School Librarians as Technology Integration Leaders: Enablers and Barriers to Leadership Enactment

Melissa P. Johnston, Assistant Professor at the School of Library and Information Studies, College of Communication & Information Sciences, University of Alabama Tuscaloosa, AL

Abstract

The highly technological environment of 21st-century schools has significantly redefined the role of school librarians by presenting the opportunity to assume leadership through technology integration. Despite the abundance of literature that has suggested the need for and the importance of school librarians to be a proactive leaders in technology integration, this role is one that has been ignored in the research arena and left undefined for school administrators, teachers, and the school librarians themselves, leading to uncertainty concerning how school librarians enact this role in practice. This research, based on distributed-leadership theory, investigates current practice of accomplished school librarians to identify what factors are enabling some to thrive as technology integration leaders and what factors are hindering others. This report of the results includes the initial identification and categorization of the enablers and barriers experienced by school librarians in enacting a leadership role in technology integration, a discussion of implications for the profession, and areas of future research.

Introduction

The changing information landscape and highly technological environment of 21st-century schools has significantly redefined the role of school librarians. As technology has become a crucial element of teaching and learning, school librarians, as information specialists and educators, have the potential to lead through technology integration. As a result, school librarians are continually directed by theorists and researchers in this area (e.g., Everhart and Dresang 2006; Hanson-Baldauf and Hughes-Hassell 2009; McCracken 2001; Shannon 2002) to assume a leadership role in integrating technology in schools. When defining the responsibilities of school librarians, the professional standards and guidelines that define and guide practice for school librarians (AASL 2007; ALA and AASL 2010; ISTE 2010; NBPTS 2010) all mention the role of leadership, especially in the area of technology integration. Yet the broad and general nature of these standards and guidelines offers little practical guidance for practicing school librarians, who need more clarification and role definition, along with explicit techniques or strategies for enacting the leadership role.

Technology is transforming not only access to information, but also the skills needed to interact

with and use it, as well. "Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally" (ISTE 2008, 6). Technology integration is the seamless infusion of technology as resource to enhance the learning in the content areas. School librarians have a vital role to play in integrating technology to help students develop 21st-century skills to enable them to use technology as a tool for learning and ensure they are prepared to succeed and participate a digital society. This increasing reliance on technology to interact with and use information has moved information literacy to the forefront in education, and presents the opportunity for school librarians to enact a leadership role within their schools through technology integration (Asselin 2005; Hanson-Baldauf and Hughes-Hassell 2009; Hughes-Hassell and Hanson-Baldauf 2008; ISTE 2010). Yet, despite the valuable contributions school librarians can make in implementing technology integration initiatives, they remain an untapped resource, due to the indefinite nature of this role.

Statement of the Problem

Because of their knowledge of pedagogical principles and curriculum, paired with technology and information expertise, school librarians are in a unique position to serve as leaders and valuable assets through making meaningful contributions toward the integration of technology and learning. Yet, despite the demands and opportunities for school librarians to accept this critical technology-integration leadership role, this role is one that has been ignored in the research arena and lacks theoretical foundation to guide enactment. The ambiguity surrounding the technology-integration leadership role has led to school librarians who are uncertain how to assume this role and, thus, are ill-prepared to enact this vital role (Asselin 2005; Tilley and Callison 2001; Everhart and Dresang 2006; Everhart, Mardis, and Johnston 2010; Shannon 2002, 2008; Vansickle 2000).

Research Purpose and Research Questions

To encourage and support school librarians in assuming a leadership role in technology integration, research is needed to learn more about the technology-integration leadership practices of school librarians who are currently successfully enacting this role. Therefore, this research investigates the enablers and barriers that accomplished practicing school librarians— defined in this research as those who are National Board Certified—experience in enacting a leadership role in technology integration. Some school librarians do perform this role and are quite successful, yet many school librarians have not assumed this role. This research examines the practices of those who have met the rigorous standards of National Board for Professional Teaching Standards certification, those school librarians who have demonstrated "essential knowledge, skills, dispositions, and commitments that allow them to practice at a high level" (NBPTS 2010, v) and are assumed to be experts in their field, including technology integration.

The specific purpose of this research is to identify what is enabling those most-accomplished school librarians to thrive in the role of technology-integration leader, as well as the barriers they face. An additional purpose of this research is to categorize and examine the identified enablers and barriers in relation to the practitioner's level of involvement in technology leadership. To investigate these enablers and barriers, this research addresses the following research questions:

- RQ1: What enablers or supporting factors do accomplished school librarians perceive in

enacting the role of leader in technology integration?

- RQ2: What barriers or constraining factors do accomplished school librarians perceive as preventing or hindering their enactment of the role of leader in technology integration?
- RQ3: What is the association between accomplished school librarians involved at a high level in technology-integration leadership and the identified enablers in comparison to the other participants?
- RQ4: What is the association between accomplished school librarians involved at a low level in technology-integration leadership and the identified barriers in comparison to the other participants?

The goal of this research is to serve as a foundation on which to build research-based strategies to support practicing school librarians who seek to overcome barriers, and to distinguish those factors that enable this vital role to be achieved in practice.

Review of the Literature

School librarians are expected to accept and fulfill numerous roles in daily practice; one of these roles is that of a leader in the area of technology integration. The ever-changing and advancing environment of 21st-century learning has necessitated this evolution of the school librarian and presents opportunities for leadership.

Leadership Directive

The evolution of the role of the school librarian is present in the standards and guidelines that define and guide practice for school librarians. The guidelines from the AASL (2009) reiterate the belief that the school librarians should act as leaders within their school communities, ensuring that the current generation of learners are equipped with the skills and knowledge they need to succeed and participate in the technological society of the twenty-first century. School librarians are charged "to play a leading role in weaving such skills throughout the curriculum so that all members of the school community are effective users of ideas and information" (AASL 2009, 46). It is this "weaving" or the integration of technology into the curricular areas where school librarians, based on their knowledge of pedagogical principles and school curriculum, along with their technology expertise and collaborative experience, can serve as leaders and valuable assets to their schools (Asselin and Doiron 2008; Everhart, Mardis, and Johnston 2010; ISTE 2010). Leadership plays a prominent role in the AASL guidelines and is representative of a larger directive for the school librarian profession in general: to accept, embrace, and enact a leadership role, especially in the area of technology integration.

As further evidence for the evolution of the school librarian's role, the *ALA/AASL Standards for Initial Preparation of School Librarians* (AASL 2010), approved for National Council for the Accreditation of Teacher Education, frequently mention leadership and technology when describing the standards for the preparation of future school librarians. These standards assert that school librarians provide leadership, instruction, and collaboration in the use of instructional technologies and should move beyond the role of provider of resources to one who leads in the use or integration of these resources for learning. This focus on technology-integration leadership is also echoed in the *Library Media Standards* from the National Board for Professional

Teaching (2012); this document defines school librarians as "accomplished…visionary leaders in their schools and in the profession" (2012, 22). These standards recognize that the school librarian can use technology to connect and create meaningful instruction and to model technology integration, and, therefore, to provide leadership in the integration of technology.

Leading Teachers and Students

Technology is transforming not only access to information, but also the skills needed to interact with and use it, as well. As a result of these transformations, information literacies have emerged as the new literacies and a critical issue in the field of education (Asselin 2005; Asselin and Dorion 2008; Kuhlthau 2010; Kuiper, Volman, and Terwel 2005; Livingstone 2008). Information literacies or "the ability to find, evaluate, analyze, and synthesize information" (Smolin and Lawless 2003, 571) go beyond simply knowing how to use technology tools and extend to also include understanding how to apply the tools in learning (Asselin 2005; Greenhow, Robelia, and Hughes 2009; Kuhlthau 2010; Kuiper, Volman, and Terwel 2005; Smolin and Lawless 2003), as well as to create and communicate new knowledge (AASL 2007; Partnership for 21st Century Skills 2009).

Students are being bombarded with information in both their academic and personal lives, and it is the responsibility of school librarians as educators to prepare students for their future and "develop information skills that will enable them to use technology as an important tool for learning, both now and in the future" to actively, safely, and ethically participate in the digital culture (AASL 2007, 2). To accomplish this preparation, it is critical for the school librarian to partner with teachers to address the needs of the 21st-century learner (Asselin 2005; Hanson-Baldauf and Hughes-Hassell 2009; Hughes-Hassell and Hanson-Baldauf 2008; Kuhlthau 2010).

Students cannot be expected to benefit from technology if their teachers are neither familiar nor comfortable with it. Although teachers are excited about the potential instructional benefits of digital resources and technology, many are overwhelmed, and need assistance and leadership in incorporating the most appropriate technology efficiently and meaningfully for both teaching and learning (Anderson and Dexter 2005; Asselin and Dorion 2008; Brush and Saye 2009; Duke and Ward 2009; Ertmer 2005; Glazer et al. 2009; Lei 2009; Lemke et al. 2009). Through leadership activities, school librarians can act as agents of change to support, encourage, assist, and facilitate the integration of technologies into daily practice (Asselin and Dorion 2008; Hughes-Hassell and Harada 2007; Branch and Oberg 2001). Among these leadership activities are keeping teachers abreast of new technologies and helping teachers understand the importance of integrating information technologies across the curriculum to create relevant learning experiences for students (AASL 2009; Asselin 2005; Asselin and Dorion 2008; Branch and Oberg 2001; Everhart, Mardis, and Johnston 2010; Hughes-Hassell and Harada 2007).

Current Relevant Research

The most current research to date in this area is by Everhart, Mardis, and Johnston, who defined and investigated the leadership practices of the school librarian in technology integration. The *School Library Media Specialist Technology Integration Survey* (PALM Center 2009),

developed through the research of Everhart, Mardis, and Johnston, is the first instrument to define and investigate the school librarian's technology-integration leadership practices. Results from the 2010 survey concluded that National Board Certified school librarians feel committed to and have experienced success in technology leadership with students to a great extent and with teachers to a lesser, but not insignificant, extent. Yet, school librarians reported much lower levels of involvement in technology leadership activities outside of their school building, such as district-wide policymaking, and information-sharing activities with peers and community members (Everhart, Mardis, and Johnston 2010).

The 2009 research by Hanson-Baldauf and Hughes-Hassell, who explored school librarians' perceived competencies with and usage of Web 2.0 technologies and the barriers school librarians believe impede the use of Web 2.0 technologies in teaching and learning, serves as an initial step in the investigation of school librarians and technology integration. Hanson-Baldauf and Hughes-Hassell found that a significant number of school librarians do not feel competent with "emergent technologies such as social-networking and file-sharing tools, [and the majority] only rarely or occasionally used podcasts, wikis, blogs, Web design tools, and electronic whiteboards" (2009, 6). School librarians agreed on the importance of integrating technology into their instruction, but fewer felt "well prepared" to do this (2009, 8).

The limited research in the area of school librarianship in the context of technology leadership also supports the contention that school librarians must embrace their leadership role in technology integration. A compilation of state studies (Scholastic Research & Results 2008) examines the work of school librarians and their impact on student achievement, and identifies two roles of the school librarian that impact student achievement: leader and technology facilitator. Those studies revealed that school librarians who exhibit leadership were more likely to plan and teach cooperatively with teachers, provide training for teachers, and take responsibility for technology integration (Lance, Hamilton-Pennell, and Rodney 2000; Lance, Rodney, and Hamilton-Pennell 2000). Findings also include a connection between leadership and collaboration, in that classroom teachers were more willing to collaborate with school librarians who had taken the initiative to become assertive, involved leaders in the school (Rodney, Lance, and Hamilton-Pennell 2002). Additionally, research indicates that in schools with "best-practice library media programs," the school librarian "acts as an innovator, transformation agent, and a technology integration leader" (Smith 2006, 16).

The school library is one of the most technology-rich spaces in many schools, with the school librarian serving as one of the school's experts in information technology integration (Massey 2009); therefore, technology-integration leadership has emerged as an essential competency for 21st-century school librarians (Shannon 2002).

Theoretical Framework

This research assumes that the leadership practices of school librarians are essentially those of teacher leaders and is based on the educational leadership theory of distributed leadership. Teacher leaders are those teachers that assume informal and formal leadership responsibilities outside the classroom, create a participatory environment where all learn from each other, and engage with others in working together for student learning (Barth 2001; Harris and Muijs 2005; Katzenmeyer and Moller 2009; Spillane 2006; York-Barr and Duke 2004). The complex environment of 21st-century schools has increased demands on educational leaders and has served as the impetus for a paradigm shift in educational

leadership (Anderson and Dexter 2005; Kowch 2009) that moves away from relying only on the traditional individual standalone formal leader toward searching for ways that principals—along with other school leaders—can work together for school leadership.

Distributed-leadership theory has emerged as a possible solution, in that it promotes a situation where multiple people work together, pooling their abilities and expertise (Harris 2004; Spillane, Halverson, and Diamond 2001) and places emphasis on the importance of context and leadership practice. This perspective asserts that leadership is about more than just people in formal leadership positions and attempts to acknowledge all contributors, formal or informal, who participate in leadership practice (Spillane 2006). The most contemporary interpretation of distributed-leadership theory from Spillane defined leadership as "the activities tied to the core work of the organization that are designated by organizational members to influence the motivation, knowledge, affect, or practices of other organizational members as intended to influence their motivation" (2006, 11) and leadership practice as "the activities engaged in by leaders, in interaction with others in particular context around specific tasks" (2006, 5). Spillane has asserted that in a distributed approach, it is necessary to start by examining leadership practices and then to explore interactions among leaders, followers, and their situation. A fundamental proposition of distributed leadership is that "the situation is not simply a context within which school leaders practice; it is a defining element of practice" (Spillane 2006, 22). Aspects of the situation define leadership practice, and, therefore, it is necessary to understand how these aspects enable and constrain leadership practice.

Distributed leadership provides a solid theoretical foundation for research on leadership practices and can illuminate the multiple dimensions of leadership that occur in a school. The concepts and propositions in Spillane's interpretation of distributed-leadership theory served as the impetus for this research, formed the theoretical basis, and presented a means for exploring and analyzing the leadership activities, actions, and role of school librarians.

Conceptual Framework

There is a dearth of research examining school librarians' role in technology integration and leadership; therefore, it was necessary to extrapolate from education research, specifically the area of teacher leadership due to the informal nature of that leadership role. Teacher leadership research provides a wealth of investigations that seek to identify what enables some teachers and deters others from enacting a leadership role in schools; the research was conducted in a variety of school contexts (Buckner and McDowelle 2000; Harris 2004; Katzenmeyer and Moller 2009; York-Barr and Duke 2004).

Zinn's (1997) research on the study of enablers and barriers to assuming leadership responsibilities resulted in a classification system that categorizes both enablers and barriers into four domains and has been used previously by researchers (Caffarella and Zinn 1999; Harris and Muijs 2005; Katzenmeyer and Moller 2009; Robertson 2008) to sort and describe barriers and supporting factors to teacher leadership. Zinn argued that enablers and barriers are clustered in four domains: "(1) people and interpersonal relationships, (2) institutional structures, (3) personal considerations and commitments, and (4) intellectual and psychosocial characteristics" (1997, 243) and each domain contains indicators of enablers and barriers.

Figure 1. Zinn's Framework: Four domains of supports and barriers to teacher leadership (Zinn, 1997).

Domain 1: People and Interpersonal Relationships	
Enabling Factors	**Impeding Factors**
-Personal support system at work - Positive working relationship with school administrators - Mentoring or modeling from respected colleagues -Collaborative team work with other teachers -Mutual respect and interdependency of the staff -Recognition provided for work -Encouragement and support from family and friends	-Lack of personal support at work -Passive or active opposition from colleagues or administrators -Tense relationship with principal or school administrators -Lack of collaboration, teachers work on their own -Lack of professional respect from other staff, resentment -No recognition for work -Passive or active disapproval or non-support from family and friends

Domain 2: Institutional Structure	
Enabling Factors	**Impeding Factors**
-Provision of necessary resources (e.g. funding, personnel, time, technology) -Opportunities for authentic leadership roles and responsibilities -Ongoing opportunities and time for formal and informal leadership training -Clearly defined role definitions (leadership roles and responsibilities) -Climate of collaboration and collegiality	-Insufficient time during the school day or year for collegial work -Lack of resources or access to resources -Rigid definition of teacher roles -Overly broad or ill-defined leadership roles and responsibilities -Lack of time and opportunity for leadership -Climate of competition -Physical barriers

Domain 3: Personal Considerations and Commitments	
Enabling Factors	**Impeding Factors**
-Support and encouragement of family members and friends -Resources to meet the demand of everyday life -Major life transitions or crisis -Continued good health -Cultural and/or religious values affirming leadership efforts	-Lack of support or active discouragement from family and friends -Family or other responsibilities which compete with leadership roles -Personal health issues or concerns -Cultural and/or religious values that conflict

Domain 4: Intellectual and Personal Characteristics	
Enabling Factors	**Impeding Factors**
-Strong personal beliefs which demand excellence - Sense of obligation to get involved -Perception that one can make a difference in the lives of student and teachers -Enjoyment of learning and professional growth; curiosity -Expertise -Enjoyment of innovative issues -Intrinsically rewarded -Self-confidence which has developed with experience -Education -Personal knowledge/skills	- Lack of commitment to excellence -Discomfort with leadership roles in general, or one role in particular -Feelings of discouragement or frustration -Feelings of exhaustion or burnout -Need for extrinsic reward -Perception that one has insufficient expertise -Reluctance to let go of comfortable routines

Zinn's framework, uniquely developed through research investigations of teacher leaders, also proposes that teacher leadership is a practical endeavor, and, therefore, any descriptions of enablers and barriers must be grounded in everyday practice. The research reported here, like that of Zinn, focuses on the practices of technology-integration leadership by school librarians and assumes that the factors that can both enable and constrain teacher leadership are the same factors that impact school librarians when enacting a leadership role in technology integration.

Method

The collection of new research is not always a necessary step in the research process; it is sometimes possible to examine a new research question using previously collected data, or secondary analysis: the "further analysis of an existing dataset which presents interpretations, conclusions or knowledge additional to, or different from, those presented in the first report on the inquiry as a whole and its main results" (Hakim 1982, 1).

A thorough investigation of the literature was conducted to ascertain what research has been and is currently being conducted in this area; the investigation revealed that, while research in the general area of school librarians and technology leadership is scarce, recent survey research had

been conducted by University of North Carolina at Greensboro (Hanson-Baldauf and Hughes-Hassell 2009), in addition to the survey research (in which the researcher participated) sponsored by the Partnerships Advancing Library Media (PALM) Center at Florida State University (FSU) (Everhart , Mardis, and Johnston 2010). The survey from FSU uniquely added the variable of leadership practice and contained questions that addressed concepts of enablers and barriers to enactment of the leadership role. Due to my professional relationship with the primary investigators, I was aware that the data collected from the two questions addressing enablers and barriers had not been analyzed or reported. Original survey research rarely uses all of the data collected, and this unused data can provide answers to or different perspectives on other questions or issues. Therefore, the research reported here employs the secondary analysis method to use unused archived survey data to investigate the enablers and barriers that accomplished practicing school librarians encounter in enacting leadership in technology integration.

To ensure congruency, appropriateness, and quality of the primary study and the resulting dataset, Stewart and Kamins' (1993) evaluative process was employed before finalizing data selection. This process for evaluating a dataset involves six questions: (1) What was the purpose of this study? (2) Who was responsible for collecting the information? (3) What information was actually collected? (4) When was the information collected? (5) How was the information obtained? (6) How consistent is the information obtained from one source with information available from other sources? To answer these questions, documentation of the primary study and published information from the original study were used; the other investigators from the primary study were also consulted.

Finding that this data would adequately address the research questions and that the primary method of data collection was appropriately suited to this research, I selected applicable data from respondents' answers to two open-ended questions from the end of the *School Library Media Specialist and Technology Integration Survey* (PALM Center 2009); these questions asked participants to respond with enablers and barriers that facilitate or constrain their technology-integration leadership involvement. These questions asked respondents to "Think back about the activities in the preceding statements, specifically those in which you are fully involved. What enables you to be involved at that level?" and "Again, think about those activities addressed earlier. Are there any activities in which you'd like to be more involved than you are right now? If so, please tell us about the barriers that hinder your involvement" (PALM Center 2009). No other research to date serves to identify the enablers and barriers to the enactment of a leadership role in technology integration. Therefore, the use of open-ended questions was vital to allow participants to express factors that enabled and constrained their technology-integration leadership involvement without participants' being limited by any preconceived categories.

Sample

The study participants for this secondary research are the same as those from the primary study, National Board Certified (NBC) school librarians practicing at the elementary, middle, and high school levels in various schools across the United States. National Board Certification is the highest credential in the teaching profession and less than 2 percent of school librarians in the United States are NBC. The participants in this sample are uniquely positioned to inform this research, because due to their documented accomplishment in meeting the rigorous standards of the National Board for Professional Teaching Standards, they are assumed to be experts in the areas of technology integration

and leadership.

Respondents for the primary study were solicited by sending invitations to NBC school librarians whose e-mail addresses could be ascertained from information available on the National Board for Professional Teaching Standards organization website. This group contained approximately 35 percent of the population of 2,100 NBC school librarians in the United States. Participants were also solicited via postings to various national and state school librarian electronic message groups (Everhart, Mardis, and Johnston 2010). The invitations and postings resulted in 295 usable survey responses. The research reported here is based on those respondents who answered the two open-ended questions addressing the variable of interest, enablers, and barriers to the enactment of the leadership role in technology integration; 279 (94.5 percent) participants answered the enabler question, and 263 (89.1 percent) answered the barrier question.

Instrumentation

The School Library Media Specialist and Technology Integration Survey (PALM Center 2009) consists of three sections: thirty demographic questions covering areas such as staffing levels, education and experience of the school librarian, and Internet access; sixty statements related to technology-integration activities; and three open-ended questions that asked respondents to discuss barriers, enablers, and other factors that influenced their leadership practices (Everhart, Mardis, and Johnston 2010). Response choices for statements related to technology-integration activities used a Likert scale that reflected the respondents' degree of leadership in the context of the particular integration activity (0=not my job; 1=rarely involved; 2=partially involved; 3=substantially involved; 4=fully involved), and each response choice was fully explained in the survey instrument. Additionally, researchers in the PALM study ranked each of the Likert scale items that represented technology-integration leadership activities; each practice was ranked as an entry-level practice, an adaptive-level practice, or a transformative-level practice. An index score was calculated for each respondent based on his or her answers to those questions. Since this instrument is newly developed, inability to assess reliability is one of the limitations in this research.

This secondary research uses the data obtained from the two open-ended questions at the end of the original survey that asked about enablers and barriers, the descriptive data obtained through the questions at the beginning of the survey, as well as each respondent's index score or level of technology leadership involvement as determined in the original study.

Data Analysis and Results

To extract the specified enablers and barriers from the text of the open-ended questions, the content analysis was performed to code the data into categories using the *a priori* coding scheme of exhaustive and mutually exclusive categories taken from Zinn's conceptual framework, "Four Domains of Supports and Barriers to Teacher Leadership" (1997). This framework explicitly lists descriptor indicators within each category of specific enablers and barriers that reside in each domain. In the study reported here, each participant response was analyzed to determine manifest and latent content, and to extract individual descriptors of enablers and barriers. The data was hand-coded by the most finite enabler and barrier descriptor and by broader category

based on the conceptual framework and the supporting literature. Intra-coder and inter-coder reliability testing were conducted, both providing acceptable agreement percentages of or close to 100 percent.

The content analysis and data coding resulted in the identification of the enablers and barriers school librarians experience in enacting a leadership role in technology integration. Most participants listed more than one enabler and more than one barrier in their responses, resulting in identification of 724 enablers and 366 barriers, which were then coded based on the conceptual framework. Statistical Package for the Social Sciences (SPSS) was used to calculate frequency distribution tables to illustrate the occurrences of specific enablers and barriers as well as their categorizations into the four domains. These resulting frequency tables (see **Table 1** and **Table 2**) served to provide results for research questions one and two.

Table 1. Frequency distribution of enablers for school librarians' enacting leadership role in technology integration.

Enablers	*f*	*%*
Supportive principal	70	9.67
Opportunities for a leadership role and responsibilities	69	9.53
Desire to make a difference for students and teachers	69	9.53
Professional development opportunities	60	8.29
Sense of obligation to get involved	48	6.63
Commitment to continual professional growth	41	5.66
Expertise	36	4.97
Collaborative teachers	33	4.56
Professional organizations	33	4.56
Personal belief and values	22	3.04
Personal interest in technology	19	2.62
Professional responsibility	18	2.49
Supportive district personnel	17	2.35
District-level support	17	2.35
Respected and valued by staff	16	2.21
Dual role as instructional technologist and school librarian	16	2.21
Education	16	2.21
Funding	15	2.07
Technology resources	15	2.07
Experience	14	1.93
Supportive teachers	12	1.66
Flexible schedule	12	1.66
Time	11	1.52

Full-time clerk	10	1.38
Collaborative instructional technologist	7	0.97
Full-time on-site tech support	5	0.69
Supportive school climate	5	0.69
Stipend	5	0.69
Volunteers	5	0.69
National Board Certification	4	0.55
Personal time	2	0.28
Personal finances	1	0.14
Family support	1	0.14
Total	724	100.00

Note. The % represents the percentage that the specific enabler was found in relation to all the total identified enablers (n = 724).

Table 2. Frequency distribution of barriers to school librarians' enacting leadership role in technology integration.

Barriers	*f*	*%*
Time	94	25.68
Exclusion from leadership role and responsibilities	40	10.93
Lack of funding	33	9.02
Inadequate staffing	25	6.83
Competitive instructional technologist	21	5.74
Climate of competition with district tech department	21	5.74
Technology resources	21	5.74
Uncollaborative teachers	19	5.19
Fixed schedule	19	5.19
Unsupportive principal	17	4.64
Lack of role definition	12	3.28
Unsupportive teachers	10	2.73
Lack of district personnel	7	1.91
Lack of professional development	6	1.64
Insufficient expertise	6	1.64
Family obligations	4	1.09
Discomfort with leadership role	3	0.82
Feelings of frustration	3	0.82
Personal finances	2	0.55
Personal inhibitions	2	0.55

| Personal health | 1 | 0.27 |
| Total | 388 | 100.00 |

Note. The % represents the percentage that the specific barrier was found in relation to all the total identified barriers (n = 366).

The identified enablers and barriers, the categorization, and the frequency tables that resulted from the content analysis were used in the next step of analysis. In this next step, the researcher chose to examine the enablers of those participants who are highly involved in technology-integration leadership; it is important to learn from this highly specialized group of accomplished school librarians and to identify enablers that have benefitted those who are involved in technology-integration leadership at the highest level. The researcher also chose to examine the barriers facing those accomplished school librarians who, despite their experience and knowledge, are involved in technology integration at a low level; it is important to learn what barriers hindered even these NBC school librarians. Identification of both enablers and barriers experienced by the NCB school librarians was regarded as a first step toward helping all school librarians examine their own situations and take steps to improve their own levels of technology-integration leadership.

Since this research uses nominal data, nonparametric tests that make no assumptions about the distribution of the data were necessary (Vaughan 2008). An association measure called percentage difference (Fielding and Gilbert 2006; Rudestam and Newton 2007) was employed as a "method to make a statement about the degree or amount of relationship by comparing percentages based on a condition" (Rudestam and Newton 2007, 145). In this case the condition is the participants' "level of involvement" in technology-leadership activities. Bivariate comparison tables were constructed; these tables show the frequencies of mention (in percentages) of the enablers by respondents with different levels of involvement—those school librarians involved at a high level in technology integration practice versus the other school librarian participants—and then the percentage difference between the two groups' frequencies of the enablers they experienced was calculated. This same procedure was followed to compare the barriers experienced by accomplished school librarians involved at a low level in technology-integration leadership versus the other participants. The results of these comparisons informed the findings and conclusions reported below.

Findings and Conclusions

The first step in this study was to identify the factors that enable and constrain school librarians to be fully involved in technology-integration leadership practices. As data was analyzed, certain enablers and barriers were identified more frequently than others, and overall themes that coincided with the Zinn (1997) categorization emerged. The identified enablers and barriers are discussed below in the context of the literature from the fields of school librarianship and teacher leadership, and according to categorization by Zinn's "Four Domains," beginning with relationships found in Domain One, followed by the institutional structure of Domain Two, the personal considerations and commitments of Domain Three, and, finally, the intellectual and psycho-social characteristics found in Domain Four. The percentage differences comparisons from research questions three and four contribute additional data on what enablers were identified more frequently by accomplished school librarians highly involved in technology leadership and, conversely, on the barriers identified by those with a low level of involvement in technology leadership.

Domain One: Relationships

Relationships were found as frequently occurring enablers for accomplished school librarians' enacting a leadership role in technology integration, yet these same relationships can also constrain leadership enactment as revealed through the findings of this research.

Principals

The most frequently cited enabler for school librarians' enacting a leadership role in technology integration was a supportive principal. This finding aligns with research from multiple studies from the school librarianship literature that identify principal support as vital (Church 2008; Hartzell 2002; Lance, Rodney, and Russell 2007; Shannon 2009; Todd 2005). When principals have a positive working relationship with school librarians, principals can serve as advocates and a source of support to promote school librarians as instructional partners; principals can also encourage teachers to collaborate (Oberg 2009). The quality of the relationship between the principal and the school librarian impacts the school library and the librarian's place within the school (Church 2008; McCracken 2001; Oberg 2009; Oberg, Hay, and Henri 2000).

Respondents commented on encouragement they received from their principals as the librarians assumed a leadership role and responsibilities, such as "I have a principal who supports my position whole-heartedly. He encourages me to continue to grow in my knowledge of technology and promotes me as a technology leader." Others described enabling respectful relationships where leadership was shared and their opinions were valued, with responses such as "my principal values my opinion in technology-related matters" and a "supportive principal who appreciates and uses my experience." This finding demonstrates a connection to principal support that can provide encouragement for teachers to take on an active role beyond the classroom to enable their development as teacher leaders (Buckner and McDowelle 2000; Katzenmeyer and Moller 2009; York-Barr and Duke 2004).

Accomplished school librarians involved at a high level in technology-integration leadership practices identified the importance of principals' support more frequently than did other participants, revealing that principals enable these librarians—who characterized themselves as highly involved in technology-integration leadership—to assume these leadership responsibilities by promoting them as leaders, recognizing their expertise, and providing encouragement. This research did not identify unsupportive principals as a frequent barrier to technology-integration leadership as Zinn's research did. Yet, this lack of congruence may be attributed to the fact that, while many of the identified barriers such as funding, scheduling, staffing, technology resources, and opportunities for leadership are not explicitly related to the principal, they could be indirectly attributed to the principal.

District Administrators

Administrators other than the school principal were found to be enablers for

school librarians' providing technology-integration leadership, and respondents frequently spoke of a district school library coordinator or supervisor who facilitated their efforts in technology-integration leadership. One comment was that "district level media personnel in our school district is the driving force for LMS to be involved with technology as a tool for improving instruction." This finding is notable because this facilitating relationship with district administrators is not prevalently mentioned in the literature about teacher leadership, and only limited research exists in the school librarian literature that examines this connection (Baumbach 2003; Hughes-Hassel and Hanson-Baldauf 2008; Underwood 2003).

Respondents commented on the benefit of having this administrator represent their interests in district-wide decision-making. For example, they made statements such as "our director of libraries understands that the library is and should be on the leading edge of technology and information literacy. She is always included in decisions and allows us to serve on district committees to give input." Overall, the statements reflected that a strong district library administrator represents the interests of school library programs and school librarians at the district level through giving voice to concerns, addressing issues with decision-makers, and positioning school librarians to lead.

Accomplished school librarians highly involved in technology-integration leadership identified district library personnel more frequently as an enabler than did other participants. The district library supervisor as an enabler is a relationship that has emerged from this research and appears to be unique to school librarians. This consistency and support across a district may be key to school librarians' developing as leaders.

Teachers
Collegial relationships with teachers were identified as facilitating school librarians' enactment of a leadership role in technology integration and were found to be the second-most-frequent relationship necessary for technology leadership involvement. Aligning with the literature (Katzenmeyer and Moller 2009; York-Barr and Duke 2004; Zinn 1997), these findings highlight the importance of collegial relationships with fellow teachers as a crucial enabler because these relationships allow for sharing of ideas, working toward common goals, supporting one another, and guidance through a common sense of purpose (Tschannen-Moran 2009).

This relationship of support, a feeling of respect, trust, and a sense of value were found to be vital enablers in facilitating accomplished school librarians' enacting a leadership role in technology integration. Respondents spoke not only of teachers' supporting them in their efforts through serving as "critical friends," but also through respecting and valuing school librarians' contributions to technology integration efforts and in librarians' willingness to collaborate with teachers. For example, one respondent shared that "a lot of support from the faculty, especially in their willingness to allow my input into their classroom teaching strategies" was what enabled the respondent to function as a technology-integration leader.

These supportive relationships lead to a feeling of trust and a sense of self-value, enabling leadership enactment (Beachum and Dentith 2004).

This important relationship with fellow teachers was reinforced as school librarians involved at a high level in technology-integration leadership activities identified collaborative teachers as an enabler more frequently than other respondents who are not highly involved. The importance of relationships with colleagues is echoed in the school librarianship literature, which reveals that cultivating accepting and trustful relationships with teachers is vital for enacting leadership (McCracken 2001; Oberg 2009; Underwood 2003). The findings reported here demonstrate this same connection; collaborative relationships with teachers facilitate and serve as a critical support for school librarians' involvement in technology-integration leadership. These findings yet again reinforce the fact that collaborating with teachers is a vital part of the job for school librarians.

Uncollaborative and unsupportive teachers were frequently cited as barriers that constrain school librarians from enacting a leadership role in technology integration. Respondents confirmed previous research (McCracken 2001) that identified teachers unwilling to collaborate and resisting change as barriers to technology-integration leadership; respondents made comments such as "teachers in the building…prefer to work alone. It is very hard to work with teachers that have that mind set" and "a lack of motivation to learn and use new technologies by some faculty members is a major source of frustration."

Other School Librarians
The identification of professional organizations as an enabler for technology leadership enactment for school librarians is an important finding of this research because professional organizations in general are cited infrequently in the existing research of school librarianship and teacher leadership. The most recent *ALA/AASL Standards for Initial Preparation of School Librarians* state the expectation that school librarians "become active contributors in education and information professional organizations and use publications, conferences, and virtual professional development experiences and opportunities to engage in social and intellectual networks that address best practice in school libraries" (2010, 13). Not only do professional organizations provide support for school librarians through relationships with other school librarians, but the research reported here finds that professional-growth opportunities from professional-organization activities such as conferences and publications served as enablers as well.

Respondents recognized that professional organizations facilitate their technology-integration leadership efforts and that "through diverse professional involvement in district, state, and national level professional organizations, I have gained exposure to different communities and am able to discuss and implement new strategies for technology integration." School librarians who have access to a strong and active network of other school librarians are more committed to ongoing professional education, mentoring, advocacy, and policy development

than those who do not (Dekker as cited in Oberg 2006).

The accomplished school librarians highly involved in technology-integration leadership identified professional organizations as an enabler more frequently than those who are not highly involved, revealing the importance of professional organizations as providing a network of fellow school librarians to learn from and share with. Respondents commented on the "strong community of librarians" that enabled their efforts. Often only one school librarian is in the building, and this finding about the recognition of professional organizations as an enabler demonstrates the importance of developing relationships with other school librarians that share the same interests, can act as mentors, and can provide support to facilitate school librarians' involvement in technology-integration leadership.

Instructional Technologists

An instructional technologist is defined as a building-level person who works with teachers to teach or integrate technology in the curricular areas. In this research, a competitive relationship with instructional technologists was the most frequently mentioned relationship barrier constraining accomplished school librarians from enacting a leadership role in technology integration. A collaborative instructional technologist was found to be an enabler, but only in a small number of cases. This is an emerging relationship as schools search for ways to deal with the ever-expanding presence of technology in schools.

Very limited research has been done in this area, but the existing studies (Nguyen 2007; Seavers 2002) urge school librarians and instructional technologists to collaborate and work as a team to benefit students and teachers. However, further research is needed to clarify and define the roles and responsibilities of each member of this team (Nguyen 2007). As the role of technologist has become even more instructionally focused, the boundaries between the role of school librarians and instructional technologists have blurred. To collaborate, it is important for these professionals to develop an understanding of both their roles and an awareness of the areas in which the roles overlap.

A lack of clarity and definition of the two roles was reflected in the identification of a competitive relationship with instructional technologists as a barrier that school librarians involved at a low level in technology-integration leadership cited more frequently than other respondents. Respondents confirmed this with comments about lack of control in technology decision-making, being excluded from working with teachers when technology was involved, not being allowed to conduct technology-related staff development, and having technology taken away from them. One respondent stated, "There is a major barrier between me and the technology facilitator as far as being able to work collaboratively. The roles are currently blurred and create conflict."

As the lines blur between these two roles, school librarians may feel threatened by instructional technologists. School librarians were once the sole person responsible for technology in their schools, but now the increased presence of

instructional technologists has resulted in school librarians who are no longer seen as the technology expert in their schools and are excluded from technology decision-making. A competitive relationship may arise from territorial battles over technology as a resource and from conflicting viewpoints relating to access. Instructional technologists are often given an increased level of authority over technology and serve as gatekeepers who, by controlling filters and passwords, restrict even school librarians' access to Web resources. As this instructional technologist role expands to include working with teachers to integrate technology into the curricular areas, school librarians may feel that they have to compete to retain their places as leaders in technology integration.

Interestingly, serving in a dual role as school librarian and instructional technologist was found to enable involvement in technology-integration leadership. In examining the percentage differences, the biggest difference between school librarians involved at a high level in technology-integration leadership and those who are not at a high level occurred in relation to identification of this enabler. Librarians highly involved in technology-integration leadership were far more likely to have this dual role than were librarians who were involved at only a low level. This finding demonstrates that when school librarians do not have to contend with a competitive, threatening instructional technologist, school librarians are more often enabled to be highly involved in technology-integration leadership; conversely, competitive instructional technologists can constrain school librarians' technology-integration leadership involvement.

Domain Two: Institutional Structure

The world of education is full of formal and informal structures that can either support or constrain teacher leadership; these structures include policies, procedures that determine the allocation of resources such as funding, time, scheduling, staffing, and technology, as well as norms and expectations that can form the aspects of school climate that influence roles and opportunities in efforts to take part in leadership (Katzenmeyer and Moller 2009; McCracken 2001; Oberg 2009). The most frequently occurring barriers identified were barriers related to institutional structure.

Leadership Opportunities

Opportunities for authentic leadership roles and responsibilities were the most frequently occurring enabler facilitating involvement in technology-integration leadership, and school librarians highly involved in technology-integration leadership mentioned these leadership opportunities more frequently than did other participants. The connection with principal support emerged here, in that administrative support, in conjunction with the decisions that the administrator makes for the school, has a great effect on the opportunities available for school librarians to develop and practice the skills needed to be leaders.

This research finds that leadership opportunities, such as serving on leadership, technology, and curriculum committees at the school and district level served as natural enablers for involvement in technology-integration leadership. When educators are part of decision-making, they feel that their expertise is valued, and

they increase their commitment and participation in the school (Barth 2001; Buckner and McDowelle 2000; Katzenmeyer and Moller 2009; Spillane 2006).

Also, respondents described serving in a leadership role by providing staff development for their faculty. School librarians have the potential to serve as leaders through "forg[ing] partnerships" with teachers and sharing their expertise with the teaching staff by using collaborative activities, and by designing and teaching staff-development workshops (Zmuda and Harada 2008, 39). These opportunities for leadership are vital in providing school librarians with the experience, confidence, and skills necessary for leadership involvement.

The barrier most frequently experienced when trying to enact a leadership role in technology integration was found to be the exclusion from leadership. Respondents' comments reflected purposeful exclusion from leadership opportunities, as well as simply being ignored. They also mentioned feeling of lack of control because "technology decisions are made by those at the top with no input from the school librarian" and being "excluded from the school leadership team and therefore decision-making." Accomplished school librarians involved in technology-integration leadership at a low level identified this exclusion from leadership opportunities as a barrier more frequently than did other participants, again demonstrating the importance of opportunities for leadership involvement. Some respondents attributed this exclusion to conflicting role definitions, school principals, and competition with instructional technologists. Yet again, the over-arching influence of the school principal is illustrated in these findings because often it is the principal who chooses those who are included and excluded in leadership opportunities.

Professional-Development Opportunities
The second-most-frequently occurring enabler identified in Domain Two was opportunities for professional development. The research into leadership by teachers supports the assertion that, to be most effective, professional development for teacher leadership needs to focus not just on development of teachers' instructional skills and content knowledge, but also on developing leadership skills and understandings to enhance the leadership role; these skills include personal, interpersonal, and group skills needed for successful leadership (Barth 2001; Harris and Muijs 2005; Katzenmeyer and Moller 2009). Yet school librarians in this research did not mention professional development related to leadership skills as an enabler. This may be attributed to the lack of recognition of school librarians as leaders by principals, resulting in school librarians' being excluded from or ignored for leadership-related professional-development opportunities. Another cause may be that professional development focusing on leadership for school librarians is limited.

Accomplished school librarians perceived professional-development activities and opportunities that were devoted to technologies and learning as essential for developing expertise in technology and technology integration—expertise that would enable them to lead. Not surprisingly, this research revealed the important connection between leadership and expertise; to assume a leadership role in

technology integration it is important to have the necessary technology expertise, including the knowledge and skills to integrate technology into instruction. Yet participants' lack of mention of leadership skills and leadership-related professional development indicates a missing piece in the training that school librarians perceive as necessary.

Resources

The majority of barriers this study identified are related to resources. Time is the most frequently noted barrier constraining involvement in technology-integration leadership practices. Respondents commented on not having enough time to work with teachers, to plan, to learn about technologies, and to devote to any one activity because of the various tasks for which school librarians are responsible, and multiple respondents noted "too much to do" and "not enough time to devote to any one role to be fully involved in accomplishing it." Others mentioned that they were assigned other duties not related to the library; among these time-consuming duties were: "teaching language arts classes," "teaching physical education classes," "serving as lunch monitor," and acting as "a substitute teacher." Time constraints were also closely tied to the barriers of a fixed schedule and the lack of a clerk.

This finding aligns with the literature relating to leadership by teachers; this literature notes that time is an issue for all teachers, with too much to do in too little time. "Time is a barrier when priorities are not clearly established. Frequently, multiple competing goals interfere with successful completion of a few key ones" (Zinn 1997, 349). Teacher leaders need time for leadership (Katzenmeyer and Moller 2009; Harris and Muijs 2005), but it is difficult for teacher leaders to find adequate time during regular school hours to take on the extra tasks often associated with teacher leadership (Beachum and Dentith 2004).

A fixed schedule was identified frequently as constraining involvement in technology-integration leadership by leaving no flexibility to collaborate with teachers or assume any additional responsibilities. Those school librarians involved in technology-integration leadership at a low level identified a fixed schedule more frequently than did those involved at a high level. While fixed schedule was mentioned frequently as a barrier, a flexible schedule was not mentioned frequently as enabler, suggesting the those with a flexible schedule either take it for granted or do not recognize the benefits.

Lack of clerical assistance was also identified as a constraining technology-integration leadership enactment as school librarians who had no assistance were busy doing clerical work— paperwork, shelving books, checking books in and out, and managing textbooks—and, therefore, had no time to be involved in technology-integration leadership.

Finally, deficiencies of technology resources, including an insufficient quantity of resources, lack of fully operational equipment, and dated equipment, were found to be barriers. A lack of funding was sometimes mentioned as tied to this lack of technology, and respondents frequently mentioned budget cuts in conjunction

with the elimination of personnel, both clerical and professional, and a lack of resources. The identification of these barriers again demonstrates the permeation of the principal's influence because, in most situations, the principal allocates resources, determines schedules, and makes staffing decisions (Church 2008; Hartzell 2002; Henri, Hay, and Oberg 2002; Shannon 2009).

A lack of a role definition, while not identified as one of the most frequently occurring barriers, warrants discussion due to its connection to other barriers. Respondents perceived that the school-librarian national professional guidelines lacked a definition of the technology-integration leadership role. Some participants were unsure of their actual role in technology integration and perceived a lack of guidance on how to add the technology-integration leadership role to all of the other various role expectations for school librarians.

This lack of role definition is also mentioned as constraining their involvement in technology-integration practices because teachers were unaware of the school librarians' role in the process and did not even recognize that school librarians could or should lead technology-integration efforts. One respondent shared that "there is ambiguity in our district over our role. In fact, some of the media specialists are strongly discouraged from trying to be involved in technology training. Our district does not understand the role of the library media specialist." Another respondent expressed that this lack of role definition extends even further stating that there is a "lack of understanding of the role of a library media specialist at the state and national level." This lack of role definition is also demonstrated in the competitive relationship with instructional technologists. Finally, respondents declared that principals had no idea what the role of school librarians is in technology integration or in leadership.

It is this lack of role definition and guidance for enactment that served to drive this research and is identified as an explicit barrier, but also one that contributed to other identified barriers, as well. The literature of school librarianship repeatedly reflects this lack of role definition as a barrier in enacting many of the roles and responsibilities of school librarians (Hartzell 2002; McCracken 2001; Zmuda and Harada 2008). School librarians consistently expressed the concern that administrators and colleagues have only minimal knowledge of the profession of school librarianship and do not understand the school librarian's role within the school, and certainly did not perceive school librarians as teacher leaders.

The roles of school librarians have been evolving and changing throughout the years as librarians make the effort to adapt to the needs of students, but unfortunately a feeling of disconnect remains between the role expectations stated by national-level professional leaders and those perceived by the professionals enacting the roles (Seavers 2002). This disconnect is evident in this research into school librarians' perceptions of their role as leaders in the integration of technology.

Domain Three: Personal Considerations

Less than 1 percent of respondents identified enablers or barriers relating to personal commitments. A few factors, including need for personal time, financial problems, and need to provide family support were listed, but none to a great extent. The low frequency in noting enablers and barriers in this area may be due to the professional nature of this survey, in that it asked about work-related tasks, and participants did not think to mention personal issues or intentionally avoided commenting on non-work-related considerations (Dillman, Smyth, and Christian 2009).

Domain Four: Intellectual and Psycho-Social Characteristics

Enablers identified in Zinn's framework as intellectual and psycho-social characteristics were found most frequently as facilitating leadership involvement in technology integration for these accomplished school librarians. These characteristics impact a teacher's willingness and ability to engage in a leadership role and assume responsibilities, and provide a teacher with the beliefs, value system, desire to learn and grow professionally, and the confidence to support educators in leadership endeavors (Zinn 1997; Caffarella and Zinn 1999).

Desire to Make a Difference and Sense of Obligation to Get Involved

The perception that one can make a difference in the lives of students and teachers was prominently identified as the most-frequently occurring enabler in this domain facilitating school librarians' involvement in technology-integration leadership. This research demonstrates the commitment of accomplished school librarians to ensuring that students are equipped with the skills and knowledge they need.

Respondents often noted a responsibility for advocacy on behalf of students to ensure access and equity; respondents commented on the importance of ensuring that students can use technology in their learning to be equipped for their future, and of making sure that teachers know how to integrate technology to benefit the students. A respondent noted "being a leader in technology makes me a better educator for the next generations, and I always want to give my students the best preparation for life that I can offer." Serving as an advocate for students is often stated in the standards that guide practice and in the professional literature, and has evolved as a competency for school librarians who are leaders.

Teachers who are leaders exhibit this same commitment to create a better world and thus better education for all children. It is this link between teacher leadership and moral purpose, as well as the goal of equipping all children for success, that frequently motivate teachers to become involved in activities related to school leadership (York-Barr and Duke 2004). This sense of moral purpose and meaning is noted by Oberg (2009) in her study examining the role of school library programs and the organizational cultures of schools; she notes that the moral purpose of the school library program is to make a difference in the lives of young people and that school library professionals also reflect this motivation. The intrinsic reward of improving learning outcomes for students makes school librarians' work gratifying, and commitment to equipping students for success was identified as an enabler for technology-integration leadership enactment.

These findings illustrate the parallels between teacher leaders and these highly accomplished school librarians in taking ownership of, and responsibility for, maximizing student learning.

A personal sense of obligation to get involved in technology-integration leadership activities was recognized by participants as an enabler. Accomplished school librarians reflected willingness with comments that reflected feeling a need to get involved and a personal commitment to being an actively involved part of the learning community; they spoke of getting involved because their involvement is needed. Those respondents highly involved in technology-integration leadership activities identified more frequently than did other participants a self-motivated obligation or need to get involved as facilitating involvement in technology-integration leadership. This finding is also consistent with the research from the school-librarianship literature that asserts that part of demonstrating leadership in schools is being proactive, and getting involved in learning and working with others in integrating technology (Branch and Oberg 2001).

Commitment to Continual Professional Growth and Learning
In this research, the commitment to continual growth, as demonstrated through self-initiated efforts by school librarians, was a prominent enabler that facilitated school librarians' involvement in technology-integration leadership practices. These efforts to achieve continual growth are designated differently from "professional-development opportunities," which represent formal professional-development leadership opportunities through institutional structures. Additional self-initiated efforts, such as furthering one's education by taking college-level courses and voluntarily participating in the National Board Certification process were also identified. Teacher leadership is connected to teacher learning, and teacher leaders need opportunities for continuous professional development to develop their role (Harris and Muijs 2005).

Aligning with the literature, this research conveys the importance of professional growth in leadership involvement, but respondents frequently noted informal professional growth activities that enabled them to be involved in technology-integration leadership practices. Respondents commented on their efforts and commitment to continual learning and staying current, including personal informal self-initiated efforts such as reading journals, attending conferences, reading webpages, and attending webinars. When asked how they prefer to learn to use technology tools and applications, school librarians in the 2008 research by Hughes-Hassell and Hanson-Baldauf also chose methods that indicated self-motivation and a willingness to learn technology on their own time to develop their expertise. Technology is constantly changing, and this commitment to continual learning is essential to stay current, to advance, and to hone the skills and knowledge that are mandatory to lead technology-integration efforts.

Expertise and Experience
The respondents frequently identified a unique combination of curriculum and technology expertise as enabling their involvement in technology-integration leadership through sharing this expertise, and working with teachers to identify

instructional needs and to recognize technologies that will serve as effective tools in the learning process. This finding is also reflected in the school-librarianship literature, which indicates that school librarians demonstrate a high level of technology-integration abilities, as well as self-confidence that has developed as a result of their expertise and technology knowledge (Hanson-Baldauf and Hughes-Hassell 2009; Massey 2009). Numerous participants spoke of their "personal skills," "knowledge," and "expertise" in technology use and integration, all of which were recognized as enablers for respondents' involvement in technology integration. Respondents also attributed their involvement in technology integration with expertise in other areas, such as instruction, assessment, and accommodating diverse learning styles.

This awareness of internal enablers suggests that self-confidence in their technology-integration expertise, and opportunities to build this sense of efficacy in their leadership abilities based on knowledge and skills are vital to facilitating leadership enactment. It is the assertion of this researcher that school librarians do have a unique expertise that presents the opportunity for leadership in the integration of technology.

Implications

This research serves as the initial identification of enablers and barriers that accomplished school librarians experience when enacting—or attempting to enact—a technology-integration leadership role. While the overall goal was not generalizability, the results of this research have implications of interest to the school library profession as a whole.

Research and Literature

Currently, very little research exists that examined leadership roles of school librarians and none that examined school librarian leadership practices in technology integration. This research addresses that void by contributing needed information about the enablers and barriers to the technology-integration leadership role and practices of school librarians. The findings serve as a foundational piece of research regarding the role of school librarians as technology leaders and provide a starting point for future investigations of technology-integration leadership by school librarians.

Conceptual Framework

The need for and the creation of an adapted framework to classify the enablers and barriers to technology-integration leadership enactment is an important aspect of this study. Zinn's (1997) teacher-leadership conceptual framework of enablers and barriers was applied in the context of school librarians as teacher leaders in technology integration since no enablers and barriers were identified in the school-librarianship literature. This framework is most relevant and applicable to this study of school librarians as technology-integration leaders, because of the informal nature of the role and the expectation for school librarians to lead teachers in the area of technology integration. This study finds that while some of the factors that can both enable and constrain school librarians' leadership of teachers are the same factors that will impact school librarians in enacting leadership in technology integration, many enablers and barriers are unique to the school librarian's role. This realization established the need for

the creation of the adapted framework, "Johnston's Domains of Enablers and Barriers to School Librarian Technology Leadership" (see figure 2).

Figure 2. Adapted framework: Johnston's domains of enablers and barriers to school librarians' technology leadership. Italics indicated additions to Zinn's framework.

Domain 1: People and Interpersonal Relationships	
ENABLERS	**BARRIERS**
-Personal support system at work (other teachers) - Positive working relationship with school administrators - Mentoring or modeling relationship from respected colleagues -Collaborative team work with teachers -Mutual respect and interdependency of the staff - *Supportive relationship with district library personnel* -*Collaborative relationship with school-based instructional technology specialist* -*Support from membership in professional organizations*	-Lack of personal support at work (other teachers - *resistant to change, opposed to technology integration efforts*) -Passive or active opposition from administrators in sharing authority -Tense relationship with principal or school administrators -Lack of collaboration, teachers work on their own -Lack of professional respect from other staff, resentment -*Lack of support from district library personnel* - *Competitive relationship with school-based instructional technology specialist*

Domain 2: Institutional Structure	
ENABLERS	**BARRIERS**

-Provision of necessary resources (e.g. funding, personnel, time, technology)
   -Flexible scheduling
   -Adequate staffing (full-time clerk, 2nd school librarian)
   -Funding for technology and digital collections
   -Up-to-date, functioning technology equipment
   -Technical support
-*Serving in a dual role as school librarian and instructional technologist*
-Opportunities for authentic leadership roles and responsibilities
-Ongoing opportunities and time for formal and informal leadership training
-Clearly defined role definitions (leadership roles and responsibilities)
-Climate of collaboration and collegiality
	-Lack of resources or access to resources
	   -Fixed schedule
	   -Inadequate staffing (no clerk or only part-time clerk)
	   -Lack of funding for technology and digital collections
	   -Out-dated technology
	   -Lack of technical support
	- Lack of time and opportunity for leadership
	-Insufficient time during the school day or year for collegial work
	-Exclusion from leadership opportunities and responsibilities
	-Lack of professional development
	-Overly broad or ill-defined leadership roles and responsibilities
	-Climate of competition
	-Physical barriers

Domain 3: Personal Considerations and Commitments	
ENABLERS	**BARRIERS**
-Support and encouragement of family members and friends -Resources to meet the demand of everyday life (e.g. financial) -Major life transitions or crisis -Continued good health -Cultural and/or religious values affirming leadership efforts	-Lack of support or active discouragement from family and friends -Family or other responsibilities that compete with leadership roles -Personal health issues or concerns -Cultural and/or religious values that conflict with responsibilities

Domain 4: Intellectual and Psycho-social Characteristics	
ENABLERS	**BARRIERS**
-Strong personal beliefs and values that demand excellence - Sense of obligation to get involved *in technology integration* -Perception that one can make a difference in the lives of students and colleagues - Commitment to learning, staying current, and continual professional growth (informal, self-motivated) -*Technology expertise (technical skills, but also integration for instructional purposes expertise)* -Experience -Education or personal knowledge/skills	-Lack of commitment to excellence -Discomfort with leadership roles in general, or one role in particular -Feelings of discouragement or frustration -Feelings of exhaustion or burnout - Perception that one has insufficient expertise *(technology expertise)* - Lack of experience - Lack of education in leadership skills

Theory

The findings of this research have implications for the distributed-leadership theoretical foundation. This research is the initial application of distributed-leadership theory to the examination of the technology-leadership role of school librarians; this study contributes to the ongoing research into distributed leadership as a viable model for leadership in schools. The distributed-leadership theoretical proposition that necessitates understanding how aspects of a situation can enable or constrain leadership practice is supported in this

research because the identification of these enablers and barriers contributes to the understanding and definition of the technology-integration leadership role for school librarians.

However, this study also has implications that illuminate the limitations of distributed-leadership theory. The findings from this study reveal that many challenges must be addressed for distributed leadership to be implemented as intended; the findings reinforce the idea that the principal is key to distributed leadership. Distributed leadership requires true delegation of responsibility and authority, and without principal support distributed leadership cannot succeed. Further examination and clarification are needed regarding the role of principals in distributed leadership, as well as investigations into how leadership can effectively be distributed and to whom.

School Librarian Preparation

Identification of the enablers and barriers that accomplished school librarians encounter when attempting to enact a technology-integration leadership role is valuable information for professors working with pre-service school librarians; this knowledge of enablers and barriers also has implications for school-librarian-preparation programs. Future school librarians can be taught how to identify enablers and to develop strategies to use them to their advantage. Conversely, pre-service school librarians can also be taught to identify barriers that even the most accomplished school librarians encounter and to develop strategies for reducing and overcoming the barriers in future practice.

The findings from this research can be useful for planning curriculum to better prepare school librarians to assume active leadership roles. School-librarian-preparation programs should help pre-service school librarians to develop competencies that support the concept of teacher leadership and teach leadership skills, such as effective communication, relationship building, problem-solving, conflict resolution, time management, and other skills that will prepare school librarians to assume leadership roles.

Practice

The primary implication of this research is the identification of the enablers and barriers that can facilitate and constrain accomplished school librarians' involvement in technology-integration leadership. The ambiguity surrounding the technology-integration leadership role has resulted in school librarians who are uncertain how to perform this role in practice. This research informs practice by providing support for school librarians by identifying factors that will enable enactment and by identifying barriers that must be overcome to achieve this vital role in practice. These findings are useful to furthering the understanding of this role for practicing school librarians who seek to enact or expand their leadership role in technology; the findings also serve as a foundation on which to build strategies that can be implemented in practice.

Future Research

This identification of what facilitates or constrains accomplished school librarians' technology-integration leadership provides for many areas of future research. This research to investigate the enablers and barriers experienced by school librarians,

affecting their ability to enact a leadership role, should be replicated with a broader population to include all certified school librarians nationwide, thereby expanding the population studied; replication with a larger sample would serve as comparison research and contribute to the reliability of the new instrument used in this study, as well as the newly created framework resulting from this study.

Future research should also allow for a mixed-method design that would include participant interviews as follow-up to the survey data collection; these interviews would allow researchers to delve further into the experiences of practicing school librarians, and in the process, develop a more nuanced understanding of what facilitates or constrains technology-integration leadership.

Several of the enablers and barriers identified in this study require further investigations. The competitive relationship with instructional technologists emerged as one of the most frequently noted barriers, and further research examining the roles of school librarians and instructional technologists is needed to determine responsibilities, overlap, effectiveness, role clarification, and collaboration opportunities. Respondents also identified as an enabler serving in a dual role as both the school librarian and the instructional technologist. This is yet another emerging role that needs clarification and definition. Research that examines the roles of the school librarian, the instructional technologist, and/or school librarians serving in a dual role may provide important insights to support future role designations.

Another enabler, professional organizations, needs further research to examine exactly which professional organizations respondents are referring to and which they find most beneficial. The importance of professional organizations is evident in the frequency with which they were named as an enabler and activities of professional organizations such as conferences, workshops, and journals were also identified as professional development. Very little research has examined school librarians' membership in professional organizations; exploration of possible associations between active participation in professional organizations, relationships with colleagues, professional development, expertise, and leadership enactment would yield useful insights that could inform practice, and guide officers and staff of professional organizations as they serve their members.

This study reveals that the support of principals and teachers is vital in facilitating school librarians' technology-integration leadership. Further research needs to be conducted to examine relationships between school librarians and other members of their school communities in the context of technology integration. Because of their overarching influence, further investigation of principals' actions and attitudes as enablers and barriers would be particularly useful. This survey could be adapted for populations of principals and teachers to gain insight into their perceptions of school librarians as technology-integration leaders.

Conclusion

This research serves as the initial identification of enablers and barriers that school librarians experience when attempting to enact leadership role in technology integration and has

implications of interest to the school library profession. The most frequently occurring enablers facilitating school librarians' technology integration leadership are a supportive principal, opportunities for a leadership role and responsibilities, the desire to make a difference for students and teachers, professional development opportunities, and a sense of obligation to get involved. While the barriers identified most frequently as constraining technology integration leadership are time, exclusion from a leadership role and responsibilities, lack of funding, and inadequate staffing. Many enablers unique to school librarians emerged, such as support from professional organizations, support from district library administrators, serving in a dual role as school librarian and technology specialist, and technology expertise. While barriers identified by school librarians that differ from those identified by teacher leaders include competitive relationships with instructional technologists, lack of support at the district level from a library administrator, and lack of technology expertise. The findings from this research contribute to the understanding of this role, propose a framework for future inquiry, and serve as a foundation on which to build research-based strategies to support practicing school librarians seeking to overcome barriers, and conversely, to highlight those factors that enable this vital role to be achieved in practice.

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