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Article

Academic Librarians in Second Life

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Abstract

The multi-user virtual world Second Life is an online software platform that allows users to jointly explore realistic three-dimensional environments via avatar characters, communicate via voice and text chat, and collaborate using shared creation tools. Librarians and educators have been developing academic content and services in Second Life for use with students and other constituency groups since 2005. This study surveyed academic librarians working in Second Life to discover their perceptions of virtual world environments for teaching and learning and to gauge the impact of this technology on their work with faculty and students. Sixty-two librarians provided details on various aspects

of their professional involvement in Second Life. Findings show that librarians from every type of academic institution, at all levels of advancement, and in every department participate in this virtual world. Results include details of roles and functions, as well as perceived benefits and challenges. Because many adolescents and teenagers worldwide are currently active virtual world participants, academic librarians in Second Life view virtual world technology as a significant near-future educational trend.

Second Life (SL) is a public 3-D virtual world used for social interaction, commerce, education and entertainment (<http://secondlife.com>). Second Life and other Multi-User Virtual Environment (MUVE) applications have been called the *3-D web* or the *immersive web*, and have been described as the next stage of development of the World Wide Web (Alpcan, Bauckhage, & Kotsovinos, 2007). These applications represent a powerful new platform for communication and information-sharing. In Second Life in particular, all content in the application is user-built and owned, making Second Life well suited for educational use. As frequently described in the literature, educators can use Second Life as a real-time communication tool for distance education and can create unique, persistent educational environments and experiences that students and others can explore. Virtual world applications like Second Life give users the opportunity to participate in collaborative online experiences in three dimensional environments using avatar characters, voice and text chat, and dynamic context creation tools.

Second Life users are typically referred to as "residents". The Second Life virtual world environment is similar in look and feel to some video games. A user guides an avatar through the environment using keyboard or mouse controls. Avatars can walk or fly within a SL location or teleport instantly between locations. The SL client includes a search utility to help users find locations of interest. Content creators may include a Second Life URL (SLURL) on a web page, which acts as a teleport link. Individual users can also save "landmarks" which, like website bookmarks, allow a user to easily return to a favorite location. Objects within the virtual world can be scripted to be interactive, allowing users to click on or approach an object to receive information or otherwise interact with the environment (e.g., sit on a chair). Users can interact with each other using text chat, voice communication or by exchanging information with objects like "Note Cards", which are similar to plain text files. The environments created in Second Life can be highly realistic or other-worldly. While it can take time to become-familiar with maneuvering in the virtual world, experienced users often become very comfortable navigating and communicating in this environment. Inventive avatars and settings become engaging rather than distracting. Video is an effective tool for conveying the "feeling" of Second Life to someone who has not experienced this kind of technology before. There are a number of good video introductions to Second Life available on the web.¹

Second Life is one of several hundred virtual world (VW) applications. KZero, a research firm based in the United Kingdom that focuses on virtual worlds, has forecast that VWs will continue to grow and develop with approximately 900 such platforms available to the public by 2012, a prediction that builds on the fact that by the end of the

¹ For example, see the video tutorials at the *Second Life Wiki*: http://wiki.secondlife.com/wiki/Video_Tutorials

second quarter of 2011 there were 1.4 billion registered accounts in approximately 400 virtual worlds ("Virtual world accounts," 2010; KZero Worldwide, 2011). This forecast aligns with the Gartner Group's ("Gartner Says," 2007) prediction that 80% of Internet users will actively participate in or use virtual world technology by 2011. According to Gartner's (2009) widely cited "hype cycle" of emerging technologies published in 2009, public virtual worlds like Second Life are currently experiencing what Gartner calls the "trough of disillusionment," (the period in the hype cycle in which a technology does not live up to inflated expectations) but will become mainstream in 2-5 years, along with e-book readers, microblogging and wikis. Though some authors contend that public virtual worlds should be placed in the "slope of enlightenment" area of the cycle, the trough of disillusionment is not necessarily negative ("Second Life Moves", 2009; Duffy, 2009; Au, 2009). During this period of the hype cycle, one can argue that the earlier phases of experimentation have reached their limit, and the use of these technologies is more focused on stable and sustainable applications.

Technical Considerations

To access Second Life, a user must download a client application and create an account. Users are represented in the virtual world by an avatar, a digital representation of the user in human, animal or fantasy form that allows people to communicate and interact with others, and to interact with the virtual environment. The software and basic account are free. Users who want to create a persistent environment pay a rental fee for "land" which is essentially server space. Linden Lab, the company that developed Second Life in 2003, maintains the servers that host the entire Second Life world. Users communicate with one another using either voice or text chat. The building tools required to create objects in Second Life are included with the client application. Linden Scripting Language (LSL), a unique programming language similar to C, is used to create interactive objects within the environment. Objects can be programmed to respond to avatar interaction or to transfer information into the virtual world, including streaming in live media such as web content and video, or sending out student avatar quiz responses to an external learning management system.

Librarians Enter the Virtual World

Many librarians entered Second Life in late 2006 when Lori Bell, Kitty Pope and Rhonda Trueman began widely speaking on and writing about their work with the Alliance Library System's *Alliance Virtual Library* (AVL) project (Bell & Trueman, 2008). The AVL (now the *Community Virtual Library*) is an international collaborative organization that supports library projects in Second Life. Librarians with widely diverse backgrounds participate in a variety of projects managed by this group, ranging from creating collections of information resources (e.g., medical resources on *Health InfoIsland*) to special exhibits and events, such as library career fairs. One centerpiece of the project is the virtual reference desk, which is staffed 80 hours per week by volunteers and has become an excellent resource for the Second Life resident population ("The Reference Desk," 2010; "Info Island," 2010).

The Community Virtual Library has been a focal point for all types of librarians interested in virtual worlds. A number of librarians started in Second Life by working with this group before moving on to create their own user environments and services and to establish educational collaborations. Librarians in Second Life are involved in the full range of "real life" librarian activities, including reference and information services, collection development, continuing professional education, and international collaboration.

"Groups" are organizations the resident can join in Second Life. Joining groups in Second Life is one of many ways that people become connected to others with similar interests. Any resident may form a new group for less than \$1USD. (Second Life has an economy based on "Linden dollars" with an exchange rate of approximately \$266L to \$1USD.) Members can participate in group-wide instant messaging conversations. Groups can define at least two (and up to ten) membership roles with different abilities (for example, owner, officer, member, etc.) that may give members different permissions within the group. Members of groups may jointly own land and items. A Second Life resident can be a member of any number of different groups.

Librarians and libraries have formed dozens of groups ranging from small working groups of two to groups with thousands of members. Groups can be located using keywords in the SL search box and limiting to "Groups". At the time of this writing, a keyword search of groups for "librarians" yielded 107 results and a keyword search of "libraries" displayed 202 results. Because these groups do not always use the word library or librarian to name or describe themselves, it is not possible to get an accurate count of the number of such groups in SL. An example is the group Alliance Volunteers (which is a community for library volunteers) whose charter states that the group was "created to serve the Alliance Community and its partners in their efforts." Because there is no mention of the word "libraries" or "librarians" in the name of this group, it does not appear in a group search using those terms. The focus of individual groups can be found in the description or group charter. For the library groups we reviewed, the descriptions ranged from specific university library groups such as the Stanford University Libraries group, described simply as "Members of the Stanford University Libraries and community" to much broader groups such as "Second Life Library 2.0," with the description "Friends of libraries in Second Life." Group members receive notices of library-related events, such as book discussions, author talks, art exhibit openings, seminars, workshops and other in-world activities.

The authors of this article are librarians and educators who have been working professionally in Second Life for a number of years. Through group membership and professional participation we each have knowledge of the activities of other librarians working in Second Life. We knew by checking the membership of various interest groups that there are at least 1,400 librarians in Second Life. Given the rapid growth of virtual worlds (VWs) in education and the tweens and teens already in VWs, the researchers deemed it important to investigate trends to gather information to prepare for the future impact of VWs on library services. We knew of no systematic attempt to catalog the activities of librarians in virtual worlds, and determined to assess the perceived benefits

and challenges of working in Second Life in order to gain perspective on the value of virtual worlds for academic librarians.

Research Questions

The researchers undertook this study to shed light on the nature of academic librarian activity in Second Life. In particular, we wanted to provide information that would help to answer a number of questions, including:

- Do academic librarians in SL represent all areas of academic librarianship or only particular areas?
- Are academic librarians who are involved in Second Life primarily new to the profession of librarianship, or are senior librarians participating?
- Are librarians performing the same kinds of activities in Second Life that they do in real life?
- In what kinds of professional activities are academic librarians engaged in Second Life?
- What are the successes and challenges academic librarians have experienced?
- How do academic librarians learn about this new technology? How do they learn about how other librarians are using it?

These questions served as the foundation for developing a method to gather information that would illustrate the uses of Second Life in academic librarianship.

Methodology

The researchers' connecting with one another was a significant step in the project because of our overlapping interests as academic librarians, educators, and researchers in Second Life. We had each been working independently or with other groups in Second Life for a year or more. We were acquainted with one another, at least by reputation, but had not yet worked together. SL proved to be an effective meeting tool for researchers collaborating in four time zones.

Second Life meetings were important during all phases of this research. A combination of voice and text chat worked well for the group. Besides Second Life, the most useful technology during this project was Google Docs, a free, web-based application similar to the MS Office applications Word, Excel and PowerPoint. Documents are stored online and can be edited by distant collaborators either synchronously or asynchronously. During our meetings, everyone in the group had Second Life and Google Docs open, using Second Life for voice communication and a sense of co-presence, while working on text and spreadsheets in Google Docs². We also used the Google Doc spreadsheet application to create our web-based survey and track responses. The survey response file can be downloaded and opened in Excel for advanced processing. Besides ease of use for participants, a distinct advantage of this format is that responses are automati-

² Primary collaboration on this project was completed before Linden Lab introduced the new "Viewer 2" client application for Second Life, which supports interactive editing of web pages within the Second Life environment.

cally delivered to a spreadsheet thereby reducing processing time and transcription errors, and facilitating immediate analysis. These were effective collaboration tools and an important part of the learning experience for the group.

The survey questions focused on three areas derived from the research questions: Demographics, Second Life Activities and Learning about SL. Demographic questions include type of library, type of library work, position title, length of time in SL, and types of activities in SL. On the survey form, the demographic questions were primarily radio buttons and check boxes, but other questions were largely open response. The questions about SL Activities were open-ended to allow participants to describe their activities in detail. The questions about Second Life as a new technology include questions about how academic librarians learn about SL and how they find out about how other librarians are using this technology.

The survey was distributed to librarians through email lists and Second Life groups. These included the largest email list for educators, the *Second Life Educators (SLED)* and an email list for librarians in SL, the *Alliance Virtual Library Google Group*. The Alliance list includes members of the Community Virtual Library, representing the largest organization for collaborative library projects in Second Life. Librarians with the Alliance Group work in many types of libraries including academic. The survey announcement was also sent to several Second Life "in-world" ("in Second Life") affinity groups likely to have academic librarian members. The SL groups included:

- ACRL in SL (99 members)
- Alliance Volunteers (117 members)
- ASIST (32 members)
- Community Colleges in SL (625 members)
- Information Literacy Group (169 members)
- Librarians of Second Life (1467 members)
- Real Life Educators in Second Life (4602 members)
- Second Life Library 2.0 (2378 members)

The announcement was repeated twice during a one month period while the survey remained live. In addition, researchers used Twitter, Facebook and blogs to broadcast the availability of the survey before the survey was closed on Oct 12, 2009.

While most of the demographic results were quantifiable and could be represented graphically, much of the best content in the survey was in the open responses. To analyze responses relating to perceived successes and obstacles, we conducted a content analysis to highlight commonalities. The first phase of this process was to generate a list of categories that all four researchers agreed encompassed the ideas represented in the survey responses. We created one list of categories relating to *Successful SL Activities* and a separate list for *Obstacles to Success*. After creating categories, the next step was to code the responses into these categories. Some responses were lengthy and included several different ideas within one comment. Because we wanted to capture distinct thoughts, each response statement was parsed into discrete ideas to be

coded separately. Two researchers independently coded each parsed response using the categories, compared coding for discrepancies, discussed instances where codes varied and came to a consensus to obtain inter-rater reliability greater than 95%. This process was repeated for all the open-ended questions in the survey.

Results and Discussion

Sixty-two usable surveys were submitted. Analysis of the quantitative responses shows that by late 2009 67% of respondents had Second Life accounts for two or more years (23%--2 years, 44%--more than 2 years). These academic librarians indicated they use Second Life for a variety of reasons. While 73% of respondents use Second Life for professional purposes, 55% of these also use SL to pursue personal interests, while 18% use SL for purely professional purposes. Table 1 shows that the 62 academic librarian respondents represent the spectrum of academic institutions. Nearly two-thirds (61%) of the librarians who responded work in an institution with an instructional or official presence in Second Life. Of the 62 academic librarians in SL, 50% work at research universities and 27% are employed at community/technical colleges, while public and private four-year colleges represent 16%. Nearly half (45%) reported other librarians at their institution participate in SL.

Institution Type	Number of Respondents	Percent
Research university	31	50%
Community/Technical college	17	27%
Public 4 year institution	6	10%
Private 4 year institution	4	6%
Other	4	6%

Forty-eight percent do not include SL work on their vitae, and nearly half of the respondents question whether work done in virtual worlds will be recognized as professional work by supervisors, directors, and contract renewal, promotion and tenure committees. Although librarians provide support to teaching faculty who use SL as an instructional platform, many academic librarians working in SL do so on their own time and not as part of the official work schedule. In addition, librarians may be required to provide extra justification for their virtual world work. Currently, academia is largely unaware of the work of librarians and subject faculty in virtual worlds, and of the rising tide of the virtual world education movement (Holmberg & Huvila, 2008; Jarmon, 2008; "The Spring 2009," 2009; Luo & Kemp, 2008; Salmon, 2009; Sanchez, 2009; Webber & Nahl, 2010). Organizations that track participation in virtual worlds and publish statistics on

the number of virtual worlds, their age groups, and the number of accounts in each, report the tween (10-15) or young teen (12-14) group has steadily increased since 2008 data (KZero Worldwide, 2011; Lenart, Purcell, Smith & Zickuhr, 2010). Higher education has begun to evolve to meet the needs of 21st century learners familiar with 3-D education (KZero Worldwide, 2009; KZero Worldwide, 2011a; Lenart et al., 2010).

To perform effectively, the Second Life client software requires a high-performance graphics card, a fast internal processor and a high-speed Internet connection. Currently, many campus offices and computer labs lack one or more of these requirements. In fact, only 35% of respondents report there is adequate campus information technology (IT) support for innovating with SL, while 65% report receiving little to no IT support. Librarians reported that they must overcome obstacles presented by their IT Departments to convince them to install upgraded equipment and to reverse the download restrictions on the SL client on their campuses. The Second Life client, in many cases, has been erroneously classified as a "game," and is routinely blocked on many campuses. Second Life is not a game, although it has many elements of traditional gaming environments and its users may engage in game-like activities within the platform.

Academic librarians in SL are not gaming; instead they are using a game-like environment to support instruction, educate students and faculty on use of the platform, provide reference and information services, build collections, and perform many of the functions present in libraries. The research is clear on the significant advantages of interactive online environments education and immersive learning (McGonigal, 2010; Connolly, Stansfield, & Boyle, 2009; Connolly & Stansfield, 2008). Unfortunately, conflict can sometimes occur between academics who pursue technology-enhanced teaching methods and technologists who are responsible for protecting institutions from malicious hacks and excessive bandwidth usage. Academic administrators and IT departments must be convinced of the usefulness of SL for the institution and for higher education before they commit to supporting the system and those who want to use it in education. The data that emerged from this study indicates academic librarians play a significant advocacy role in influencing their institutions to adopt virtual worlds as platforms for teaching and research. Librarians partner with faculty who are teaching in SL and support students using SL in courses. Librarians also deliver campus presentations and training workshops for faculty, students and staff in the use of SL. Since it is the librarian's responsibility to be aware of and address the information needs of students and faculty on campus, it is beneficial that librarians become involved at every level in an institution's use of Second Life and other virtual world technologies.

Table 2 shows that academic librarians representing every library department participate professionally in SL. Respondents reported their primary academic library responsibilities include public services (48%), technical services (44%), administration (35%), acquisitions (31%), and instruction (13%).

TABLE 2 Distribution of Primary Work Responsibilities*		
Work Categorization	Number of Respondents	Percent
Public Services (reference, circ, access services)	30	48%
Technical Services, Systems (includes web development)	27	44%
Administration	22	35%
Collection Management & Acquisitions	19	31%
Instruction	8	13%
Note. *People selected more than one primary work area so percents do not add up to 100%.		

Table 3 lists the 59 separate job titles provided by the respondents, grouped into six broad categories representing every area of academic library work:

1. *Public Services Librarians*: Reference librarians, circulation, access services and other public service roles.
2. *Administrators*: Deans of Libraries, Associate Deans, Directors and those who manage the work of other librarians.
3. *Technical Services Librarians*: Catalogers, systems librarians, digital librarians and archivists.
4. *Collections Librarians*: Collection development, acquisitions, and electronic resources librarians.
5. *Instruction and Instructional Support Librarians*: Instruction/Information literacy librarians, instructional design and technology librarians and graduate-level LIS Professors.
6. *General Librarians*: Librarians and project leader.

The results included three people employed in libraries as library assistants or school library media specialists as well as an LIS student and web developer. The position titles of these library professionals are not included in Table 3. Academic librarians typically have duties in more than one area as reflected in position titles, Technical Services/Reference Librarian or Reference/Instruction Librarian. To reflect the compound nature of library work, the 15 position titles (25%) marked with an asterisk (*) have been assigned to two categories, e.g., Reference, Outreach and Instruction Librarian* is assigned to both the Public Services and Instruction categories, and Technical Services/Reference Librarian* appears in both the Public Services and Systems, Technical Services, and Cataloging categories. The raw numbers account for the number of position titles in the category, while percents are a proportion of the 59 separate titles.

TABLE 3
Distribution of Position Titles Throughout Library Departments[†]

Public Services (n=13) (22%)	Administration (n=20) (34%)	Systems, Technical Services, and Cataloging (n=13) (22%)	Instruction (n=11) (19%)	Acquisitions (n=9) (15%)	General (n=6) (10%)
Virtual Reference Librarian	Assistant Director	Director of IT Project Management, University Libraries*	Information Literacy Librarian	Supervisor (Acquisitions)*	Librarian
Distance Education Coordinator/Social Sci Librarian/Ref Desk Manager*	Head of Public Service, Special Collections	Systems Librarian	Online Learning Librarian	Acquisitions Librarian	Project Leader
Head of Reference and Librarian for Engineering*	Coordinator, LRC	Associate Director for Technical Services*	Reference, Outreach and Instruction Librarian*	Collection Manager*	Librarian
Reference Librarian	LRC Supervisor	Systems Librarian	Instructional Technology Librarian*	Collection Management Librarian	Librarian
Technical Services/Reference Librarian*	Department Head	Head Music Cataloger*	Distance Education Coordinator/Social Sci Librarian/Ref Desk Manager*	Collections Librarian	Librarian
Reference and Distance Services Librarian	Interim Library Director	Digital Access Manager	Coordinator of Instructional Technology Services	Electronic Resources Librarian and Subject Liaison	Librarian
Public Services Librarian	Director of Library Services	Data Librarian	Instructional Developer	Collection Manager*	
Reference Librarian, Instructor*	Portland Center Head Librarian	Systems/Elec. Resources Librarian	Instructional Technology Librarian	Collection Management Librarian	
Reference, Outreach and Instruction Librarian*	Director	Head Cataloger*	Assistant Professor	Electronic Resources Librarian	
Academic Team Manager*	Director	eReserve Librarian	Professor		
Access Librarian	Chief Library Assistant	Digital Librarian	Reference Librarian, Instructor*		
User Support Librarian	Associate Director for Technical Services*	Technical Services/Reference Librarian*			
Liaison Librarian	Director of IT Project Management, University Libraries*	Instructional Technology Librarian*			
	Supervisor (Acquisitions)*				

	Head of Reference and Librarian for Engineering*				
	Head Music Cataloger*				
	Head Cataloger*				
	Collection Manager*				
	Academic Team Manager*				
	Collection Manager*				

[†]Many respondents indicated more than one job title and more than one classification, resulting in a total greater than 100%.

*Denotes position titles assigned to two categories.

Due to the complex nature of academic librarians' work, job titles have expanded to incorporate the variety of work academic librarians perform. The Public Services and Instruction categories represent 22% and 19% of the 59 position titles. These categories are aligned in practice since reference and instruction are often provided by the same librarians. Systems, Technical Services, and Cataloging represents 22% and Acquisitions 15%, while the broadest titles represent 10% of the 59 position titles. The Administration category (38%) includes both those with purely administrative jobs (n=11, 19%) and those with positions that combine supervisory and other responsibilities. It is evident that academic librarians representing all areas and levels of work are exploring the possibilities of SL for users and staff.

The roles of academic librarians in Second Life are remarkably similar to that of real life. As shown in Table 4, librarians named a wide variety of roles performed in their SL work as an extension of real-world activities such as reference, instruction and collection development. A majority of the respondents indicated that they provide support for students and faculty who are using Second Life for teaching and learning which is congruent with the instructional data found in Table 5. Further, librarians acquire new technical knowledge and skill while working within Second Life that enables them to design and build innovative instructional environments. And these roles extend beyond what is needed by their home institutions to managing and participating in conferences, virtual meetings, networking with international colleagues, finding research partners, and participating in professional development opportunities.

TABLE 4
The Roles of Academic Librarians in SL

- Content developer
- Partnering with faculty and staff
- Engaging students and faculty in learning activities
- Extended reference services
- Distance learning support
- Providing resources for courses, events, projects
- Developing new methods for information mediation
- Providing support for virtual world skill development
- Professional development
- Developing international collaboration
- Attending and managing virtual meetings and conferences
- Instructional design for immersive environments

While some librarians believe that virtual worlds hold "endless possibilities" for academic librarians in SL, the majority of the respondents discussed their support for both traditional and distance education as well as participation in institutional exploration of new information technologies. The role of the academic librarian in SL is varied and somewhat dependent on the needs of the institution. Some respondents maintain that, as academic librarians, they frequently take on the role of both librarian and instructional designer when working with faculty to create information-dependent learning experiences for students, and see their work in the virtual environment as simply an extension of that role. As one respondent notes, "many educational institutions are already using SL as a means of delivering distance education, so the population that would require academic library services are already in-world." Several respondents indicate that they believe that these virtual world environments are oriented in information-seeking and that teaching students and faculty how to access and use this information is part of the academic librarian's role as educator. Further, if virtual world content constitutes information, these resources need to be located and documented for educators who are using virtual worlds for teaching. In this case, the librarian provides guidance in the "exploration and use of a [virtual world] environment as an information resource." Several respondents commented that they view Second Life as a potential new space for information literacy instruction. These librarians believe that information literacy instruction could be extended to include skills that are important to learning in virtual worlds, such as visual literacy and copyright/intellectual property.

Some respondents sense that virtual worlds "have a lot of potential" for distance education but are unsure of what their role as librarian will be should these platforms become mainstream. For now, many are functioning in the academic librarian's traditional role of informing and instructing constituents on the use of new technology tools for teaching. Librarians are providing technical assistance and instruction by conducting workshops on the technology and assisting in the creation of in-world experiences for students with their faculty partners. Though many respondents are enthusiastic about the "wave of the future" they believe virtual worlds to be, others contend that their involvement in Second Life is more exploratory and are somewhat cautious. These librarians indicate that they

function within self-imposed guidelines in Second Life such as aligning their work with ACRL standards and library mission statement[s]. Others indicate that they are somewhat skeptical but are looking into the possibilities of virtual worlds generally. Though these respondents are finding that Second Life and other public virtual worlds currently require too much time and effort, they remain peripherally involved in Librarian-centered events and activities in Second Life to keep abreast of developments in virtual world teaching and learning. Table 5 presents the variety of collaborative instructional roles in which academic librarians are engaged in Second Life.

The Instructional Role of Academic Librarians in Virtual Worlds

In an article discussing the significance of "blended librarianship" for academic librarians, Stephen Bell and John Shank (2004) express urgency about librarians embracing new technologies and working closely with instructional faculty: "It is imperative and no exaggeration to claim that the future of academic librarianship depends on our collective ability to integrate services and practices into the teaching and learning process" (p. 372). Bell and Shank assert that the integration of technology into teaching and learning radically shifts the role of academic librarians to collaboration, technological innovation and instructional design. This concept of blended librarianship comes into sharp focus for librarians working in virtual worlds since librarians are assisting in the creation of virtual learning experiences as well as working with students in the environments they are instrumental in creating. The phenomenon of "embedded librarianship" is also important here. David Shumaker (2009) defines the embedded librarian as an information professional who is "a member of the customer community rather than a service provider standing apart" which, in the academic realm, involves "virtual collaboration, such as interacting with dispersed students in a computer-based distance learning environment" (p. 240). The labels "blended librarians" and "embedded librarians" are very similar, of course, but further refinement and discussion of these definitions is beyond the scope of this paper. Suffice it to say that in the virtual world of Second Life, librarians are offering services that Bell and Shank would define as "blended" since these librarians are using their technical skills in an instructional design capacity to assist in the creation of learning spaces. And they are also employed as members of virtual world learning communities as information specialists providing reference, information literacy instruction, wayfinding and other traditional library services that are defined by Shumaker and others as elements of "embedded" librarianship (Shumaker & Talley, 2010; Davis & Smith, 2009).

Esther Grassian and Rhonda Trueman (2007) assert that academic librarians who are working in Second Life "have an excellent opportunity to work with faculty in incorporating information literacy in curricula, research and course assignments as they are designed" (p. 86). The data in Table 5 show that academic librarians have taken advantage of these opportunities and expanded upon them, providing support for the curriculum, faculty, and students.

Reported method	Number of Respondents	Percent
General user support	25	40%
Distance learning support	19	31%
Support education in teaching faculty-led classes	16	26%
Creating learning objects	16	26%
Instructional design	14	23%
Building immersive environments	14	23%
*Respondents describe that they provide more than one area of teaching and learning support services, accounting for the percentage not equaling 100%.		

Librarians report that their instructional work in Second Life includes providing distance learning support (31%), support for specific courses taught by disciplinary faculty (26%), and general user support (40%) including in-world office hours, SL orientation, and in-world reference services. The virtual world of Second Life enables librarians to employ instructional design skills (23%) in creating immersive 3D instructional environments (23%) and learning objects (26%) to facilitate and support learning. Librarians work collaboratively with teaching faculty to design immersive experiences and settings in the virtual world to enhance information seeking and use for students in SL.

Perceived Benefits and Challenges of SL for Academic Librarians

Academic librarians reported both successes and failures in their virtual world experiences. Table 6 outlines the categories that the researchers defined as “successes” and “challenges.” The questions from which these categories were drawn are: Q. 13, "Which activities have been most successful and why?" and Q. 14, "Any activities that were unsuccessful or you have abandoned or postponed?" Comments were also extracted and coded from survey questions that included mentions of clear successes or challenges.

TABLE 6
Category Definitions

<u>Reported Successes</u>	<u>Reported Challenges</u>
<p>1. Collaboration & Connecting – Expanded opportunities for professional activities relating to working and connecting with other professionals</p> <p>2. Professional Development - Conference attendance, taking classes, and other traditional PD activities, including gaining experience in Virtual Worlds</p> <p>3. Reference & Instruction Opportunities – Reaching new user groups, connecting with users in new ways, traditional reference about this new technology and meeting information needs</p> <p>4. Socializing – Social interaction, recreation, and other use outside the scope of professional librarianship</p> <p>5. Content Creation – Creating something new or representing information in Second Life (SL)</p>	<p>1. Technical Difficulties – Includes blocked access by some institutions, incapable equipment, hardware and broadband requirements, etc.</p> <p>2. Steep Learning Curve – Includes the idea that SL is too time-consuming due to the level of difficulty to learn</p> <p>3. Insufficient Value – Includes comments that suggest SL is not (yet) worth the perceived cost and those who are unsure if it is worth the cost</p> <p>4. Unknown Application – Comments suggesting the user hasn't made a decision about how or whether to use this technology</p>

Table 7 shows intensity of involvement in terms of number and percent of comments in certain roles, activities, and perceived difficulties. It shows that the comments about successes (n=152, 77%) outnumber the comments about challenges (n=46, 23%) by three to one. The focus of the survey participants is on the successes and perhaps on overcoming most of the perceived difficulties. Among the successes categories, the roles receiving the highest number of comments are Reference and Instruction services (36%) and Professional Development (28%), along with Collaboration and Connecting (23%). Fewer comments were reported about creating content for SL libraries and exhibits (13%), likely because this activity requires more advanced SL creation skills. Socializing was rated as surprisingly low (0%), although it may be possible that some did not consider listing socializing as a success or benefit in the context of this survey. Since connecting/networking with other library professionals in SL can involve aspects of socializing, it may have been considered within other categories by some respondents.

TABLE 7 Perceived Benefits and Challenges				
N comments in each category	Successes Categories	%	Total	%
54	Reference & Instruction	36%		
42	Professional Development	28%		
35	Collaboration & Connecting	23%		
19	Content Creation	13%		
2	Socializing	0%		
	TOTAL	100%	152	77%
	Challenges Categories			
16	Insufficient Value	35%		
12	Steep Learning Curve	26%		
12	Unknown Application	26%		
6	Technical Difficulties	13%		
	TOTAL	100%	46	23%
	GRAND TOTAL All Comments		198	100%

The Insufficient Value category received the highest number of comments (n=16, 35%). This category included librarians who are not certain whether SL is worth the cost in terms of time and effort to learn and work on SL projects. Some of the comments in the Challenges category included comments from administrators and/or students who were not aware of SL and perceive no demand for it on campus. Some librarians entering SL without colleagues to form a supportive group stated they feel overwhelmed and unsure of where or how to start.

The following are examples of comments deemed "successes" or "challenges":

One respondent (in SL under a year) answers to Q13: Which activities have been most successful and why?

"Attending in-world events/classes-develop a sense of community, learn new skills or info about SL culture, discover new ways to do things in a 3D environment. Also like to volunteer at the Ref Desk--meet new people, enhance friendships, check on what I do/do not know. Participating in activities like the job fair or being speaker--have to increase my skill set from passive participant to planner/builder."

The same respondent answers Q14: Can you describe any activities that were unsuccessful or that you have abandoned or postponed?

"Building anything more complex than hollowing out a basic prim. I get frustrated with trying to build because it does not come easily."

Another respondent's answers to Q13 and Q14:

Q13 ("successes") - "Network with colleagues around the world. Collaborate with colleagues to research and write. Instructional technology development. Professional Development training. Facilitate real world SL classes. Advise, consult, learn."

Q14 ("obstacles") - "Developing a standalone library that mimics RL library services"

Librarians in Second Life have discovered the benefits of collaboration, of developing new information seeking and creation skills, of providing traditional services using emerging technology, and of expanding opportunities for extending services and participating where students and faculty are interacting. Some of the challenges are easily overcome while others require deeper understanding of the technology. Many librarians began in Second Life by creating replicas of portions of their campus, of library buildings and other institutional attributes in order to design a recognizable environment for students, faculty, and administrators. Actual use of replica environments showed that buildings with fly-through roofs and walls or open structures better suit avatar movement. The information environment is malleable and SL librarians can easily change it in concert with user needs.

Librarians appreciate the ease of networking with colleagues in SL, the ability to provide services to their constituents, and making valuable connections within the broader SL community. Some have described SL as a continuous learning experience in which it is possible to develop skills and implement learning outcomes in a way that benefits those from an individual librarian's institution as well as others throughout the SL educational community. Successes mentioned range from Second Life as a platform for professional development (similar to web conferencing but with the added benefits afforded by 3D environments) to more traditional reference roles, to interactive exhibit creation and hosting events. A few talented librarians have realized success by utilizing more advanced content creation skills to create immersive information experiences such as The Tintern Abbey Experience at the College of DuPage (2010). Challenges experienced involve technical issues (software, hardware and connectivity), cost-benefit concerns, sometimes described as return on investment (ROI), with time to learn the SL system being the major investment in SL (monetary costs are relatively low), and cultural issues of adapting to a novel technical environment. Figures 1 through 4 represent common examples of successes and challenges described by respondents. Respondents' comments focused on perceived successes over challenges approximately three to one, which is reflected in the ratio of included images.

Successful Academic Librarianship in SL

Professional development and the ability to collaborate and/or connect on a global level was mentioned by 51% of respondents as a benefit of their involvement as academic librarians in SL. Figure 1 showcases a presentation by University of Edinburgh librarians on University of Sheffield's Infolit iSchool Island (2010) in December 2009. The librarians provided a slide show presentation, led a discussion, and displayed a 3D example of an interactive learning object designed to meet the information needs of their students. Librarians from several countries were in attendance and were able to learn, connect, share their experiences, and benefit from attending in this virtual world in much the same way one could expect from attending a face-to-face international library conference. This is not to say that attending presentations in SL is the same as in real life but it is closer than other technologies (i.e., web conferencing) we have used for this purpose to date.

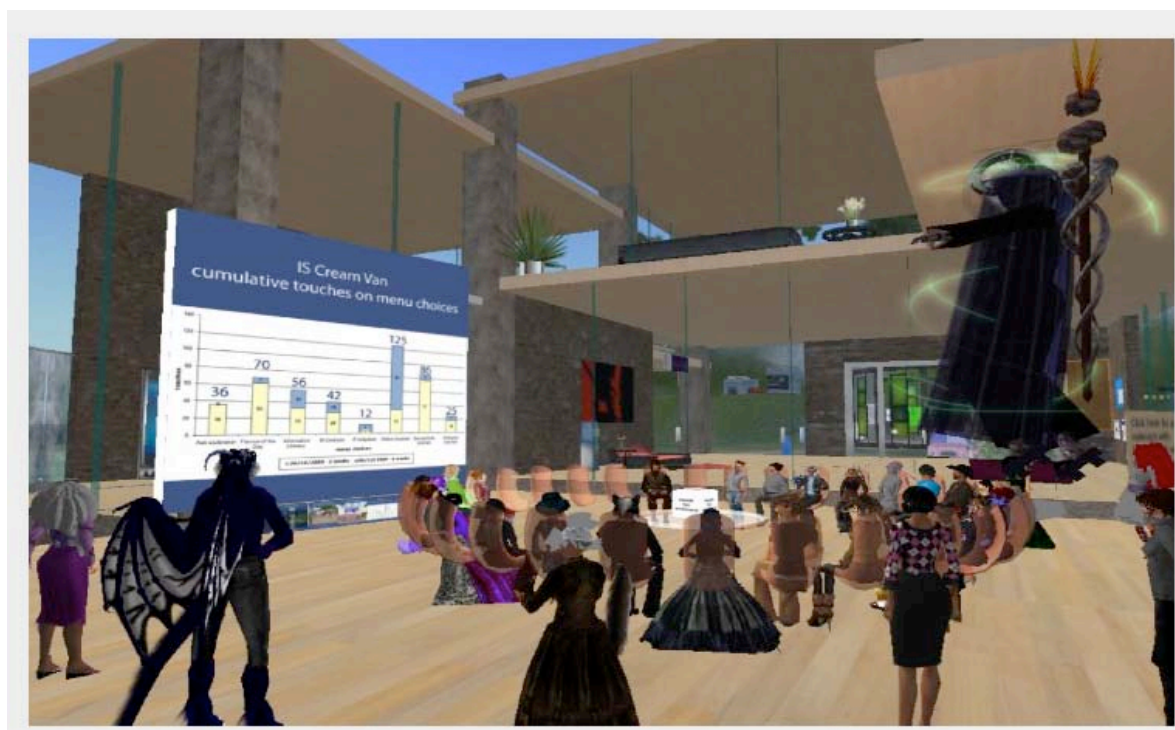


Figure 1. Image of the University of Edinburgh's "InfoLit iSchool" Presentation in Second Life.

The image in Figure 2 demonstrates an extension of the traditional role of an academic librarian answering student questions. The main difference in the figure is the platform exists within SL instead of a brick-and-mortar library building or online (text) chat. Traditional campuses have librarians who work to meet the needs of their students and faculty in many ways. These roles include staffing the reference desk, teaching information literacy classes, conducting library research sessions in the classroom, etc. When courses at some institutions began moving online, and often using course or learning management systems (LMS), the need for librarians to be embedded within those sys-

tems became clear to many institutions. Second Life and other virtual worlds are being used by some institutions as teaching platforms (Dewey, 2004; Kapp & O'Driscoll, 2010; Thomas & Brown, 2011). Some believe SL is closer to face-to-face course experience as it is a live synchronous system as opposed to the asynchronous LMS. Tools such as Sloodle (Kemp, Livingstone, & Bloomfield, 2009), designed to bridge SL and Moodle (an open-source LMS), can be utilized to combine the benefits of both synchronous and asynchronous teaching and learning, which some argue is best pedagogically and can be especially useful for distance education (Johnson, 2006).



Figure 2. Traditional reference services being conducted in Second Life.

Figures 3 and 4 present two examples of academic librarians taking the traditional role as expert evaluators of information content, who typically create subject guides for discipline specific information, and transferring those abilities to the 3D information environment. Figure 3 is of a librarian evaluating Genome Island (2010), a science environment in SL (Clark, 2009). The librarian visited, evaluated and determined it was indeed an excellent creative learning environment filled with immersive and interactive science content, and chose to add this particular SL build to an in-world (inside SL) subject guide for Science. By evaluating places within SL, creating subject guides using virtual world technologies and aggregating that content for easy use, librarians provide an important and much needed role. There are many creative ways librarians in SL are working to this end.

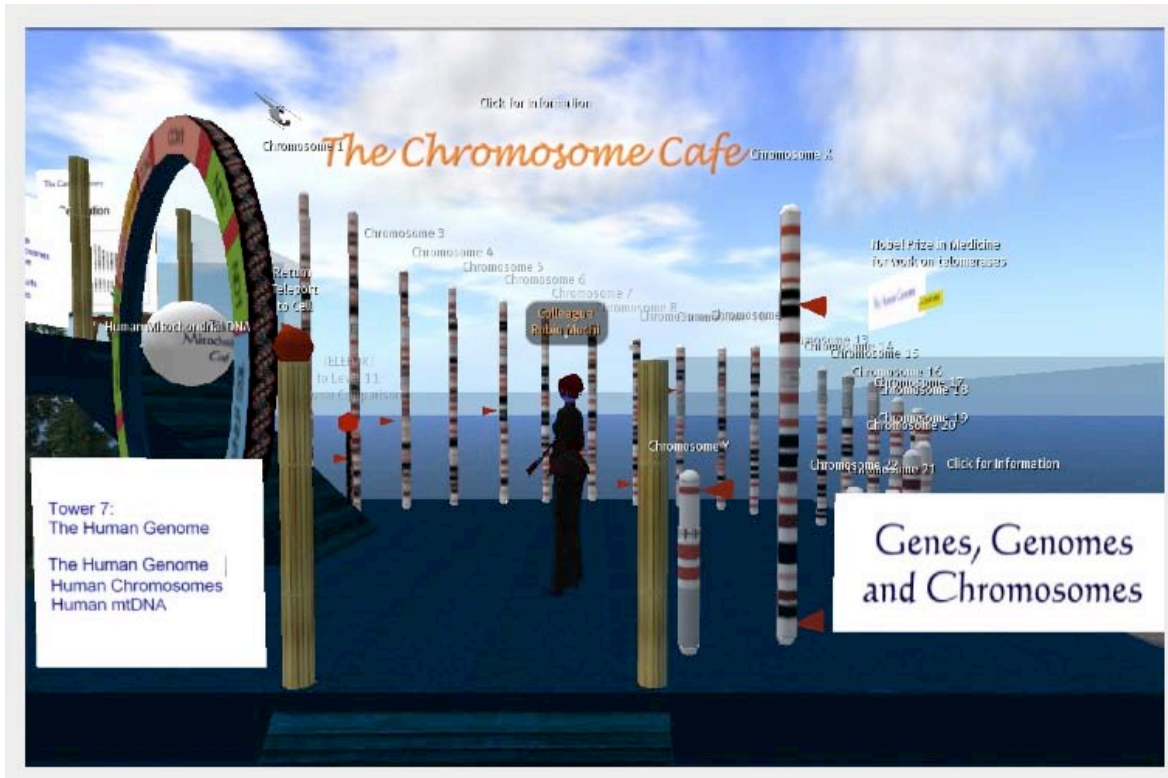


Figure 3. Image of the Chromosome Café in Second Life created by Texas Wesleyan University.

Figure 4 shows one format for an academic librarian's subject guide creation. In this case, a librarian created tree objects containing "Landmarks of Educational Locations in Second Life" (2010). The Landmarks Tree has discipline-specific branches that the user touches (or clicks) to receive a folder containing collections of landmarks to Second Life locations that have been evaluated and are recommended by the librarian. One can use these landmarks to teleport directly to those places and share them with students and colleagues.



Figure 4. Image of the subject and locations guide (“Landmark Trees”) in Second Life, created by the College of DuPage.

Challenges of Academic Librarianship in SL

Figure 5, an image of Second Life's own public Help Island (2010), depicts challenges identified by respondents. The common thread among reported challenges is the need for help. From obstacles related to the steep learning curve, to unknown applications (how should I use SL, what can I do here?), most commentary on challenges was related to a need for assistance or guidance. Librarians also mentioned problems due to technical issues such as hardware, institutional blocking and insufficient bandwidth, which can be especially challenging. The challenges and obstacles raised by respondents are familiar to the authors, who have all dealt with various aspects of these challenges.



Figure 5. Image of “Help Island” in Second Life, created by Linden Lab.

This research showed, however, that librarians also have opportunities to make connections via groups in SL and through the many professional organizations in SL such as the ALA, ACRL and others, where members offer help and are glad to mentor librarians new to SL.

Conclusion

While virtual world (VW) technologies are still in the early development stages, academic librarians are exploring the uses of emerging technologies to prepare for the wave of VW-literate students entering college in 5-10 years who will transform education with new VW learning styles. Educational applications of VWs require creative and innovative thinkers willing to lead organizations through change and take risks to effectively leverage the full potential of technology to enhance learning. While Second Life is currently the most developed virtual world with an established online community, eventually new virtual platforms will arise and supplant it. However, for professionals, the persistent online community in Second Life adds value for professional development and collaboration, course support, and meeting user needs in novel information environments. From the authors' experiences, virtual worlds such as Second Life allow for developing

new and transferable skills. As Dewey (2004) points out "Many of these changes are related to the impact of information technology. Innovative and exciting collaborations account for a major part of the library's transition from passive to active, reactive to proactive, staid to lively, and singular to social" (p. 6). As with other emerging technologies, when librarians are willing to experiment and learn, they often find the skills they develop assist them with other more traditional functions. Academic librarians working in SL practice blended librarianship that demands continuously adapting to changing technology in collaboration with various stakeholders including administration, IT staff, faculty and students.

The ability to globally connect and collaborate should not be underestimated. An added benefit of SL over web conferencing programs, and one that draws SL closer to the face-to-face presentation experience, is the opportunity to remain after a presentation to talk with speakers and those who have similar interests. New acquaintances may then teleport elsewhere to explore further, or have other serendipitous experiences which can lead to people making rich connections and sometimes develop into valued professional relationships. A large difference between SL and attending real life presentations, and one that takes on new meaning in the current economic climate, is that there are often zero costs associated with attending national and international presentations (other than time to attend), and significant time is saved by not traveling.

The successes and challenges shared by respondents reflect the manifold roles of academic librarians in SL. Most continue moving forward to learn how best to serve their institutions and to grow professionally in virtual worlds. The survey respondents express awareness of how much librarians can learn from each other and the value of interacting with an international community of professionals. As pioneers who are often leaders in emerging technologies, academic librarians see educational virtual world environments as yet another venue in which library services and support will be necessary. The return on investment can be argued to be large if not always immediate. At a minimum, librarians who are experienced with emerging VW technologies are able to utilize the platform for rich professional development purposes and to easily connect to and learn from an international educational community. Academic librarians support teaching and learning wherever it occurs; those librarians who are experienced in virtual worlds are prepared to lead and to serve their constituents in this new educational landscape.

Future Research

Academic librarians are likely to remain in Second Life as long as educators choose to use it as a teaching platform for immersive learning, for research and simulations, as well as for conferences, symposia, and meetings of all kinds. Instructional design for virtual environments is likely to expand as academic institutions adopt VW technologies in distance learning and immersive education. Blended librarians will participate in design groups to create information-intensive learning environments and experiences. Future research tracking such developments in academic libraries will enable libraries to respond to the changing service environment. A survey of academic library projects in SL would shed light on the actual activities, collections, presentations, projects and prod-

ucts created by librarians as well as their impact on students and faculty. In-depth interviews would give insight to the phases librarians pass through in adopting VWs and how they achieve success working with users at a distance.

It would be useful to apply the Technology Frames of Reference model (Orlikowski & Gash, 1994; Davidson, 2002; Davidson, 2006) to conduct a comparative study of perspectives on the uses of SL in education by examining five stakeholder groups: IT, administration, librarians, teaching faculty, and students. Technology Frames of Reference analysis allows comparing value statements of stakeholder groups to achieve an understanding of the dynamics both supporting and obstructing change in organizations. Such analysis is necessary to navigate the rapid advance of VWs in education and thereby in academic libraries. The librarians in Second Life are proactive innovators doing the necessary work to prepare the ground for new educational approaches and platforms of the near future.

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