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Abstract

In recent years, there have been some discussions in the scholarly literature about using Consumption Value Model (CVM) for explaining the adoption and usage of hedonic information technologies. As CVM is a relatively new theoretical lens, limited empirical evaluation of this model has so far been reported. In this article, we thus report an empirical evaluation of CVM for games downloading by students on their mobile phones context. We observe partial support for the applicability of CVM as only two value dimensions of CVM (performance/quality value and emotional value) are related to students' intentions to download games. We further find mixed influence of students' demographic characteristics on their value perceptions. The implications of these findings are discussed.

Keywords

Hedonic technology, downloading games, CVM, behavioral intentions, value dimensions.

MOTIVATIONS OF THE RESEARCH

Downloading games on mobile phones represents an instance of hedonic activity and is a relatively new phenomenon for which limited studies are reported in scholarly literature. Many contemporary technologies are applied for hedonic, lifestyle-augmentation, entertainment and non-utilitarian purposes. IT applications that support these enjoyment-oriented services are referred to as hedonic information technologies (Turel et al, 2007a). For example, playing games on-line, downloading games and ringtones on mobile phones, and on-line gambling represent typical hedonic activities that are often supported by suitable e/m-commerce technology based applications. Traditionally, the adoption and use of hedonic technologies are examined using Technology Adoption Model (TAM) which was originally developed by Davis (1989). This model though quite popular among m-business adoption researchers, fails to provide sufficient explanation about the variation in individuals' intentions to adopt/use new innovative technologies. To address this weakness, Sweeney et al., (2001) developed an alternate theoretical lens known as Consumption Value Model (CVM) which was initially applied to assess customers' perceptions of the value of consumer durable goods. Although CVM has been applied to other technological contexts like short messaging services (SMS) and ringtone downloading, this model still suffers from generalization problem. This is not surprising given the fact that unlike TAM, CVM is relatively new and hence awareness among IT adoption researchers about CVM is still limited. We further argue that it is important for the mobile communication service providers to identify the factors (drawn on CVM) to help them develop appropriate strategies for targeting the needs of individual users about their intentions to download games on mobile phones. These factors can also prove crucial to adoption researchers. The motivation of this research is therefore to contribute to enhancing generalization of CVM by applying this theory to a different hedonic technology context. We have chosen games downloading devices as an appropriate context for evaluating the applicability of CVM because it differs from SMS and ringtone downloading in several ways. We argue that SMS involves typing and cognitive skills and downloading ringtones involves a developing a soothing feeling based on the cognitive perceptions. In contrast, we believe that downloading games involve primarily a person's dispositions about excitement and thrill. Hence, the application of CVM to games downloading context will help in increasing the validity of CVM by highlighting its ability to explain technology context which has not been previously explored. Another motivation emerges from the fact that existing literature on the influence of demographic characteristics in the application of CVM is limited. There exists conflicting evidence in the broader e-commerce and m-business literatures about the role of demographic characteristics on technology adoption practices by individuals. To shed further light into this issue, the application of CVM for mobile games downloading should take into consideration the influence of demographic characteristics of mobile phone users.

Motivated by these two concerns, we therefore initiated this exploratory study among a segment of student population at a large Australian university to find out the applicability of CVM in general and the influence of the demographic characteristics of the students on their perceptions of value dimensions and downloading intentions in particular. Our empirical findings suggest the existence of partial support for the applicability of CVM as only two value dimensions of CVM (i.e. performance/quality value, emotional value) are related to students' intentions to download games. We further find mixed influence of students' demographic characteristics on their value perceptions. The rest of this article is structured as follows. Next section provides a brief synthesis of the relevant literature including an overview of CVM and its past applications to few hedonic technology contexts. In doing so, the gaps in the literature were further highlighted. Following this, a set of hypothesis is derived from CVM for the games downloading context. Then, the research approach is presented and the survey findings are analysed and discussed in the light of CVM and past literature. Finally, the article ends with concluding remarks highlighting contributions and identifying future directions of research.

LITERATURE BACKGROUND

Overview of CVM: CVM was originally developed by Sheth et al., (1991) to explain consumer choices of whether to buy or not buy, the choice of one product over the other, and the choice of one brand over the other in relation to cigarette smoking. We however use a modified version of the model due to the irrelevance of some of the variables for technology adoption context. The modified model was developed by Sweeney et al., (2001) to assess customers' perceptions of the value of consumer durable goods. Following its successful implementation, Turel et al., (2007b) have applied Sweeney et al.'s, model with regard to user acceptance of SMS. This generic version of CVM is presented in Figure.1

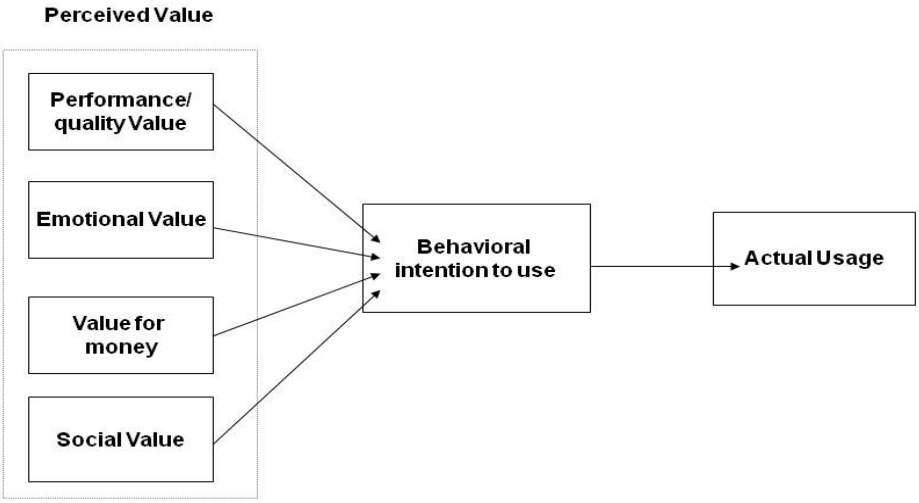

Figure 1: Consumption Value Model (CVM)

According to CVM, four distinct types of value perceptions (also known as value dimensions), encompass perceived value of an individual towards his/her intentions to engage in a behaviour. The intentions are in turn associated with the actual execution of the behaviour by that individual. These relationships are clearly indicated in Figure.1 using arrows. These dimensions can be seen as the perceived value which is a perception based on beliefs regarding the benefits and sacrifices associated with the use of a product (Dodds, Monroe & Grewal, 1991). This perception may directly affect users' attitudes and behaviours. The performance/quality dimension is a functional value that captures the

utility resulting from quality perception and performance expectation. This dimension reflects the design of the service, consistency and the network quality of the product/services. Emotional value is the utility derived from the feelings or affective states generated by a product and is said to reflect enjoyment, pleasure and anxiety of using product/services. Value for money is a functional value dimension that encapsulates the utility derived from the product due to the reduction of its perceived short term and longer term costs and this dimension is expected to influence the overall perceived value of the product/services. Finally, social value is defined as the enhancement of a person's self-concept provided by the product/services, which reflects social approval and desirability of product/services. All four dimensions have some effect on behavioural outcomes such as intentions to buy and recommend the product (Sweeney et al., 2001; Turel et al., 2007).

Application of CVM - A brief summary: Application of CVM to hedonic technology adoption context is relatively new and hence limited studies are reported in the m-business literatures. For example, McManus et al., (2004) used the original CVM to explain user acceptance of various mobile services. Their study involved interviewing five university students who were considered to be the right target population for evaluating mobile services. The life histories used in the paper highlights that the approach could be used to explain adoption and use of mobile-services. While mobile services fulfil functional requirements, and provide entertainment services to individuals, the social and epistemic values can also play an important role. In another study, a modified version of CVM developed by Sweeney et al., (2001) was used by Turel et al., (2007b) to evaluate user acceptance of wireless value added pay-per use service as SMS. This model was empirically examined using data collected from a survey of 222 North American young-adult SMS users. Performance/quality, value for money, and social values were found to be important determinants towards SMS technology adoption. In a subsequent study, Turel et al., (2007a) used a modified version of CVM by incorporating visual/musical appeal, enjoyment and playfulness values to explain individual acceptance of such hedonic technology as downloading ringtones on mobile phones. Their study investigated this burgeoning phenomenon by measuring several value drivers for downloading mobile phone ringtones using survey data collected from 119 North American users of ringtones.

Gaps in the Literature: We acknowledge the works of McManus et al., (2004) and Turel et al., (2007a, 2007b) on the applicability of CVM for SMS and ringtone context as being useful. We believe that their studies make an important contribution towards establishing the validity of CVM. Despite such contribution, no work has yet been reported in this literature as to how CVM applies to other emerging hedonic technologies such as downloading of games on mobile phones. The reason for choosing games downloading on mobile phones as an example of hedonic technology adoption is that it is popular particularly among the younger generation and can not only be used for communication purposes, but also for entertainment at a reasonable cost. Therefore, a large user community can be easily found who are downloading games on their mobile phones. Moreover, past studies of the applicability of CVM has focussed on the North American student population, and to the best of our knowledge, no empirical work involving CVM has been reported for the Australian student context. Furthermore, we cannot assume that the norms, values and dispositions towards using hedonic technology of the North American student population would be exactly similar to those of Australia without empirical confirmation. Hence, further studies are needed to examine whether demographic characteristics are significant in explaining the variations in students' perceptions towards downloading games on mobile phones.

RESEARCH MODEL AND HYPOTHESIS

As indicated in the previous section, the perceptions of the Australian student population towards downloading games on mobile phones need to be empirically evaluated in terms of the key constructs included in CVM. We have therefore derived several hypotheses (shown in our research model - Figure 2) which are briefly described below.

Performance quality value: It refers to efficient, consistent and effective performance of the service through which games are downloaded on mobile devices (Turel et al, 2007a). Kettinger and Lee (2005) validated the importance of performance value on overall value assessment. Likewise, Baker et al (2002) claimed the existence of several other studies, which show the higher quality of performance results in higher overall perceived value which in turn affect intentions. In the light of this observation, for downloading games context, we believe that perception of students about performance quality value would positively affect their intention to download games. As such, the following hypothesis is proposed:

H1: The performance/quality dimension of the perceived value is positively related to an individual's intentions to download games on mobile phones.

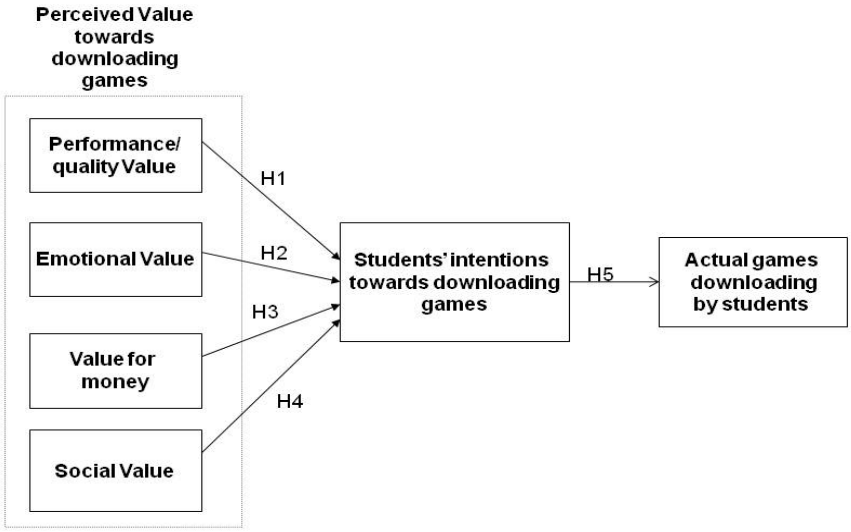

Figure 2: Our research model

Emotional value: It is defined as the level of enjoyment, pleasure and anxiety, which a customer receives, when he or she downloads games on his/her mobile devices (Turel et al., 2007b). Pura (2005) found that emotional value indirectly effects loyalty via satisfaction. Hence, emotional value is important in building a loyal customer community. This is especially significant in creating close emotional link with loyal customers. In light of this observation, for the downloading games context, we believe that perception of students about emotional value would positively affect their intentions to download games. As such, the following hypothesis is derived:

H2: The emotional dimension of the perceived value is positively related to an individual's intentions to download games on mobile phones.

Value for money: It is defined as the trade off between quality of service (take) versus cost of the service (give) (Turel et al., 2007b). This should have a strong influence on perceived value, as downloading games is pay per download basis. Hence, customers would think twice before downloading games which does not provide any utilitarian gain and is done purely for entertainment purposes. Price is also the main "give" component in overall value assessment. In the light of this observation, for the downloading games context, we believe that perceptions of students about value for money would positively affect their intention to download games. As such, the following hypothesis is developed:

H3: The value for money dimension of the perceived value is positively related to an individual's intentions to download games on mobile phones.

Social value: It represents the value a user gains due to the fact that downloading games would increase ones social approval and status (Turel et al., 2007b). This captures the self-assessment concept, which is a non-instrumental driver of downloading games. People in the young age group (which our study targets) may feel having latest games on their mobile phones, might amplify their social rapport among groups and position the user as being trendy and sophisticated. In the light of this observation, for the downloading games context, we believe that perception of students about social value would positively affect their intention to download games. As such, the following hypothesis is postulated:

H4: The social dimension of perceived value is positively related to an individual's intentions to download games on mobile phones.

Behavioural intention: It can be defined as an individual's intent to download the game, once the antecedents are properly evaluated by the individual in the context of downloading games on mobile phone (Davis, 1989). The positive impact of behavioural intention on actual usage has been validated in almost all the studies (Legris, Ingham and Collerette, 2003) and we therefore believe that perception of students about their intention to download games would in turn positively affect the actual usage of the service. As such, the following hypothesis is proposed:

H5: An individual's intention to download games on mobile phones is positively related to actual usage of downloading games service.

OPERATIONALISATION OF THE RESEARCH CONSTRUCT

Our research model (Figure 2) involves four independent value dimensions and two dependent variables. These six constructs were operationalised using various items identified from the relevant literature. A high level summary of the sources of operationalization used to measure these constructs are shown in Table 1. The following observations are made. First, the three items which measure quality performance/quality value constructs are concerned with the quality of games downloaded, the design of the interface on the mobile phone, and the overall quality of the service. Second, the four items measuring the emotional value construct, aimed at evaluating the intrinsic motivation behind downloading games (e.g. entertainment, enjoyment). Third, the seven items which are used to measure value for money construct focus on the price for downloading each game, and solicit an individual's perceptions about the reasonableness of the price of per game. Fourth, the four items which measure social value factor, are concerned with an individual's opinion as to whether having games on mobile phone increase their social status, or help them becoming more socially available. Behavioural intention and actual usage are the two dependent variables. Those two items which measure behavioural intention establishes the relationship between accessibility to games downloading services and intentions. Finally, the three items that measure the actual usage focus on the frequency of use, amount of time spent and cost involved with respect to downloading games.

Table 1. A Summary of the operationalisations used for research constructs

Construct	Number of Items	Reference Sources
Performance/Quality value	3	Turel et al (2007b), Sweeny et al (2001)
Emotional value	4	Sweeney et al (2001), Turel et al (2007b)
Value for money	7	Sweeney et al (2001), Turel et al (2007b), Turel et al (2007a), Pura 2005.
Social value	4	Sweeney et al (2001), Turel et al (2007b).
Behavioural Intention	2	Turel et al, (2007a,b)
Actual downloading usage	3	Self created
Total	23	

RESEARCH APPROACH

Justification of survey approach: Our research is exploratory in nature because the relationship between the various factors included in the research model, and individuals' intentions to download games on mobile phones for the Australian student population context has not been investigated in the past. Hence, little is known about the influence of the factors on games downloading intentions. Our research further addresses 'what', 'how much' and 'how frequently' type of research questions relating to the use of and intentions towards downloading games on their mobile phones. Given these characteristics of our research project, an exploratory survey approach was considered appropriate (Yin, 2003).

Survey population and sample: Participants of the survey are students from a large Australian university. They were chosen at random basis at places around university where large number of

students gather (e.g. cafes, library). A total of 300 questionnaires were distributed and the Data obtained from the survey were analysed using SPSS version 19.

Survey instrument design: Drawing on Table 1, an initial theory driven survey instrument was developed which included 23 items. According to research gurus, a research instrument should be refined before administering it among the target population in order to enhance instrument reliability and validity (Yin, 2003). In keeping with this view the initial survey instrument has been evaluated through a three stage qualitative process: a) evaluation by domain experts (Kitchenham and Pfleeger, 2002), b) item factor association, and c) pilot test. At the first stage, the initial survey instrument was circulated to four domain experts who were asked to comment on the comprehensiveness, accuracy, and readability of the items included in the instrument. The domain experts are academics who have teaching and research experience in the areas of m-commerce and e-business. Based on their suggestions, several items were rephrased. At the second stage, the revised instrument was given to five participants including two PhD students and three undergraduate students. Based on their evaluation of the importance of research constructs and strengths of associations between items and constructs, several amendments were incorporated. However, the process did not eliminate any items. Finally, a pilot test was conducted among ten randomly selected students (who we believe exhibit the characteristics of our target surveyed student population) to identify any ambiguities still present in the survey instrument which in turn enhances the face validity of the instrument. The analysis of the feedback from these students enabled us to further refine the instrument. Following that, the revised survey instrument was distributed among a randomly selected sample of 300 students at a large Australian university.

Instrument validation: In order to improve the reliability of the survey instrument, we have first applied the suggestions of Churchhill (1979) to purify the items included in the instrument by drawing on the responses received from the survey. Out of 18 items used for operationalisation of value dimensions in CVM (shown in Table 1), we have removed 8 items for which "corrected-item-total" correlation was less than 0.30 (Table 2).

Table 2. Item total statistics

Item	Item Description	Corrected item-total correlation	Chronbach's alpha value
PQV1	I am satisfied with the performance of the games download service provider, because I get high quality games.	.333	
PQV2	I am satisfied with the performance of the games download service provider, because they provide high quality interface for downloading games.	.319	
EV1	I enjoy downloading games	.573	
EV2	Downloading games entertains me.	.524	
VM1	The price for downloading games is reasonable.	.567	.818
VM2	Games downloading offers me value for money	.645	
VM5	Overall, I am happy with the per game price for downloading games on my mobile phones.	.550	
SV2	Using mobile games downloading services make me socially available.	.419	
SV3	Having downloaded games on my mobile phone improves the way I am perceived by my social network.	.484	
SV4	The fact I download games on my mobile phone makes a good impression on people.	.542	

We have then computed the reliability (Chronbach's alpha value) of the survey instrument involving the remaining 10 items which was found to be 0.818 and is satisfactory. We have then applied an exploratory factor analysis to determine whether the remaining 10 items truly represent the four perceived value dimensions (performance/quality value, emotional value, value for money and social value) of CVM as shown in Figure 1. The results of the factor analysis are shown in Table 3 and Table 4

which confirm that these 10 items indeed correspond to four different value dimensions indicated in Figure 1.

Table 3. Factor loading of retained items

Items	Dimensions			
	Dimension 1 (PQV)	Dimension 2 (EV)	Dimension 3 (MV)	Dimension 4 (SV)
PQV1				.887
PQV2				.884
EV1			.876	
EV2			.900	
MV1		.888		
MV2		.816		
MV5		.824		
SV2	.880			
SV3	.888			
SV4	.793			

Table 4. Results of factor analysis

Dimensions	Dimension 1 (PQV)	Dimension 2 (EV)	Dimension 3 (MV)	Dimension 4 (SV)
Eigen values	3.81	1.77	1.3	1.07
Variance by individual dimension	38.19	17.75	13.12	10.72
Cumulative variance	38.19	55.94	69.07	79.79
Kaiser-Meyer-Olkin Measures of Sampling Adequacy = .753; Bartlett's Test of Sphericity (Approx. Chi-Square = 905.681; df = 45; Sig.(p) = .000				

EMPIRICAL FINDINGS AND DISCUSSION

Demographic Characteristics: A total of 209 completed questionnaires were received. Out of that we find that 102 students have downloaded games on their mobile phones. This indicates that 48.08% of students have experience with mobile games downloading service. The demographic profile of the survey participants is summarized in Table 5. Out of 209 participants, 138 are male (66%) and the remaining 71 are female (34%). Hence, a dominance of the male participants is observed. A vast majority of the participants were young (93.8%) as they belong to age group of 18-25 years. About three/fourths (76.6%) of the respondents are currently enrolled in undergraduate degree, and nearly 20% are enrolled in post graduate degree.

Table 5. Demographic Profile of Survey Participants

Variable	Number	Percentage (%)
Gender		
Male	138	66
Female	71	34
Age		
18-21 years	135	64.6
22-25 years	61	29.2
26 and above	13	6.2
Education		
Undergraduate	160	76.6
Post-graduate	49	23.4

Hypothesis Evaluation: A regression analysis was performed to examine the relationship between each of the perceived value dimensions of CVM with the participating students' intentions to download

games on their mobile phones. The results are presented in Table 6. It can be suggested that out of four value dimensions, only performance/quality value (p = .03) and emotional value (p = .000) are significantly related to the students' intentions to downloading games on their mobile phones. These four value dimensions together explain only 23.9% of the variation in students' intentions to download games on mobile phones.

Table 6. Regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Std. Error	Beta		
1 (Constant)	.585	.358		1.637	.103
PQV	.303	.102	.190	2.974	.003*
EV	.402	.079	.353	5.077	.000*
VM	.057	.088	.045	.639	.523
SV	.129	.089	.095	1.457	.147
R^2(Adjusted) = 23.9%; F = 17.33; p = .000					

Note: * means statistically significant at 95% confidence level.

With regard to empirically evaluating the relationship between the surveyed students' intentions to download games and their actual practice of downloading games, both Pearson correlation and regression analysis were performed. The results are shown in Table 7. Two observations can be deduced: a) there is a significant relationship between intention and each of the items used in measuring actual downloading practices; b),however, the extent of relationship is low as shown by the low R^2(Adjusted) values and Pearson correlation values.

Table 7. Results of Pearson and regression analysis for testing H5

Intention to usage	R^2(Adjusted) Regression	Pearson Correlation
Average students' intentions with frequency of their downloading games.	R^2 = 26.5%	.517
	p = .000	P = .000
Average students' intentions with time spent on downloading games.	R^2 = 12.9 5%	.365
	p = .000	p = .000
Average students' intentions on cost incurred by downloading games	R^2 = 12.7%	.363
	p = .000	p = .000

Out of five proposed hypotheses, three (H1, H2 and H5) were empirically supported by our survey findings. The implication is that CVM, in its current format, is not fully able to explain students' downloading intentions. We found that two value perceptions such as Value for money and Social value with respect to downloading games intention was not significant. These findings are different compared to those of Turel et al., (2007a, 2007b). This is due to the fact that they have not examined how each value dimension relates to students' intentions. Despite this difficulty of direct comparisons, we find that consistent with their studies Social value did not play an important role across all three SMS, ringtones and games downloading contexts. However, consistent with their findings Performance/quality value and Emotional value appear to be more significant in explaining the relevance of CVM.

The findings are indicative of the possibility that CVM alone cannot fully explain the variation in intentions which in turn calls for more research into integrating TAM with CVM. This may provide greater explanations into the variations of students' intentions. Both Pearson and regression analysis confirm the existence of a significant relationship between students' intentions and their actual downloading behaviour of games on their mobile phones. This finding is in line with that of Turel et al.,

(2007b) who have observed a strong association between students' intentions to use SMS and their actual usage of SMS.

Regarding the second question, we have conducted student t-tests comparing students' perceptions about four value dimensions towards downloading games intentions based on their age, gender and education. Detailed results are not included due to page constraints. The results of these tests indicate that demographic characteristics of the surveyed students, in general, has limited relevance to their value perceptions towards downloading games intentions. The findings do not suggest an overwhelming variation in students' quality value perceptions based on their demographic characteristics. It appears that students' perceptions about value for money dimension differs significantly based on gender and age. We find that the perceptions towards value for money are greater among female students (mean score = 2.79) than their male counterparts (mean score = 2.52). Likewise, older students (mean score = 2.80) seem to have more sensitivity towards value for money dimension than younger ones (mean score = 2.51). In contrast, perceptions of the students towards emotional value are more pronounced among postgraduate students (AV = 3.27) as opposed to undergraduate students (mean score = 2.94). Our findings also support the commonly held view that students' intentions for downloading games are significantly related to their actual downloading behaviour of games.

CONCLUSION

Our research project reported in this article address the following two research concerns: a) how does CVM explain intentions' of students to engage in games downloading behaviour? b) do the value perceptions of the students towards downloading games behaviour significantly differ based on their demographic characteristics? In order to answer these questions, a questionnaire was rigorously designed based on CVM literature and was subsequently distributed among students of a large Australian university. A total of 209 completed responses were received and were then analysed using SPSS.

With regard to the first question, we find that only two value dimensions of CVM (i.e PQV and EV) are significantly associated with the surveyed students' intentions for downloading games. We further find that CVM explains only 23.9% variation in students' intentions to download games. A plausible explanation could be that students' find playing games on their mobile phones more convenient and useful as opposed to having a compact gaming console like PSP or computer. This aspect may help explain the limited impact of value dimensions of CVM on students' intentions. On the matter of the second question, we find mixed influence of demographic characteristics on students' value perceptions towards downloading games on their mobile phones. Hence, the controversy about the role of demographic characteristics on value perceptions is not resolved.

These findings make contributions to theory and practice. To theory, our research has produced an empirically examined and validated instrument for measuring individuals' intention to download games on their mobile phones. Other e-commerce or m-commerce researchers can adopt this instrument as a template to evaluate individuals' intention to adopt other types of hedonic technologies such as playing online games, and engaging in online social networking. To practice, knowledge of factors having positive relationship with individual's intention to download games can help telecommunication companies to develop guidelines/policies for promoting mobile games downloading. Companies during their marketing campaigns can also make use of their understanding of these factors to promote their products in an effective manner.

Our research although useful is not free from weaknesses. One limitation of our research is that the survey participants are predominantly students currently pursuing their degree. As a result, views from other type of participants (e.g professionals, tradespersons) were not captured, thereby restricting generalisability of the research findings. To address this weakness, further research studies are needed to include different types of respondents (e.g. business people, professionals, trade people) in a survey. As the capability of CVM to explain variation in individuals' intention to download games is 23.9%, this suggests the possible presence of additional factors (e.g an individuals' social context, cultural norms) affecting intentions. Therefore, further research is required to discover those additional factors.

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