ABSTRACT
This poster describes progress on a research project, based on Everett Rogers’ Diffusion Theory as a theoretical framework, which analyzes factors contributing to the adoption of virtual worlds by librarians and educators. A mixed methods study, using both qualitative and quantitative methods, obtained study participants (n= 219) through online listservs. Survey questions were coded to match Rogers’ five attributes: (relative advantage, compatibility, complexity, trialability, and observability). Results of the study identify five current predictors along with perceived benefits for the use of virtual worlds in educational settings and libraries.

Keywords
Virtual worlds, avatars, immersive learning environments, diffusion theory.

INTRODUCTION
Virtual worlds are one of the fastest growing modes of interaction on the web (Harris & Rea, 2009). Bell defines a virtual world as “a synchronous, persistent network of people, represented as avatars, facilitated by networked computers” (Bell, 2008). People interact across the globe through online worlds such as Gaia (popular with teens) or Webkinz (for the youngest users). By creating a virtual character to represent one’s identity, called an avatar, individuals present themselves in a simulated context. Avatars may resemble the person, may be an animal, or some other creative object. Virtual worlds can provide educational opportunities through a platform or 3D virtual mode without any gaming rules (Lamb & Johnson, 2009). Roleplay can be part of a virtual world, if desired, but is often not necessary or required.

With the rising popularity of virtual worlds for children over the past decade, schools and universities are beginning to explore immersive learning environments, such as Second Life (SL). Librarians, in particular, are in the forefront of the adoption of the innovation and have made recent strides in virtual librarianship through volunteer work at a virtual world reference desk in SL. Perceptions held by librarians and educators regarding their contributions to the fields of education and librarianship in this new virtual medium need to be identified and examined in order to understand best practices and the stages of innovation.

LITERATURE REVIEW
A research study by Shen and Eder (2009) based on the Technology Acceptance Model (TAM) developed a survey designed to measure perceived usefulness and perceived ease of use. Other factors measured in the survey included computer playfulness, computer self efficacy, computer anxiety, and behavioral intention to use Second Life. Surprisingly, the perceived ease of use had no direct affect on the behavioral intention to use Second Life among undergraduate and continuing studies students in a university in Northeastern United States. Results suggested that students perceive the achievement of learning tasks as extrinsic to the use of the virtual world; In other words, the use of SL is perceived as only the means, or interface to achieving learning, as opposed to the central component of the process (Shen & Eder, 2009). Thus, creativity, playfulness, and social interaction far outweighed feelings of computer anxiety. While these pioneers explore potential for education, critics raise questions about sustainability, accessibility, privacy, security, and potentially harmful content.

A study at the University of California’s Conference on Grey Literature addresses whether or not virtual worlds like Second Life are grey literature (not found through traditional methods) or ephemera (Ferry, Peterman, & Tomren, 2008). And since virtual worlds have evolved out of Massively Multiplayer Online RolePlaying Games (MMORPGs), they are often viewed as games. However, even though video games may be played within Second Life, the environment itself is not a game; Second Life has been commonly called a platform or virtual environment.
Research in virtual worlds is relatively new; however, exploration of this new frontier is illustrated by Boellstorff (2008). In describing the creativity of this new techne, Boellstorff writes, “I hope to have left the reader with a sense of wonder at the emergence of our New Worlds, a sense of wonder at how they draw upon our oldest traditions while presenting new possibilities (Boellstorff, 2008, p. 248).” In addition, San Jose State University School of Library and Information Science has already developed a number of projects and courses in Second Life including a Learning Lab. The Learning Lab was designed with four objectives for experiential learning: a library design toolkit, a student commons, a social skills venue, and a lecture hall. Such virtual world projects were integrated into SJSU’s core competencies of the MLIS program. A survey of SJSU students shows that 79% agreed or strongly agreed that they enjoyed using Second Life as a learning setting (Haycock & Kemp, 2008). The SJSU study concluded with a thorough examination of advantages and disadvantages of learning in a virtual world which can help identify areas for future study and further research, such as privacy and safety, curriculum development, adoption and support.

THEORETICAL FRAMEWORK: DIFFUSION THEORY
Diffusion Theory deals with the process of adoption of an innovation. Rogers believed that members of a given social system adopt emerging technologies over time through a communication process involving five stages: knowledge, persuasion, decision, implementation, and confirmation. Adopters may embrace the innovation at various intervals from early (Innovators) to late (Laggards) Surry (1997). Surry built upon Rogers’ diffusion theory explaining that some people are predisposed to being innovative and tend to adopt an innovation earlier than others. According to Rogers (2003), the following perceived characteristics (5 Perceived Attributes) of an innovation help to explain the rate of adoption by a particular community: relative advantage, compatibility, complexity, trialability, and observability.

Diffusion Theory accounts for the process by which information about an innovation is communicated and embraced through channels over time among members of a social system. An innovation is an idea, practice, or object that is perceived as a new by an individual or other unit of adoption. Adopters of an innovation identify relative advantages (benefits) and compatibility to needs within a role or profession. Complexity and trialability (the degree to which experimentation initially takes place) are evaluated. The degree to which the results of an innovation are visible to others is called observability. Knowing of an innovation creates uncertainty in the mind and the potential of a new idea impels an individual to learn more about the innovation. Once information seeking activities reduce uncertainty about expectations to a comfortable level, a decision concerning adoption is made. If adopted, further evaluation about the effects of the innovation is carried out (Orr, 2003).

RESEARCH QUESTIONS
In this study, two basic research questions are investigated: 1) according to diffusion of innovation theory, what is the current stage of adoption of Second Life virtual libraries and what might they offer beyond the physical library or classroom, 2) what can we expect or have to prepare for the next level of innovation of virtual world librarianship?

Research Framework
A survey was designed using Rogers’ five perceived attributes. Three questions for each of the 5 attributes were asked, along with demographic questions and the questions relating to virtual world tools that can be used within the innovation, which were identified in an exploratory study on libraries and immersive learning environments in Second Life (Hill & Lee, 2009). Attributes were not labeled within the survey, but were coded as shown in the Data Collection.

Data Collection
Survey questions were coded to match Rogers’ five attributes (relative advantage, compatibility, complexity, trialability, and observability). Three questions were designed to examine each attribute and questions relating to the fourteen virtual world tools were designed to identify specific benefits currently available for using virtual worlds in classrooms and libraries. Participants were instructed to mark not applicable if they had never heard of the tool.

CONCLUSION
Use of avatars, which provide a sense of synchronous presence, and virtual world field trips were consistently viewed as important factors in the study. Learning a new innovation with as many varied tools and applications as a virtual world (such as Second Life) can be difficult for many people. Weeks of immersion in the environment may be necessary for some individuals before meaningful content can be delivered for meaningful purposes.

A full report on the findings of this research will be forthcoming, along with complete data analysis. Overall, the results are impressive as they estimate moderate to strong effects when considering the relationship between self reported activity and the outcome variables. Future studies are needed to understand how the attributes of Diffusion Theory will continue to evolve as new tools are implemented in virtual worlds. Additional research may examine best practices for the library profession and for education within virtual worlds through identification of undesirable consequences along with benefits throughout the stages of adoption. A meta analysis of current and past research in virtual worlds will be included in the final research paper.
REFERENCES


