

Research Article

Learning Technology Leadership: A Literature Review and Proposed Agenda for Investigating Future School Librarians' Experiences

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Abstract: Current school librarian standards highlight the need for school librarians to be technology leaders in their schools, and current research supports the ability of the school librarian to be a strong technology leader. However, there is a lack of research on how pre-service schools are preparing their students to become these leaders. The following article proposes research that would examine current school librarian preparation program syllabi for technology leadership theories and concepts. The results of the proposed research will enable school librarian preparation program administrators and faculty to reflect on their curricula and prepare their students to be technology leaders.

Keywords: technology leadership, literature review, syllabi, content analysis, school librarian, curriculum

Introduction

Students without strong information technology (IT) skills will be at a disadvantage. Technology is needed for all aspects of life including academics, work, and personal use. This can come in the form of computer programs, basic technology skills, and a developed fluency with various technological devices, such as smartphones, tablets, laptops, desktops, e-readers, and more. Students need to be able to utilize, as well as to create with technology and understand the applications of IT based on academic, work, and personal needs, and when the use of these is appropriate. Information technology is also related to information literacy and educational technology. How information is found, assessed, and used is all part of the process of students knowing how to find information through technology, deciding whether and if the information is credible, and how, when and where to use the information appropriately.

Children are often introduced to technology at a very young age, (Findahl, 2013). Children as young as, or sometimes younger than 3 or 4, use various electronic devices such as tablets, computers, and smartphones (Ofcom, 2017) to differing degrees depending on age and availability of devices in the home. Eventually children go to school and begin to use technology

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for structured educational purposes. And the school librarian becomes a part of how students use technology. School librarians provide support to students and teachers in the use of technology to meet different needs in the classroom, turning technology use into information technology use (American Association of School Librarians [AASL], 2016). It is for this reason that it is vital for school librarians to be prepared to meet the many needs of their students and the other teachers in their school, and to be able to support and lead IT usage and change throughout the school, for different age levels, skill levels, and applications.

While research supports the need and ability of school librarians to be IT leaders (AASL, 2016), how pre-service educators aim to address this need with prospective school librarians is not clear. In this paper, I review relevant literature relating to professional school librarian preparation and technology leadership, as well as information and technology literacy, and then propose a research agenda that will enable researchers to find out what future school librarians are learning about technology leadership through pre-service curriculum by examining syllabi for content that includes technology leadership theory and concepts. The results of the proposed research will enable school librarian preparation program administrators and faculty to reflect on their curricula and help prepare their students to be technology leaders.

Literature Review

Researchers have suggested that school librarians are well positioned to assume the role of technology leader (Branch-Mueller & DeGroot, 2011; Everhart & Dresang, 2006; Hughes-Hassell & Hanson-Baldauf, 2008; Johnston, 2012; Mardis & Everhart, 2014; McCracken, 2001; Shannon, 2002; Smith, 2010; Vansickle, 2000). As information technology has become integral in most schools and a vital part of student learning and engagement, the school librarian has an increasingly important role to play in using, facilitating, and embedding this type of learning within the school library and in collaboration with teachers in the school to meet these IT needs. The additional challenge of information literacy is also present, with an abundance of information available to students through access to technology, and a need to be able to sort fact from fiction for educational and personal use.

Current research covers how school librarians are educated pre-service, the importance of IT for students, information literacy related to technology, as well as the need for school librarians to be both educational leaders in their school as well as technology leaders. The following literature review will cover these topics as well as indicate where a need for further research lies, and how this may be addressed.

School Librarian Preparation

There are several paths to school librarian preparation; requirements will vary from state to state (Jesseman, Page, & Underwood, 2010). School librarian certification usually involves a combination of coursework toward or completion of a Master's in Library and Information Science and a specialized teaching credential (AASL, 2016). In some states, one need only be a certified classroom educator (usually a classroom teacher) and take a test to qualify as a school librarian (American Library Association [ALA], 2006). In other states, prospective school librarians need only obtain a specialty degree or certificate, generally with a focus on education

(ALA, 2006). In some circumstances educators with an Associates or other educational degree have been placed in the library as the “librarian” though they would have no professional education in librarianship (ALA, 2006). While some states do not require that a school librarian have a degree in Library Science, the most typical path to school librarianship occurs after having completed a Master’s program, which is the focus of this proposed research. Other paths to school librarianship are not affected by school librarian preparation program curriculum and guidelines and so are not addressed in the proposed research discussed here.

Foundations and Development of Technology Leadership in the School Library

Technology has become more common and accessible over the years and the school library has gradually transitioned from a book repository to an information and technology center (Midland, 2008). As technology became a part of the library setting, standards were created that addressed how to integrate it into the library. The *Standard Library Organization and Equipment for Secondary Schools* standards were the first library standards to guide school librarians on integrating technology in their school by discussing the need for libraries to collect and use other resources other than books to include pictures, slides, and records (Committee on Library Organization and Equipment of the National Education Association and the North Central Association of Colleges and Secondary Schools, 1920).

In 1988, the standards were updated again as *Information Power: Guidelines for School Library Media Programs*, based on the core idea that to meet the needs of students, teachers, principals, and school librarians must partner and plan programs together. These guidelines also focused on the need for the school librarian to be a leader in these partnerships, as well as extend the teaching role of the school librarian as instructor in the school. Several other standards revisions took place in the following years addressing technology in the library.

More recently, *Information Power* was updated in 1998 with information literacy standards for student learning as well as a section on collaborating, leading, and incorporating technology for student achievement. These standards evolved into the *Standards for the 21st Century Learner* (2007), which focused on the information and technology knowledge, skills, and dispositions that students should be taught in an effective library program. In 2009 AASL published *Empowering Learners: Guidelines for School Library Programs*, a companion to the 2007 Standards that included guidelines for preparing the school library program for the future and directives for school librarians to create goals, priorities, criteria, and principles to build a dynamic, technology-rich school library program. There is a long history of standards-based work for the school librarian, and its incorporation into school library preparation programs is vital in order for the school librarian to be fully educated on their importance and integration within their schools.

Current Technology Standards for School Librarian Programs

To date, accredited school librarian preparation programs have been based on both the philosophy and mission of AASL’s 2009 *Empowering Learners: Guidelines for School Library Programs*. These guidelines provide an outline for best practices in preparing school librarians for their roles. AASL has provided a set of standards for school librarianship preparation programs, the *Standards for Initial Preparation of School Librarians* (ALA & AASL, 2010),

which covers literacy and reading, information and knowledge, advocacy, leadership, teaching for learning, and program administration and management. Of importance to the topic of technology leadership preparation are the following:

Standard 1, Teaching for Learning, are requirements for school librarians to be able to integrate the use of emerging technologies for effective instruction to support students' conceptual understanding, critical thinking and creative processes. Standard 3, Information and Knowledge, includes using current and emerging technologies to locate, analyze, evaluate, and use information to support research and learning and be able to communicate that learning in a digital society. Standard 4, Advocacy and Leadership, develops the school librarian's role as a leader because of their impact on student achievement throughout the school and the contributions made toward the school's improvement and academic efforts (Wine, 2016, p. 212).

In November 2017, the American Association of School Librarians published the *National School Library Standards for Learners, School Librarians, and School Libraries*. These new standards integrate and reframe the *AASL Standards for the 21st-Century Learner*, *Standards in Action*, and *Empowering Learners* by emphasizing the importance of all of the stakeholders served by these documents (AASL, 2017). The concepts of "inquire, include, collaborate, curate, explore, and engage" within the standards form the shared foundations upon which the content of the standards is constructed. For school librarian educators and pre-service students, these standards set an agenda for updating school librarian preparation programs' curricula; innovative and current preparation opportunities are the groundwork for preparing future school librarians to become technology leaders in their schools.

For school librarians to achieve the status of IT leader, they must learn how to do so effectively, and their preparation programs should provide them with a solid foundation (Houston, 2012). This preparation should include preparing their students for understanding and effectively using current standards as well as providing students with a solid basis in theory and leadership concepts from which to draw. Professional organizations acknowledge this needed role and recommend that the school librarian be an IT leader and focus on IT integration in instructional practice (International Federation of Library Associations and Services [IFLA], 2015; International Society for Technology in Education [ISTE], 2016). In order to achieve positive IT-related outcomes for students, IT leadership is vital (Anderson & Dexter, 2005).

National Board Certification and Technology Leadership

Teachers and school librarians have the option of become National Board Certified (NBC), a separate process that takes place while practicing as a school librarian, and if they are successful they are considered highly qualified for their position. In more than half of the states in the United States, they receive pay raises as a result (National Board for Professional Teaching Standards, 2018a). The process is lengthy and standards based. Teachers who are interested in becoming NBC must pass a written exam in the area they are attempting to certify in. Additionally, they must complete a portfolio showing student work, the reasoning behind instructional choices, and proof of student academic growth and differentiation of learning. Video recordings of active teaching and commentary on the recordings is also required, as well

as a reflective component on instructive practices, collaboration with parents and other teachers, and student growth (National Board for Professional Teaching Standards, 2018b).

The *Library Media Standards* from the National Board for Professional Teaching (2012, p. 31) define an accomplished school librarian as one who is a visionary leader in the school as well as within their profession and is defined as follows:

Visionary leadership requires sustained professional commitment, innovation, and thorough knowledge of opportunities and challenges facing the library media profession as well as providing consistent and visionary instructional leadership.

Everhart, Mardis, and Johnston (2011) looked at the practices of Nationally Board Certified (NBC) school librarians and reported that respondents to a survey overwhelmingly indicated a comfort level with technology and stated that they used, shared, and helped create access to technology throughout the school. NBC teachers and librarians have demonstrated exemplary performance and teaching ability, but it is clear from this study that school librarians are more than able and prepared to take on this role of technology leader in their school.

Information Technologies, Leadership, and the School Librarian

Information technology leaders are promoters, supporters, and users of IT within their organizations. The role of IT leader is one that the school librarian plays. Additionally, professional organizations acknowledge this needed role and recommend that the school librarian be an IT leader and focus on IT integration in instructional practice (International Federation of Library Associations and Services [IFLA], 2015; International Society for Technology in Education [ISTE], 2016). A successful IT leader is one who will model the use of IT, create, and share a vision, reward teachers for integrating IT, and share leadership within the organization (Baylor & Ritchie, 2002). In order to achieve positive IT-related outcomes for students, IT leadership is vital (Anderson & Dexter, 2005).

Within a school, the school librarian is poised to be the ideal IT leader since it is in the school library where most of the IT accessible to students is located (Scholastic, 2016). It is in the school library where most the computers are, as well as other technology equipment to include spaces and devices and equipment that make up makerspaces (Moorefield-Lang, 2014). Makerspaces are an important and perfect fit for libraries (Goerner, 2015) where users can freely play with technologies, and hands on arts, crafts, and many other mediums to include wood, metal, jewelry and others, and allows users to be creative. The Library as Incubator Project (2013) defines makerspace as “collaborative learning environments where people come together to share materials and learn new skills.” According to Kurti, Kurti & Fleming (2014), “[t]he maker movement in education is built upon the foundation of constructionism, which is the philosophy of hands-on learning through building things” (p. 8). There are no set rules to a makerspace. Essentially it can be any space with items that allow people to be creative with a variety of items.

The school librarian is an information specialist and should be a valuable resource for teaching and using IT at all levels (Bush & Jones, 2010). It is the school librarian who can play a critical role by focusing student experiences on authentic learning, information literacy, and a

mastery of the curriculum through the use of technology as a resource and medium for learning (American Association of School Librarians [AASL], 2009). This is different than using technology as simply a tool through making technology a seamless part of the learning experience, inseparable from the lesson or curriculum. IT integration moves technology use from a resource to an invaluable skill woven into the fabric of the curriculum. School librarians integrate IT by infusing information literacy skills as well as IT learning into many different learning experiences (Loertscher, 2006).

Importance of Technology Leadership in Contemporary Schools

A content analysis of technology leadership literature by McLeod and Richardson (2011) found that the preparation of students to live in a technologically savvy way as well as to be globally competent citizens and employees requires a school leader who can lead technological and educational changes within the school. Technology is now used daily in schools, the personal lives of students, and in the global workforce. It is therefore important that students be prepared to use this technology in appropriate ways. *How* technology is used is an important part of the equation as well. There has been a proliferation of political outcry about “fake news” and “alternative facts.” Teaching students how to separate fact from fiction has become even more important as our communities and schools learn to wade through an abundance of information and decide what is trustworthy and not.

More than ever, information literacy has become tied tightly to the technology upon which students and teachers rely to garner their educational information and sources. In 2016, the Stanford History Education Group conducted a survey of over 7000 middle, high school, and college students and found that their ability to effectively evaluate information was “bleak” (p. 4). So, while students may feel comfortable with technological devices, they do not seem as able to use the devices to assess content and figure out what is credible (Saunders, Severyn, and Caron, 2017). In the same study by Saunders, Severyn, and Caron, the researchers found that even though school librarians and college librarians agreed on what is important for students to know regarding information literacy skills, that college students do not seem to be coming into college with the appropriate skill level needed (2017). Some studies have shown that high school students are either not learning the information literacy skills they need, or not retaining them into college. At the Southern Utah University in the 2014-2015 school year, 1290 students took the required information literacy pre-test for a course they must take as freshmen. The average score for those incoming college freshman was 67%, not a strong indicator of the ability of students to assess information reliably (Lanning & Mallek, 2017).

Additionally, classroom teachers tend to rate their own information and technology literacy higher than testing scores indicate their actual ability is (Dincer, 2018). This finding seems to point to a need for more leadership and skill building on the part of the school librarian in teaching their students and other teachers how to successfully use technology and merge that technology with the information literacy skills they will need. This technology leadership and instruction is vital in order for students to be successful beyond high school. Studies like these seem to suggest a strong need for more information literacy instruction in schools.

The National Center for Educational Statistics (NCES) reports on the number of computers in schools and how many schools have access to the Internet - between 1998 and 2008 that number grew exponentially. 5,621 public schools had computers in 1995 – 8% of those had

access to the Internet. In 2008, 15,434 public schools had computers and 98% had access to the Internet (2016a). These statistics demonstrate the growing ubiquity of computer and Internet usage in schools. Additionally, online courses have become more common in public schools. In the 2002-2003 school year 36% of schools had students enrolled in online courses. During the 2009-2010 school year that number reached 55% (NCES, 2016b). It is likely that number has jumped dramatically upwards since the last reported school year. These statistics point toward a growing trend of IT use among students in public schools. The school librarian is poised to take a leading role in providing instruction and support in this growing area of learning.

The school librarian can provide curriculum assistance, instructional support for students, and guidance in using new information technologies and in navigating new policies such as open access resources like the #GoOpen initiative currently taking place. #GoOpen is part of a movement to bring openly licensed educational resources to the public domain, and is defined by the Department of Education as “openly licensed educational resources such as teaching, learning, and research resources that reside in the public domain or have been released under a license that permits their free use, reuse, modification, and sharing with others. Digital openly licensed resources can include complete online courses, modular digital textbooks as well as more granular resources such as images, videos, and assessment items” (Department of Education, 2018, n.p.). Navigating new territories like #GoOpen fits well with the role of the school librarian as technology leader. Exploring the many open resources available electronically and then sharing and training teachers, students, and administrators on how to utilize these resources in the classroom is an excellent way for school librarians to take the lead in promoting and using such IT resources within their school.

Another recent trend is that makerspaces have become commonplace in many school libraries. Makerspaces can be comprised of a variety of different activities, some technological and some not. In the school library however, all should provide some kind of learning experience and help to support the curriculum. During the latest reiteration, the maker movement was tied to science, technology, engineering, and mathematics (STEM) activities. However, as the Common Core Standards emerged, makerspaces became associated with a resurgence of interest in experiential, project-based approaches to learning. They can be linked with participatory learning, problem-solving environments, and inquiry-based learning, making them an excellent means to address the diverse needs of today's students along with *Standards for the 21st Century Learner* (Lamb, 2015).

Makerspaces can be tied to current standards in various ways and give the school librarian the opportunity to lead in this area of learning and to support learning with IT, especially since the school library offers the ideal space to place makerspaces and the school librarian can also be a leader who provides structure, instruction, and guidance to students, teachers, and staff.

School librarians can also use their leadership training to address the negative issues that technology may bring to their schools. There is the obvious need to learn to wade through the “truths” online that information literacy addresses, as well as the fact that technology is not just for fun and communication, but a tool to be used for learning— and that for IT to be truly educational and useful in the curriculum, it should be used purposefully. Simply having technology without a strong educational purpose integrated into the curriculum does not itself lead to better outcomes. Knowing if and when technology should be used to meet an educational

need is one aspect of technological leadership that school librarians can be a part of, if they understand the pedagogy and benefits as well as the drawbacks to its use in the classroom.

School Librarians and Pre-Service Experience with IT Integration and Use

School librarians undoubtedly come into their pre-service programs with some experience using IT and an understanding that IT will be a part of their job once they are in a school library. The ability to use IT to achieve student learning goals is another skill entirely. As Brinkerhoff (2006) notes, while teachers and school librarians may have been taught lesson planning skills and models for infusing IT into the curriculum, they may not have been taught how to effectively integrate IT into instruction. Preparing future school librarians and teachers for this role is an important factor that has been associated with the school librarian and teacher for using technology in the curriculum (Franklin & Bolick, 2007). For school librarians to be successful IT leaders, learning and experience supporting this type of leadership must be in place. Lawless and Pellegrino (2007) noted that teachers might be able to accept and integrate IT into their classrooms better if pre-service programs focused more on IT skills and innovative techniques for using IT in the classroom. This would seem to hold true for other educators such as the school librarian – particularly so since they have the ability to become technology leaders and bring their knowledge of IT integration to other teachers in the school. An excellent, well-rounded pre-service program can help school librarians go into their first school library with a solid set of skills and knowledge on how to implement these skills. If teachers and school librarians are to integrate IT effectively they must have technology-supported pedagogical knowledge and skills upon which to draw when planning for technology integration in their teaching (Hughes, 2005). As Branch-Mueller and de Groot (2011) found, when technology tools are taught in a supportive environment, school librarians embrace their potential use and tend to adopt them.

With rapid technological change, including interactive and participatory technologies, school librarians must move into leadership roles to best serve students (Everhart, Mardis & Johnston, 2011). IT leaders must also learn to fit themselves into the leadership atmosphere of a particular school, thus school librarians should also learn how to recognize different leadership styles in order to relate to others in their schools.

The Council for Accreditation of Educator Preparation (CAEP) is the accreditation body for over 600 colleges of education and has prepared a set of national teaching standards. One of these standards states that educators must prepare future teachers to focus on student learning through IT applications which enhance learning as well as to incorporate IT strategies for learning (ISTE, 2016). Additionally, ALA/AASL standards for pre-service education state five areas in which pre-service school librarians should be educated: Teaching for Learning, Literacy and Reading, Information and Knowledge, Advocacy and Leadership, and Program Management and Administration (2010). Each of these areas should be explicitly taught pre-service. While pre-service teachers and school librarians may be taught the skills to use various information technologies, software, and applications, the skill associated with using these does not automatically transfer over into an ability to use these in an effective manner with students by integrating them into lessons and curriculum planning. Rather, IT integration skills are not truly a technology issue, but a pedagogical one (Duttdoner, Allen, & Corcoran, 2008). While accreditation and AASL standards are in place to guide school library preparation programs and

school librarians, how explicitly they are taught in preparation schools and carried over into a school librarian's first job would be useful to know in order to address gaps in pre-service education. A teacher or school librarian who may have expert IT skills may not be an effective teacher if he or she does not have the ability to effectively utilize those skills with students' learning.

Shannon (2008) conducted a study in which school librarians were asked to rate their satisfaction with their pre-service programs and how well-prepared they felt they were to take on leadership roles within their schools in a professional capacity. School librarians in this study did not rate preparation for leadership in their pre-service programs as high as most of the other program-related items in the survey. Interestingly, when the author separated responses of respondents with previous teaching experience before graduation and those without, the graduates with teaching experience were more satisfied with their ability to integrate information literacy and technology skills into the curriculum than those without teaching experience. This finding might be due to the comfort levels of graduates with prior teaching experience in general, or it might indicate a lack of pre-service preparation for school librarians in regard to how to implement these skills in the classroom. In any case, it is clear from this finding that faculty should consider this when preparing pre-service school librarians for their future roles as IT leaders.

School Librarians' Current Use of IT

In a 2011 study, Everhart, Mardis and Johnston found that school librarians felt confident in using and integrating technology with their students. However, the same study found that only 61% had full or substantial involvement in information dissemination about the use of technology in the school, 53% were disseminating information about technology advances, and only 35% stated that they were either fully or substantially involved in advocating for technology use in their school. While the level of confidence is reassuring, the fact that schools are not utilizing the school librarian as a technology resource is unfortunate when the school librarian is willing and capable of being an important and integral part of the integration of technology into the curriculum. This lack of inclusion of school librarians in the technology use in schools makes it difficult for school librarians to collaborate effectively with teachers in an effort to integrate IT more fully into the curriculum for the benefit of student learning. Emphasis on the role of school librarian as IT leader in this regard is something which could and should be addressed pre-service.

When Dotson & Jones (2011) surveyed 149 school librarian graduates of a school in the southeast United States over a five-year period they found that less than 30% of respondents stated that they served on media and technology advisory boards or committees which would be a key indicator of a technology leader since these boards are so vital to current educational practices. These findings would seem to show the importance of developing leadership coursework and training for future school librarians and keeping school librarians as a vital and integral part of their schools and districts.

Faculty who prepare pre-service school librarians to use and integrate IT in the classroom are also preparing the school librarian for best practices in their schools (Reigeluth, 2003). If IT is to enhance the curriculum it must be aligned with the curriculum, it cannot simply be added on or used as an afterthought (Hew & Brush, 2007). AASL's *Empowering Learners* (2009) has an

entire chapter devoted to the need for leadership of the school librarian in technology, education, and learning. Because AASL is the national association for the school library profession, these guidelines should be part of every school library pre-service program serving as a guide to preparing future school librarians for excellent school library management and leadership roles within their schools. Best practice should always be at the forefront of pre-service education as well as encouragement for continued life-long learning in pursuit of best practices throughout a school librarian's career.

Research Agenda

While the previously research cited pertains to the importance of technology leadership and the existence of varied IT use, research is lacking on what leadership concepts and theories are taught in pre-service programs. The proposed research will help to address this missing piece of research by exploring how school librarians are prepared in their programs for their role as technology leader.

Possible Research Questions

As the analysis presented in this paper suggests, to further knowledge of school librarian technology leadership preparation, researchers may wish to investigate whether and how leadership theories and concepts are being taught in pre-service school library programs. To this end, I propose the following research questions:

RQ1: To what extent do school librarian preparation programs teach IT leadership?

RQ2: What kinds of IT leadership material, including theory, do school librarian preparation programs include?

RQ3: How are school librarian candidates enacting technology leadership in their preparation experiences?

In support of these research opportunities, Hanson-Baldauf and Hassell (2009) focused on the information and communication technology (ICT) competencies of students in school library certification programs - the findings indicated that while over 75% of those in school library programs stated that their coursework on technology-use and how to integrate it was effective, they expressed a need for a more hands-on learning experience in authentic and practical ways in regard to technology integration. This would seem to indicate that faculty may need to reevaluate ways in which they are teaching their pre-service students how to integrate technology. It is also possible that lack of time, support, training, an absence of models, and a lack of technology in schools where pre-service students intern are possible barriers to pre-service school library faculty in teaching best practice in the use of IT integration for their pre-service teachers and school librarian students (Brzycki & Duted, 2005). There are likely other internal barriers on the part of students, or external factors like lack of administrative support or infrastructure problems in the schools that lead to the inability to address effective IT integration pre-service.

One area in which faculty might address preparation for the role of the school librarian to take on leadership and IT roles is through the use of modeling as well as explicit teaching by faculty during the field experience. Current programs seemed to support this type of preparation when questionnaires were sent out to 56 American Library Association (ALA) accredited library schools in the United States and Canada. Leadership and collaboration are mentioned in 25% of the mission statements of these schools, while 30% mention information literacy, and 40% of these schools indicated that they strive to prepare their school librarians to develop the skills needed to enhance learning and become instructional leaders through the use of technology (Tilley & Callison, 2001). On the other hand, when internship supervisors of school librarians graduating from the University of South Carolina were asked about the intern's skills, knowledge, competencies, personal characteristics, and leadership skills, these supervisors gave the fewest "excellent" and "good" ratings for "potential as a curriculum and instructional leader with the school and beyond" (Shannon, 2008, p. 33). So while the mission statements of schools might indicate that this preparation is taking place, it may not be put into practice.

Prospective School Librarians' Attitudes Toward Technology

It is in pre-service programs where faculty can help to instill attitudes and beliefs about the importance of IT integration and leadership abilities in future school librarians. It is a teacher's or school librarian's perceptions of information technologies and their attitudes towards IT use together with their IT self-efficacy that have direct effects on a pre-service school librarian's or teacher's acceptance of IT in instruction (Teo, 2009). When pre-service teachers and school librarians are exposed to new information technologies during their programs their attitudes and beliefs about IT can change for the positive. Research has shown a positive relationship between having stronger confidence or self-efficacy and how much teachers use IT in the classroom (Pope, Hare, & Howard, 2005; Swain, 2006; Willis and de Montes, 2002). In a survey of pre-service teachers by Pasternak (2007) it was found that pre-service teachers wanted to learn how to incorporate technology into instruction during their programs, partly because they did not feel that they would be comfortable in experimenting once on the job. Other responsibilities and time constraints as well as fear of using something unfamiliar might be a deterrent to experimentation once in a school. Giving pre-service school librarians a chance to experiment with IT and help them to feel comfortable doing so might help school librarians feel much better about trying out new information technologies once in the school library. The rapid changes in IT will make this type of experimentation vital for school librarians to keep instruction relevant. Leadership is often built on innovation and experimentation, so making school librarians comfortable with this during pre-service learning is important. The more exposure to IT that school librarians have, the more that their beliefs about the value of IT change in a positive way (Russell, Bebell, O'Dwyer, & O'Connor, 2003).

All of this makes it clear that it is not just about the technology itself, but also about the attitudes, beliefs, and comfort level of the school librarian in using technology in the classroom. Faculty also must prepare pre-service librarians for what they will need to do with IT once in their first school. In a study by Pope, Hare, and Howard (2002), addressing the gap between perceptions of what will be used in the classroom and the reality of technology use in the classroom and school library increases teacher confidence in regard to technology use. Preparing teachers and school librarians involves not just explicit teaching, but modeling of IT use by

faculty as well.

Innovative faculty and programs are needed in order to prepare students to take on roles such as IT leader in the school. One innovative program has come out of Florida State University. Project LEAD (Leaders Educated to Make a Difference) began in 2005 in an effort to address critical shortages of highly qualified school librarians by preparing school librarians to become leaders in their schools (Everhart & Dresang, 2006). Faculty in the program built the curriculum based on National Board Certification standards for school librarians. Programs such as these are likely to produce future school librarians with higher comfort levels and expertise in using student-centered educational technology skills that will be beneficial to students in their future schools. When Smith (2015) followed up on Project LEAD participants, their responses indicated that the program helped them to become more confident and willing to share their skills in their schools to help facilitate change, and that they were participating in aspects of technology leadership within their schools that were taught during their pre-service program under the Project LEAD curriculum.

Possible Research Methods

The possible research questions could be pursued using a number of methods, but a promising method involved syllabi analysis which can give educators a chance for reflection on how well their syllabi reflect student learning (Parkes & Harris, 2002), as well as areas where specific content such as technology leadership may be lacking which can allow programs to reevaluate their program content and structure (Boss & Drabinski, 2014). For example, a researcher could collect syllabi from pre-service education courses throughout the U.S. and then content analyze course descriptions, reading assignments, and course assignments listed in syllabi. Huckin defined content analysis as the “identifying, quantifying, and analyzing of specific words, phrases, concepts, or other observable semantic data in a text or body of texts with the aim of uncovering some underlying thematic or rhetorical pattern” (2003, p.14). Content analysis is an approach that analyzes, codes, and sorts textual data into new formulations addressing specific research questions (Babbie, 2013).

Course descriptions as well as syllabi can give insight into goals and planned outcomes in courses in school librarianship, as well as provide information on content, assignments, and activities for students in the course (Saunders, 2015). While syllabi may not contain every detail of the course, syllabi provide an accurate and faculty-endorsed account of the aim and scope of the course (McKeachie, 1999). A closer examination of readings and assignment guidelines may reveal more detail about the nature of the learning activity.

The syllabi from courses can also be analyzed manually by pulling only from courses that are on the school librarian track, including foundations courses and electives within the program. Content from courses outside of the school librarian curriculum, such as electives or courses outside of the department, may provide additional detail about the nature of pre-service school librarians’ preparation experiences. School librarians’ internship experiences may provide an additional opportunity to gather information about how pre-service school librarians enact technology leadership.

Additionally, an interview and survey component could be added to enrich the findings of the syllabi analysis. Surveys could be sent out to graduate library programs and be disseminated to students and faculty in the program to explore how they feel their school is preparing them for

using educational technology in their future school libraries, and what leadership components might be present in the program and courses. It might then be helpful to interview some of the responding graduates about their leadership learning experiences and readiness to enact leadership roles to get a deeper understanding of their course work and what they might feel the strengths and weaknesses may be in their technology leadership preparation through their schools. It would also be useful to interview pre-service educators about their perceptions of leadership content in their programs.

The rationale behind using a multi-method study is that while the content analysis can suggest what is stated to be happening, the follow-up interviews will hopefully provide some insight into how school librarians feel that what is suggested is happening, is helpful or useful to them as they practice, or if instead they are not learning what schools are indicating that they are teaching. Coupled with interviews of school library educators on how they feel their programs are doing at teaching technology leadership skills to their students, this can either confirm that pre-service programs are successfully teaching their students how to become IT leaders in their school, or possibly point to a disconnect in what is being taught and how it is being used by practicing school librarians. Interviews with school librarians and school library educators will also explore what strengths and weaknesses the interviewees feel are present in their programs regarding IT leadership preparation.

Conclusion

To ensure that future school librarians are being prepared to lead and innovate with technology, researchers need to investigate technology leadership practices and theories present in school librarian preparation programs. An openness to objectively look at individual school librarian preparation programs will be key. As Houston (2012) admitted after finding in a survey that students were not using technology tools in their academic lives as much as in their personal lives: “my colleagues and I have not been making extensive use of these tools in our [own] educational activities... our graduate program is not preparing our students for the (technology) world to come” (p. 139).

This willingness to explore areas of pre-service teaching and pinpoint weaknesses in technology preparation for students will be vital in helping to make changes and prepare future school librarians for their IT leadership roles in schools. Only when educators in school librarian preparation schools have a grasp of what is present and lacking in their programs to prepare school librarians for the role of IT leader, and what types of leadership models that pre-service school librarians are being taught, can they begin to adapt or extend their curriculums to meet the needs of current and future school librarian practitioners.

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