SCHOOL LIBRARY RESEARCH
Research Journal of the American Association of School Librarians

Volume 20, 2017
ISSN: 2165-1019

Approved May 1, 2017
www.ala.org/aasl/slr

School Librarians Fully Online: Preparing the Twenty-First Century Professional

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Abstract

Online learning, already an essential component of the higher-education and professional landscape, has now developed a more ubiquitous presence in K–12 learning due to educational trends such as flipped education and use of tools such as Google Classroom. Despite the increasingly important role of online learning in K–12 education, little evidence indicates that graduates of school library preparation programs enter the profession with the knowledge, skills, and dispositions required to design and deliver online learning experiences for K–12 students, experiences that take advantage of available resources and platforms. A mixed-method national survey of programs in the United States was conducted to examine the ways that school library preparation programs prepare candidates to design digital learning spaces that include fully online courses for K–12 students. Results indicate that preparation of future school librarians for the design and delivery of online instruction to K–12 students is not yet seen as an integral component of these graduate programs.

Introduction

The American Library Association/American Association of School Librarians (ALA/AASL) *Standards for the Initial Preparation of School Librarians* (2010) call on educators of school librarians to prepare candidates who are able to equip all K–12 students in a diverse school community, regardless of students' cultural background and socioeconomic status, with essential knowledge-building skills for the twenty-first century. In their role as an instructional partner, school librarians collaborate with teachers to plan, develop, deliver, and assess instruction that infuses technology, inquiry, and information literacy skills into the subject curriculum. For the

most part, school library preparation programs graduate candidates who have a clear understanding of how to implement this role in the physical library space. However, many practicing school librarians still do not fully understand how to serve as an instructional partner in digital library spaces, spaces commonly identified as virtual libraries, flipped classrooms, and fully online course offerings (Green and Jones 2014).

Wendy Steadman Stephens claimed that "our traditional concerns for social justice and open access information position librarians for school leadership roles in this digital age," making us responsible for providing "access to a full range of educational resources so that no learner will be disenfranchised in the digital transition" (2011, 20). This digital transition reflects a move from face-to-face classrooms to fully online courses, representing the learning setting for one-third of undergraduate and graduate students in the United States (Allen and Seaman 2014). K–12 education is also moving in a similar direction with several states requiring that students take at least one online course before high school graduation and with all fifty states providing fully online K–12 courses (Kennedy and Archambault 2012).

Considering the explosive and steady growth of online learning in both K–12 and higher education, including use of the extremely popular Google Classroom, much of learners' ability to navigate educational resources and settings will be tied to their experience and comfort level with fully online coursework. From a social justice perspective, school library candidates who are prepared to support student access to a "full range of educational resources" are school library candidates who advocate access to digital learning spaces for all children, including those "who have been marginalized, that is, excluded, ignored, or relegated to the outer edge of academic success" (Marbley et al. 2011, 61). The ability to support this access involves knowledge of instructional design principles, universal design for learning, and an understanding of online pedagogy. In other words, "the school librarian is a curriculum developer who identifies 'access' as an 'understanding goal' – an essential learning goal for [his or] her students" (Abilock 2006, 12).

In response to the need for these newer competencies, some have called for school library preparation programs to revise their curriculum so as to include more technology courses (Yi and Turner 2014). A high interest in professional development on technology-enabled learning and online learning for students in grades K–12 is reflected in current initiatives such as Future Ready Librarians. Under the umbrella of Future Ready Schools, Future Ready Librarians "lead, teach, and support the Future Ready goals of their school and district in a variety of ways through their professional practice, programs and spaces" (2017). The Future Ready Schools website goes on to declare that "***if properly prepared*** [authors' emphasis] and supported, school librarians are well-positioned to be at the leading edge of the digital transformation of learning." Key to school librarians becoming leaders in this movement is their being properly prepared.

In light of initiatives such as Future Ready Librarians, initiatives that reflect employer expectations for future graduates of school library educator preparation programs, the purpose of our study was to develop a national picture of the ways that school library preparation programs prepare candidates to design digital learning spaces, including fully online courses for diverse K–12 students.

Literature Review

Educator Preparation and Professional Development in K–12 Online Learning

Quality school library programs typically have dynamic school librarians who take on a leadership role in technology integration (Everhart and Johnston 2016). Numerous studies have shown that school librarians serve a critical role in improving student achievement when librarians collaborate and coteach with classroom teachers to integrate information literacy and technology literacy skills into the content curriculum (Scholastic 2016). The 2015 Speak Up National Research Project noted that "school librarians continue to be at the forefront of digital integration in schools, supporting students, teachers, and administrators every day with new resources, training, and strategies" (Rosa 2016, 9).

With the proliferation of 1:1 initiatives and of flipped learning, there is a need for school librarians to develop a larger role in technology leadership by becoming "a big part of the school's online environment" (Boyer 2015, 72). Technology leadership and integration strategies employed by school librarians fall along a continuum that reflects a range of technology integration levels (Maloney 2004). This continuum ranges from digital library portals that provide learners with 24/7 access to library resources, all the way to "full-on embeddedness" (Boyer 2015, 74) in which the school librarian takes an active design and teaching role in fully online courses. Despite the growing presence of K–12 online learning, much of the technology integration occurring in school libraries falls somewhere in the middle of the technology leadership and integration continuum.

Since 2007 several higher-education institutions began preparing pre-service teachers to teach online. Iowa State University was the first to develop teacher education programs for fully online K–12 teaching, quickly followed by the University of Florida, the University of Virginia, and Graceland University (Archambault and Kennedy 2014). In a study of teacher education programs accredited by the American Association of Colleges for Teacher Education (AACTE) and National Council for Accreditation of Teacher Education (NCATE), researchers found that only 1.3 percent of the programs offered field experiences in K–12 online learning programs. This in spite of the fact that the institutions had previously indicated they prioritized inclusion of field experiences and student teaching in virtual school settings. Regardless of the presence of these types of programs in some institutions, and the investment in K–12 online teaching that their existence represents, national data on K–12 practitioners does not reflect a profession in which practitioners start their careers with robust expertise in online teaching and learning.

In 2014 Lucy Santos Green and Stephanie Jones surveyed one hundred school librarians in Georgia and Texas. Sixty-nine percent of respondents reported they received little if any formal training on teaching online or designing instruction for fully online delivery to K–12 students. In the following year Leanna Archambault and Jean Larson conducted a nationwide study of 325 K–12 teachers responsible for teaching one or more online courses in an online school at the K–12 level. When respondents were asked how they were prepared to teach online, 12.7 percent explained that they took graduate courses in educational technology and online teaching. However, the majority of respondents stated that they received the bulk of their training in the form of webinars, meetings, and workshops delivered through the virtual school where they taught. While some mentioned a mentor or colleague who provided help and guidance, over 30

percent described themselves as self-taught (2015, 68), having learned to teach online through the experience and practice of teaching in a virtual school.

School Library Preparation and Standards for Candidate Preparation

Individuals pursuing school librarian credentials have several educational options. One option is to earn a degree from one of the forty-nine university programs leading to school library certification that are currently accredited by the American Library Association. This degree, most often referred to as the Master of Library and Information Science (MLS or MLIS), typically qualifies the candidate to work in any type of library, including a school library, provided the candidate also meets a state's certification requirements for teachers. Another route to school library certification is through a university or college program accredited by the former National Council for Accreditation of Teacher Education (now CAEP: Council for the Accreditation of Educator Preparation) in cooperation with the American Association of School Librarians (AASL). These institutions offer pathways for school library certification only, usually as an add-on certification program, or as part of a Masters of Education. Finally, interested individuals may earn a degree from one of the more than one hundred state-approved college or university school library programs (Underwood 2007).

Much of the literature that examined library and information science (LIS) programs found that technology has become an integral part of LIS curricula (Beheshti 1999; Branch-Mueller and deGroot 2011; Hall 2009; Markey 2004; Yi and Turner 2014). Kwan Yi and Ralph Turner's review of eighty-four school librarianship Master's degree programs found that "all program types commonly cover the concepts of leadership, web, literacy, methodology, and curriculum" (2014, 314). *Service to user populations* was a common feature across all school library programs, confirming that technology literacy and information literacy were "two emerging subjects of importance" to twenty-first century library education (Yi and Turner 2014, 316).

As part of a larger study, Shelbie D. Witte, Melissa R. Gross, and Don L. Latham, Jr. (2015) examined the Library Information Science (LIS) curriculum at a large Southern research university for evidence that student outcomes from the Partnership for 21st Century Learning's Framework for 21st Century Learning (2016) were included. Witte, Gross, and Latham determined that most of the framework was addressed in the curriculum. The portions of the Partnership for 21st Century Learning's Framework of particular relevance to the study reported in this paper are the student outcomes concerning information, media, and technology skills. Witte, Gross, and Latham found that one of the LIS courses titled Digital Libraries prepared pre-service librarians to understand the "technical skills needed to develop, manage and evaluate digital libraries as well as an appreciation of issues around access and usability" (2015, 218). This ability to apply technology effectively reflects AASL program standards.

All school library preparation programs contain curriculum that was developed and based upon accreditation standards from ALA. "The ALA/AASL Standards for Initial Preparation of School Librarians apply to all Master's programs that prepare candidates to develop and manage library and information services in a Pre K–12 setting, regardless of degree name or professional title" (2010, 13). Although each preparation program's approach is unique, the programs must keep their curriculum within the framework of the five standards: (1) Teaching for Learning, (2) Literacy and Reading, (3) Information and Knowledge, (4) Advocacy and Leadership, and (5) Program Management and Administration (2010). For a detailed breakdown of the standards used in school library preparation programs, see Audrey Church et al. (2012). While the

standards do not specifically state that school librarians should be able to teach online, the use of technology is addressed in Standard 1, Teaching for Learning, and Standard 3, Information and Knowledge.

Element 1.2 of Standard 1 sets the expectation for candidates to "make use of a variety of instructional strategies and assessment tools to design and develop digital-age learning experiences and assessments in partnership with classroom teachers and other educators" (AASL 2010, 13). Element 1.4 of Standard 1 continues to emphasize the use of technology in implementation of AASL's 2007 *Standards for the 21st Century Learner*, as well as the state student curriculum standards: "Candidates integrate the use of emerging technologies as a means for effective and creative teaching and to support P–12 students' conceptual understanding, critical thinking and creative processes" (AASL 2010, 13). Standard 3, Element 3.3, states that candidates should be able to "demonstrate their ability to design and adapt relevant learning experiences that engage students in authentic learning through the use of digital tools and resources" (AASL 2010, 22). Clearly, the intention of the preparation standards is for school librarians to take advantage of the latest technological developments, including the presence of flexible learning environments (AASL 2010, 3), for the purpose of fulfilling the school library's mission: ensuring that all students and staff are effective users of ideas and information.

Theoretical Framework

Much of the effort behind training pre-service and in-service educators on technology use and technology integration has been analyzed through the lens of TPACK: technological, pedagogical, content knowledge (Koehler and Mishra 2009). TPACK (see figure 1) is a framework based on the premise that teaching expertise reflects a mental flexibility and recall of different knowledge systems—mental flexibility and recall that allow teachers to retrieve techniques to apply to new technology integration situations.

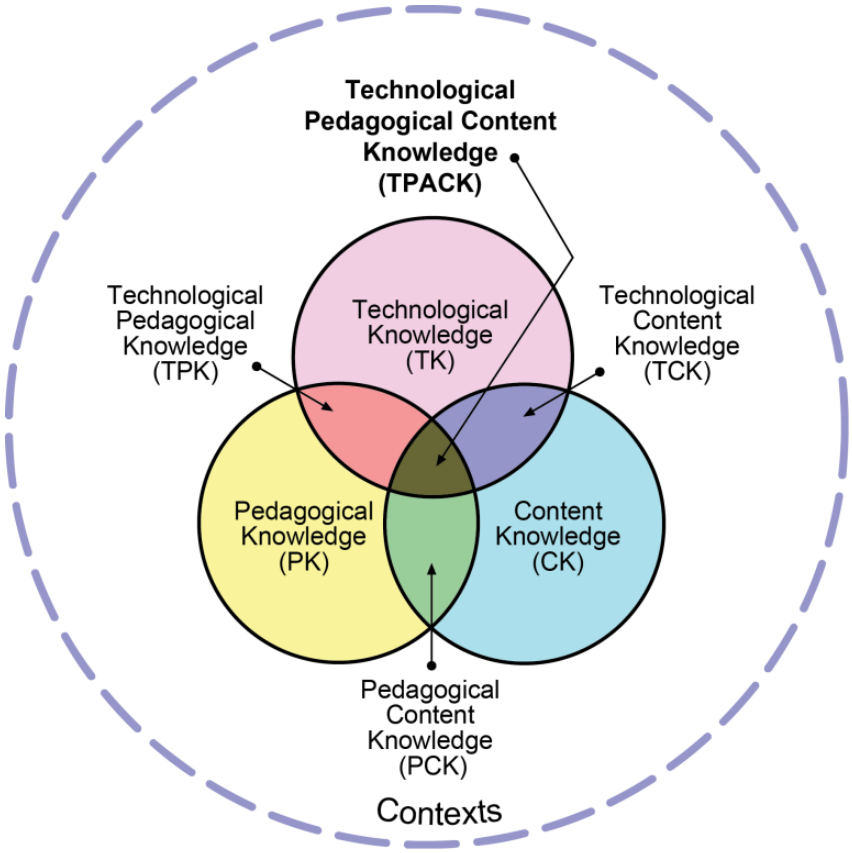

Figure 1. TPACK framework (reproduced by permission of the publisher, ©2012 by tpack.org).

This framework, an extension of Lee S. Shulman's pedagogical content knowledge (PCK) framework (1986), proposes three separate knowledge systems: a) technological knowledge (TK), b) pedagogical knowledge (PK), and c) content knowledge (CK). It has been suggested that TCK, the knowledge of how technology can enhance and support student mastery of academic content, is particularly important for teachers because this construct "supports the decision-making processes and skills necessary to choose appropriate technologies to support content learning" (Young, Young, and Shaker 2012, 26). Therefore, the TPACK framework informed the development of both the research question and the data collection instrument for this study.

Methodology

Purpose of Study

The purpose of this study was to develop a national picture of the ways that school library preparation programs prepare candidates to design digital learning spaces for K–12 students. Since this study focused on a specific population while targeting a large data set, a survey methodology (Czaja and Blair 2005) was used to answer the following research question:

What coursework and learning experiences exist to help prepare school library candidates to design digital learning spaces for all K–12 students?

Data Collection

We developed a web-based questionnaire adapted with permission from Kennedy and Archambault (2012) National Survey of Teacher Education Preparation Programs for Virtual K–12 Schools. The resulting instrument contained both closed and open-ended questions intended to elicit from faculty and program directors information regarding characteristics of school library candidate preparation programs. Aside from convenience and economy, this data collection method was used because of previous research (Shin, Johnson, and Rao 2012) that suggested web-based instruments result in higher data quality compared to other collection methods for closed and open-ended questions. To establish content validity, the instrument was reviewed by two field experts and subsequently adjusted for clarity, accuracy, and appropriateness.

A cross-reference of programs listed by ALA, AASL, and the 2015 *Educational Technology and Media Yearbook* generated a list of 134 program director or coordinator contacts. These individuals were purposely selected for their leadership roles and in-depth knowledge of program curriculum. E-mail invitations for survey completion were sent to the identified contacts, along with three subsequent reminder e-mails (if necessary). Of the 134 programs contacted, 85 responses representing 38 states were collected, resulting in a 63 percent response rate; this rate is well within an acceptable range for online surveys in higher-education settings (Shih and Fan 2009).

Data Analysis

Closed survey items were analyzed quantitatively using descriptive statistical measures in order to develop a detailed picture of the ways participating graduate programs are structured, ways program culture and course design are informed by K–12 online learning trends, and ways the design of digital learning environments are infused in program curricula.

Open-ended questions were analyzed qualitatively using inductive content analysis and open-coding (Glaser 1965). Once a list of codes was generated, two researchers independently coded all open-ended responses. Then, codes entered were analyzed by the third researcher using SPSS to determine intercoder reliability. Content analysis revealed that coders showed sufficient agreement, as determined by Cohen's Kappa ($\kappa = .9$). Various studies (among them Lombard, Synder-Duch, and Bracken 2002; Viera and Garrett 2005) propose that a Kappa above .7 is acceptable, with 1.0 reflecting perfect intercoder reliability.

While findings are not generalizable to all graduate preparation programs leading to school library certification nationwide, the analysis of both quantitative and qualitative data engendered a rich and thorough description of the information collected, so that the reader may determine what is transferrable to his or her context and setting (Creswell 2008).

Findings

Introduction

The collection of both quantitative and qualitative data through the administered survey aided in highlighting complex phenomena present in higher-education settings so that results further informed each type of data set (Onwuegbuzie and Leech 2004). The following section outlines quantitative and demographic information about the study sample, including data on program location, delivery format, and curriculum.

Quantitative Data

Of the 85 respondents, 49 percent (n = 42) reported a hybrid or blended program delivery, 45 percent (n = 38) reported fully online program delivery, and 6 percent (n = 5) reported fully face-to-face program delivery. Only 10 of the 42 hybrid or blended programs offered a K–12 online teaching endorsement, with 8 of the 38 online programs, and none of the face-to-face programs offering this endorsement option (see figure 2).

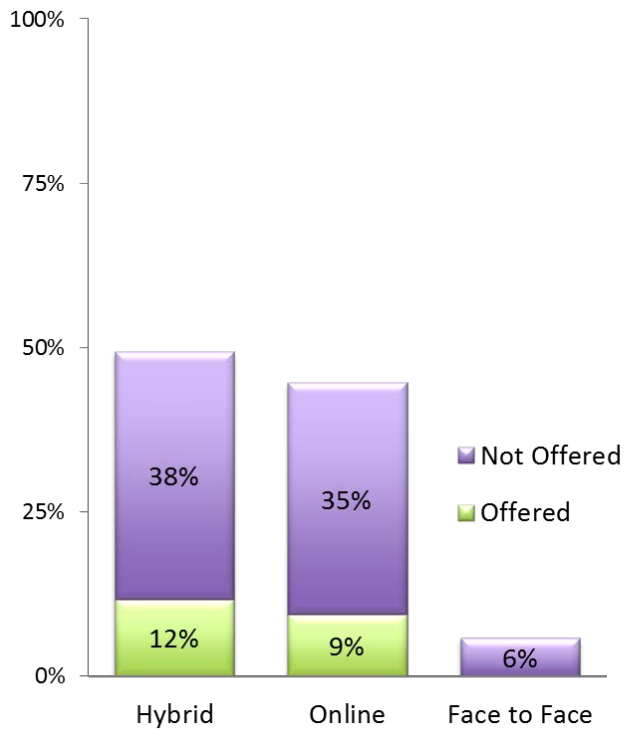

Figure 2. Distribution of K–12 online teaching endorsement option by program format.

An overwhelming percentage of respondents (71 percent; n = 60) indicated that the school library certification options their institutions offered did not provide opportunities for candidates to obtain a K–12 online teaching endorsement or certification within the school library program

of study (see figure 3). Of the 29 percent (*n* = 25) offering K–12 online teaching as an endorsement or certification option, 10 (12 percent) offered this endorsement through a hybrid or blended school library certification program, 8 (9 percent) through a fully online school library certification program, and 7 (8 percent) through its institution but not necessarily through the school library certification program.

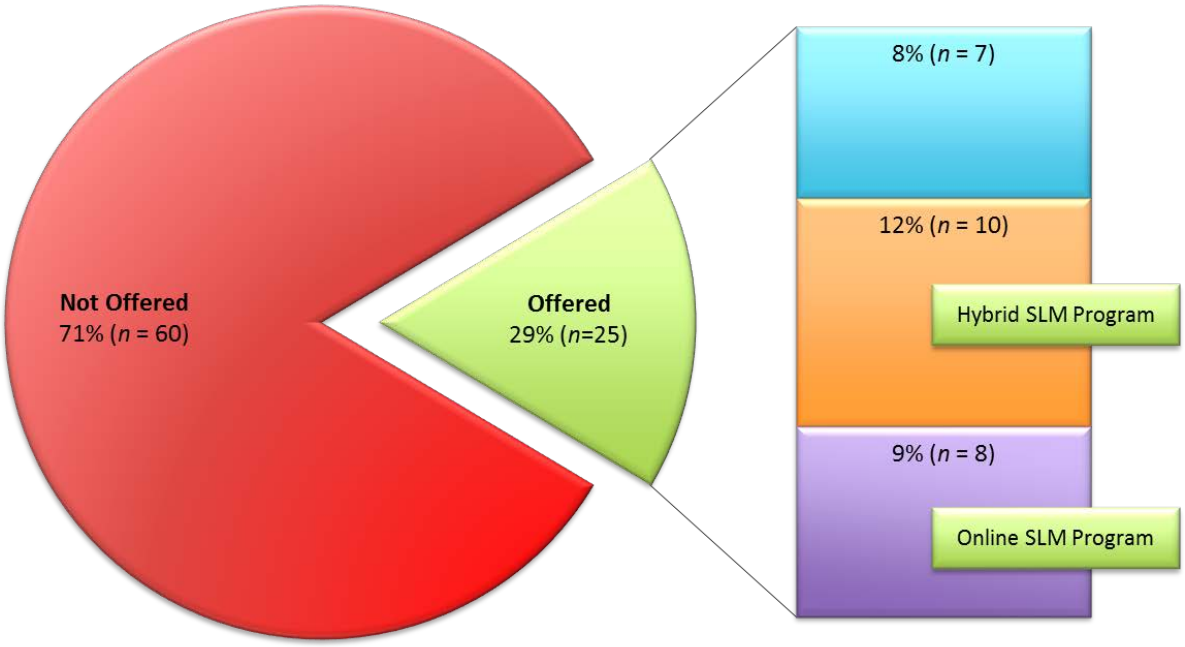

Figure 3. Availability and distribution of K–12 online teaching endorsement offerings.

Figure 4 displays courses relating to online instruction offered as part of school library certification options, with 80 percent (*n* = 68) of programs featuring a course focused on technology integration, 68.2 percent (*n* = 58) offering a course on instructional design, 48.2 percent (*n* = 41) offering coursework on technology administration in the school library, 31.8 percent (*n* = 21) offering a course on web design, 16.5 percent (*n* = 14) offering courses on online teaching for K–12, and 5.9 percent (*n* = 5) of responding programs that do not offer courses featuring any of these topics.

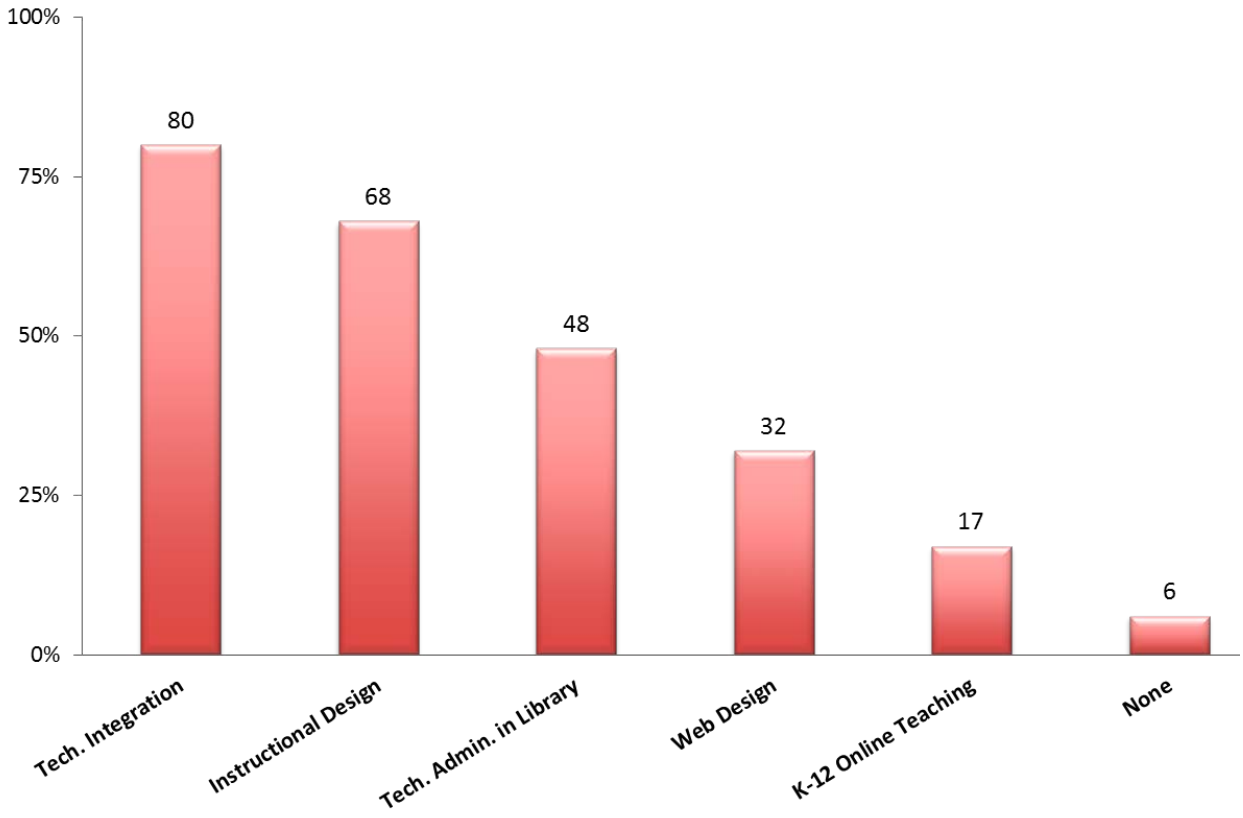

Figure 4. Course topics offered as part of the school library certification option.

Figure 5 represents a comparison of the various technology tools used in course instruction and in student-generated work. Web 2.0 technologies (e.g., YouTube, Voice Thread, Scoop.it) were among the tools most often employed by instructors (90.6 percent) and students (94.1 percent). Surprisingly, social media (e.g., Twitter, Tumblr, Facebook) was one of the technology tool categories that was used the least by instructors (57.6 percent) and students (60 percent).

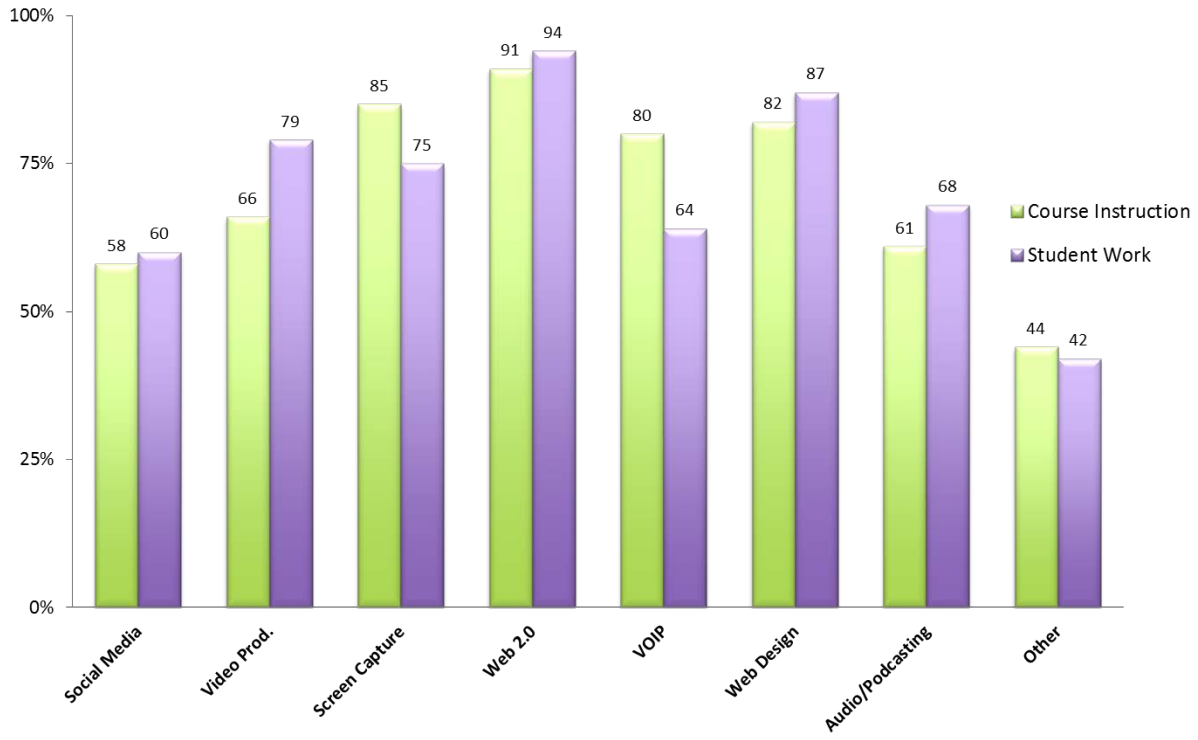

Figure 5. Technology tools used in course instruction and student-generated work.

In terms of program requirements, 72.9 percent (n = 62) required candidates to develop virtual library resources, but only 15.3 percent (n = 13) of programs required the development of fully online modules for K–12 students (see figure 6). Seven programs (8.2 percent) did not require candidates to develop any of the digital learning environments listed in the survey (flipped or virtual learning resources, personal learning networks, content curation, fully online modules for K–12 students or for professional development, and webquests).

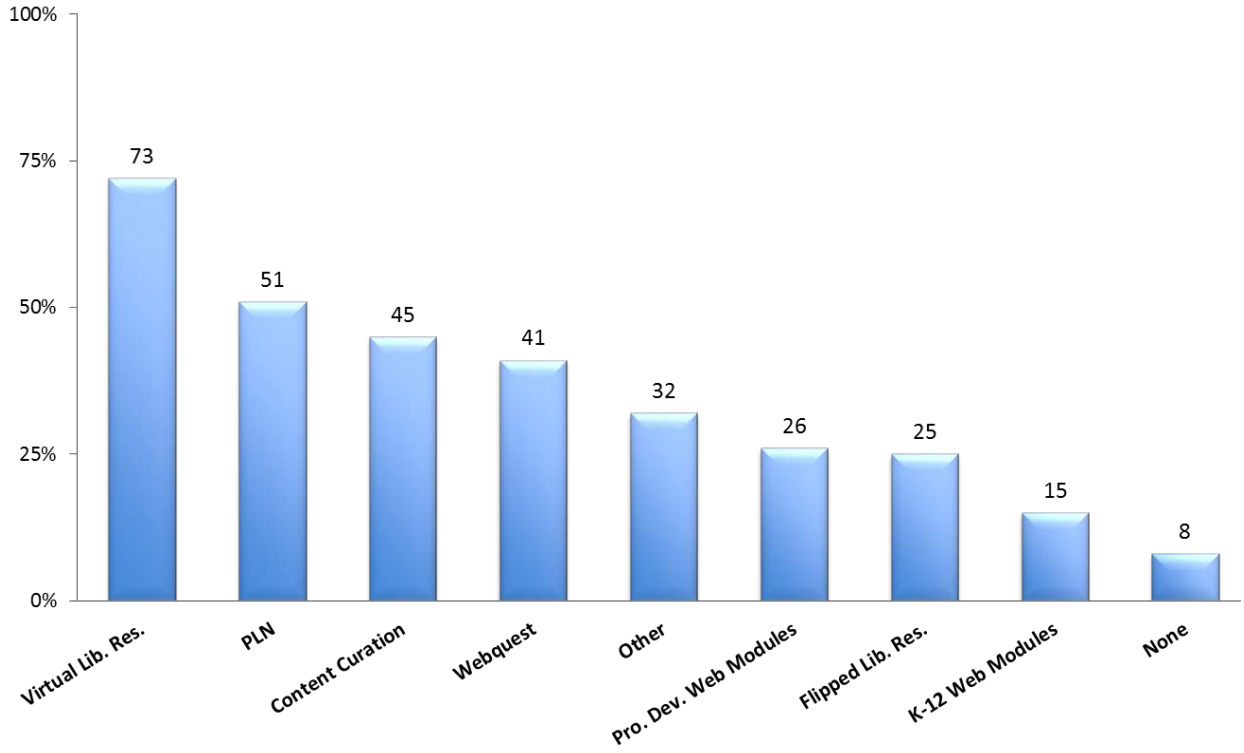

Figure 6. Digital learning environment requirements.

Qualitative Data

Introduction

The following section describes the themes identified during an analysis of participant responses to two open-ended questions. These themes reflect commonalities in survey responses about graduate preparation programs; these commonalities include the differences between state-led and institutionally-led curriculum changes, the ever-shifting nature of the school library profession, and institutional and cultural barriers to school librarian presence in K–12 virtual schools.

Theme 1: Curriculum for an Evolving Profession

The first theme, curriculum for an evolving profession, relates to ways school library preparation programs structure curriculum to prepare school library candidates for professional flexibility. School librarianship has recently been referred to as an evolving profession, one that over the last decade shifted from "a reactive stance to a proactive one" (Dickinson 2015, 24). As a response to this pivot in focus, respondents from several preparation programs spoke about the importance of graduating candidates who become life-long learners, committed to a dynamic exchange of ideas:

> We work on building the capacity of our students to keep learning through involvement in conferences, publications, PLNs [personal learning networks], social networks, etc. We make it clear that they are going to experience many changes in their career and give them strategies to help them keep learning and growing.

Others described a preparation program that envisioned candidates as future school library leaders in "innovation laboratories where educators and students can experiment with new educational ideas" (Dickinson 2015, 27):

> We pay considerable attention to developing school libraries as digital libraries, intersecting with the provision of vibrant physical spaces to support pedagogical engagement by the whole school. This integration positions the library as a physical and virtual learning commons which gives primary emphasis to the library as an across-school instructional zone to nurture inquiry, discovery, reading and literacy development, creativity, problem solving and knowledge development, and the development of competencies and dispositions for learning for life.

Some programs acknowledged "school librarians will be leaders in K–12 online learning…" though the description of this leadership role mirrored traditional school library activities such as collection development and information literacy instruction: "…through delivery of content to students and teachers, through identification, selection, and provision of resources to support online learning, and through modeling best practices for other educators." Most responses under the umbrella of this theme acknowledged K–12 online learning's growing presence in schools, claiming "the media center must address this, embrace it and provide [K–12] students with practice to use [this] skill set effectively."

Theme 2: Program Efforts in Response to Change

Program efforts in response to change, the second theme gleaned from the data, refers to curriculum revisions or efforts undergone by a school library preparation program in response to program reorganizations, institutional mandates, or changes in educator certification requirements at the state level. The changes resulting in a newer focus on digital learning environments are directly attributed, by the survey participant, to external pressure by an agency or organization rather than to a program vision or belief: "A continuum of K–12 Library Media Frameworks from the state level frame the curriculum. Candidates develop curriculum incorporating online instruction."

Program reorganizations most commonly identified were those that described a combining of school librarianship and instructional technology into one department or program:

> Our program is combined in one department with an educational technology program; SLMC students are encouraged to take classes from both sides of the house. We additionally have an online instruction certificate, though it is currently oriented toward post-secondary education. We are partnered with the College of Education online school, and some of our students are working to develop information literacy modules and instruction for that.

Still others implemented a formal program of study in K–12 online teaching in response to institutional pressure for the development of recruitment/retention efforts through cutting-edge graduate program options:

> We have a new graduate certificate in online teaching that our Masters students and other students enrolled through the state consortium can 'add on' with only 6 extra hours (other courses from the MS can count toward it) and the majority of our students choose to take the extra courses and get the additional preparation even though it's not a state category of certification or formally recognized by the K–12 community in our state just yet. However, the students [candidates] find it valuable and challenging. So we talk and work quite a bit to find ways to support online teaching for all students and ways teachers and librarians can assist with online teaching and learning activities.

Not all programs experienced change as a positive impact on curriculum. Some perceived change as a contextual barrier to adding K–12 online learning and other digital learning settings to the curriculum. One program described how more stringent accreditation requirements for higher-education coursework hampered curricular innovation: "The school librarian preparation is so prescribed we are not able to delve into the content." Others spoke about the lasting impact of an economic recession that cut into employment opportunities in school libraries: "Librarianship has been in a steady decline in our state for at least ten years, as our recession began far earlier than the rest of the country's, and we are still rebounding." The economic downturn also influenced how programs perceived the instructional needs of their candidates, some finding the idea of K–12 online learning in school library preparation not in line with the technological resources available to practitioners:

> Considering that we are fighting just to keep school libraries open and staffed, and that most of them lack adequate basic information technology, the question seems irrelevant. Many of our graduates work in schools which are still on dial-up.

Theme 3: Experience Leading to Expertise

Wes Higbee, a former software developer and current technology consultant, is fond of saying "repeated exposure to events is not what leads to expertise…do not confuse expertise with experience, experience is much more likely to simply be exposure" (2015). Theme three reflects instances where program faculty members view candidate expertise in K–12 online learning and other digital learning environments as being developed through exposure to online coursework and graduate online activities: "We are actively looking at ways to teach school librarians how to do this more proactively. By being involved as online learners themselves they will have a lot of experience in this area from the student perspective." Another program highlighted the benefits of its hybrid delivery structure: "Because half of our program is online, our graduates have personal experience with learning online. In addition, we model the use of online technologies, expecting that our graduates will promote their use."

Ronald A. Smith and Richard G. Tiberius claimed that "the feature that really distinguishes experts from others is their approach to new problems." Expert educators, they explained, "continually redefine the classroom situation and reinterpret the individual student…teachers learn about students and about teaching as students are learning about the material" (1998). This contrasting definition of educator expertise, expertise developed through hands-on practice and experience, was reflected in one program's preparation of its school library candidates for K–12 digital learning environment development:

> We prepare our pre-service school librarians to be conversant in the tools of digital and online learning and how these tools can be integrated into the educational setting. We

> prepare our students to be K–12 school library program advocates to make sure the school library program is at the heart of the educational enterprise.

Discussion and Conclusion

As reflected in the curriculum design, course assignments, and expectations for graduating candidates reviewed in this study, technology in K–12 school libraries is here to stay. The vast majority of the preparation programs surveyed for this study acknowledge that technological literacy and technology leadership are now essential components of the school library profession. Both quantitative and qualitative data collected and examined indicated programs are desperately trying to prepare candidates for any and all potential school library settings, in response to fast-paced technological innovation, federal educational policy, and shifting job descriptions. Even so, there is an inconsistency in how technological literacy is defined by preparation programs. Qualitatively, programs articulate the placement of the school library "at the heart of the educational enterprise," recognizing that the traditional school librarian's role of instructional partner has significantly broadened in the last decade. However, quantitatively, the majority of coursework and assignments related to use of technology in K–12 instruction tackle software/hardware skills and the curation of online resources versus the design and development of digital learning spaces.

Melissa P. Johnston asserted that the "changing information landscape of the 21st century that includes interactive technologies and a participatory culture" places the burden of preparing "learners for participating and succeeding in future global society on school librarians" (2015, 19). The TPACK construct used to frame this study describes technological-pedagogical instructional expertise as the mental flexibility to retrieve different techniques to apply to new technology integration situations (Koehler and Mishra 2009). To meet the challenge outlined by Johnston, the instructional partner role must now be embodied by school librarians who combine knowledge of pedagogy, content, and technology (TPACK) in creative and flexible ways to design and develop technology-enabled learning activities in all environments (Voogt et al. 2013).

The programs interviewed in this study prepare school library graduates who are "helping students with online research, acquiring and making digital resources available to students and teachers, and identifying digital content such as videos and animations for teachers to use in their lessons" (Project Tomorrow 2015, 9). While these activities are reflective of strong TCK—technological content knowledge—focus on only these activities removes the librarian from the pedagogical aspect of TPACK.

Brenda Boyer described a fully embedded designer librarian as one who maximizes his or her TPACK to design and deliver a laundry list of learning objects and experiences in fully online environments, ranging from scaffolding advanced search techniques to providing instruction on use of data analysis tools and metacognitive supports for critical thinking. However, she goes further, emphasizing the considerations unique to pedagogical decisions for K–12 online learning:

> What reusable learning objects (RLOs) (e.g., video tutorials, Tildee lessons, presentations, handouts) need to be incorporated? What is the optimal placement of resources and dashboards, digital inquiry learning objects, learning scaffolds and tools for visualization, sharing, collaborating, and publishing?...A well-placed screencast tutorial

> reminding learners how to use database advanced search features, or perhaps explaining how they can evaluate sources for scholarly purposes, placed exactly where the learner may need it improves workflow and increases the immediate value of those resources for that learner. We need to make design decisions that optimize workflow and meet the learner at the point-of-need. (2015, 75)

She concluded this description by calling on higher education to prepare the next generation of designer librarians in response to the needs of K–12 online education. To meet this challenge, it is critical that program faculty specifically endorse and include online pedagogy for K–12 students in school library coursework.

Leanna Archambault and Kathryn Kennedy recommended that educator preparation programs develop curriculum based on standards for quality online teaching, standards developed by professional organizations such as the Southern Regional Education Board, the National Education Association, the International Society for Technology in Education, the International Association for K–12 Online Learning, and Quality Matters (2014). Several components common across these various organizations describe the type of skills and dispositions that an online educator should have to be successful. To help pre-service school librarians develop these skills and dispositions, school library preparation coursework should include courses that focus "on designing and implementing curriculum and instruction for online/blended settings, online pedagogy, and online assessment and evaluation" (Archambault and Kennedy 2014, 237). The areas identified by Archambault and Kennedy easily align with the TPACK framework and its characterization of quality online pedagogical practice.

The design and development of fully online instruction and other digital learning environments should also be included in the practicum or capstone experience. Just as one's personal experience as a frequent library user does not prepare the individual to be a library professional, or one's experience as a K–12 student prepare an individual to teach in a K–12 classroom, one's personal experience as an online student or abstract discussions of online learning do not prepare a future school librarian to design and implement curriculum in K–12 online settings. Research on the preparation of educational professionals has determined that direct and active learning experiences provide pedagogical entry points that help educators develop the required and deeper awareness of challenges within a particular learning context (Gravett 2004). In a landmark comprehensive review, Edward W. Taylor found that true transformative learning occurs when graduate candidates complete "learning experiences that are direct, personally engaging, and stimulate reflection upon experience (2007, 182).

Speaking directly to the school library preparation setting, Daniella Smith explained that "project-based experiences with feedback provide the best opportunities for teaching educators how to implement technology…if they are not taught [in this manner], they are less likely to grasp how to use the technology they have learned" (2010, 617 and 626). Nancy Everhart and Melissa P. Johnston echoed the importance of a formalized curriculum in the development of school librarians as technological and transformational leaders who credit "development of new technology skills that [give] them the confidence and knowledge to take on leadership roles and build their capacity for leading the integration of technology for learning" (2016, 6). The findings of this study indicate that that several graduate school library preparation programs have formally embraced technology integration and the school librarian's role as technology leader. Even so, others are still skeptical of the need for curricular changes addressing digital learning

environments and the full continuum of technology leadership as described by Boyer (2015) or are unsure of how to accomplish these tasks in the face of legislative and institutional challenges.

Despite these circumstances, online learning in K–12 grades is a growing learning context with distinct pedagogical and technological needs. With a careful reevaluation of the professional preparation both pre-service and in-service school librarians receive, we can populate school libraries with professionals ready to provide K–12 students with "opportunities for personal growth and participation on a global scale; opportunities to become agile, lifelong learners" (Boyer 2015, 76).

Online learning is prominent in higher education, as well as in job-training situations; therefore, K–12 students who have access to online learning earlier in life develop skill sets that will be advantageous after high school graduation. School librarians, professionals rooted in the belief of "access for all," are perfectly placed for designing and delivering these digital instructional experiences for K–12 student populations. Consequently, it is imperative that school library preparation programs invest in developing a curriculum that produces school library professionals with a true understanding of TPACK: a) technological knowledge of resources and tools; b) pedagogical knowledge of instructional design, universal design, and online learning principles; and c) content knowledge of school librarianship. Continued research in this area is needed to inform both the practice of school librarianship and the preparation of its professionals.

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Cite This Article

Santos Green, Lucy, Stephanie A. Jones, and Panne Andrea Burke. 2017. "School Librarians Fully Online: Preparing the Twenty-First Century Professional." <http://www.ala.org/aasl/slr/volume20/santosgreen-jones-burke>

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