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# User Acceptance of Virtual Worlds: Towards an Integrative Framework

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## ABSTRACT

As a relatively new research area, inquiries into understanding factors which influence the user acceptance of virtual worlds remains an important undertaking. Initial research efforts have been informed largely by theories or frameworks from a rational or utilitarian perspective, such as the technology acceptance model. While results indicate support for the predictive influence of utilitarian factors such as the perceived ease of use in the virtual world context, there is growing recognition that virtual worlds are multi-faceted environments which encompass both utilitarian and hedonic content. This recognition along with the explosive subscriber growth in hedonic virtual worlds such as massively multiplayer online games begs for congruence between the theories and frameworks utilized and the context(s) studied.

Drawing from the information systems, marketing, consumer behavior, and gaming literature, we identify 29 factors which may be used to study the user acceptance of virtual worlds. Lastly, we describe a pilot study which investigates the relative predictive power of both utilitarian and hedonic factors with regards to encouraging prospective user participation in virtual worlds. It is hoped that these results will help guide efforts to develop of an integrated framework which provides a richer understanding of the user acceptance of virtual worlds.

## KEYWORDS

Virtual Worlds, Technology Acceptance, Hedonic Technology, Utilitarian Technology, Motivation Theory

## INTRODUCTION

Virtual worlds are “graphically-rich, three-dimensional (3D), electronic environments where members can assume an embodied persona (i.e., avatars) and engage in socializing, competitive quests, and economic transactions with globally distributed others” (Schultze, Hiltz, Nardi, Rennecker, and Stucky, 2008). According to Schultze and Rennecker (2007), 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). Simulation and fantasy games are characterized by a large number of rules and predetermined goals. In contrast, virtual reality and virtual fantasy games are characterized by smaller numbers of rules and goals that are not predetermined. Simulation games and virtual reality can be considered as “realistic virtual worlds” in which the virtual world environment and avatars utilized correspond highly with the real world. In contrast, fantasy games and virtual fantasy can be considered as “fantasy virtual worlds” in which the environment is fantastical. The nature and mechanics of, and derived experiences from these types of virtual worlds are therefore very different.

Utilizing the above taxonomy also allows us to frame virtual worlds as having both hedonic and utilitarian purposes. For example, simulation games may be used for utilitarian purposes, such as education and training. In contrast, fantasy games may be used for hedonic purposes, including entertainment. According to Van der Heijden (2004), a hedonic technology aims to provide self-fulfilling value to the user, such as pleasure and enjoyment. A utilitarian technology aims to provide instrumental value to users, such as improving job performance.

Prior studies of individual technology adoption have identified factors that motivate individuals to adopt based on either hedonic or utilitarian factors. Since virtual worlds can be viewed as both hedonic and utilitarian technologies, it is important to cross examine which of these previously-studied factors may motivate individuals to adopt virtual worlds. To date, only a few academic and empirical studies have investigated the factors that motivate individuals to participate in virtual worlds (e.g., Shen and Eder, 2008), and have only investigated a limited number of factors. In addition, to our knowledge, no academic studies have comprehensively examined the relative importance of different dimensions of the utilitarian and

hedonic factors that motivate individual participation in virtual worlds. Furthermore, although Schultze and Rennecker (2007) suggest that there are different types of virtual worlds, most prior studies focus only on one type of virtual world (e.g., Shen and Eder, 2008; Holsapple and Wu, 2007). Therefore, the purpose of this study is to answer the following research questions: (1) **What are the important factors that drive user interest in virtual worlds?** (2) **Are these factors contingent upon the virtual world type in question?**

The rest of this paper is organized as follows. The relevant literature is discussed in the Literature Review section. Then, our research methodology is presented. Next, the data analysis and findings from a pilot study are presented. The paper concludes by discussing some of implications of the results. The limitations of the study and recommendations for future research are discussed at the end.

## LITERATURE REVIEW

### Motivation Theory

Motivation theory (Deci and Ryan, 2000; Vallerand, 1997; Deci, 1975) has been used often to understand individuals' IT adoption (Van der Heijden, 2004; Igbaria, Parasuraman and Baroudi, 1996; Davis, Bagozzi, and Warshaw, 1992). Motivation theory suggests that individual behavior is determined by two fundamental types of motivation: extrinsic (utilitarian) motivation and intrinsic (hedonic) motivation. Extrinsic motivation refers to performing an activity because it is perceived to be instrumental in achieving valued outcomes that are distant from the activity itself, such as improving job performance, pay, or promotion (Davis, 1992; Deci, 1975). Intrinsic motivation refers to performing an activity for no apparent reinforcement other than the process of performing the activity per se (Davis, 1992; Deci, 1975).

In the context of technology adoption, extrinsic motives, such as perceived usefulness and perceived ease of use have been seen as dominant predictors of utilitarian technology adoption (Wakefield and Whitten, 2006). On the other hand, intrinsic motives, such as perceived enjoyment and perceived playfulness, are viewed as strong predictors of hedonic technology adoption (Venkatesh, 1999). Therefore, as virtual worlds can be seen as examples of either hedonic or utilitarian technology, or mixture of both it is important to examine the various motives and comprehend the relative importance of those motives to better comprehend virtual world adoption.

### Technology Acceptance Literature

Prior studies of individual technology acceptance found factors that influence the adoption of utilitarian technologies. For example, Venkatesh, Morris, Davis, and Davis (2003) identified factors from eight prominent models and theories including the theory of reasoned action (TRA), the technology acceptance model (TAM), the theory of planned behavior (TPB), innovation diffusion theory (IDT), and social cognitive theory (SCT). Through a longitudinal empirical investigation of the impact of the factors on individuals' intent to use utilitarian technology (a database application and online meeting software), Venkatesh et al. (2003) found perceived usefulness, extrinsic motivation, job fit, relative advantage, perceived ease of use, complexity, ease of use, subjective norm, image, and social factors as being significant predictors (See Table 1 for a definition of the factors). Combined, these factors were integrated into the Unified Theory of Acceptance and Use of Technology (UTAUT).

Recently, only very few studies have investigated empirically the individual adoption of hedonic technologies. Yee (2007) identifies motivations for playing online games, 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 as being a strong determinant of intention to use a movie website. Drawing from the marketing literature, Holsapple and Wu (2007) identify the motivations relevant for participation in "virtual worlds with an entertainment" dimension. These motivations include fantasy, role projection, escapism, enjoyment, emotional involvement, and arousal.

Based on our review of the literature, we identified the key motivations predicting adoption of utilitarian technologies and hedonic technologies. The table below shows those motivations, their definitions and the prior studies that examined the factors. All of these factors will be examined in this study in order to identify factors that motivate individuals to participate in virtual worlds.

Motives	Definition	Relevant Studies
Perceived Usefulness	The degree to which using a particular technology would	Venkatesh et al. (2003); Davis

	enhance his or her job	(1992)
Perceived Ease of Use	The degree to which a person believes that using a particular system would be free of effort	Venkatesh et al. (2003); Davis (1992)
Ease of Use	The degree to which using an innovation is perceived as being easy to use	Venkatesh et al. (2003); Moore and Benbasat (1991)
Job-Fit	The extent to which an individual believes that using a technology can enhance the performance of his or her job	Venkatesh et al. (2003); Thompson, Higgins, Howell (1991)
Outcome Expectation	The performance-related consequences of the behavior	Venkatesh et al. (2003); Compeau, Higgins, and Huff (1999); Compeau and Higgins (1995);
Extrinsic Motivation	Doing something because it leads to separable outcome	Deci (1975)
Complexity	The degree to which an innovation is perceived as difficult to understand and use.	Rogers (1995)
Subjective Norm	The person's perception that most people who are important to him think he should not perform the behavior in question	Fishbein and Ajzen (1975)
Social Factors	The individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situation	Venkatesh et al. (2003); Thompson et al. (1991)
Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system	Venkatesh et al. (2003); Moore and Benbasat (1991)
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	Holsapple and Wu (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)
Perceived Playfulness (Curiosity)	The extent to which an individual is curious during the interaction a certain technology	Moon&Kim (2003)
Perceived Playfulness (Concentration)	The extent to which an individual focus on the interaction with a technology	Moon&Kim (2003)

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 and Wu (2007)
Arousal	The state of emotional and mental activation or alertness elicited by external sensory stimulation	Holsapple and Wu (2007)
Novelty-Seeking	The curiosity of human to seek something new and different	Wang, Zhang, and Ouyang (2005)
Relative Advantage	The degree to which the innovation is perceived as better than the idea it supersedes.	Venkatesh et al. (2003); Rogers (1995)

**Table 1. Summary of Factors that Motivate Individual Adoption of Utilitarian or Hedonic technologies**

**RESEARCH METHODOLOGY**

Data for the pilot study was collected using a survey research methodology. This study focuses on three different types of virtual worlds: simulation-gaming oriented virtual worlds, socially-oriented virtual worlds, and fantasy-gaming oriented virtual worlds. Three survey questionnaires were developed (assessing motivations for each different environment), and administered to junior and senior level undergraduate business students from two Management Information Systems classes at a university in the Southeastern US. We argue that undergraduate students present a potentially informative subject pool due to certain demographic factors. For example, undergraduate students possess substantial internet experience and thus are familiar with virtual worlds as compared to people who do not have much access to the Internet (Hua and Haughton, 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., Venkatesh et al. (2003); Yee (2007); Holsapple and Wu, 2007). One item representing each construct identified in table 1 was chosen using the following process. We first examined items for each construct identified in our literature review. 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 context. 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. 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 with any research, the pilot represents cost-benefit trade-offs with several compromises. While we do not debate 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 motivations simultaneously. One goal of the pilot instrument was to identify potentially important factors 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 the pilot surveys, parsimony was another clearly sought after goal for the pilot.

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 contexts, 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.

<b>Simulation-Gaming</b>			
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
<b>Socially-Oriented</b>			
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
<b>Fantasy-Gaming</b>			
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

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 context shown in bold.

<b>Simulation-Gaming</b>	<b>Mean</b>	<b>S.D.</b>
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
<b>Novelty</b>	<b>4.16</b>	<b>1.744</b>
<b>Social Factors</b>	<b>4.28</b>	<b>1.779</b>
<b>Relative Advantage</b>	<b>4.44</b>	<b>1.823</b>
<b>Ease of Use</b>	<b>4.79</b>	<b>1.753</b>
<b>Perceived Ease of Use</b>	<b>4.96</b>	<b>1.716</b>
<b>Perceived Enjoyment</b>	<b>5.1</b>	<b>1.694</b>
<b>Job Fit</b>	<b>5.15</b>	<b>1.688</b>
<b>Extrinsic Motivation</b>	<b>5.17</b>	<b>1.763</b>
<b>Perceived Usefulness</b>	<b>5.18</b>	<b>1.786</b>
<b>Outcome Expectations</b>	<b>5.46</b>	<b>1.693</b>

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

<b>Socially-Oriented</b>	<b>Mean</b>	<b>S.D.</b>
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
<b>Arousal</b>	<b>4.12</b>	<b>1.592</b>
<b>Social Factors</b>	<b>4.22</b>	<b>1.609</b>
<b>Ease of Use</b>	<b>4.44</b>	<b>1.748</b>
<b>Relative Advantage</b>	<b>4.46</b>	<b>1.539</b>
<b>Perceived Ease of Use</b>	<b>4.61</b>	<b>1.726</b>
<b>Perceived Enjoyment</b>	<b>5.22</b>	<b>1.428</b>
<b>Extrinsic Motivation</b>	<b>5.27</b>	<b>1.623</b>
<b>Perceived Usefulness</b>	<b>5.28</b>	<b>1.524</b>
<b>Job Fit</b>	<b>5.33</b>	<b>1.471</b>
<b>Outcome Expectations</b>	<b>5.5</b>	<b>1.661</b>

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

<b>Fantasy-Gaming</b>	<b>Mean</b>	<b>S.D.</b>
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
<b>Arousal</b>	<b>3.96</b>	<b>1.815</b>
<b>Relative Advantage</b>	<b>4.08</b>	<b>1.666</b>

<b>Competition</b>	<b>4.09</b>	<b>1.767</b>
<b>Ease of Use</b>	<b>4.17</b>	<b>1.642</b>
<b>Perceived Ease of Use</b>	<b>4.23</b>	<b>1.774</b>
<b>Perceived Usefulness</b>	<b>4.36</b>	<b>1.883</b>
<b>Perceived Enjoyment</b>	<b>4.58</b>	<b>1.665</b>
<b>Job Fit</b>	<b>4.61</b>	<b>1.83</b>
<b>Extrinsic Motivation</b>	<b>4.65</b>	<b>1.83</b>
<b>Outcome Expectations</b>	<b>4.91</b>	<b>1.815</b>

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

Regardless of the context, the top 10 list of potential factors identified were mostly factors with a utilitarian or rational perspective. 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, and competition.

Based upon the discussions in class, the questions raised by the subjects, and an analysis of the qualitative comments provided by the subjects to the two open-end questions, we noted that there might be potential gender and experience effects. Therefore we ran post-hoc one-way ANOVA analyses for each virtual world context to test for these effects. The results are presented below as Tables 6 – 11. In each table, the constructs with significant differences and their means are listed, with the bolded mean representing the larger mean. P-values are also provided; some constructs with p-values from 0.05 to 0.1 are listed for reference. As this is an exploratory pilot study, these constructs with marginal p-values could be still important for future study.

While cell sizes for gender were fairly balanced, cell sizes for the experience effect were biased in favor of subjects with no experience. For simulating-gaming, socially-oriented, and fantasy-gaming virtual worlds, there were 31 of 132, 25 of 133, and 25 of 129 subjects with prior virtual world experience of that context. Unbalanced cell sizes indicate that additional caution when interpreting the results may be needed. In particular, tests to see if assumptions behind ANOVA analysis are met should be performed. A Levene's statistic, which tests of the homogeneity of variances between groups, was utilized. Any violations of this assumption are noted explicitly in the accompanying tables.

Simulation-Gaming	F	M	df	p-value
Mechanics	3.09	3.64	1,129	0.073
Perceived Playfulness				
Concentration	2.46	2.97	1,129	0.06
Relationship	3.44	2.69	1,127	0.021
Fantasy	2.58	3.23	1,128	0.033
Competition	3.57	4.41	1,130	0.006
Arousal	3.73	4.32	1,130	0.068

**Table 6. Mean difference between Females and Males (Simulation-Gaming Oriented Virtual Worlds)**

Socially-Oriented	F	M	df	p-value
Customization	4.32	3.29	1,131	0.001
Job Fit	5.59	5.13	1,132	0.071

**Table 7. Mean difference between Females and Males (Socially Oriented Virtual Worlds)**

Fantasy-Gaming	F	M	df	p-value
Escapism	2.7	3.19	1,128	0.087
Novelty	3.49	4.04	1,127	0.054
Socializing	3.17	3.7	1,127	0.078
Overall Interest	2.75	3.39	1,128	0.045

**Table 8. Mean difference between Females and Males (Fantasy-Gaming Oriented Virtual Worlds)**

Simulation-Gaming	0	1+	df	p-value
Escapism	2.89	3.57	1,128	0.08
Novelty	3.99	4.71	1,131	0.044
Perceived Usefulness	5.03	5.7	1,128	0.071

**Table 9. Mean difference between individuals who have prior experience with simulation oriented virtual worlds and individual who have no prior experience**

Socially-Oriented	0	1+	df	p-value
Advancement	2.84	3.76	1,131	0.027
Customization	3.62	4.46	1,131	0.033*
Role Projection	3.09	3.75	1,132	0.073
Relationship	2.79	3.68	1,132	0.017
Novelty	3.8	4.6	1,133	0.019
Fantasy	2.69	3.32	1,133	0.064
Competition	3.78	4.44	1,133	0.08*

**Table 10. Mean difference between individuals who have prior experience with socially oriented virtual worlds and individual who have no prior experience (\* Levene's Reject)**

Fantasy-Gaming	0	1+	df	p-value
Advancement	3.07	4	1,127	0.027
Perceived Ease of Use	4.03	5.08	1,127	0.007*
Discovery	3.53	4.2	1,127	0.082
Mechanics	3.14	4.68	1,128	<0.0001
Novelty	3.64	4.4	1,127	0.036
Ease of Use	4.03	4.76	1,126	0.045
Social Factors	3.6	4.68	1,126	0.004
Image	3.3	4.28	1,126	0.007
Perceived Enjoyment	4.34	5.56	1,128	0.001
Relative Advantage	3.9	4.88	1,128	0.007
Competition	3.76	5.48	1,128	<0.0001
Socializing	3.28	4.16	1,127	0.019
Perceived Playfulness	3.57	4.44	1,127	0.015

Curiosity				
Teamwork	3.51	4.4	1,125	0.012
Emotional Involvement	3.15	4.16	1,127	0.006
Arousal	3.69	5.12	1,128	<0.0001
Overall Interest	2.74	4.56	1,128	<0.0001

**Table 11. Mean difference between individuals who have prior experience with Fantasy-Gaming oriented virtual worlds and individual who have no prior experience (\* Levene's Reject)**

Overall, there does not appear to be a strong gender effect. Statistically significant differences ( $p$ -value  $< 0.05$ ) between males and females were found in 3, 1, and 2 constructs for simulation-gaming, socially-oriented, and fantasy-gaming virtual worlds. For simulation-gaming virtual worlds, females placed greater importance on relationships than males, while males reported fantasy and competition as being more important than females. For socially-oriented virtual worlds, females placed greater importance on the ability to customize their avatars than males.

Results indicate that there may be an experience effect. While experienced users of virtual worlds placed higher importance on only one factor, novelty, for simulation-gaming worlds and placed higher importance on 4 factors, advancement, customization, relationship, and novelty, for socially-oriented worlds, results for fantasy-gaming virtual worlds were very different. For fantasy-gaming virtual worlds, experienced users of these worlds placed greater importance on 16 out of 29 total factors.

## DISCUSSION AND DIRECTIONS FOR FUTURE RESEARCH

Our literature review has helped to identify a large number (29) of potentially study-worthy factors which impact the user adoption of virtual worlds. Utilizing a survey-based study, we were able to parsimoniously narrow down this large list of factors by ranking them according to their means. Consistent with our earlier arguments 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 pilot is that future acceptance studies should consider the mixed purposes and therefore mixed motivations when developing models geared towards the virtual world context. A unified theoretical model to understand virtual world acceptance is still needed.

Surprisingly, the results do not indicate that factors which affect the user adoption of virtual worlds do not vary significantly between virtual world contexts. 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. These explanations are purely guesses and further research should identify why the initial adoption of virtual worlds does not appear to be affected by virtual world context.

The post-hoc analyses of gender and experience effects offer some interesting insights. While there does not appear to be a strong gender effect, experience seems to play a role in what is important to individuals. While we did not explicitly collect data that spoke to the length and intensity of usage, it was obvious from the in-class discussions, questions, and qualitative comments, that our subjects had significantly more experience with fantasy-gaming virtual worlds than the other two virtual world contexts we studied. What is most interesting about the experience effect, is that when we reanalyzed the rankings as separated by experience, the type of factors which were most important changed. Specifically, three utilitarian factors, 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 factors with the highest means were hedonic – perceived enjoyment, competition, and arousal.

While we are unable to empirically suggest reasons for this drastic turnaround, we do suggest that theoretical models for virtual world adoption should also take into account what effects prior experience may have on user usage. Specifically, future research should be aware that user motivations are not static and can change with time and experience. 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.

Lastly, a preliminary analysis of the qualitative comments has been informative in an unexpected way. Our primary focus for this study was to identify and rank potential factors which positively affect user intentions to adopt virtual worlds. As we noted, the mean rankings for overall interest in virtual worlds were relatively low, looking at the qualitative comments helped identify several key factors why individuals do not adopt and participate in virtual worlds. While a full content analysis is still underway, the comments provided indicate that high opportunity costs, the lack of a “killer application” to drive serious interest, a lack of perceived added value, and a stereotyped geeky image for virtual world users serve to discourage virtual world adoption.

As the taxonomy formulated by Schultze et al. (2008) points out, virtual worlds do offer a fascinating array of uses and purposes. However, there is still much to be learned about how to attract new virtual world users. Moreover, scholars have noted that early efforts, such as companies building in-world facilities on islands within Second life have met with limited success – mainly the lack of virtual foot traffic (Ives and Junglas, 2008). We argued that the divergence in the types of virtual worlds motivate studies which aim to understand what the important factors which draw potential user interest and that mixed models of user acceptance need to be developed. User interest, or the intentions to adopt a virtual world, is an important topic to understand as virtual worlds, like other technologies, require a critical mass of users in order to be self-sustaining.

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