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Enocuraging Participation: Facilitators and Inhibitors of Virtual World Acceptance

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ABSTRACT

Much of the promise implicit in virtual worlds depends on a critical mass of virtual world users, making it important to understand how to encourage individuals to participate in virtual worlds. Therefore, the objective of this study is to propose an integrative and parsimonious theoretical framework that is specific to virtual world acceptance. As many existing technology acceptance models have been focused primarily on utilitarian technologies, these models may not be sufficient to explain individual acceptance of virtual worlds because of their unique nature; specifically, virtual worlds may be viewed as both hedonic and utilitarian technologies.

Based upon the unified theory of acceptance and use of technology (UTAUT) and a deep literature review of hedonic influences on acceptance, we parsimoniously identify potential constructs influential in virtual world acceptance by analyzing quantitative and qualitative data using a survey research method designed to elicit feedback from potential adopters. Our proposed model extends UTAUT to include hedonic influences as well as integrating an unexpected finding; acknowledging the role of inhibitors in virtual world acceptance.

Keywords

Virtual world acceptance, UTAUT, theoretical framework, utilitarian technology, hedonic technology, facilitators, inhibitors

INTRODUCTION

In critical mass theory, Markus (1987) suggested that an individual considering the adoption of a potential technology is likely to take a wait and see position and refrain from using the technology until a sizable number of initial adopters have already done so. Understanding how to encourage individuals to use a technology is therefore pressing for several reasons. For example, critical mass theory suggests that without universal access, non-adopters do not receive the full benefits of the technology. This indicates that for some technologies, extensive user participation and adoption is necessary to derive network-like benefits. Furthermore, and relevant to the virtual world context, in the absence of a critical mass of adopters, a new technology is unlikely to diffuse but also fail (Markus, 1987).

As evidenced by what we have witnessed thus far, for example with the empty storefront phenomena in Second Life, virtual worlds in particular, depend on user participation in order to deliver much of the user experience. For example, Second Life encourages, while simultaneously depends on, user-created content from basic objects to the virtual terra-forming of entire islands. Massively online games (MMOGs) also depend on having a large base of players to play or compete with in order to be fun. Socially-oriented virtual worlds would serve no purpose without having others present to interact with. Simply put, much of the promise behind virtual worlds depends on having individuals who are willing to try and use virtual worlds. Therefore, as also suggested by Fuller, Hardin, and Scott (2007), developing theoretical frameworks that explain virtual world acceptance is important.

In the development of our proposed framework for virtual world acceptance, we began by asking two questions. Firstly, how are virtual worlds different than other contexts previously studied in the acceptance literature? Second, given the variety of virtual worlds available, do the motivations to participate in a virtual world vary by virtual world type? A useful way to frame both questions is to understand the differences between utilitarian and hedonic technologies. According to Van der Heijden (2004), a utilitarian technology aims to provide instrumental value to users (e.g., improving job performance) whereas a hedonic technology aims to provide self-fulfilling value to the user (e.g., pleasure and enjoyment). This implies that the underlying motivations to accept a technology may vary given the context.

While an extensive theoretical and empirical base for the study of technology acceptance exists, the contexts studied have been mostly utilitarian (e.g. spreadsheets, e-mail, new IT systems at work). Accordingly, predictors of individual technology acceptance include constructs such as perceived ease of use and perceived usefulness (e.g., Mathieson, 1991; Davis, 1989;). These constructs are different from the ones identified in studies which have looked at hedonic technologies. Recent studies focused on hedonic technologies (e.g., movie web sites and entertainment–oriented virtual worlds) have found additional predictors of individual technology acceptance such as, socializing, fantasy, and escapism (e.g., Yee, 2007; Van der Heijden 2004).

According to Schultze, Hiltz, Nardi, and Rennecker (2008), virtual worlds may be categorized into four different types: simulation games (e.g., America's Army), virtual reality (e.g., Second Life), fantasy games (World of Warcraft (WoW)), and virtual fantasy (e.g., Second Life and Uru). While some types of virtual worlds tend to provide utilitarian values, other types of virtual worlds tend to provide hedonic values. For example, simulation-gaming virtual worlds may be used for education and training. Using them can help individuals to improve their job performance. In contrast, fantasy-gaming virtual worlds, such as MMOGs, may be used for entertainment. Using them can provide individuals pleasure and enjoyment. Therefore, virtual worlds can be viewed as both hedonic technologies and utilitarian technologies.

The answer to our first question is thus that, overall, virtual worlds differ in that they provide both utilitarian and hedonic uses; as such existing technology acceptance models may not be sufficient to explain individual acceptance of virtual worlds (Holsapple and Wu 2007). For the second question, the mixed nature of virtual worlds suggests that the important predictors of acceptance, as well as the relative importance of each predictor, utilitarian and hedonic, may need to be reevaluated. Furthermore, new predictors may need to be identified (Van der Heijden, 2004).

Our paper is organized as follows: We discuss the unified theory of acceptance and use of technology (UTAUT) that synthesizes eight prominent technology acceptance models. Next, we identify potential acceptance constructs for hedonic technologies and suggest that UTAUT may be extended to include "mixed" models. We discuss the findings from a survey presented to potential virtual world adopters which allows us to parsimoniously identify important constructs to include in our proposed model as well as if the constructs identified varied by virtual world type. Lastly, utilizing a qualitative content analysis, we integrate an unexpected finding from the survey and present our proposed model.

LITERATURE REVIEW

The Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) formulated UTAUT by integrating the constructs of eight prominent technology acceptance models. The eight models include the theory of reasoned action, the technology acceptance model, the motivational model, the theory of planned behavior, a model combining the technology acceptance model and the theory of planned behavior, the model of PC utilization, the innovation diffusion theory, and the social cognitive theory (see Venkatesh et al., 2003 for more detail about these models). They determined that UTAUT outperforms the eight models in explaining variance in user intention. In the UTAUT, four main constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions are posited to influence the user acceptance of a technology (both intention and actual usage). The performance expectancy construct is defined as "the degree to which an individual believes that using IT will him or her to attain gains in job performance". The effort expectancy construct is defined as "the degree of ease associated with the use of IT". The social influence construct is defined as "the degree to which an individual perceives that important others believe he or she should use IT". The facilitating condition construct is defined as "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of IT".

Furthermore, the relationships between these main constructs and technology acceptance are moderated by age, gender, prior experience, and voluntariness of use. For example, the effect of performance expectancy on intention is moderated by gender and age, such that the effect is stronger for men and particularly for younger men. The effect of effort expectancy on intention is moderated by gender, age, and experience, such that the effect is stronger than for women, particularly younger women with limited exposure to the technology. Lastly, the effect of social influence on intention is moderated by gender, age, voluntaries, and experience, such that the effect is stronger for women, particularly older women with limited exposure to the technology, and in mandatory setting.

While UTAUT's predictive power is very strong, for example Venkatesh et al. (2003) noted that their model explained 70% of variance in individual acceptance, there are reasons however that suggest that UTAUT may need theoretical extensions in order to understand virtual world acceptance. Firstly, the constructs from both the theoretical perspectives integrated into UTAUT and UTAUT itself, have been primarily examined in the context of utilitarian technologies such as word processors, database applications, e-mail, and spreadsheets (e.g., Mathieson, 1991; Davis, Bagozzi, and Warshaw, 1989). Given that

virtual worlds provide a mixture of hedonic and utilitarian content, models which encompass motivations from both perspectives should be developed.

Secondly, the UTAUT does not directly theorize that intention is influenced by constructs associated with feelings or affect associated with technology use, such as attitude toward behavior, intrinsic motivation, affect toward use, and affect. In their empirical validation, Venkatesh et al. (2003) found that these constructs did not have significant influence on intention to use of technologies. However, recent studies have found that such constructs can influence individual intention to use technologies, especially hedonic technologies. For example, Van der Heijden (2004) found perceived enjoyment to influence an individual's intention to use a hedonic technology. Furthermore, Holsapple and Wu (2007) suggested that the bulk of previous research on technology acceptance, which was based on the theoretical perspectives described previously, has focused primarily on utilitarian technologies, motivating studies which identify new constructs that influence hedonic technology adoption. These arguments lead us to reviews constructs which primarily influence the individual acceptance of hedonic technologies.

Constructs That Primarily Influence Individual Acceptance of Hedonic Technologies

In addition to those constructs described above, several recent studies identified new constructs that primarily influence hedonic technologies. Yee (2007), through a factor analysis of a series of surveys administered to MMOG participants, identified constructs that motivate an individual to participate in fantasy-gaming virtual worlds, including advancement, mechanics, competition, socializing, relationship, teamwork, discovery, role-playing, customization, and escapism (See Table 1 below for a definition). In addition, Van der Heijden (2004) found perceived enjoyment to be a strong determinant of intention to use a movie Web site. Drawing from the marketing literature, Holsapple and Wu (2007) suggested additional motivations specific to participation in "virtual worlds with an entertainment" dimension. These motivations include fantasy, role projection, escapism, enjoyment, emotional involvement, and arousal (See Table 1 below for a definition).

Overall, since virtual worlds can be considered as both hedonic and utilitarian technologies, it is necessary to consider constructs empirically validated in contexts of both hedonic and utilitarian technology acceptance to develop a theoretical framework that can explain virtual world acceptance.

Constructs	**Definition**	**Relevant Studies**
Advancement	The desire to gain power, progress rapidly, and accumulate in-game symbols of wealth or status	Yee(2007)
Mechanics	Having an interest in analyzing the underlying rules and system in order to optimize character performance	Yee(2007)
Competition	The desire to challenge and compete with others	Yee(2007)
Socializing	Having an interest in helping and chatting with other players	Yee(2007)
Relationship	The desire to form long-term meaningful relationships with others	Yee(2007)
Teamwork	Deriving satisfaction from being part of a group effort	Yee(2007)
Discovery	Finding and knowing things that most other players don't know about	Yee(2007)
Role-Playing	Creating a persona with a background story and interacting with other players to create an improvised story	Yee(2007)
Customization	Having an interest in customizing the appearance of their character	Yee(2007)
Escapism	An individual's desire to escape unpleasant realities or to distract his/her attention from real life problems	Yee(2007); Hirschman(1983)
Perceived Enjoyment	The degree to which performing an activity is perceived as providing pleasure or joy in its own right, aside from performance consequences	Venkatesh(1999)
Fantasy	The imagined events or sequences of mental images representing an integration of the demands of all the psyche and reality components	Conrad(1966)
Role Projection	The mental activities whereby individuals project themselves into particular roles or characteristics	Hirschman(1983)
Emotional Involvement	The degree to which an individual is emotionally engaged in a behavior	Holsapple & Wu (2007)

Perceived Playfulness (Curiosity)	The extent to which an individual is curious during the interaction with a technology	Moon & Kim (2001)
Perceived Playfulness (Concentration)	The extent to which an individual focus on the interaction with a technology	Moon & Kim (2001)
Novelty	The desire to seek out something new and different	Hirschman (1980)
Arousal	The state of emotional and mental activation or alertness elicited by external sensory stimulation	Holsapple & Wu (2007)

Table 1. Summary of constructs that primarily influence individual acceptance of hedonic technologies

RESEARCH METHODOLOGY

Three survey questionnaires were developed (assessing motivations for three different types of virtual worlds: simulation-gaming oriented virtual worlds, socially-oriented virtual worlds, and fantasy-gaming oriented virtual worlds), and administered to junior and senior level undergraduate business students from two Management Information Systems classes at a university in the Southeastern US. While the use of student subjects may potentially be limiting, we argue that students are capable of providing meaningful responses for this study. First, our interactions with the subjects revealed that students had extensive prior experience with social-networking and on-line gaming applications. Also, these students are all upper-classmen working towards a business degree. Given this study's focus on socially-oriented, fantasy-gaming, and simulation-gaming (business-oriented) virtual worlds, we believe our focal group is acceptable. Furthermore, the use of student subjects is also evident in other virtual world acceptance studies (e.g., Hua and Haughton, 2008; Shen and Eder, 2008).

Prior to each survey, the subjects were introduced to the type of virtual worlds referred to in the surveys to ensure that participants understood the different types of virtual worlds. Subjects were also showed several video clips describing each type of virtual world. Course credit was given as an incentive for survey participation. The instrument was developed based on previously validated items from prior studies (e.g., Yee, 2007; Venkatesh et al., 2003). We used one item to measure each construct identified from our review of literature on technology acceptance. While we are aware that there are inherent reliability issues in using single item constructs, this approach was utilized for several reasons. First, our study examines the influence of many constructs simultaneously that influence an individual's intention to adopt virtual worlds. One goal of this survey was to identify potentially important constructs and to help narrow down the list of potential constructs, not to collect data for a full statistical analysis. As we were limited by both the large number of total constructs included in the survey and the limitations on class time we could allocate to these surveys, parsimony was another clearly sought after goal for this study. A total of 29 constructs were represented, 11 from UTAUT and 18 from Table 1. This approach is consistent with what Venkatesh et al. (2003) utilized for parsimony, measuring a higher order construct based upon one survey item from each lower order construct.

The one item representing each construct was chosen using the following process. We first examined items for each construct. The item selected was chosen either because it had the highest factor loading or because we felt it best represented the given definition of the construct. Next, the wording for each item was modified if necessary to represent the particular virtual world type. Lastly, the order of the items was randomized for the final instrument. All items were measured using a 7-point Likert scale that ranged from not important to extremely important. Subjects were asked how important each item would be with regards to their intention to participate in each virtual world. The questionnaire also collected additional respondents' information, such as demographics, and prior experiences with virtual worlds of the same type. Lastly, we used two open-ended questions which asked subjects to identify other factors which would influence them to adopt or not to adopt virtual worlds. The purpose of the open-ended questions was to elicit potential factors that were not previously identified in the prior literature.

As may be seen in table 2 below, 133 questionnaires were collected for the simulation-gaming virtual worlds, 136 questionnaires were collected for the socially-oriented virtual worlds, and 130 questionnaires were collected for the fantasy gaming virtual worlds. For all three virtual world types, the number of male respondents represented slightly more than the number of female respondents, and the majority of respondents stated that they had no prior experience with virtual worlds.

Simulation-Gaming			
Age	N	Mean	S.D.
	129	21.78	2.787

Gender	F	M	Total
	56	76	133
Prior VW Exp	No	Yes	
	102	31	134
Socially-Oriented			
Age	N	Mean	S.D.
	129	21.78	2.787
Gender	F	M	Total
	63	62	136
Prior VW Exp	No	Yes	
	110	25	135
Fantasy-Gaming			
Age	N	Mean	S.D.
	126	21.45	2.694
Gender	F	M	Total
	60	70	130
Prior VW Exp	No	Yes	
	105	25	130

Table 2. Demographic Statistics

Data Analysis and Results

This section provides findings from quantitative and qualitative data that are collected via the first survey. Tables 3, 4, and 5 provide the mean scores and standard deviations for each item relative to each type of virtual world: simulation-gaming, socially-oriented, and fantasy-gaming. Items are sorted in ascending order, with the top 10 factors for each virtual world type shown in bold.

Simulation-Gaming	Mean	S.D.
Perceived Playfulness – Concentration	2.78	1.555
Fantasy	2.97	1.709
Relationship	3.03	1.842
Escapism	3.05	1.859
Role Playing	3.21	1.713
Advancement	3.26	1.733
Image	3.36	1.734
Role Projection	3.41	1.648
Mechanics	3.41	1.745
Emotional Involvement	3.44	1.715
Subjective Norms	3.57	1.629
Socializing	3.71	1.741
Complexity	3.78	2.126
Discovery	3.79	1.744
Perceived Playfulness - Curiosity	3.9	1.701
Teamwork	3.95	1.643

Customization	3.98	1.652
Competition	4.08	1.756
Arousal	4.09	1.842
Novelty	**4.16**	**1.744**
Social Factors	**4.28**	**1.779**
Relative Advantage	**4.44**	**1.823**
Ease of Use	**4.79**	**1.753**
Perceived Ease of Use	**4.96**	**1.716**
Perceived Enjoyment	**5.1**	**1.694**
Job Fit	**5.15**	**1.688**
Extrinsic Motivation	**5.17**	**1.763**
Perceived Usefulness	**5.18**	**1.786**
Outcome Expectations	**5.46**	**1.693**

Table 3. Means and Standard Deviations (Simulation-Gaming oriented virtual worlds)

Socially-Oriented	Mean	S.D.
Fantasy	2.81	1.528
Perceived Playfulness - Concentration	2.89	1.812
Escapism	2.93	1.649
Relationship	2.96	1.69
Advancement	3.01	1.872
Role Playing	3.11	1.642
Role Projection	3.21	1.626
Emotional Involvement	3.27	1.832
Mechanics	3.35	1.711
Complexity	3.37	2.003
Image	3.59	1.609
Discovery	3.75	1.665
Teamwork	3.76	1.635
Customization	3.77	1.743
Subjective Norms	3.77	1.569
Socializing	3.81	1.649
Perceived Playfulness - Curiosity	3.83	1.617
Competition	3.9	1.697
Novelty	3.94	1.548
Arousal	**4.12**	**1.592**
Social Factors	**4.22**	**1.609**
Ease of Use	**4.44**	**1.748**
Relative Advantage	**4.46**	**1.539**
Perceived Ease of Use	**4.61**	**1.726**

Perceived Enjoyment	**5.22**	**1.428**
Extrinsic Motivation	**5.27**	**1.623**
Perceived Usefulness	**5.28**	**1.524**
Job Fit	**5.33**	**1.471**
Outcome Expectations	**5.5**	**1.661**

Table 4. Means and Standard Deviations (Socially oriented virtual worlds)

Fantasy-Gaming	Mean	S.D.
Relationship	2.56	1.489
Escapism	2.96	1.611
Fantasy	3.05	1.644
Role Playing	3.14	1.596
Perceived Playfulness - Concentration	3.23	1.778
Advancement	3.25	1.9
Complexity	3.29	1.806
Role Projection	3.35	1.689
Emotional Involvement	3.35	1.647
Subjective Norms	3.41	1.632
Mechanics	3.44	1.791
Socializing	3.45	1.7
Image	3.49	1.655
Customization	3.66	1.909
Discovery	3.66	1.734
Teamwork	3.69	1.597
Perceived Playfulness - Curiosity	3.74	1.623
Novelty	3.79	1.623
Social Factors	3.81	1.687
Arousal	**3.96**	**1.815**
Relative Advantage	**4.08**	**1.666**
Competition	**4.09**	**1.767**
Ease of Use	**4.17**	**1.642**
Perceived Ease of Use	**4.23**	**1.774**
Perceived Usefulness	**4.36**	**1.883**
Perceived Enjoyment	**4.58**	**1.665**
Job Fit	**4.61**	**1.83**
Extrinsic Motivation	**4.65**	**1.83**
Outcome Expectations	**4.91**	**1.815**

Table 5. Means and Standard Deviations (Fantasy-Gaming oriented virtual worlds)

Regardless of the virtual world type, the top 10 list of potential constructs identified came from UTAUT. Looking at the top 15 constructs revealed that constructs identified in each virtual world type did not seem to vary much. In particular, outcome expectations, extrinsic motivations, ease of use, and perceived usefulness were important considerations to the subjects.

However, there were several potentially important factors from a hedonic perspective identified; perceived enjoyment, arousal, novelty, curiosity, and competition.

There was another unexpected finding. Simply put, our subjects did not seem very interested in trying virtual worlds. On a scale of 1 - 7 (1 being not and 7 being very interested), the mean scores were 3.19, 2.93, and 3.09 for simulation-gaming, socially-oriented, and fantasy-gaming virtual worlds. When individuals with prior experience were held out of the sample, meaning only individuals without experience were analyzed, these means drop even further. Research on technology acceptance has focused extensively on facilitators to technology acceptance. Much less attention has been given to the inhibitors to technology acceptance due to the assumption that the inhibitors are merely the opposite of the facilitators (Cenfetelli 2004). Recent studies suggest that it is important to identify inhibitors of technology acceptance. For example, according to Cenfetelli (2004), facilitators and inhibitors of technology acceptance are independent of one another, and it is just as important to identify inhibitors as facilitators. Fuller et al. (2007) also suggests that it is necessary to identify individual level inhibitors in theoretical frameworks that explain virtual world adoption. Accordingly, we performed a content analysis to integrate into our model potential inhibitors of virtual world acceptance.

The analysis of qualitative data (responses to the open-end questions, reasons for adopting and not adopting virtual worlds) involved coding the data, which allowed us to organize a large amount of text and to discover patterns in the data. As reasons for adopting technologies have been studied extensively, we focused mainly on the reasons for not adopting virtual worlds. Coding was a multi-step process. First, we read and re-read the data and created a specific coding scheme. Based upon our understanding of the responses, we arrived at six constructs (opportunity cost of time, opportunity cost of money, perceived lack of value, perceived lack of realism, negative image, and other). Next, we coded 20% of the data independently by using the coding scheme for comparison. Cohen's kappa was calculated to assess inter-rater reliability, and the Cohen's kappa was 0.73, an acceptable level. This allowed one researcher to code the remaining responses. Table 6 shows the five constructs and their definitions along with some examples of related responses. Table 7 summarizes the results of the content analysis.

Constructs (Inhibitors)	**Definitions**	**Examples of Related Responses**
Opportunity Cost (Time)	The degree to which an individual views participating in a virtual world involves investing too much time or that time could be spent engaging in other alternative activities.	▪ "I would rather be doing other real-life activities". ▪ "Waste of time, might be harmful to my real life socializing". ▪ "Not enough time to play with my kids now". ▪ "Takes up too much time".
Opportunity Cost (Money)	The degree to which an individual views participating in a virtual world involves too high monetary costs or monetary costs that could be spent engaging in other alternative activities.	▪ "Cost". ▪ "Money". ▪ "I don't want to pay high monthly fees for RPGS". ▪ "High fees". ▪ "Too expensive".
Perceived Lack of Value	The degree to which an individual views participating in a virtual world is pointless or lacks utility.	▪ "Not worth my time". ▪ "No purpose to do". ▪ "I think it's pointless". ▪ "I do not see any benefits of using virtual worlds".
Perceived lack of Realism	The degree to which an individual views participating in a virtual world lacks a sense of realism as compared to real life.	▪ "This is fake!" ▪ "Prefer the real thing". ▪ "Because I like real life". ▪ "Poor graphics".

		▪ "Why have a fake life?" ▪ "It is not realistic".
Negative Image	The degree to which an individual views participating in a virtual world projects a negative image or stereotype unsuitable for the focal group.	▪ "Being labeled as a "dork"". ▪ "I think its dumb". ▪ "Immature". ▪ "I think it is weird". ▪ "Everyone I've met that plays it is a little bit strange and is obsessed with it".

Table 6.Constructs (Inhibitors) which emerged from the analysis of qualitative data

Social-Oriented			**Simulation-Gaming**		
Opportunity Cost (Time)	72	53.33%	Opportunity Cost (Time)	20	37.04%
Opportunity Cost (Money)	3	2.22%	Opportunity Cost (Money)	2	3.70%
Perceived Lack of Value	12	8.89%	Perceived Lack of Value	9	16.67%
Perceived Lack of Realism	30	22.22%	Perceived Lack of Realism	13	24.07%
Negative Image	26	19.26%	Negative Image	5	9.26%
Other	25	18.52%	Other	9	16.67%
Total	**168**		**Total**	**58**	
Fantasy-Gaming			**Overall Total**		
Opportunity Cost (Time)	56	60.87%	Opportunity Cost (Time)	148	52.67%
Opportunity Cost (Money)	2	2.17%	Opportunity Cost (Money)	7	2.49%
Perceived Lack of Value	9	9.78%	Perceived Lack of Value	30	10.68%
Perceived Lack of Realism	13	14.13%	Perceived Lack of Realism	56	19.93%
Negative Image	5	5.44%	Negative Image	36	12.81%
Other	9	9.78%	Other	43	15.30%
Total	**94**		**Total**	**320**	

Table 7. The results of the content analysis

A PROPOSED FRAMEWORK OF VIRTUAL WORLD ACCEPTANCE

Our proposed model is presented as figure 1. The responses from our focal group indicate strong support for the inclusion of both the performance and effort expectancy constructs from UTAUT. For example, all five of the constructs which comprise the performance expectancy construct were rated highly by our subjects. For the effort expectancy construct, two of the three constructs identified by UTAUT were rated highly by our subjects.

UTAUT defines social influence as comprised of three dimensions: subjective norms, social factors, and image. Of these three, social factors, was rated highly by our subjects, indicating some support for including social influence in the model. An actual test of this model should be cautious of only looking at social factors as UTAUT suggests that social influence is a multi-dimensional construct.

We extend UTAUT in two ways. First, we propose that hedonic expectancy, defined as the hedonic fulfillment which individuals expect from engaging in a virtual world, influences an individual's intention to participate in a virtual world. As our focal group indicated, perceived enjoyment, arousal, novelty, curiosity, and competition were important to them. Second, we differentiate between facilitators and inhibitors of virtual world acceptance. We define performance expectancy, effort expectancy, social influence, and hedonic expectancy as facilitators of virtual world acceptance. These are expected to positively influence individuals to participate in virtual worlds. We define opportunity costs in time and money, perceived

lack of value, perceived lack of realism, and a negative image as inhibitors of virtual world acceptance. These are posited to negatively influence individuals to participate in virtual worlds.

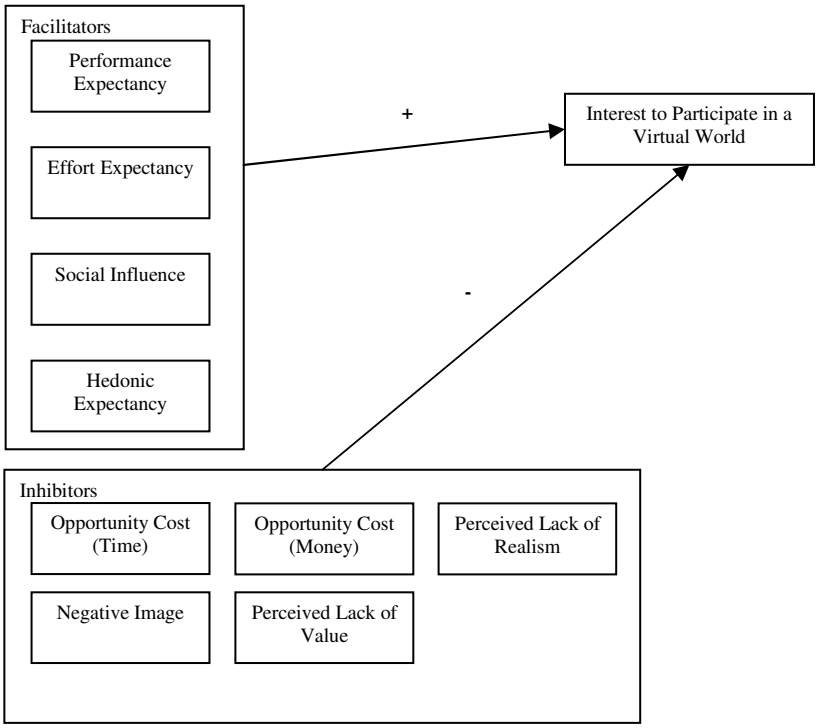

Figure 1. A proposed framework of virtual world acceptance

This model is not without limitations. Without a doubt, empirical validation is required. In addition, the relative strength of predictors between different virtual world types should also be examined. Also, future research should take into account the moderators which the original UTAUT suggest. Given that UTAUT was developed and tested in a non-voluntary and utilitarian context, much of the theoretical foundations for the moderators draw from work-based literature. This presents an obvious disconnect between UTAUT and the virtual world context, motivating more research into potential moderators and developing theoretical underpinnings specifically for the virtual world context. To this end, a post-hoc analysis of our survey indicates that prior virtual world experience may be a moderator of the relationships posed. For example, in the fantasy-gaming survey, a one-way ANOVA indicated that individuals with prior experience had different ratings on 16 out of the 29 constructs than individuals without prior experience.

What is most interesting about this experience effect is that when we reanalyzed the rankings as separated by experience, the constructs as ranked by their means, which were most important changed. Specifically, three utilitarian constructs, outcome expectations, extrinsic motivation, and job fit had the highest means for subjects with no fantasy-gaming experience. For subjects with fantasy-gaming experience, the three constructs with the highest means were hedonic – perceived enjoyment, competition, and arousal. This finding is consistent with other TAM related studies that show that the perceived ease of use for a technology declines in importance as compared to the perceived usefulness of the technology as users gain experience with the technology. Future research should be aware that user motivations are not static and can change with time and experience.

CONCLUSION

Our study has helped to identify a large number (29) of potentially study-worthy factors which impact the user adoption of virtual worlds. Utilizing responses from potential adopters in a mixed-methods study, we were able to parsimoniously narrow down this large list of factors by ranking them according to their means. Consistent with our earlier argument that virtual worlds are not simply utilitarian or hedonic but both, the factors identified did contain both utilitarian and hedonic motivations. While we do not debate that utilitarian factors appear to be more important than hedonic factors initially, a conclusion we may draw from this study is that future acceptance studies should consider the mixed purposes and therefore mixed motivations when developing models geared towards the virtual world context.

Surprisingly, the results do not indicate that factors which affect the user adoption of virtual worlds do not vary significantly between virtual world types. One possible explanation is that individuals who have no prior experience with a technology have discerning real differences between virtual world offerings. Another possible explanation is that individuals, when faced with a new technology, are more concerned with difficulties associated with mastering the technology first. This effect however, may be mitigated by prior experiences in virtual worlds.

Finally, our model extends UTAUT to include hedonic expectancies and acknowledging the role of proposed facilitators and inhibitors on virtual world acceptance. Understanding how to encourage individuals to participate in virtual worlds is an important topic to pursue as virtual worlds, like other technologies, require a critical mass of users in order to be self-sustaining.

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