Assessing the Value of Virtual Worlds for Post-Secondary Instructors: A Survey of Innovators, Early Adopters and the Early Majority in Second Life

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Summary of Findings

The purpose of this study was to assess the value of the virtual world Second Life among post-secondary instructors with experience using Second Life as an educational tool. Using the diffusion of innovations as the theoretical framework, respondents to the survey were divided into three adopter categories (innovators, early adopters and the early majority) based on the time they had spent using Second Life as an educational tool. In addition to providing detailed descriptive statistics on the instructors, institutions and courses being taught in Second Life, this survey assessed the satisfaction level of instructors across adopter categories and different course structures, as well as the factors influencing the adoption of Second Life as an educational tool.

Based on the respondents to this survey, post-secondary instructors with experience using Second Life as an educational tool are split fairly evenly by gender and are 45 years old on average. These instructors generally have over a decade of higher education teaching experience with the vast majority (85.8%) teaching at institutions that grant at least a master's degree. Since this study revolved around Second Life as a computer-mediated form of communication being used for

Table 1

Instructors by Country

Country Represented	Number of Instructors (% of N)
United States	110 (67.9)
United Kingdom	13 (8.0)
Australia	8 (4.9)
Germany	8 (4.9)
Spain	4 (2.5)
Sweden	4 (2.5)
Canada	3 (1.9)
France	2 (1.2)
Italy	2 (1.2)
Netherlands	2 (1.2)
Portugal	2 (1.2)
Austria	1 (.6)
Colombia	1 (.6)
Finland	1 (.6)
Norway	1 (.6)

Items: Subjects were asked "What country do you teach in?" with approximately 200 countries to select from in response.

Table 2

Instructors by Academic Discipline

Discipline	Number of Instructors (% of N)
Education	40 (24.7)
Journalism/Media/Communications	20 (12.3)
Computer Sciences	19 (11.7)
English/Literature	11 (6.8)
Business	10 (6.2)
Visual Arts	9 (5.6)
Architecture/Design/ Applied Arts	7 (4.3)
Health Sciences	6 (3.7)
Performing Arts	5 (3.1)
Languages/Linguistics	3 (1.9)
Law	3 (1.9)
Life Sciences	3 (1.9)
Psychology	3 (1.9)
Religion	3 (1.9)
Social Work	3 (1.9)
Sociology	3 (1.9)
Chemistry	2 (1.2)
Engineering	2 (1.2)
History	2 (1.2)
Personal Service Professions	2 (1.2)
Political Science	2 (1.2)
Geography	1 (.6)
Gender/Sexuality Studies	1 (.6)
Physics	1 (.6)
Space Sciences	1 (.6)

Items: Subjects were asked "What academic discipline do you teach in?" with 37 disciplines to select from in response.

educational purposes, it was not surprising to find that almost half of the respondents were from academic disciplines such as Education, Journalism/Media/Communications and Computer Sciences. However, it was interesting to find that 22 other disciplines were represented. While the majority of respondents were from the U.S., a total of 15 countries were represented. The diversity of respondents by nationality and academic discipline suggests that Second Life has the potential to be adopted across many different borders and in many different areas of academe.

The second research question examined the relationship between the length of time the instructor had used Second Life as an educational tool and the instructors' level of satisfaction with using Second Life for this purpose. This question also examined the instructors' perception of how using Second Life in their curricula affected students' learning. For both levels of satisfaction and perceived student learning effect, respondents in the different adopter categories

indicated no significant differences. In fact, respondents from each adopter category not only reported mean satisfaction levels that were very similar to respondents in the other adopter categories, but the overall mean satisfaction score across all adopter categories was also very similar to the overall mean score for student learning effect. The overall mean scores of 4.76 for instructors' levels of satisfaction and 4.86 for perceived student learning effect, both on a seven-point Likert-type scale, indicate that respondents hold an above average opinion of this innovation. This is also consistent with the fact that a commanding 93.8% of respondents reported they intend to use Second Life as an educational tool again. Thus, the notable implication of this seems to be that while instructors' satisfaction with Second Life as an educational tool is closely tied to their perception of its benefit for student learning, there is no indication that having used the program as an educational tool for a longer period of time, or characteristics unique to members of different adoption categories have any influence on their satisfaction with the innovation.

Table 3

Instructors' Satisfaction Levels and Perceived Effect on Student Learning by Adopter Category

	Innovators Mean (sd)	Early Adopters Mean (sd)	Early Majority Mean (sd)	Total Mean (sd)
Instructors' Satisfaction Levels	4.53 (1.07)	4.81 (1.55)	4.72 (1.61)	4.76 (1.51)
Perceived Effect on Student Learning	4.88 (.86)	4.88 (1.24)	4.75 (1.02)	4.86 (1.16)

Items: For instructors' satisfaction levels, subjects were asked "What is your level of satisfaction with using ..." with 7 = very satisfied and 1 = very unsatisfied. For perceived effect on student learning, subjects were asked, "How has using Second Life overall affected ..." with 7 = strongly improved and 1 = strongly hindered.

Respondents also indicated that the more Second Life was integrated into the class structure, the more satisfied they were with it. Specifically, instructors who conducted class fully in Second Life were significantly more satisfied than those who used Second Life as only a small supplement to a real-world class. For administrators and instructors considering using Second Life as an educational tool, these results indicate that a fully immersive Second Life experience, rather than isolated experimentation, could be the most rewarding. Considering the amount of time it takes to become comfortable with the Second Life user interface, students may have to wait until they have attained a sufficient working knowledge of the program to receive the most benefits from its utilization. Likewise, instructors may need to be fully engaged in using Second Life in their course structure to determine how the medium best suits their teaching needs and the needs of their students. More intensive exposure to Second Life's various tools and features may allow students to gain this familiarity in a shorter overall time span, and better enable instructors to find the best use of the virtual world medium for matching with their unique classroom goals.

The final research question looked into the differences among adopter categories regarding the factors that influenced their decision to adopt Second Life as an educational tool. A significant difference among adopter categories was found for only one influential factor, "Linden Lab support for educators." The early majority and innovators both found Linden Lab support to be significantly more influential than early adopters. The early majority may score Linden Lab support the highest among the adopter categories because they are the newest to Second Life and are the least likely to try an innovation on their own. Innovators may score Linden Lab support more highly than early adopters because these innovators may want to use the more advanced features in Second Life for their classes, such as using the Second Life prim system for building objects. Exploring and implementing these more advanced features may

mean innovators likewise seek more advanced technical support than either of the other two adopter categories.

Overall, the most influential factors among the survey respondents were personal interest categories such as "personal interest in improving my students' learning", "personal interest in instructional technology", and "personal interest in improving my own teaching". These factors were followed by "access to computer hardware and software." Interestingly, these results indicate the reverse of the findings in Roberts, Kelley and Medlin's study (2007) of the factors influencing the adoption of new technology by accounting faculty in accounting classes. Roberts et al. (2007) found that availability, reliability and the ease of use of physical resources were the most important adoption factor, followed by personal motivation factors, such as personal satisfaction and a perceived improvement in teaching. Roberts et al. (2007) also found that interpersonal communication factors, such as peer support, shared departmental values, friends and students, were significant in influencing faculty to adopt new technology. Kelton (2007) also cited institutional support as a factor that should speed up the adoption of an educational innovation.

Respondents in the current study scored interpersonal communications factors relatively low compared with the personal factors. These findings support the researchers' belief that Second Life's use as an educational tool is still in the early stages of the diffusion process, as personal motivation factors tend to be more important for educators in the earlier adopter categories. Networks through which evaluations of Second Life's educational abilities could aid in its diffusion are still being constructed. In a normal diffusion process, "most people depend mainly upon a subjective evaluation of an innovation that is conveyed to them from other individuals like themselves who have already adopted the innovation." (Rogers, 2003, pp. 18-19)

Table 4

Importance of Influential Factors to Adoption of Second Life as an Educational Tool

Influential Factors	Mean (sd)
Personal interest in instructional technology	6.00 (1.34)
Personal interest in improving my teaching	5.77 (1.45)
Personal interest in enhancing student learning	6.30 (.99)
Success stories from colleagues	2.80 (1.83)
Well established use of Second Life for teaching	2.60 (1.57)
Administrative and departmental support	3.03 (1.99)
Peer support from colleagues	3.40 (2.04)
Academic journals and conferences	3.04 (1.86)
Mass media	3.30 (1.85)
Linden Lab support for educators	3.01 (1.83)
Student enthusiasm	4.07 (1.97)
Access to computer hardware and software	4.76 (1.79)

Items: Subjects were asked "How influential were each of the following factors …" with 7 = very influential and 1 = not influential at all.

Early in the diffusion process, there are few individuals who can provide an appropriate evaluation. As the process approaches critical mass, more interpersonal communication channels should emerge and exert a stronger influence on the diffusion of the innovation (Rogers, 2003). With this in mind, assuming Second Life's usage as an educational tool follows a normal diffusion process, subsequent surveys should predictably reveal that interpersonal and institutional support factors are more influential for later adopters.

This study is notable in several ways. Most academic research into the usage of Second Life as an educational tool has consisted largely of discipline-specific qualitative case studies. This study provides one of the first comprehensive quantitative reviews of *which* post-secondary instructors, institutions and disciplines are using Second Life and *to what effect*. While the body

of literature regarding diffusion of innovations theory is extensive, this study is also unique in that it builds on previous diffusion findings, yet examines an innovation that is new to the diffusion literature. Finally, this study answers Rogers's (2003) call to "investigate the diffusion of an innovation while the diffusion process is still under way." (p. 112) Diffusion studies are often conducted *after* an innovation has already diffused completely to the members of a system, leading to research focused on successful innovations (Rogers, 2003).