School Librarians as Technology Leaders: An Evolution in Practice

Lois D. Wine

Darden College of Education, Old Dominion University. Email: lwine004@odu.edu

The role of school librarians has a history of radical change. School librarians adapted to take on responsibility for technology and audio-visual materials that were introduced in schools in earlier eras. With the advent of the Information Age in the middle of the 20th century and the subsequent development of personal computers and the Internet, the American Library Association (ALA) recommended schools and colleges begin integrating information literacy into students' learning (1989). Today school librarians are entering another period of Radical Change as they combine their information specialist roles with technology integration. This leadership role in technology integration is at times in conflict with a new role in K-12 schools, that of an instructional technology specialist. This new role is also charged with integrating technology into classroom instruction by working with faculty and students. School librarians and instructional technology specialists have complementary roles that would benefit students and staff through a collaborative team approach to support. When educating future school library practitioners LIS educators need to be aware of this evolution in practice and adjust curriculum accordingly.

Keywords: collaboration, school librarians, instructional technology specialists, technology integration, LIS education

Introduction

When Eliza Dresang coined the term *Radical Change* she was referring to literature for youth that have digital age characteristics: connectivity, interactivity, and access (Dresang, 1999). Connectivity refers to both connections to books as well as sense of community provided through books. Interactivity refers to the reader's interaction with books, regardless of their format. Interactivity may be in response to digital formats or may be mental interaction as a reader responds to a book. Access refers to breaking barriers through access to diverse opinions and perspectives previously unavailable to youth. While Dresang's theory is directed toward the digital age, it also applies to the development of the school librarian profession. The role of school librarians has a history of Radical Change as expressed by Dresang. School librarians adapted to take on responsibility for technology as audio-visual materials were introduced in schools. This was a Radical Change in their roles. With the advent of the Information Age in the middle of the 20th century, and the subsequent development of personal computers and the Internet, the American Library Association (ALA) recommended schools and colleges begin integrating information literacy into students' learning (1989), another Radical Change.

Today, school librarians are entering another period of Radical Change as they combine their information specialist roles with technology integration. This literature review traces the Radical Changes that have affected the role of the school librarian. This paper begins with a general overview of changes occurring

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in the field of school librarianship. This is followed by a more detailed focus on the role of the school librarian now that technology integration leadership is more often shared with instructional technology specialists. Forming a collaborative partnership between school librarians and instructional technology specialists may be the next Radical Change for school librarians.

Development of the School Library Profession

In the first half of the 20th century, high school libraries were collections of content related publications that students could use for research. The school librarians cataloged, organized, and assisted with accessing these materials. The school librarian's role was limited to that of "keeper of the books". By mid-century many elementary schools also had libraries but only a few of these had qualified school librarians.

Several major events precipitated the first Radical Change in school libraries. In 1960 the American Association of School Librarians (AASL) published standards for school libraries with recommendations for equipping qualified school librarians with quality literature and non-fiction books, films, filmstrips, slides, and other audio-visual equipment (AASL, 1960). The second event was the release of groundbreaking research on the impact of a centralized school library staffed by qualified school librarians on students' learning at a time when there were few school librarians (Gaver, 1961). Furthermore, the Knapp School Library Project provided funds and support for model school libraries following the new standards developed by AASL (Boardman, 1994). The fourth event was federal funding through the Elementary & Secondary Education Act (ESEA) of 1965 that helped increase the number of school libraries and the inclusion of certified school librarians (Sutherland, 1970; Michie, Holton, & National Center for Education Statistics, 2005).

Information Literacy and Technology

It was in this atmosphere of change that the role of school librarians was about to change again. In 1974 Paul Zurkowski first mentioned the term "information literacy" while advocating for government training programs to achieve universal information literacy by 1984 (Zurkowski, 1974). Zurkowski, a lawyer, was addressing the National Commission on Libraries and Information Science as the president of the Information Industry Association, an organization which had grown from 12 companies at its establishment in 1968 to 70 companies by 1974. Zurkowski recognized the need to expand access to information tools to the entire population, not just the approximately one-sixth of the population who were "trained in the application of information resources" (p. 6) and identified by Zurkowski as "information literates." Zurkowski described information literate as "being able to find what is known or knowable on any subject" to solve a problem within the vast amount of information available (p. 23). These information literates had been trained with the techniques and skills needed to use information tools to develop solutions to their information problems. Zurkowski called for "The top priority of the Commission should be directed toward establishing a major national program to achieve universal literacy by 1984" (p. 27). In order to support this idea ALA issued a white paper recommending schools and colleges take on the role of integrating information literacy into their students' learning (ALA, 1989).

In 1988 the AASL collaborated with the Association for Educational Communications and Technology (AECT) to publish school library media program guidelines that incorporated information literacy, *Information Power: Guidelines for School Library Media Programs* (AASL & AECT, 1988), responding to rapidly increasing access to new sources

of information provided through the use of instructional technology. These guidelines identified three roles for school librarians in their schools, as information specialists, teachers, and instructional consultants. The role of information specialist was seen as vital in preparing students and staff for success in the next century through the development of the ability to access, evaluate, and use information. While recognizing that school librarians had long been responsible for providing access to information and resources to the school community "the importance and complexity of this function have increased dramatically in recent years, in part, due to the revolution in information and instructional technologies" (AASL & AECT, 1988, p. 27). As teachers, not only were school librarians directly teaching information literacy skills to students, they were also expected to work cooperatively with teachers and administrators to ensure that these information skills were integrated into the school curriculum. As instructional consultants the guidelines address the school librarians' role of responsibility to take leadership roles in the incorporation of technology in the school's instructional program as well as on the technology team and professional development of new instructional technologies, "instructing faculty and students in its [technology's] optimal use" (AASL & AECT, 1988, p. 38). School librarians were clearly taking the lead in incorporating information literacy and instructional technology into the schools' instructional programs.

A decade later AASL and AECT released *Information Power: Building Partnerships for Learning* (1998), including information literacy standards for student learning in response to the continuing growth of information and ways of accessing it. This was a Radical Change for school library programs, moving from an emphasis focusing on resources to students as lifelong learners (AASL & AECT, 1998, p. v). This revision of the original *Information Power* provides a vision for school library programs using three broad concepts of collaboration, leadership, and technology to guide school librarians in creating a student-centered program. Collaboration with teachers is required in order to create authentic opportunities to incorporate information literacy in learning. Leadership is advocated through school librarians "exerting strong curriculum and instructional leadership" by promoting information literacy and its importance in developing twenty-first century skills (AASL & AECT, 1998, p. 52). In the concept of technology, school librarians are described as "a primary leader in the school's use of all kinds of technologies—both instructional and informational—to enhance learning" and acting as technologists to collaborate with teachers to integrate learning with technology (p. 54).

Standards for Today's School Librarians

In light of these initiatives and the explosion of technology in our society, the role of school librarians was again transformed by Radical Change. With the ever increasing incorporation of technology tools in schools, the role of school librarians added technology integrationist to the role of information specialist. The most recent library standards, *Standards for the 21st Century Learner* (AASL, 2007) continues to emphasize the development of literacy skills. By working collaboratively with classroom teachers as instructional partners, school librarians provide instruction through lessons that model the integration of multiple literacy requirements including information literacy, media literacy, visual literacy, and technology literacy into current and emerging technologies to create learning opportunities in new and engaging ways (AASL, 2009).

Technology is prevalent throughout today's schools and is a crucial tool in 21st century learning that is infused with multiple literacy requirements. The AASL developed the expectations and standards

that describe the multiple roles of school librarians. In the AASL's (2009) most recent revision of the mission of the school library program, school librarians are directed to "empower students to be critical thinkers, enthusiastic readers, skillful researchers, and ethical users of information" (p. 8).

A Changing Environment

School librarians are now at a crossroads in their instructional roles. Today the school librarians' roles are being divided. As technology resources have rapidly expanded, instructional technology specialist positions were added to schools, with the role of supporting teachers' effective integration of technology into lessons, providing training on new technologies, making recommendations for purchases, and contributing to planning for division technology policies and processes (Sugar & Holloman, 2009). The addition of the instructional technology specialist created a change in technology integration that has impacted the role of school librarians by creating a gray area in regard to overlapping responsibilities (Johnston, 2013). When computers were first introduced into schools, the computer labs were located in the library and school librarians were the educators tasked to maintain them. As information sources became digitized more of the school librarians' time was focused on rapidly expanding information resources and instructional technology specialist positions were added. Now, when instructional technology specialists describe their work as collaborating with teachers and sharing effective computer media and technology methods, they describe a role that was originally the responsibility of the school librarian (Nguyen, 2007). Separating technology integration responsibilities from the school librarians' roles may demote the school librarian back to the keeper of the books. In 1999 Eisenberg and Lowe described school librarians, technology teachers, and administrators as "working in isolation and fighting for turf and control" (p. 2). This is unfortunate because a collaborative relationship between instructional technology specialist and school librarians provides benefits to the students. Collaboration opens an avenue to combine the knowledge and experience of two unique members of the teaching staff to support classroom teachers and students to make learning highly engaging through the integration of technology and information literacy skills into content curriculum. Combining the efforts of the school librarian and the instructional technology specialist to work together will benefit the students. Researchers have found that although today's students have grown up with access to technology, they are not experienced in using technology for academics (Ausband, 2006). In addition, research continues to show that technology is not being effectively integrated into classroom instruction. Lack of knowledge in using technology in student-centered instruction is a concern, along with teachers' attitudes and confidence in using technology (Buckenmeyer, 2010; Ertmer & Ottenbreit-Leftwich, 2010; Ryan & Bagley, 2015). This leaves a large need for support in integrating technology into teaching and learning and the importance of technology integration leadership. A Radical Change creating an instructional partnership will realize another Radical Change in the school librarians' roles.

In a study on enablers and barriers to school librarians' role in technology integration in their schools, Johnston (2012b) identified a "competitive relationship" with the instructional technology specialist as the most often mentioned relationship barrier preventing the school librarian from participation in a leadership role in instructional technology integration (p. 16). In the same study a collaborative relationship between the instructional technology specialist and the school librarian was identified as an enabler to school librarians' technology integration role (Johnston, 2012b). While the barriers outweigh

the enablers in this research, the finding of positive enablers support the idea that a collaborative relationship between instructional technology specialists and school librarians is possible and would benefit students and staff.

The school librarian and the instructional technology specialist each have their own contributions to make through a collaborative relationship, both with technology skills and their individual specialties. There is commonality between the standards of the school librarian and instructional technology specialist, their leadership roles, technology skills, and instructional knowledge, providing the opportunity for them to combine in a partnership to support and enhance the school learning community. They each bring special skills to a collaborative partnership, the school librarian as an expert on information literacy and the technology integration specialist as a technology expert. Is it possible for them to work together?

Eisenberg and Lowe suggested the development of an Information & Technology team that would work together to create a "true integration of information, library, and instructional technology services, resources and roles" (1999, p. 1). By looking at the current roles of the school librarian and the information technology specialist, how this integration can be supported by the specializations and commonalities each bring, a collaborative partnership will become apparent. Following is a description of the process used to identify relevant literature describing the roles of the school librarian and information technology specialist, along with commonalities and specializations of both.

The Roles of the School Librarian and the Instructional Technology Specialist

While a school librarian is also called library media specialist, school library media specialist, and teacher librarian the term "school librarian" is used here as it is designated by AASL as the official title of the role (Book, 2011). The term "instructional technology specialist" is used but refers to a role that is also designated as educational technology specialist, instructional technologist, instructional technology resource teacher, technology coach, technology coordinator, and technology integration specialist. These various terms for each role were used to identify relevant literature to establish the major roles of the school librarian and instructional technology specialist.

EBSCO Discovery Service databases were primarily used to conduct searches for literature describing the roles of each position as well as research relevant to collaboration between school librarians and instructional technology specialists, including international journals. Additional literature was located through the Library Literature & Information Science Full Text database and Google Scholar searches. Some literature and the dissertations were located by reviewing references at the end of articles. Research within the past ten years was accepted, but five years was the preference due to the rapid changes occurring in technology and the development of the instructional technology specialists' role as well as recent changes to standards for both positions. Articles on information technology specialists are not prevalent in the literature, especially at the K-12 level. The search was expanded to included articles at the K-12 and college level in order to find relevant information. Searches targeted information on each of the school librarian and the instructional technology specialist roles separately to identify the expected standards, knowledge, collaboration experience, and leadership that they each bring to their roles. Searches conducted to locate research documenting collaboration between school librarians and instructional technology specialists at the K-12 level were not successful, returning articles in practitioner journals only. When this search was expanded to the college level, a few research articles were

located and are used to describe collaboration practices between the two roles.

The Role of the School Librarian

The school librarian role as keeper of the books is well known. The school librarian chooses books and other materials to support the curriculum of the school and circulates these items to students and teachers. Additional roles of the school librarian are as teachers, instructional partners, information specialists, and program administrators. All of these roles are developed under guidelines provided by the AASL, the national organization for school librarians and a division of the ALA. There are several different standards which contribute to the knowledge and efforts of the school librarian.

School Library Standards

National learning standards for school librarians developed by AASL provide the framework for the field. In 2007 the new *Standards for the 21st-Century Learner* were released focusing on the learning process and included standards for literacy, technology, critical thinking, and information skills. Guidelines promote school librarian collaboration with all members of the learning community to provide support for students to be independent, lifelong users of information and ideas (AASL, 2009). These standards provide the basis for all instruction, collaboration, and collection decisions by the school librarian.

The ALA/AASL Standards for Initial Preparation of School Librarians (2010) provide the structure for school library certification programs. These standards include teaching for learning; literacy and reading; information and knowledge; advocacy and leadership; and program management and administration. Within these standards are expectations for school librarian candidates to learn to integrate information literacy skills into content area learning standards. Information literacy skills include multiple literacies, adding digital, visual, textual, and technological literacies to information literacy. Also, specifically included in the elements of 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 student's 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 (ALA/AASL, 2010). These standards support the school librarian's role as a leader and knowledgeable technology integrator along with the diverse knowledge and skills that the school librarian brings to their school and student learning. Nationally recognized programs prepare for certification at the graduate level.

In addition to these two areas of standards, the National Board for Professional Teaching Standards (NBPTS) include *Library Media Standards, Second Edition* (2012). These standards are also used by school librarians to inform their knowledge of expectations and exemplary school librarianship. Standard 4: Leadership, requires school librarians to exhibit instructional, administrative, and professional leadership through strong, evidence-based instructional practices, implementation of library initiatives and creation of partnerships, and sharing their expertise with their school, district, national, and global colleagues. Standard 6: Integration of Technologies provides an expectation that school librarians create library media centers that are the hub of their school community, with technology-enhanced spaces

that enable students to use emerging technology in their learning.

Leadership

School librarians have multidimensional leadership roles as instructional partners, information specialists, teachers, and program administrators (AASL, 2009). Many of the standards that define school librarians' practice also include technology leadership (AASL, 2007; ALA & AASL, 2010; International Society for Technology in Education [ISTE], 2010; NBPTS, 2012). School librarians are critically involved with the integration of educational technology (ISTE, 2010, p. 1) and work in technology-rich spaces (Massey, 2009, p. 7) with computer resources that allow for meaningful engagement with various information sources (Scholastic Research & Results, 2008). The education of preservice school librarians now incorporates leadership skills to allow for new school librarians who are ready to take on leadership roles (Smith, 2010, 2014). As school leaders who work with all teachers and students, school librarians are positioned uniquely to provide technology leadership through integration of technology and learning (Branch-Mueller and deGroot, 2011; Hughes-Hassell & Hanson-Baldauf, 2008; Johnston, 2012a, 2012b). AASL describes leadership as an essential role of school librarians, stating that "as information literacy and technology skills become central to learning, the school librarian must lead the way in building 21st-century skills throughout the school environment" (AASL, 2009, p. 16).

Technology Knowledge

School librarians' competencies in the use of emerging technology are factors in the ability of school librarians to take on the role of technology integration leaders (Branch-Mueller & deGroot, 2011; Hanson-Baldauf & Hughes-Hassell, 2009). School library certification programs that have incorporated emerging technology into coursework have found that class participants increase their confidence with technology and their ability to take on technology leadership roles (Hanson-Baldauf & Hughes-Hassell, 2009; Smith, 2010). Branch-Mueller and deGroot (2011) studied a graduate course on Web 2.0 technologies and described an increased use of and confidence with emerging technologies among participants, as well as school librarians' increased roles as technology leaders in their schools after the class concluded.

Collaboration

Monteil-Overall (2005) defines collaboration as "a trusting, working relationship between two or more equal participants involved in *shared thinking, shared planning and shared creation of integrated instruction*" (p. 5). Collaboration is a major component of the school librarian's role, strengthened by their prior roles as classroom teachers and curriculum specialists (Monteil-Overall, 2011). School librarians' have knowledge and experience as teachers, instructional specialists, and information specialists that make them strong partners with teachers. AASL and the Association for Educational Communication and Technology (AECT) (1998) describe collaboration as essential, with school librarians working with teachers to incorporate information literacy through joint planning, teaching, and evaluation. AASL (2009) more recently identifies teaching and learning built on collaborative partnerships between school librarians, teachers, and students in order for students to acquire 21st century skills. Collaboration allows opportunities for school librarians to incorporate information literacy skills and technology into curricular content in classrooms. This experience with collaboration positions the school librarian to effectively collaborate with the instructional technology specialist.

Instructional Technology Specialist

The instructional technology specialist may also be known by several other names such as Instructional Technology Resource Teacher, Instructional Technology Coordinator, Technology Coaches, and Technology Integration Specialist among others (Coffman, 2009; Johnston, 2010; Nguyen, 2007; Sugar, 2005; Sugar and Holloman, 2009). Although in some school settings this specialist may also be providing troubleshooting and repair, the main role of this position is to provide support to teachers and students for instructional use of technology. Like the school librarian, instructional technology specialists are school leaders working with all teachers and supporting student learning (Sugar and Holloman, 2009).

Standards

ISTE provides the standards for instructional technology specialists. The *ISTE Standards: Coaches* (2011) include standards for visionary leadership; teaching, learning, and assessments; digital age learning environments; professional development and program evaluation; digital citizenship; and content knowledge and professional growth. University programs now offer master's degrees with educational certification in instructional technology. The expectation for classroom teacher experience is an expectation by some school districts but varies by location. The ISTE standards are recognized by the Council for the Accreditation of Educator Preparation as the standards required for these preparation programs (ISTE, 2012). Instructional technology specialists are expected to promote "comprehensive integration of technology" throughout the learning environment (ISTE, 2011), modeling the incorporation of technology into curricular content, and sustained professional development based on the needs of the teachers. Like school librarians, instructional technology specialists model and promote digital citizenship through providing access to tools and resources that promote the use of best practices by students and teachers (AASL, 2009; ISTE, 2011). As part of the digital age learning environment standard, instructional technology specialists are also encouraged to collaborate with teachers and administrators in the selection and evaluation of digital tools and to model collaborative learning strategies (ISTE, 2011). The goal of these standards is to prepare instructional technology specialists to work as leaders to effectively integrate technology into instruction to maximize student learning.

Leadership

One of the roles of the instructional technology specialists is as a leader. Visionary leadership is the first standard in the ISTE Standards for instructional technology specialists. These specialists participate in creating, implementing, and evaluating a shared vision for technology development that includes the use of technology to support student learning and the integration of technology into strategic plans at the school and district level. Instructional technology specialists are also expected to develop and support innovation in technology use in schools and classrooms (ISTE, 2011). As leaders these specialists participate in frequent division level meetings and have close contact with school administrators (Langan, 2010).

According to Sugar and Holloman (2009) instructional technology specialists have four responsibilities in their roles. The first is in instruction, where they are instructional experts on incorporating appropriate technology into lessons. The second responsibility is technical, with the expectation that they will maintain equipment as well as make recommendations for and purchase new technologies. This responsibility also includes keeping up with emerging technologies and sharing information about them with teachers. Analysis is the third responsibility.

Sugar and Holloman found that expected analysis responsibilities for instructional technology specialists include planning and implementing technology policies in schools and districts, followed by evaluating their effectiveness, responsibilities that ISTE (2011) also described as leadership expectations. The final responsibility is leadership. Instructional technology specialists need to possess leadership skills such as being visionary as well as showing willingness and the ability to create collaborative relationships with principals and school staff. Although principals are recognized as the leader of the school and have oversight over technology, many principals do not have an extensive technology background, they share the responsibility of leadership with the instructional technology specialist.

Sugar and Holloman (2009) view leadership as a characteristic that is demonstrated within an organization by observing who exhibits influence over others. Leadership is not achieved through appointment as a leader and anyone in the organization can develop leadership capacity (p. 69). In their research, Sugar and Holloman identified nine leadership characteristics and conducted a survey of teachers to determine the leadership characteristics exhibited by instructional technology specialists. Problem-solving and facilitating were core characteristics, but they exhibited all nine leadership characteristics. Over 90% of the teachers surveyed rated the majority of the instructional technology specialists' leadership characteristics as "very effective" or "effective," including problem-solving, facilitating, corporate vision, development of others, and school communications. The researchers determined that the instructional technology specialist "clearly exhibited the nine technology leadership characteristics" (Sugar & Holloman, 2009, p. 73) and teachers recognized this specialist as a leader in the school. Instructional technology specialists become leaders in their schools as evidenced by their actions in using their knowledge of technology and teaching in their schools.

Collaboration

A key part of instructional technology specialists' job is to develop collaborative relationships with teachers. To successfully integrate technology into instruction, teachers have to be willing to work with the instructional technology specialist. Ausbund (2006) describes collaboration with teachers for technology integration into instruction, conducting staff development, and working with curriculum committees to integrate technology into curriculum as some of the categories of instructional technology work. As identified earlier, collaboration is shared thinking, planning, and creation of integrated instruction (Monteil-Overall, 2005). Research by Streich (2007) identified instructional technology specialists' communication and collaboration skills as important reasons for success in technology integration.

Common Ground and Specialization

The school librarian and the instructional technology specialist have much in common. They are active users of technology and keep current with emerging technologies. Both have experience integrating technology into curriculum content. They promote and engage in collaboration to work with teachers in engaging students in innovative instruction. Through their actions and support of teachers, students, administrators, and their school community they demonstrate their leadership skills as they work in classes, on committees, and in professional associations. With all of these shared abilities it is also important to note significant strengths of each of them, school librarians' expertise in information literacy and the instructional technology specialists' deeper knowledge of technology.

School Librarian

An important part of what school librarians teach students is information literacy skills, which have traditionally been interpreted to be research oriented skills. The ALA definition of information literacy as being able to recognize when information is needed and the ability to locate, evaluate, and effectively use information is one of many, all of which center on the ideas of identifying an information need and searching, selecting, evaluating, synthesizing, and using the information (Webber & Johnston, 2000).

As Grafstein (2002) noted, "rapid advances in digital technologies have resulted not only in a proliferation of the amount of information available to students, but also in the packaging of that information in an increasing variety of formats" (p. 198). The traditional role of librarians teaching research skills using materials within the library had to change in order to include the use of these new information tools in the skills that students possessed (Grafstein, 2002). The importance of teaching information literacy skills has become ever more apparent with the recognition that the development of technology tools and the information age have created a different learning world than the one in which their teachers learned, and it continues to evolve rapidly (Grafstein, 2002). The AASL *Standards for the 21st Century Learner* provides an inquiry framework where "students use skills, resources, and tools to inquire, think critically, and gain knowledge; draw conclusions, make informed decisions, apply knowledge to new situations, and create new knowledge; share knowledge and participate ethically and productively as members of our democratic society; and pursue personal and aesthetic growth" (AASL, 2007, p. 2). The definition of information literacy has been expanded to include digital, visual, textual, and technological literacies. School librarians collaborate with teachers to model and teach multiple literacies while helping students learn to be ethical users of information (AASL, 2009). School librarians have a strong information literacy focus in all of their interactions with students.

Instructional Technology Specialist

As evidenced by the ISTE standards, instructional technology specialists are required to have a much deeper understanding of technology and role in technology exploration, purchasing, and implementation. They meet more frequently with principals and in division level technology meetings and are more involved in division level technology planning (Langan, 2010). Instructional technology specialists are in a position to advocate for policies, procedures and funding for implementing division plans, as well as participants in decisions to purchase new technologies (ISTE, 2011). Higher education institutions have begun offering graduate programs in educational technology, allowing graduates better preparation with technology and its applications to education (Nguyen, 2007). These programs include preparation of their students in instructional design, online and blended learning models, and technology program evaluation (ISTE, 2012) with standards approved by the Council for Accreditation of Educator Preparation (ISTE, 2015). Instructional technology specialists are prepared with a deeper background in technology.

Implications

In articles describing collaboration between academic librarians and instructional technology specialists, positive relationships emerged in ways that benefited professors and students as well as the librarians and technologists. Oldham and Skorina (2009) describe two settings, a small college and a medium-sized university. At first, the librarian needed to develop a survey to determine information about library need but did not have the time or resources so she reached out to the

technology department. Through that project the librarian and instructional technology specialist discovered common responsibilities and found ways to work together to benefit the students. The instructional technology specialist helped the librarian develop a Google search box on the campus Blackboard course management system, allowing students to search the library from within Blackboard. Similar projects were undertaken at the university level including developing an online academic integrity tutorial for undergraduate students, a successful collaboration between the academic librarians and the technology department. This was followed by development of a similar tutorial for graduate students.

In another study, Boisselle, Fliss, Mestre, and Zinn (2004) describe how representatives from a small college and a large university, including an academic librarian, an instructional technology specialist, a professor, and a student from each, attended an integration training seminar and returned to their schools with two different experiences. During the training the group from the small college collaborated and established goals to increase student communication in group work and advanced information skills in the faculty member's course. A plan for implementation the next semester was developed. Introduced as a team to the class, the instructional technology specialist trained the students on the discussion tools in a lab and the librarian taught the students information literacy principles. This team continued to work together over the next several semesters to improve the collaboration, making improvements in the tools and support provided to the professor and students.

The group from the large university approached collaboration differently following the integration training. At the training, participants were able to have casual conversations as they ran into each other, but the physical distance between the participants when they returned to their large university provided a barrier to conversation. In response, the librarian and the instructional technology specialist developed a common goal of developing improved courses through their support of staff and students. They set up a retreat bringing the instructional technology staff and librarians together, where the librarian and instructional technology specialist who had attended the training introduced the idea of using teams of technology specialists and librarians to support faculty and students. Through that day's discussion, participants realized they needed to become more familiar with the skills of the other group. A series of workshops followed, then monthly "cookie chats" allowing sharing of stories and current projects. Each group began referring faculty to the other group when appropriate. The role of both the librarians and the instructional technology specialists were no longer doing quick demonstrations of how to use a tool, instead, with more of a teaching and coaching role, their collaboration with faculty was more focused on how to use tools in the context of a specific course (Boiselle *et al.*, 2004, p. 133). They have developed a new culture of collaboration, supporting faculty training and presenting new tools and technologies to each other.

There are implications for K-12 schools from these experiences of academic librarians and instructional technology specialists. The commonality of purpose and responsibility drew the librarians and instructional technology specialists together to work toward a common goal, resulting in the realization that they could do more in-depth work together in larger projects benefitting students and professors. Communication between school librarians and instructional technology specialists improves collaboration, understanding and identification of common goals, and creates more familiarity with each other, leading to more collaboration in providing support to teachers and students. If it can work between academic libraries and instructional technology departments at colleges and universities, it should also be possible in K-12 settings.

Conclusions

The school librarian and instructional technology specialist have many common skills, interests, and priorities. They fill leadership roles in their schools as they work with students, teachers, administrators, and their communities, and are collaborative by nature. Technology is a mutual interest and knowledge, with both the school librarian and instructional technology specialist working to keep up with emerging technology and integrate it into their work with others. Perhaps there are some school librarians and instructional technology specialists who are working in collaborative partnerships. With their common responsibilities and additional specialized skills, they have the ability to form a powerful partnership to benefit their entire school. As researchers, we need to identify these partnerships and study what the school librarian and instructional technology specialist are doing to make an integrated technology leadership position work for the betterment of teaching and learning. If these partnerships are not being formed between school librarians and instructional technology specialists, we need to identify what is happening in schools in its stead, and whether it is effective. As library and information science educators, we should be preparing future school librarians to successfully integrate instructional technology into curriculum, perhaps as part of a collaborative team with instructional technology specialists and other staff members.

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