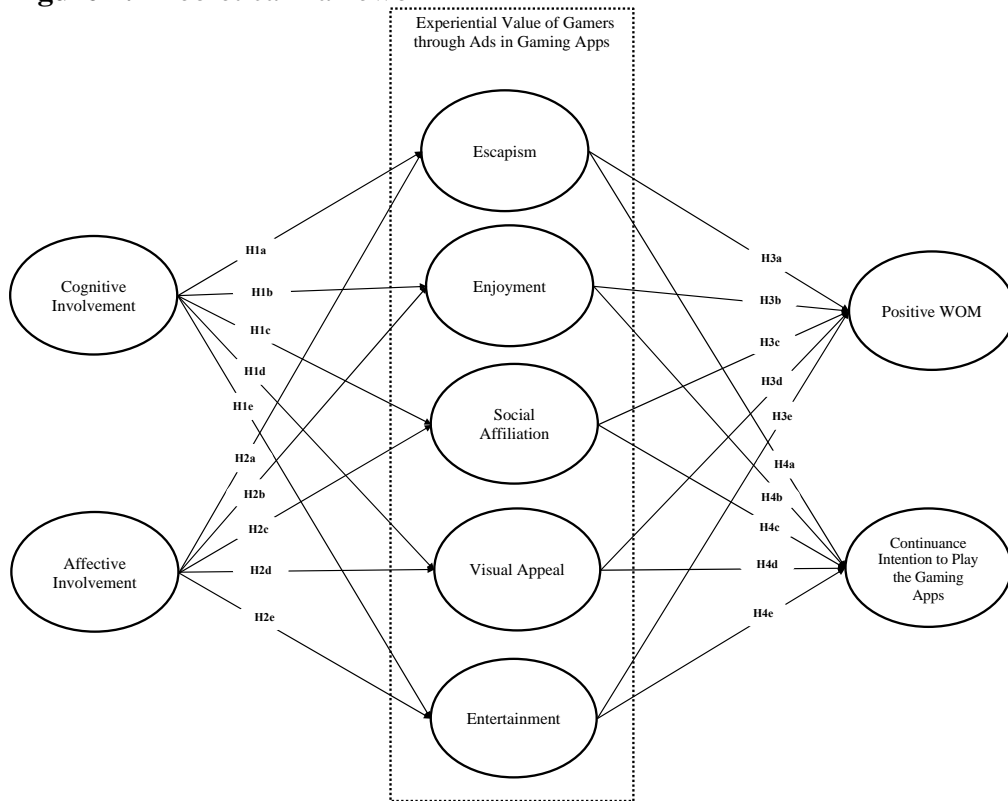


Figure 2: Measurement model

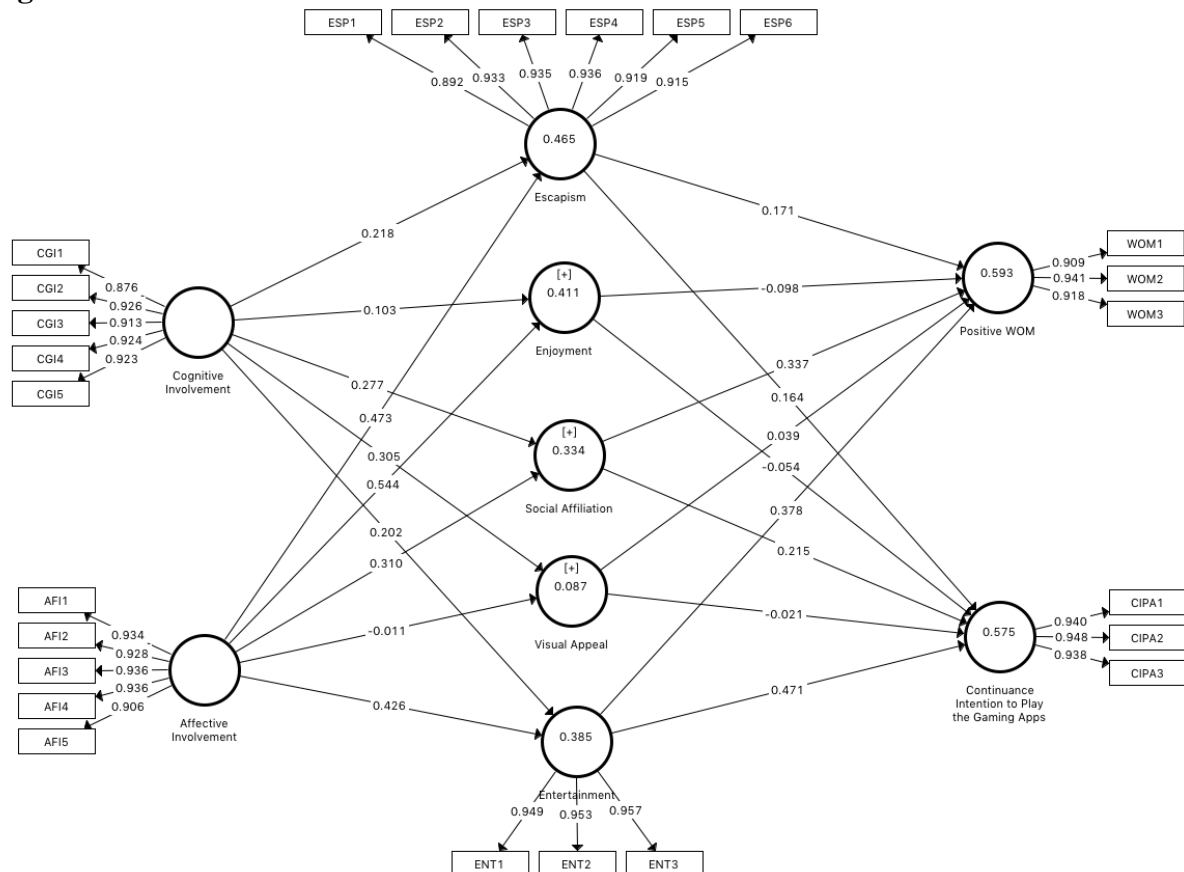


Figure 3: Nonlinear relationship between entertainment and positive WOM

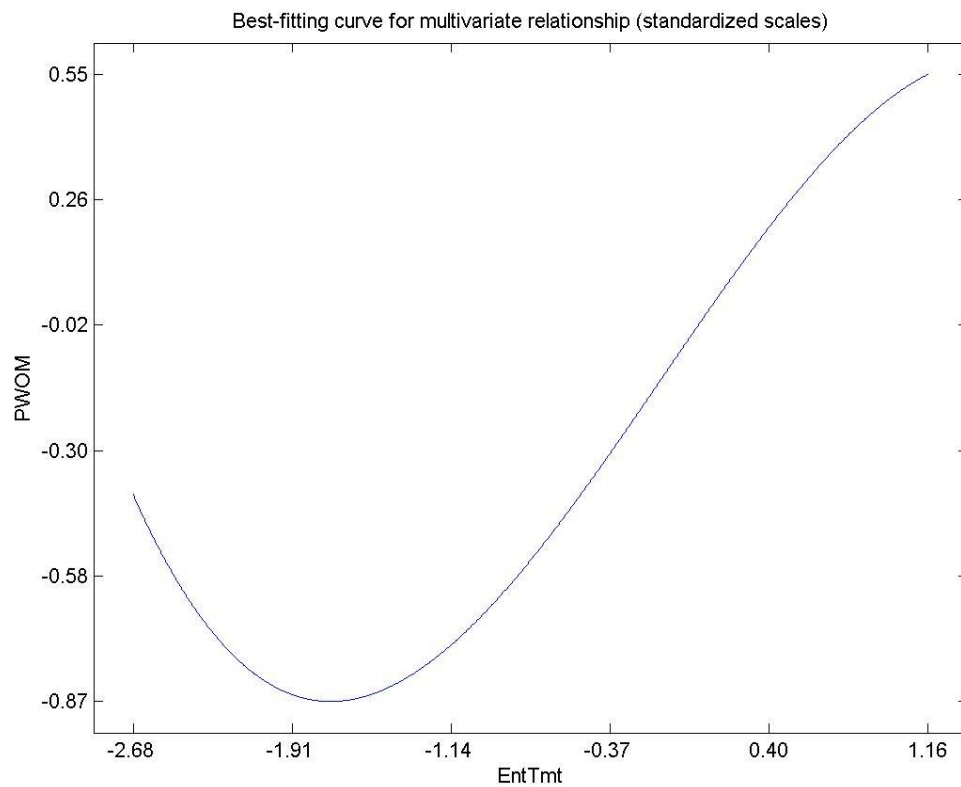
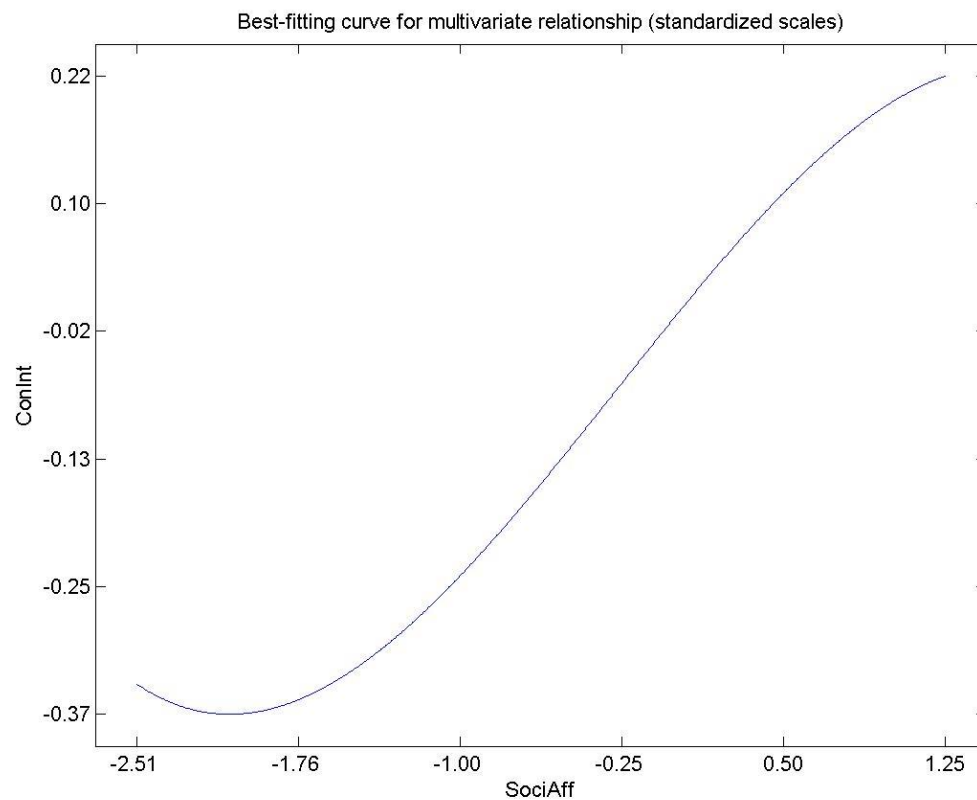


Figure 4: Nonlinear relationship between social affiliation and continuance intention to play the gaming apps



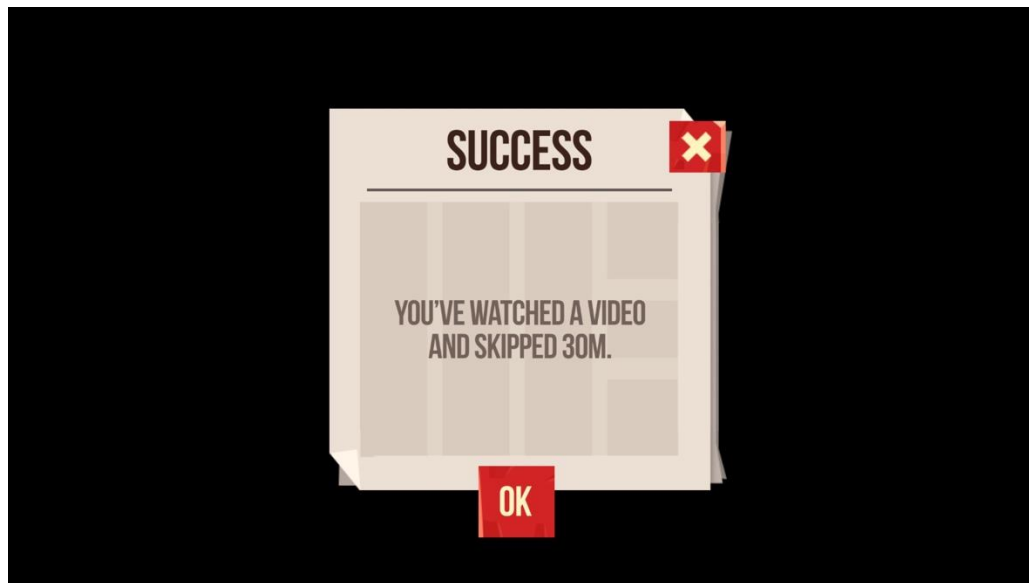
Appendix A: Example of game A before viewing an ad



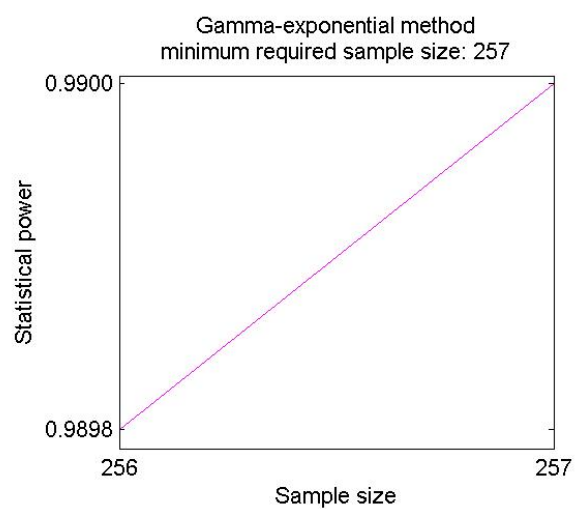
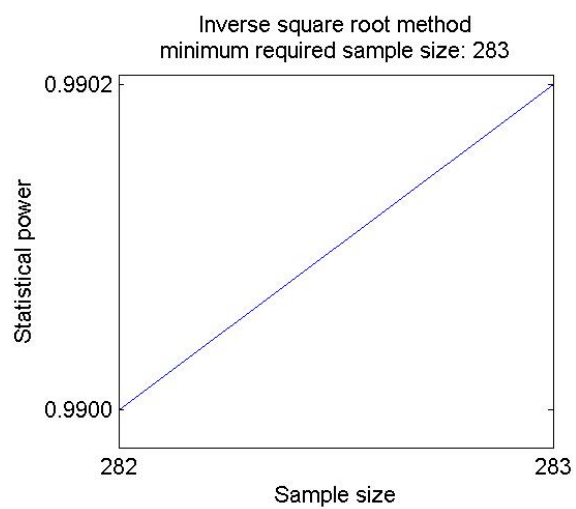
Appendix B: Example of game A after viewing an ad



Appendix C: Example of game B after viewing an ad



Appendix E: Sample size efficiency



List of Tables

Table 1: Sample characteristics (*N*=600)

	Characteristic	Frequency	Percent
Gender	Male	336	56.0
	Female	264	44.0
Ethnicity	Malay	102	17.0
	Chinese	414	69.0
	Indian	60	10.0
	Other	24	4.0
Education	Pre-university	154	25.7
	Bachelor degree	396	66.0
	Master degree	30	5.0
	Professional degree	4	0.7
	Others	16	2.6
Income/ monthly allowance	Below RM3000	426	71.0
	RM3001 to RM6009	152	25.3
	More than RM7000	22	3.7
Degree of attachment to game	High	160	26.7
	Medium	238	39.7
	Low	202	33.6

Table 2: Construct validity and reliability

Constructs	Item	Item Loading	Cronbach Alpha	Rho_A	AVE	Composite Reliability
Affective Involvement	AFI1	0.934	0.960	0.960	0.969	0.861
	AFI2	0.928				
	AFI3	0.936				
	AFI4	0.936				
	AFI5	0.906				
Cognitive Involvement	CGI1	0.876	0.950	0.950	0.961	0.833
	CGI2	0.926				
	CGI3	0.913				
	CGI4	0.924				
	CGI5	0.923				
Enjoyment	ENJ1	0.947	0.970	0.970	0.978	0.918
	ENJ2	0.960				
	ENJ3	0.964				
	ENJ4	0.962				
Entertainment	ENT1	0.949	0.949	0.950	0.967	0.908
	ENT2	0.953				
	ENT3	0.957				
Escapism	ESP1	0.892	0.965	0.965	0.971	0.850
	ESP2	0.933				
	ESP3	0.935				
	ESP4	0.936				
	ESP5	0.919				
	ESP6	0.915				
Social Affiliation	SA1	0.923	0.938	0.939	0.956	0.843
	SA2	0.885				
	SA3	0.924				

Visual Appeal	SA4	0.940				
	VA1	0.960	0.957	0.964	0.972	0.920
	VA2	0.959				
Positive WOM	VA3	0.959				
	WOM1	0.909	0.913	0.914	0.945	0.852
	WOM2	0.941				
Continuance Intention to Play the Gaming Apps	WOM3	0.918				
	CIPA1	0.940	0.936	0.937	0.959	0.887
	CIPA2	0.948				
	CIPA3	0.938				

Note: AVE: Average Variance Extracted

Table 3a: Fornell-Larcker criterion - discriminant validity

Constructs	1	2	3	4	5	6	7	8	9
AFI (1)	0.928								
CGI (2)	0.639	0.912							
CIPGA (3)	0.436	0.405	0.942						
Enjoyment (4)	0.640	0.613	0.599	0.958					
Entertainment (5)	0.616	0.603	0.741	0.712	0.953				
Escapism (6)	0.678	0.662	0.717	0.703	0.794	0.922			
Positive WOM (7)	0.449	0.425	0.731	0.701	0.738	0.729	0.923		
Social Affiliation (8)	0.570	0.568	0.701	0.748	0.737	0.675	0.631	0.918	
Visual Appeal (9)	0.276	0.295	0.254	0.343	0.364	0.353	0.303	0.295	0.959

Notes: The off-diagonal values are the square roots of AVEs. AFI: Affective Involvement; CFI: Cognitive Involvement; CIPGA: Continuance Intention to Play the Gaming Apps.

Table 3b: Heterotrait-monotrait ratio

Constructs	1	2	3	4	5	6	7	8
CGI (2)	0.884							
CIPGA (3)	0.460	0.429						
Enjoyment (4)	0.663	0.639	0.734					
Entertainment (5)	0.645	0.634	0.786	0.851				
Escapism (6)	0.704	0.692	0.755	0.833	0.834			
Positive WOM (7)	0.478	0.455	0.899	0.742	0.791	0.775		
Social Affiliation (8)	0.598	0.600	0.748	0.887	0.885	0.818	0.789	
Visual Appeal (9)	0.287	0.308	0.266	0.355	0.380	0.366	0.321	0.308

Notes: Affective Involvement (1). CIPGA: Continuance Intention to Play the Gaming Apps; AFI: Affective Involvement; CFI: Cognitive Involvement.

Table 4: Structural relationships and hypothesis testing for direct effects

Hypothesis	path	PC	Standard Error	T Statistics	Decision
H1a	Cognitive Involvement → Escapism	0.218	0.132	1.654*	Supported
H1b	Cognitive Involvement → Enjoyment	0.103	0.148	0.695	Not Supported
H1c	Cognitive Involvement → Social Affiliation	0.277	0.157	1.769*	Supported
H1d	Cognitive Involvement → Visual Appeal	0.305	0.158	1.890*	Supported
H1e	Cognitive Involvement → Entertainment	0.202	0.141	1.436	Not Supported
H2a	Affective Involvement → Escapism	0.473	0.137	3.460***	Supported
H2b	Affective Involvement → Enjoyment	0.544	0.151	3.604***	Supported
H2c	Affective Involvement → Social Affiliation	0.310	0.161	1.930*	Supported
H2d	Affective Involvement → Visual Appeal	-0.011	0.158	0.069	Not Supported
H2e	Affective Involvement → Entertainment	0.426	0.140	3.042***	Supported
H3a	Escapism → Positive WOM	0.171	0.182	0.941	Not Supported

H3b	Enjoyment → Positive WOM	-0.098	0.137	0.711	Not Supported
H3c	Social Affiliation → Positive WOM	0.337	0.129	2.605***	Supported
H3d	Visual Appeal → Positive WOM	0.039	0.043	0.889	Not Supported
H3e	Entertainment → Positive WOM	0.378	0.153	2.467***	Supported
H4a	Escapism → CIPGA	0.164	0.127	1.29	Not Supported
H4b	Enjoyment → CIPGA	-0.054	0.119	0.452	Not Supported
H4c	Social Affiliation → CIPGA	0.215	0.099	2.179**	Supported
H4d	Visual Appeal → CIPGA	-0.021	0.041	0.509	Not Supported
H4e	Entertainment → CIPGA	0.471	0.13	3.634***	Supported

Notes: ***(significance level of 0.01), **(significance level of 0.05), *(significance level of 0.1). PC: Path Coefficient; CIPGA: Continuance Intention to Play the Gaming Apps

Table 5: Results of conditional probabilistic queries

Positive WOM:
The absolute probability that (top expression): lv:PWOM > 1 Is: 0.120 (12.0 percent) The absolute probability that (bottom expression): lv:CogInv > 1 & lv:AffInv > 1 Is: 0.100 (10.0 percent)
The absolute probability that (top expression): lv:PWOM > 1 And (bottom expression): lv:CogInv > 1 & lv:AffInv > 1 Is: 0.070 (7.0 percent)
The conditional probability that: lv:PWOM > 1 If: lv:CogInv > 1 & lv:AffInv > 1 Is: 0.700 (70.0 percent)
The absolute probability that (top expression): lv:PWOM > 1 Is: 0.120 (12.0 percent) The absolute probability that (bottom expression): lv:Escapism > 1 & lv:EnjoyMnt > 1 & lv:SociAff > 1 & lv:VisApl > 1 & lv:EntTmt > 1 Is: 0.033 (3.3 percent) The absolute probability that (top expression): lv:PWOM > 1 And (bottom expression): lv:Escapism > 1 & lv:EnjoyMnt > 1 & lv:SociAff > 1 & lv:VisApl > 1 & lv:EntTmt > 1 Is: 0.030 (3.0 percent) The conditional probability that: lv:PWOM > 1 If: lv:Escapism > 1 & lv:EnjoyMnt > 1 & lv:SociAff > 1 & lv:VisApl > 1 & lv:EntTmt > 1 Is: 0.900 (90.0 percent)
Continuance intention to play the gaming apps:
The absolute probability that (top expression): lv:ConInt > 1 Is: 0.127 (12.7 percent) The absolute probability that (bottom expression): lv:CogInv > 1 & lv:AffInv > 1 Is: 0.100 (10.0 percent)
The absolute probability that (top expression): lv:ConInt > 1 And (bottom expression): lv:CogInv > 1 & lv:AffInv > 1 Is: 0.060 (6.0 percent)
The conditional probability that: lv:ConInt > 1 If: lv:CogInv > 1 & lv:AffInv > 1 Is: 0.600 (60.0 percent)
The absolute probability that (top expression): lv:ConInt > 1 Is: 0.127 (12.7 percent) The absolute probability that (bottom expression): lv:Escapism > 1 & lv:EnjoyMnt > 1 & lv:SociAff > 1 & lv:EntTmt > 1 Is: 0.063 (6.3 percent)
The absolute probability that (top expression): lv:ConInt > 1

And (bottom expression): $lv:Escapism > 1 \ \& \ lv:EnjoyMnt > 1 \ \& \ lv:SociAff > 1 \ \& \ lv:EntTmt > 1$
Is: 0.060 (6.0 percent)

The conditional probability that: $lv:ConInt > 1$
If: $lv:Escapism > 1 \ \& \ lv:EnjoyMnt > 1 \ \& \ lv:SociAff > 1 \ \& \ lv:EntTmt > 1$
Is: **0.947 (94.7 percent)**

Notes: **lv:** Latent Variable. **PWOM:** Positive Word of Mouth; **CogInv:** Cognitive Involvement; **AffInv:** Affective Involvement; **EnjoyMnt:** Enjoyment; **SociAff:** Social Affiliation; **VisApl:** Visual Appeal; **EntTmt:** Entertainment.

Appendix D: Measurement scale

Construct	Measurement Item	Source
Cognitive Involvement*	To me, the ads in the XYZ's gaming app (which gives rewards/ points/ credits) is: CGI1 Unimportant vs. Important CGI2 Worthless vs. Valuable CGI3 Irrelevant vs. Relevant CGI4 Means nothing to me vs. Means a lot to me CGI5 Not needed vs. Needed	Adopted from Zaichkowsky (1994)
Affective Involvement*	To me, the ads in the XYZ's gaming app (which gives rewards/ points/ credits) is: AFI1 Boring vs. Interesting AFI2 Unexciting vs. Exciting AFI3 Unappealing vs. Appealing AFI4 Mundane vs. Fascinating AFI5 Uninvolving vs. Involving	Adopted from Zaichkowsky (1994)
Escapism**	ESP1 When looking at the ads on the XYZ's gaming app, I felt I was in a different world. ESP2 I felt like I was a different person while looking at the ads on the XYZ's gaming app. ESP3 When looking at the ads on the XYZ's gaming app, it let me imagine being someone else. ESP4 I felt I played a different person while looking at the ads on the XYZ's gaming app. ESP5 I totally forgot about my daily routine while looking at the ads on the XYZ's gaming app. ESP6 While looking at the ads on the XYZ's gaming app, I completely escaped from reality.	Adopted from So et al., (2009)
Enjoyment**	ENJ1 It is exciting to watch ads on XYZ's gaming app. ENJ2 It is fun to watch ads on XYZ's gaming app. ENJ3 It is interesting to watch ads on XYZ's gaming app. ENJ4 Watching ads on XYZ's gaming app makes me enjoy.	Adopted from Koo (2009)
Social Affiliation**	SA1 Watching ads in an XYZ's gaming app makes me feel friendly and talkative to others. SA2 I enjoy being part of a community. SA3 I usually talk to other people when watching ads on the XYZ's gaming app. SA4 Watching ads on the XYZ's gaming app makes me talk to other people.	Adopted from Koo (2009)
Visual Appeal**	VA1 The way XYZ's gaming app displays its ads is attractive. VA2 The ads on XYZ's gaming app is aesthetically appealing. VA3 I like the way the ads on XYZ's gaming app looks.	Adopted from Mathwick (2010)
Entertainment**	ENT1 The way ads were shown on the XYZ's gaming app was amusing to me. ENT2 The way ads were shown on the XYZ's gaming app was very entertaining. ENT3 I enjoyed looking at the ads on the XYZ's gaming app.	Adopted from So et al., (2009)
Positive WOM**	WOM1 I transmit my personal experience from this game to other people I know. WOM2 I recommend this game to people I know. WOM3 I talk about this game to people I am familiar with.	Adopted from Tuškej et al. (2013)
Continuance Intention to Play Gaming Apps**	CIPA1 I would like to play the [XYZ] game in the future. CIPA2 I would recommend the [XYZ] game to my friends or others. CIPA3 I would more frequently play the [XYZ] game.	Adopted from Bhattacharjee (2001)

Notes: * Semantic differential scale. **7-point scales anchored by strongly disagree to strongly agree.

Appendix F: Model fit and quality indices

Indices	Value	Criteria
Average path coefficient (APC)	0.246	P<0.001
Average R-squared (ARS)	0.455	P<0.001
Average adjusted R-squared (AARS)	0.450	P<0.001
Tenenhaus GoF (GoF)	0.631	Small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36
Sympson's paradox ratio (SPR)	1.000	Acceptable if ≥ 0.7 , ideally = 1
R-squared contribution ratio (RSCR)	1.000	Acceptable if ≥ 0.9 , ideally = 1
Statistical suppression ratio (SSR)	1.000	Acceptable if ≥ 0.7
Nonlinear bivariate causality direction ratio (NLBCDR)	0.975	Acceptable if ≥ 0.7
Standardized root mean squared residual (SRMR)	0.035	Acceptable if ≤ 0.1