2024

School Librarians' Self-Efficacy as Educational Technology Coaches

Becky P. Johnson
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By Becky P. Johnson

A dissertation submitted in partial fulfillment

Of the requirements for the degree of

Doctor of Education

Seattle Pacific University

David Wicks, EdD, Chairperson, Dissertation Committee

Michael Paulus, DMin, Committee Member

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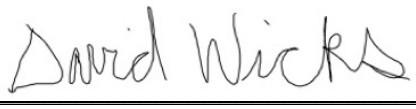

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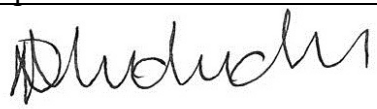
Date September 2024



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Dedication Page

“A school library is like the Bat Cave: it's a safe fortress in a chaotic world, a source of knowledge and the lair of a superhero."

-Tom Angleberger

To all the school librarians and future school librarians who put on their capes each day and keep inspiring. We need you.

Acknowledgement Page

My deep and sincere thanks to Dr. David Wicks, my committee chair. The first day I met you at a community of practice session, I dashed home to gather my documents and apply for the Digital Education Leadership program. I have always been deeply proud to be a member of the pilot cohort. You started as a mentor and advisor, became a friend, and are back to mentor and advisor through this doctoral program. You may never know the impact you have had on my life, but I will be forever grateful for all that you are and all that you have taught me.

To Doctors Paulus and Beers, thank you for the time and dedication you put into serving on my committee. I appreciate your valuable feedback. I would also like to extend my thanks to all the professors and librarians I have met along this journey. I appreciate all of your guidance and encouragement.

A special heartfelt thank you to my statistics guru, Dr. Denton. You were my sounding board, statistics translator, confidence builder, and quiet support throughout this process. I appreciate you deeply. You went above and beyond, using your own time to help me when I needed it most. Thank you.

To my cherished doctoral classmates – Alex, Jen, Jose, Pam, and Yao Eun – we made it! Thank you for the laughter, tears, friendship, support, and ongoing encouragement.

To my loving and devoted husband, Zack, thank you for the love, hugs, and unending support. To my sweet daughter, Coralie, I did not know I could simultaneously complete a dissertation, play hide-and-seek, and make muffins with you until I tried. I hope you always try to do more than you think you are capable of. To my mom, you

started this journey with Winnie the Pooh many years ago. You set in motion my path to becoming a librarian and a lifelong learner. Thank you. You always knew I could do it.

Last, but certainly not least, to my dear friend, Dr. Liz Ebersole. I have put together pages and pages of words but I cannot seem to find words adequate enough to thank you. I would not have finished this without you. You have been my role model since day one and I always strive to “be like Liz” and make you proud. You are always there, paving the path and guiding me along the way. I am endlessly grateful for your friendship, support, love, and mentorship. My heart is bursting with appreciation.

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Abstract

Although school librarians adapt and continue to thrive through radical changes, one in five school librarian positions are cut due to a loss of funding. One way school librarians can promote their knowledge in digital and information literacy and their skills as education leaders is to serve as educational technology (EdTech) coaches in their school community. With the influx of EdTech in schools, districts are shifting budgets and quickly adding technology-focused jobs, which leaves other positions at risk for job loss. This exploratory mixed-methods study examined the self-efficacy of school librarians to serve as EdTech coaches through the lens of the ISTE Standards for Coaches. It also measured if school librarians are interested in this work and, if so, what responsibilities they would need to eliminate to accommodate this shift in workload. Quantitative and qualitative data was collected from 311 participants via a newly-created survey instrument. The results show that school librarians had a medium to high level of self-efficacy as EdTech coaches. There was also a statistically significant difference in self-efficacy between the groups based on both qualifications and ages served. Qualitative data supported the findings and provided further information about what would need to change for school librarians to shift their work. If schools are going to benefit from the dynamic EdTech coaching model afforded by activating school librarians in this role, they will need to examine their current responsibilities, develop a culture of collaboration, facilitate a deep understanding of the various roles of the school community, and establish an inclusive leadership team that brings multiple perspectives and expertise to the table.

Keywords:

Chapter 1: Introduction

School librarians have long been essential members of the education community, providing students and teachers with resources and skills that help them develop new knowledge (Elkins, 2018; Wine, 2016). For many years, that meant managing the print book collection, but as technology has become an increasingly integral part of learning environments, librarians have added those skills to their repertoire (Adair et al., 2023; Wine, 2016). School librarian preparation programs include leadership development, and this, combined with librarians' expertise in educational technology (EdTech), makes them ideal candidates to serve as EdTech coaches in their school communities. However, district and school leaders often neglect the opportunity to use this valuable human resource (Baker et al., 2020; Lewis, 2019).

Problem

An increasing number of school librarian positions are being cut from districts despite an overwhelming body of research that shows positive correlations between high-quality library programs and student achievement (Gretes, 2013). Data from more than 34 national studies show that students tend to score higher on standardized tests in schools that have vital library programs (Lance & Kachel, 2018). Further, when administrators, teachers, and librarians consider the school librarian a leader, student standardized test scores tend to be higher (Lance & Schwartz, 2012). While the mere presence of a school librarian produces better student learning outcomes, there are a variety of tasks performed by the school librarian that further increase the positive impact, including instructing students in the classroom and the library, planning collaboratively with classroom teachers, providing professional development to teachers, meeting with the school

principal, serving as a member of the school leadership team, and facilitating the use of EdTech for both students and teachers (Lance & Kachel, 2018). School librarians' myriad of positive impacts suggests that educational organizations should tap into librarians' expertise and leadership. However, a literature review revealed that the opposite occurs in schools across the United States.

Between 1999 and 2016, the National Center for Education Statistics (NCES) found that more than 10,000 full-time school librarians lost their positions, equating to approximately 19% of the workforce nationwide (Lance, 2018). California, Idaho, Michigan, and Oregon have lost between 25 and 90 percent of their school librarians in the last ten years (Lance & Kachel, 2018). When faced with a $31 million budget shortfall, school districts in Spokane, Washington, thought eliminating all school library positions was the answer (Yorio, 2019). Despite some schools adding school librarians during the pandemic and others cutting school librarians, the most recent publication from Lance and Kachel (2021) reports an overall 20% job loss. Other post-pandemic data shows that school librarian job loss has continued to grow since 2020 (Tomko & Pendharkar, 2023).

School library programs are often considered supplemental to student instruction and, therefore, put on the chopping block when budget cuts are necessary (Pickett & Combs, 2016). Despite the evidence that school librarians provide invaluable expertise and that researchers have reported gains in student achievement when a school librarian is on staff, their positions continue to be at risk for elimination (Ahlfeld, 2019; Lance & Hofschire, 2011, 2012; Lance & Kachel, 2018, 2021; Small et al., 2009).

At the same time, schools have been adding EdTech coaching roles to their staff and their budget. Data shows that between 2009 and 2019, instructional coordinator positions have grown by 34% (Lance & Kachel, 2021; Lance et al., 2023). EdTech coaches mentor teachers through new technology initiatives, offer professional development, and provide teachers with support for creating projects utilizing EdTech (Douglas, 2017). More specifically, the relationship between an EdTech coach and a teacher is a collaboration that includes regular and continuous communication with personalized support to address specific instructional questions or concerns through technology (Bakhshaei et al., 2020). School librarians are familiar with collaborating with teachers and providing professional development, making them a great fit as EdTech coaches.

Purpose of the Study

The purpose of this study was to examine the role of school librarians as EdTech coaches through the lens of the self-efficacy theory (Bandura, 1977) and the International Society for Technology in Education (ISTE) Standards for Coaches (2019). Specifically, do school librarians believe they are prepared to serve as EdTech coaches?

Terms and Definitions

The following terms will be used in this study to provide clarity and standardization. Since school librarians and EdTech positions can use various job titles, these terms are meant to encompass the range of professionals who operate under varying titles.

School Librarian

School librarians have experienced many job title changes over the years. Therefore, it is essential to note that, for this study, the title school librarian will be used because it is the official professional title adopted by the American Association of School Librarians (AASL) and the American Library Association (ALA; AASL, 2010). As AASL (2009b) defines it, the school librarian works with both students and teachers to provide environments that support and foster successful learning, help them to inquire and think critically while gaining new knowledge, apply knowledge to make informed decisions, and share knowledge as ethical and productive members of our democratic society.

EdTech

The Association for Educational Communications and Technology (AECT) has defined educational technology as the study and practice of teaching and learning by creating and using technological processes (Richey, 2008). Some educators use the term education technology, while others use technology integration in learning environments (Luppicini, 2005; Schad et al., 2021). This study uses the term EdTech because it has become widely used in research and everyday speech on the pedagogy and implementation of technology in learning environments.

EdTech Coach

Instructional coaches have been present in the field of education for decades (Showers & Joyce, 1996), with models including peer coaches, as well as dedicated specialists who work with individuals or groups of teachers to optimize their teaching practice and improve student learning outcomes (Knight, 2007). According to ISTE (2020), effective coaches empower and inspire educators, education leaders, and students

to “harness technology to improve pedagogy and reach higher learning goals” (p. 1). EdTech coaches have also transformed from technology facilitators who taught educators and students how to use computer programs, to the original coaching role which was an expert director and instructor, to today’s EdTech coach who provides professional development through a collaborative partnership with teachers (ISTE, 2020). EdTech coaches are specialists who help teachers to effectively and innovatively use EdTech resources to transform their teaching practice and the learning environment (Bakhshaei et al., 2018; Drennan & Moll, 2018; Meeuwse & Mason, 2018). Like school librarians, EdTech coaches have various job titles, including information technology facilitator, lead technology teacher, and instructional technology coach (McBride, 2021). For this study, the term EdTech coach will be used.

Research Questions

The research questions are:

1. What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills?

H_1: School librarians will have a high level of self-efficacy as EdTech coaches.

H_0: School librarians will not have a high level of self-efficacy as EdTech coaches.

2. Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

3. Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

4. Are school librarians interested in incorporating the role of EdTech coach into their current position?

5. What responsibilities do school librarians need to give up to manage their workload?

Significance of Study

Although research has been done in general regarding school librarian self-efficacy (Haeffner, 2020; Thompson et al., 2021; Weber, 2017), a search of the available literature revealed no published studies about librarian self-efficacy around serving as an EdTech coach. Similarly, prior research has connected the ISTE Standards and school librarianship (Cooper, 2015; Lewis, 2019; Wine, 2016), and crosswalks have been developed to align the ISTE Standards with the AASL National School Library Standards (Cooper, 2015; AASL, 2018a). Additionally, numerous articles have been written in school librarian organization trade magazines and blogs promoting school librarians as EdTech partners and leaders (Johnston, 2012, 2015; Thompson, 2021). However, a search of the available academic literature found one study (Cooper, 2015) that reported the connection between the ISTE Standards for Coaches and AASL Standards for School Librarians.

This study addressed these gaps in the academic literature by using a survey instrument aligned with the ISTE Standards for Coaches to examine school librarians' self-efficacy in serving as EdTech coaches.

Methodology

An exploratory mixed-methods research design was used to collect and analyze qualitative and quantitative data. This research design was used because it would allow many school librarians from across the United States with varying backgrounds and experiences to rate their self-efficacy around serving as EdTech coaches while providing detailed responses on their lived experiences. Qualitative and quantitative research are not set categories but instead ends of a continuum with all research falling somewhere on that continuum (Creswell & Creswell, 2018). This mixed-methods study falls near the middle of the qualitative and quantitative continuum. One of the challenges of using this methodology is weaving together the qualitative and quantitative results so that they paint one full and meaningful picture. Another challenge of using this methodology is the likelihood of unequal sample sizes for quantitative and qualitative data (Creswell & Creswell, 2018).

Regarding the current study, because some participants may not respond to the qualitative survey questions, there was a good chance that sample sizes could be unequal. However, this challenge was mitigated by presenting the qualitative data as a composite narrative with the understanding that the qualitative data cannot be considered comprehensive or representative of the lived experiences of all the school librarians in this study. This study's qualitative data provides further insight into the self-efficacy and

experiences of school librarians who may serve as models and mentors for other librarians who might see themselves in and learn from what is shared.

This study's participants were a convenience sample made up of members of either the Library Media ListServ, the AASL Member Forum, or one of the state school librarian associations who chose to participate. Chapter 3: Methods will discuss further details about the sampling techniques.

Qualitative and quantitative data was collected through the School Librarian EdTech Coaching Survey (Appendix A), which comprised 26 items designed to assess self-efficacy across the seven categories of the ISTE Coaching Standards (2019). The survey also included nine demographic questions (current role, qualification, age, experience, gender, ages served, school setting, and schedule), six questions related to EdTech background and interest, and four about workload and job responsibilities. Five qualitative questions were included throughout the survey to gain deeper insight into participants' lived experiences. The survey instrument was developed for this study. The entire survey is included in Appendix A, and details about its development and validation are discussed in Chapter 3: Methods.

Summary

This mixed-methods study will be presented in five chapters. Chapter 1 included an overview of the topic and problem, purpose statement, terms and definitions, research questions, significance of the study, and an overview of the methods and limitations of the study. Next, Chapter 2 will review the current literature involving self-efficacy theory, the ISTE Standards for Coaches, and the role of school librarians and EdTech coaches. Chapter 3 will provide a detailed description of the research design and methods

used in this study. Chapter 4 will summarize the qualitative and quantitative data collected for the study. Finally, Chapter 5 will present the findings and limitations of the study. It will also discuss the study's strengths and implications for future research and practice.

Chapter 2: Background and Literature Review

This chapter summarizes the relevant literature and is organized into two sections. The first section, Theoretical Constructs, reviews the self-efficacy theory and the ISTE Standards for Coaches (2019) framework, which are the basis for the School Librarian EdTech Coaching Survey. The second section, Literature Review, reviews the role of school librarians, school librarians as leaders and collaborators, the role of EdTech coaches, and barriers to school librarians serving as EdTech coaches.

Theoretical Construct and Framework

Self-Efficacy Theory

Self-efficacy refers to a person's belief that they have the skills to do well, as it relates to the attempted task (Bandura, 1977). Albert Bandura first developed the concept of self-efficacy within his social cognitive theory, which states that human achievement depends on interactions between one's behavior, beliefs, and environmental conditions (Bandura, 1986). Bandura and others (Bandura, 1982, 1997, 2002; Kazu & Erten, 2014; Ozer & Bandura, 1990; Schunk & Pajares, 2002; Sezgin & Erdogan, 2015; Zimmerman, 1995) have repeatedly found that self-efficacy is a strong predictor of performance. If a person believes they are capable of completing a particular task, they are more likely to do so. As a result, Bandura (1997) believed that people may be more inclined to engage in activities if they perceived competence in those areas.

As it relates to the world of education, teacher self-efficacy is a teacher's belief in their ability to positively impact student achievement (e.g., Hoy & Woolfolk, 1993; Tschannen-Moran et al., 1998). Teachers with high self-efficacy are often open to incorporating new ideas and methodologies into their classroom and curriculum

(Friedman & Kass, 2002; Tschannen-Moran & Barr, 2004). An open mind and willingness are crucial when effectively implementing EdTech into the classroom. With that, technology self-efficacy is a teacher's perceived confidence in integrating technology effectively into the classroom and the curriculum (Albion, 1999; Ertmer, 2005; Gomez et al., 2022; Holden & Rada, 2011; Kwon et al., 2019; Ottenbreit-Leftwich et al., 2018). One study found that a strong sense of technology self-efficacy "may be more important than skills and knowledge among teachers who implement technology in their classroom" (Ertmer & Ottenbreit-Leftwich, 2010, p. 261).

While self-efficacy is essential for school librarians, limited studies have been conducted that specifically focused on school librarians' self-efficacy. Weber (2017) examined school librarian self-efficacy and argued that school librarians need a high level of teacher self-efficacy because they require expertise in a wide array of knowledge and skills. In addition, researchers have found that school librarians who feel like strong leaders in their school community are more likely to work cooperatively with the teachers and have an impact on student achievement (Ash-Argyle & Shoham, 2012, 2014; Carson, 1993; Thompson et al., 2021). While these stand-alone findings provide helpful context, school librarians' self-efficacy around serving as EdTech coaches has not been studied.

ISTE Standards for Coaches

The ISTE Standards are a well-regarded and widely adopted set of standards for teaching and learning with technology that comprise standards for students, educators, leaders, and coaches (ISTE, 2022). The ISTE Standards for Coaches (2019; Appendix B) define the knowledge and skills coaches need to support their peers in serving as effective educators in a digital society. Researchers have investigated the impact of the ISTE

Standards for Students (Fuller, 2020; Yang, 2020), Educators (Trust, 2017; Vucaj, 2020), Administrators (Gonzales & Jackson, 2020; Yu & Prince, 2016) and Coaches (Cooper, 2015; Haynes et al., 2014).

While there is much written about the ISTE Standards and school librarianship (Cooper, 2015; Lewis, 2019; Wine, 2016), including crosswalks between the ISTE Standards and several library standards (Cooper, 2015; AASL, 2018a), there is a gap in the research around librarians and ISTE Standards for Coaches. Moreover, much of what has been written about school librarians and the ISTE Standards has been related to school librarians directly serving students (e.g., teaching digital citizenship lessons) rather than coaching fellow educators (Dawkins, 2020; Gomez et al., 2022; Huett & Neubauer, 2019; Phillips & Lee, 2019). Before looking at how librarians are ideal candidates for serving as EdTech coaches, it is helpful to review the role of school librarians.

Literature Review

The Role of School Librarians

Today, the school librarian embodies at least five distinct roles defined in *Empowering Learners: Guidelines for School Library Programs*: information specialist, instructional partner, leader, program administrator, and teacher (AASL, 2009a). When a group of school librarians and administrators were asked to rank the four primary roles of the school librarian in order of importance to the future success of schools, the responses showed a shift towards being an instructional partner and information specialist (AASL, 2009a).

While the standards, qualifications, and even readiness for school librarians continue to evolve, the perception of those positions is still rooted in the idea of the school librarian as the keeper of the books, who is simply responsible for curating, cataloging, and circulation duties (Lester, 2023; Wine, 2016). Part of this misunderstanding could be attributed to a general need for more clarity on the role of school librarians. Stewart & Deans (2020) conducted a study to examine the barriers to effective teacher-librarian partnerships. They found that teachers perceive school librarians' responsibilities as limited to providing only physical resources to staff and students. Additionally, while school librarians are recognized for their library management and leadership skills, they are not considered essential members of the school executive leadership team (Stewart & Deans, 2020). Some educational community members have significant misconceptions that interfere with understanding and fully appreciating school librarians. However, the multiple studies demonstrating school librarians' positive impact on student outcomes are noteworthy.

School Librarians as Leaders

For as long as school librarians have been positively impacting student success, they have been tasked to serve as leaders for the broader school community. While the first set of standards for school librarians did not explicitly mention the word "leader," it did indicate that the school librarian "should be made head of the library department, with status equal to that of the heads of other departments" (ALA, 1920, p. 18). One of the overarching missions of school librarians, according to AASL and Association for Educational Communications and Technology (AECT), is to "provide leadership, instruction, and consulting assistance in the use of instructional and information

technology and the use of sound instructional design principles" (AASL & AECT, 1988, p. 15). In an updated version of those standards, AASL & AECT (1998) defined the school librarian as an "advocate for integrating information literacy skills in instruction of the curricular areas" and that "as a leader, the school library media specialist promotes the use of technology" (p. 54). It also encourages school librarians to step into leadership roles by demonstrating strong curriculum development and instructional skills focused on digital and information literacy.

In their proposed theory of school librarian leadership, Everhart and Johnston (2016) defined school librarian leadership as "the ability to influence and inspire others to meet identified goals or to share an identified vision" (p. 19). School librarians' knowledge of pedagogy and curriculum, along with their expertise in technology and information, puts them in a unique position to serve as leaders in their school community.

School Librarians as Collaborators

Montiel-Overall (2005) defines collaboration as "a trusting, working relationship between two or more equal participants involved in shared thinking, shared planning and shared creation of integrated instruction" (p. 5). School librarians are tasked with taking the lead on working collaboratively within the school community through various standards and guidelines. AASL (2009a) also charges school librarians with promoting collaboration among the entire school community to help learners become confident, independent information producers and consumers. In *National School Library Standards for Learners, School Librarians, and School Libraries,* AASL (2018b) characterizes a collaborative relationship as one where both parties broaden their ideas, achieve common

goals, think critically to solve problems, negotiate new and shared meanings, solicit and respond to feedback from others, and adapt thinking to new ideas.

While all forms of teacher-librarian collaboration are beneficial, Farmer (2006) examined the characteristics of various school library programs and explicitly found that collaborative planning between the school librarian and the classroom teacher is one of the most effective ways to improve student outcomes (Stock-Kupperman, 2015).

Role of EdTech Coaches

Foltos (2013) describes a coach as a teacher leader who supports a colleague's work in actively engaging students in learning activities. Knight (2008) states that coaches must be skilled at "unpacking their collaborating teachers' professional goals so that they can help them create a plan for realizing those goals, all with a focus on improving instruction" (p. 31). Knight (2006) also noted that, for coaches to be effective, they need to utilize research-based practices and a repertoire of tools to apply to any given instructional challenge. The ISTE Standards for Coaches provide direction to the characteristics, activities, philosophies, and dispositions of today's EdTech coaches through the following seven categories: change agent, connected learner, collaborator, learning designer, professional learning facilitator, data-driven decision-maker, and digital citizen advocate. When compared (Table 1) to the ALA/AASL/Council for the Accreditation of Educator Preparation (CAEP) School Librarian Preparation Standards (2019), there is a clear correlation between what an EdTech coach is expected to do and the responsibilities of a school librarian (Church, 2011; Lewis, 2016).

Table 1

Comparison of ISTE Standards for Coaches and School Librarian Preparation Standards

ISTE Standards for Coaches	ALA/AASL/CAEP School Librarian Preparation Standards
4.1 Change Agent: Coaches inspire educators and leaders to use technology to create equitable and ongoing access to meaningful learning.	Standard 1: The Learner and Learning. Candidates in school librarian preparation programs are effective educators who demonstrate an awareness of learners' development. Candidates promote cultural competence and respect for inclusiveness. Candidates integrate the National School Library Standards considering learner development, diversity, and differences while fostering a positive learning environment. Candidates impact student learning so that all learners are prepared for college, career, and life.
4.2 Connected Learner: Coaches model the Student and Educator standards, and identify ways to improve their coaching practice.	Standard 2: Planning for Instruction. Candidates in school librarian preparation programs collaborate with the learning community to strategically plan, deliver, and assess instruction. Candidates design culturally responsive learning experiences using a variety of instructional strategies and assessments that measure the impact on student learning. Candidates guide learners to reflect on their learning growth and their ethical use of information. Candidates use data and information to reflect on and revise the effectiveness of their instruction.

4.3 Collaborator: Coaches establish productive relationships with educators to improve instructional practice and learning outcomes.	Standard 5: Leadership, Advocacy, and Professional Responsibility. Candidates in school librarian preparation programs are actively engaged in leadership, collaboration, advocacy, and professional networking. Candidates participate in and lead ongoing professional learning. Candidates advocate for effective school libraries to benefit all learners. Candidates conduct themselves according to the ethical principles of the library and information profession.
4.4 Learning Designer: Coaches model and support educators to design learning experiences and environments that meet the needs and interests of all students.	Standard 2: Planning for Instruction. Candidates in school librarian preparation programs collaborate with the learning community to strategically plan, deliver, and assess instruction. Candidates design culturally responsive learning experiences using a variety of instructional strategies and assessments that measure the impact on student learning. Candidates guide learners to reflect on their learning growth and their ethical use of information. Candidates use data and information to reflect on and revise the effectiveness of their instruction.
4.5 Professional Learning Facilitator: Coaches plan, provide and evaluate the impact of professional	Standard 5: Leadership, Advocacy, and Professional Responsibility. Candidates in school librarian preparation programs are actively engaged in leadership, collaboration, advocacy, and professional networking. Candidates

learning for educators and leaders on the use of technology to advance teaching and learning.	participate in and lead ongoing professional learning. Candidates advocate for effective school libraries to benefit all learners. Candidates conduct themselves according to the ethical principles of the library and information profession.
4.6 Data-Driven Decision-Maker: Coaches model and support the use of qualitative and quantitative data to inform their own instruction and professional learning.	Standard 4: Organization and Access. Candidates in school librarian preparation programs model, facilitate, and advocate for equitable access to and the ethical use of resources in a variety of formats. Candidates demonstrate their ability to develop, curate, organize, and manage a collection of resources to assert their commitment to the diverse needs and interests of the global society. Candidates make effective use of data and other forms of evidence to evaluate and inform decisions about library policies, resources, and services.
4.7 Digital Citizen Advocate: Coaches model digital citizenship and support educators and students in recognizing the responsibilities and opportunities inherent in living in a digital world.	Standard 3: Knowledge and Application of Content. Candidates in school librarian preparation programs are knowledgeable in literature, digital and information literacies, and current instructional technologies. Candidates use their pedagogical skills to actively engage learners in the critical-thinking and inquiry process. Candidates use a variety of strategies to foster the development of ethical digital citizens and motivated readers.

Regardless of who is doing the work, students can only benefit from the proliferation of EdTech tools if teachers are familiar with and comfortable integrating those resources into their classrooms (Ertmer & Ottenbreit-Leftwich, 2010). Although many teachers may be excited about the influx of EdTech tools, the sheer number of digital resources can be overwhelming, and teachers can benefit from assistance in incorporating these tools into their classrooms (Johnston, 2012). The need for this type of expertise is evident in the changing job roles in schools; between 2008 and 2019, the number of instructional coordinators in the U.S. increased from 73,457 to 104,603, an increase of 42.4% (U.S. Department of Education, National Center for Education Statistics, 2021).

One significant difference between EdTech coaches and school librarians is the certification requirements for their positions. Lance and Kachel (2018) note that all states have certification requirements for school librarians, and most states also require school librarians to hold an active teaching certificate. Research has shown that there is no difference in the self-reported levels of technology competence between school librarians who received graduate degrees from ALA-accredited schools versus those with joint approval from the National Council for Accreditation of Teacher Education (NCATE) and AASL (Cockcroft, 2023; Hanson-Baldauf & Hassell, 2009; Kimmel et al., 2019; Latham et al., 2013). However, studies have not been conducted on school librarians with a graduate degree in a subject other than library science but have earned a library endorsement through other means. Regardless of their preparation, nearly all states require school librarians to have an advanced degree or endorsement and a teaching certificate.

The education, experience, and training of EdTech coaches vary significantly across states and school districts (Marsh et al., 2010; Reid, 2019; Stroup et al., 2010). Although EdTech specializations have been available for decades in graduate teacher education programs (e.g., master's and doctoral degrees), the widespread availability and promotion of certifications and degrees in EdTech is a recent development in higher education. Similarly, EdTech certifications and degrees have only recently been sought after as a career-enhancing professional learning choice by teachers whose districts have finally created separate instructional EdTech administrative departments and coaching roles (Reid, 2019). Regarding school librarian preparation for technology integration, the ISTE Standards for Coaches were used to inform the AASL Standards for School Librarians, so it can be inferred that expertise in EdTech coaching is part of the school librarian certification process (Cooper, 2015).

Another difference between EdTech coaches and school librarians is how organizations structure these positions within the district. There are numerous models of EdTech coaching; some are district-level, with coaches supporting teachers in multiple schools, and others feature site-based coaches who serve at only one school and are sometimes classroom teachers (Van Ostrand et al., 2020). Often, librarians are school-embedded, whereas EdTech coaches are shared between multiple buildings (Israel et al., 2018). Both positions require trust-building and establishing rapport with the classroom teachers (McBride, 2021). A significant difference between the school-embedded librarian and the district-wide coach is the level of familiarity with the teachers; those that are at the district level often only have interactions during their non-daily co-planning and co-teaching times rather than the daily interactions that are possible between a school

librarian and teacher (Israel et al., 2018). From a preparation, certification, and human resource perspective, it is clear that the school librarian is an optimal choice for a school site-based and job-embedded EdTech coaching model.

Barriers to School Librarians as EdTech Coaches

While school librarians have the skills, expertise, and trusted relationships to serve as effective EdTech coaches, some barriers prevent this organizational shift. First, although administrators might recognize school librarians' role in curating resources and delivering necessary information literacy curricula, some have yet to acknowledge librarians as leaders who can enact change toward strategic goals (Baker et al., 2020). For decades, there has been evidence in the literature regarding administrators' lack of knowledge or understanding of the role of the school librarian (Church, 2008, 2010; Lance & Kachel, 2018; Lewis, 2019). This can lead to underutilization and, potentially, job cuts for many school librarian positions (Johnston, 2012; Lewis, 2021).

Part of this misunderstanding might stem from role ambiguity around school librarian positions (Gross, 2022). Often, the perceptions teachers and administrators have regarding the role of the school librarian may differ from those of the librarian themselves (Church, 2008, 2010; Shannon, 2009). Elkins (2018) notes that "school librarians may be particularly susceptible to experiencing role ambiguity, conflict, erosion, and/or role overload" (p. 89). This lack of understanding could be tied to the absence of information about librarians in school administration preparation programs (Croft, 2022; Pickett & Combs, 2016). There is no mention of school librarians or school library programs in the current national standards for principal preparation, the Standards for Advanced Programs in Educational Leadership for Principals, Superintendents,

Curriculum Directors, and Supervisors (National Policy Board for Educational Administration, 2002). Lewis (2016) pointed out that school leaders often do not consider school librarians when the need arises for an EdTech coach. Lewis (2016) attributed this missed opportunity to a lack of clarity about the school librarian's role. She suggested that further research is needed regarding all aspects of preservice preparation and hiring of librarians, including an EdTech coaching role.

Librarians are sometimes reluctant to take on new responsibilities because they lack time in their existing schedules (Johnston, 2012). However, Wine (2016) has noted that the role of a school librarian is continuously evolving, and responsibilities have shifted immensely over time. The current workload of librarians may need to be reviewed and updated, especially in light of all the changes to education caused by Covid-19 (Valenza et al., 2023; Zhao & Watterston, 2021).

Summary

This literature review focused on presenting Bandura's self-efficacy theory (1977) and the ISTE Standards for Coaches as a theoretical construct and framework as a basis for the study. This included how self-efficacy has been used in education and librarianship. This was followed by an examination of the ISTE Standards for Coaches and the lack of research between these standards and the standards used by many school librarians. Supported by the literature review, the current study seeks to demonstrate how school librarians continue to evolve over time and that they have the confidence and skills to serve as EdTech coaches in their school communities. The specific research design used for this purpose will be discussed in Chapter 3: Methods.

Chapter 3: Methods

The purpose of this chapter is to describe the research design and methodology of the study. This chapter reviews the research questions, expands on the research design, reviews the survey instrument validation process, describes the participant selection methods and procedures, describes the data collection methods, and explains the data analysis procedures.

Research Questions

This exploratory mixed-methods study is intended to assess the self-efficacy of school librarians in terms of the skills needed to serve as EdTech coaches using the ISTE Standards for Coaches (2019) as a contextual framework. Therefore, the research questions are:

6. What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills?

H_1: School librarians will have a high level of self-efficacy as EdTech coaches.

H_0: School librarians will not have a high level of self-efficacy as EdTech coaches.

7. Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

8. Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

9. Are school librarians interested in incorporating the role of EdTech coach into their current position?

10. What responsibilities do school librarians need to give up to manage their workload?

Research Design

A mixed-methods research design was used, which combines quantitative and qualitative research methods and data, with the overall goal of maximizing the strengths of each method and minimizing their weaknesses (Creswell & Creswell, 2018; Gall et al., 2007; Johnson & Onwuegbuzie, 2004). The mixed-methods design was specifically chosen to gather quantitative data about librarians' feelings of self-efficacy regarding the ISTE Standards for Coaches and the EdTech coach role and qualitative data that would provide greater insight into their lived experiences.

Instrument

This research study collected quantitative and qualitative data via a newly created survey instrument. A search of the literature revealed that no existing survey instrument was designed to evaluate the school librarians' self-efficacy as EdTech coaches, so developing a new tool was necessary. According to Bandura (2006), there is no universal scale for measuring self-efficacy; therefore, a new measure must be developed for each investigation.

Survey Instrument Development

The School Librarian EdTech Coaching Survey was developed for this study and comprises 26 items designed to assess self-efficacy across the seven categories of the ISTE Coaching Standards (2019): Change Agent, Connected Learner, Collaborator, Learning Designer, Professional Learning Facilitator, Data-Driven Decision-Maker, and Digital Citizen Advocate. Each of the seven categories has between three and five indicators. The categories became the survey subscales, and the indicators became the basis for the individual question items. The resulting 26 questions were rated on a 5-point Likert scale, with one being strongly disagree and five being strongly agree. The Likert scale was designed to assess one's attitude toward various statements, an ideal tool for rating one's confidence and skills (Gliem & Gliem, 2003; McIver & Carmines, 1981). A Likert scale is a set of items with equal numbers of favorable and unfavorable statements (Gliem & Gliem, 2003). Respondents were asked to rate each statement based on their degree of agreement or disagreement. Individual responses were then combined so that participants with the most favorable attitudes had the highest scores, while the participants with the most unfavorable attitudes had the lowest scores (Gliem & Gliem, 2003). In the literature, the usual practice for self-efficacy surveys is to calculate mean scores, with higher scores indicating higher self-efficacy (Sherer et al., 1982).

For the 26 items that are aligned with the ISTE Standards for Coaches, the survey items were created by first reviewing the literature for the creation of self-efficacy surveys (Bandura, 2006; Chen et al., 2001; Weber, 2017), which suggests items should be tailored to the particular skills required to complete a specific task and should be phrased in terms of can-do currently as opposed to will-do in the future. The ISTE Standards for Coaches

were already phrased as action items, and self-efficacy statements were developed by adding “I can” at the beginning of each indicator to prompt the reader to reflect on their ability to perform each action. Sample items include: “I can help educators create a shared vision and culture for using technology to learn and accelerate transformation through the coaching process (4.1.a.; see Table 1)”; “I can pursue professional learning that deepens expertise in the ISTE Standards in order to serve as a model for educators and leaders (4.2.a.; see Table 1)”; “I can model the use of instructional design principles with educators to create effective digital learning environments (4.4.d.; see Table 1).”

The survey also included nine demographic questions (current role, qualification, age, experience, gender, ages served, school setting, and schedule), six questions related to EdTech background and interest, and four about workload and job responsibilities. Five qualitative questions were included throughout the survey to gain deeper insight into participants’ lived experiences.

Survey Instrument Validation Procedures

Because the School Librarian EdTech Coaching Survey was newly developed for this study, it needed to be validated (van Dinther et al., 2013). Validity refers to the extent to which a survey instrument measures what it was intended to measure (American Educational Research Association et al., 1999). Rubio et al. (2003) outlined the three types of validity traditionally used in the social sciences: content, criterion, and construct validity. Content validity can be measured as face or logical validity, with the first appearing valid “on its face” (Rubio et al., 2003, p. 94). Logical validity, on the other hand, requires a rigorous review by a panel of content experts. An instrument is considered to be content valid when the survey items reflect the instrument's objectives.

Following content validity, a pilot study is administered to a representative sample (Sherer et al., 1982). The pilot survey will provide quantitative data that can be tested for internal consistency. To validate the School Librarian EdTech Coaching Survey, the following steps were taken:

Step 1: Content Review.

Step one of the validation process aimed to establish content validity through an expert review of the proposed instrument items. Eight credentialed, practicing school librarians served as content experts and provided feedback on the School Librarian EdTech Coaching Survey. A group of practicing school librarians was used to determine the validity of the content of the survey, which provided crucial information about how the questions were interpreted. It answered questions that arose before the instrument was disseminated widely (Rubio et al., 2003). All feedback from step one of the validation process is included in Appendix C. Changes were made to the survey based on the input from step one. For example, more explicit instructions for the survey's standards portion and additional options for age bands and school types were added.

Step 2: Peer Review of Survey Questions.

The goal of step two of the validation process was to have a peer review the survey to check for common questionnaire construction errors. The peer reviewer was a credentialed practicing school librarian. The reviewer did not have any suggested revisions for the self-efficacy portion of the survey. Still, they did provide helpful feedback on the questions regarding demographics, EdTech background and interest, workload, and job responsibilities (Appendix D). Additional changes were made to the survey based on the feedback from step two of the validation process. For example, the

initial question about the current responsibilities of school librarians was very lengthy, and the peer reviewer recommended compressing options into overarching categories to avoid survey fatigue.

Step 3: Pilot Survey.

The goal of the third step of the validation process was to run a pilot phase of the survey. The pilot survey was sent to school librarians who were Washington Library Association (WLA) School Library Division (SLD) members. The invitations for the pilot were sent via the WLA SLD listserv on April 26, 2023, and the survey was open for one week. During that time, 37 participants responded to the pilot survey.

Step 4: Data Analysis.

The goal of step four of the validation process was to determine factorial validity, a form of construct validity that is established through a factor analysis. Factor analysis is the process of analyzing the interrelationships among a set of variables and then explaining those relationships in terms of a reduced number of variables, called factors (Niederhauser & Perkmen, 2008). Some common options for assessing factorial validity are principal components analysis (PCA), linear discriminant analysis (LDA), exploratory factor analysis (EFA). All three analyses are used for dimensionality reduction but PCA is used to find the directions of maximum variance in the data, while the objective of LDA is to find the projection that separates the classes in the data and EFA hypothesizes an underlying construct from a variable that was not measured directly (Abdi & Williams, 2010; Suhr, 2005).

Principal components analysis (PCA) was conducted on the pilot survey data (N = 37) to analyze the survey instrument for trends and patterns by transforming the data into

fewer dimensions. First, the Kaiser-Meyer-Olkin (KMO) measure was used to determine the suitability of PCA. The KMO measure is used as an index of whether there are linear relationships between the variables and, thus, whether it is appropriate to run PCA on your current data set. Its value can range from 0 to 1, with values above 0.6 suggested as a minimum requirement for sampling adequacy. Still, values above 0.8 are considered good and indicate useful principal components analysis. A KMO measure can be calculated for all variables combined and for each variable individually. For the 26 ISTE Standards for Coaches survey items, inspection of the correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The overall KMO measure was 0.68 with individual KMO measures all greater than 0.5, which is a classification of mediocre according to Kaiser (1974). Bartlett's test of sphericity was statistically significant ($p < .001$), indicating that the data was likely factorizable. These results indicated that PCA was appropriate for the pilot survey data.

PCA is performed to reduce a larger set of variables into a smaller set of 'artificial' variables that account for most of the variance in the original variables (Cattell, 1966). The results of the PCA on the pilot survey data ($N = 37$) revealed four components with eigenvalues greater than one and explained 65.6%, 8.1%, 4.7%, and 3.9% of the total variance, respectively. The four-component solution explained 82.3% of the total variance. The rotated component matrix showed that 19 variables loaded onto more than one component and seven variables loaded onto only one component, including one variable that loaded onto only component 3 and one that loaded onto only component 4. Extracting components would have resulted in each variable being left with only one strongly loaded component. Visual inspection of the scree plot indicated that two

components should be retained. The scree plot generated during PCA is a graphic visual representation of how many components should be retained (Cattell, 1966). It shows the eigenvalues on the y-axis and the number of factors on the x-axis. The first component often explains much of the variability, the middle components generally explain a moderate amount, and the far right components explain a small fraction of the overall variability. The elbow point, or any factors with eigenvalues equal or greater than 1, shows which components should be retained (Laerd Statistics, 2018). For this study, it was determined that retaining all four components was necessary to preserve the integrity of the ISTE Standards so that all seven standards and their indicators were represented in the survey instrument. In addition, a four-component solution met the interpretability criterion. As such, four components were retained.

In addition to PCA, Cronbach's alpha was run on the 26 ISTE Standards for Coaches survey items to measure internal consistency. The scale had a high level of internal consistency, as determined by a Cronbach's alpha of 0.978.

Step 5: Survey Revision.

The results of the PCA showed that all of the survey questions were loaded onto a single component, which means there was an overlap in the 26 items measured. These results were likely because the ISTE Standards for Coaches were not designed to be a formal measurement tool but to guide coaches when serving fellow educators. Although these results indicated that the survey items should be revised (e.g., so that the questions for individual standards would load onto separate components), no questions or components were removed or revised. This decision was made to preserve the integrity of the ISTE Standards for Coaches, a well-known and well-regarded tool for understanding

and developing EdTech coaching skills. While the ISTE Standards met the criteria for a PCA test, the ISTE Standards were not written as an assessment tool and, therefore, were not designed to withstand reduction of variance. The possible development of a valid, reliable survey instrument based on the ISTE Standards for Coaches will be further discussed in the Limitations and Implications for Future Research section of Chapter 5: Discussion.

Research Study Procedures

Ethical Considerations

The IRB of Seattle Pacific University reviewed the research purpose, design, and data collection and sampling procedures and approved this human subject research (IRB number 222306016). The informed consent form was embedded in the electronic survey as the first item for participants to accept or deny. The IRB and informed consent form reported minimal risk for participants and no direct benefit due to participation in the study. Participants were also assured that their survey responses were anonymous and that participation was voluntary. Participants, upon completion of the survey, were given the option of entering a drawing for one of two $25 gift certificates. For participants who chose to enter the gift certificate drawing, they selected a separate link to add their contact information, ensuring anonymity in the survey. The informed consent form, survey invitations, and follow-up emails are included in the appendices.

Participants

The population of interest in this study was practicing, credentialed school librarians. Participants were currently employed as a public or private K-12 school librarian. They were credentialed, meaning they had to have a Master in Library Science,

a state-level teaching certificate with a library endorsement (school library endorsement), or the equivalent. They were also members of the Library Media ListServ, the AASL Member Forum, or one of the 47 state school librarian associations. The Library Media ListServ is an online professional networking space with over 11,000 members that is managed and moderated by Blythe Bennett, Program Manager of the Library Information Science/School Media program at Syracuse University, and by Michelle Kelley, current Butte College Instructor and longtime K-12 Teacher Librarian (http://www.lm-net.info/). The AASL Member Forum is an online professional networking space for AASL members that ALA's Online Code of Conduct regulates (ALA, 2022) and currently has 194 members. The administrators of the 47 individual state school librarian associations were contacted; 14 chose to share the survey with their members, one elected not to share, and 32 did not respond. Of the 14 state school librarian associations that shared the survey with their members, they have 6,191 members.

Sampling and Data Collection Procedures

Participants in this study were a convenience sample made up of members of either the Library Media ListServ, the AASL Member Forum, or one of the 14 state school librarian associations who chose to participate. It should be noted that nonprobability sampling limits the generalizability of the results (Bhattacherjee, 2012). The decision to recruit participants from these email-based librarian communities was made so that there would be a greater chance that participants would represent the desired demographic characteristics and also so that participants would represent a wide range of experiences (e.g., ages served, school type, etc.). Permission to post a research study participation invitation was requested and granted by the managers of the Library Media

ListServ (Appendix E), as well as the administrators of the 14 state school librarian associations, and the Code of Conduct for the AASL Member Forum allows for survey participation requests to be posted to the forum (Appendix F).

An invitation to participate in this study (Appendix G) was posted to the Library Media ListServ and AASL Member Forum on May 1, 2023. A request was also sent to the 47 school librarian association administrators on May 15, 2023, asking them to share the survey with their members (Appendix H). Two reminder posts were sent following the initial invitation to participate in the survey. The invitations included a link to the School Librarian EdTech Coaching Survey. The survey was administered through Microsoft Forms, a cloud-based platform for creating, distributing, and managing data collection for web-based surveys.

Sample Characteristics

There were 311 survey respondents. Although this corresponded to a low 1.8% response rate, this was still considered a good response given that this was a convenience sample from a pool of participants who were contacted through email services where the level of participation is voluntary and varies among participants. Additionally, 311 responses were adequate to meet this study's statistical significance threshold. To control for the intended population, survey participants were asked a screening question before gaining access to the survey: were they current, practicing school librarians? In addition, when a participant selected the same Likert-scale score for all survey questions, qualitative responses were compared to quantitative responses to ensure the responses were valid. Figures 1-10 show the demographic characteristics of the participants. The descriptive data in Figure 1 shows that over half of the participants had a Master in

Library Science (65.9%; *n* = 205). Of those, nine participants indicated they had a Master in Library Science plus at least one more advanced degree (*n* = 9). Over one-quarter of the participants had a school library endorsement (27.1%; *n* = 84). The remaining participants selected other (7.1%; *n* = 22). Of those who selected other, three participants were working on their Library Science degree or certification, five had an Education Specialist degree, five had a Bachelor's degree in Library Science, and nine had various work experience and other academic degrees.

The descriptive data in Figure 2 shows that the largest number of participants were 48-55 years old (32.5%; *n* = 101), followed by 58 years and older (24.4%; *n* = 76), 41-47 years old (22.8%; *n* = 71), 36-40 years old (10.9%; *n* = 34), 30-35 years old (7.1%; *n* = 22), and the smallest age group were 21-29 years old (2.3%; *n* = 7).

The descriptive data in Figure 3 shows that the vast majority of the participants identified as female (90.7%; *n* = 283), followed by male (6.1%, *n* = 19), non-binary (1.0%, *n* = 3), and other (0.3%, *n* = 1). Five participants preferred not to share their gender (*n* = 5).

The descriptive data in Figure 4 shows that more than half of the participants had 11+ years of experience as a school librarian (57.9%; *n* = 180), followed by 6-10 years (20.9%; *n* = 65); 1-5 years (14.5%; *n* = 45); and less than one year of experience (6.1%; *n* = 19). Two participants did not answer the question.

The descriptive data in Figure 5 shows that almost half of the participants had 11+ years of experience providing technology support (47.6%; *n* = 148), followed by 6-10 years (23.2%; *n* = 72); 1-5 years (14.8%; *n* = 46); less than one year (3.2%; *n* = 10), and no experience providing technology support (11.3%; *n* = 35).

The descriptive data in Figure 6 shows that approximately one-third of the participants served high school students (29.9%; *n* = 93), followed by elementary school students (23.2%; *n* = 72), middle or junior high students (21.9%; *n* = 68), 6-12 grade students (8.4%; *n* = 26), K-12 grade students (5.8%; *n* = 18), K-8 grade students (5.5%, *n* = 17), and multiple ages (4.2%; *n* = 13). Those who selected multiple ages were asked to provide the age ranges of the students they served and responded with ranges not represented by the other survey choices, such as K-5 plus 9-12. The remaining participants selected other and reported that they worked in schools that span grades not captured in the survey choices, including preschool (1.3%, *n* = 4). The ages served categories were developed based on feedback from the pilot survey, but it proved challenging to analyze the quantitative data. The Limitations and Implications for Future Research section of Chapter 5: Discussion will further discuss these categories.

The largest number of participants worked in a public school setting (85.9%; *n* = 267), followed by a private school setting (13.5%; *n* =42). One participant selected other and noted they worked in a charter school (0.3%; *n* = 1), and one participant did not answer the question.

The descriptive data in Figure 7 shows the type of schedule facilitated by the school librarian. A flexible schedule is defined as a library schedule that allows the school community access to the library before, during, and after school (Gavigan et al., 2010). On the other hand, a fixed (or rigid) schedule happens when the library is only available to students during their set library time (McGregor, 2006). Bishop (2007) pointed out that a fixed schedule was developed to help provide teachers with a set-aside planning time. This study's largest number of participants operated on a flexible schedule

(45.7%; *n* = 142). Nearly a third of the participants operated on a fixed schedule (29.9%; *n* = 93). The remainder of the participants operated on both fixed and flexible schedules (20.9%; *n* = 65), on neither a fixed nor a flexible schedule (1.9%; *n* = 6), or other (1.3%; *n* = 4). One participant did not answer the question.

Almost half of the participants (45.3%; *n* = 141) reported having EdTech responsibilities, while nearly as many (43.1%; *n* = 134) reported that they did not. Thirty-five (11.3%) participants were unsure if they had EdTech responsibilities. One participant did not answer the question.

Most participants were familiar with ISTE as an organization (90.0%; *n* = 280). A small number of participants were not familiar with ISTE (6.4%; *n* = 20), some were unsure (2.9%; *n* = 9), and two participants did not answer the question.

The descriptive data in Figure 8 shows the participants' familiarity with the ISTE Standards. Participants were allowed to select all of the ISTE Standards they were familiar with and 81.0% (*n* = 251) reported that they were familiar with the ISTE Standards for Students, followed by 71.1% (*n* = 221) who were familiar with the ISTE Standards for Educators, 12.9% (*n* = 40) were familiar with the ISTE Standards for Education Leaders, 11.6% (*n* = 36) were familiar with the ISTE Standards for Coaches, and 10.0% (*n* = 31) were familiar with the ISTE Computational Thinking Competencies. Additionally, 18.0% (*n* = 56) of participants were unfamiliar with any of the ISTE Standards.

The descriptive data in Figure 9 shows participants' interest level in incorporating the role of EdTech coach into their current school librarian position. About one-third of participants (32.2%; *n* = 100) were interested in incorporating the role of EdTech coach

into their current school librarian position, and about one-third (31.2%; *n* = 97) were neutral to this idea. Additionally, 19.3% (*n* = 60) of participants were very interested in incorporating the role of EdTech coach into their current school librarian position, whereas 12.2% (*n* = 38) were not interested, and 4.8% (*n* = 15) were not at all interested. One participant did not answer the question.

The descriptive data in Figure 10 shows the participants' responses to their current school librarian position. The participants reported responsibilities that were traditional library-focused duties, such as collection development (100.0%; *n* = 307), circulation desk (95.8%; *n* = 294), and creating displays, bulletin boards, or other visual elements for the library (90.2%; *n* = 277). Participants also reported student-focused duties, some of which were library-related, including supervising students in the library (94.1%; *n* = 289), teaching digital citizenship lessons (68.7%; *n* = 211), and planning and teaching weekly library lessons (54.7%; *n* = 168). Participants reported duties related to school leadership and teacher support, including planning cooperatively with teachers (81.4%; *n* = 250), serving on school or district committees (63.5%; *n* = 195), and facilitating professional development for teachers (44.3%; *n* = 136). Other duties were related to administrative tasks and non-library related responsibilities such as training and supervising assistants and volunteers (69.4%; *n* = 213); substituting for classroom teachers (33.9%; *n* = 104), performing lunch room, recess, and other coverage duties (29.6%; *n* = 91), and other (26.1%; *n* = 80). The responses of the participants who selected other for this survey question will be further explored in the Results section. Four participants did not answer the question.

Almost half of the participants do not think the responsibilities that were part of their current workload no longer served them or their students (46.3%; *n* = 144). However, 27.7% (*n* = 86) of participants did think that responsibilities that were part of their current workload no longer served them or their students, and 25.7% (*n* = 80) of participants were unsure. One participant did not answer the question.

Figure 1

School Librarian Qualification

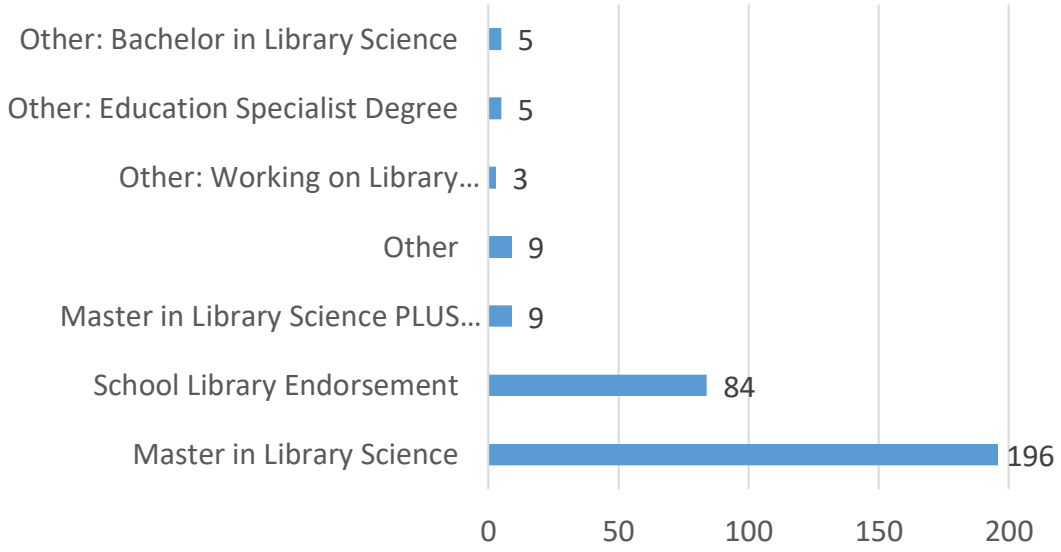


Figure 2

Age of Participants

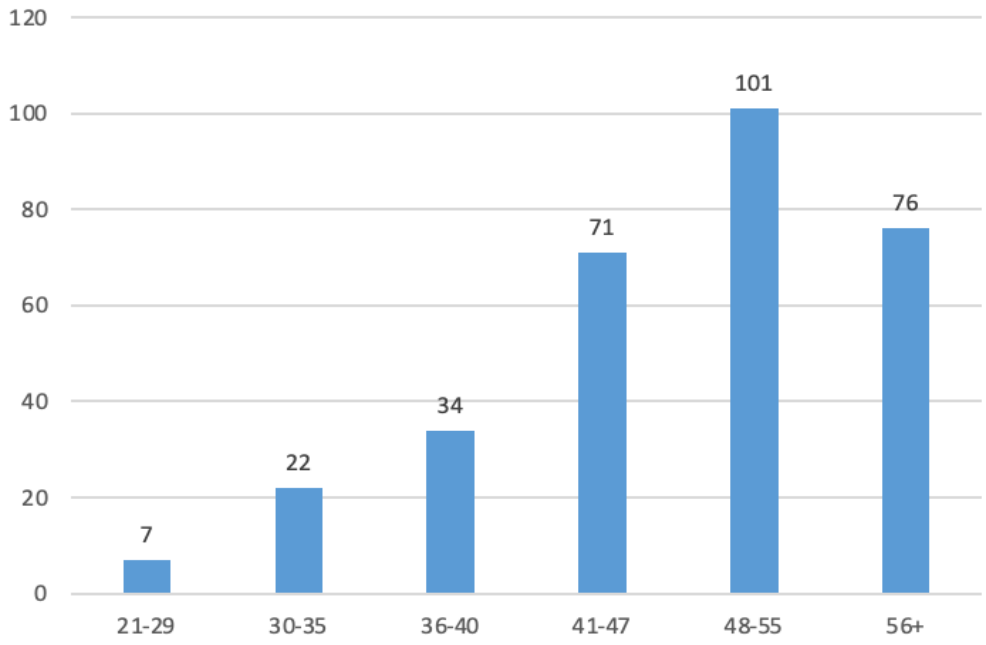


Figure 3

Gender of Participants

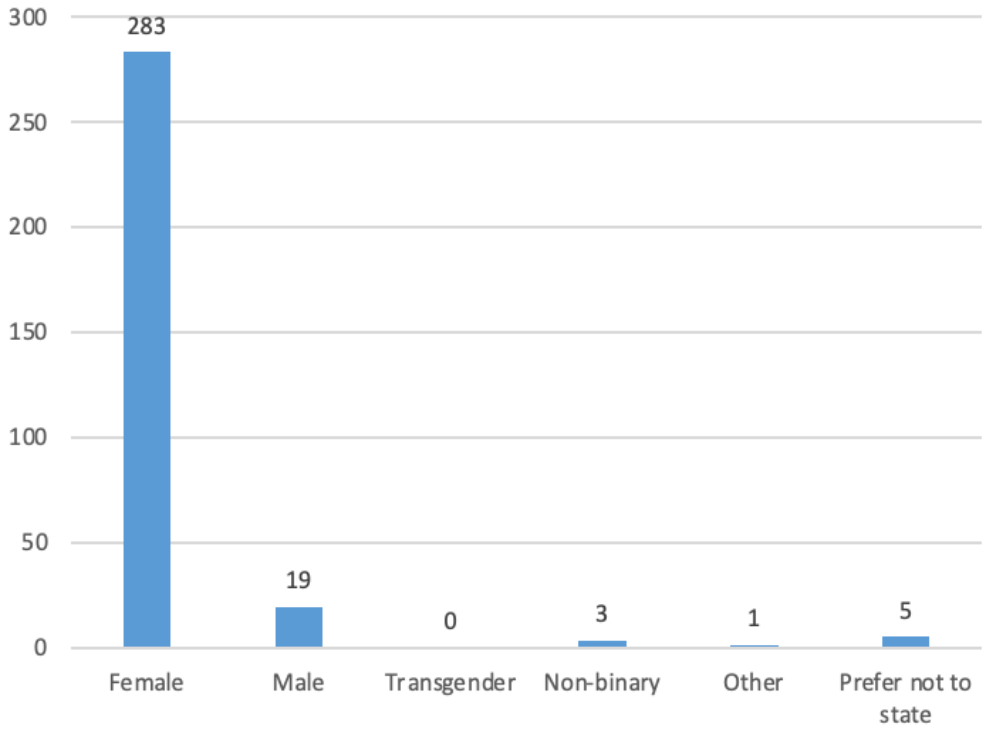


Figure 4

Years of Experience as a School Librarian

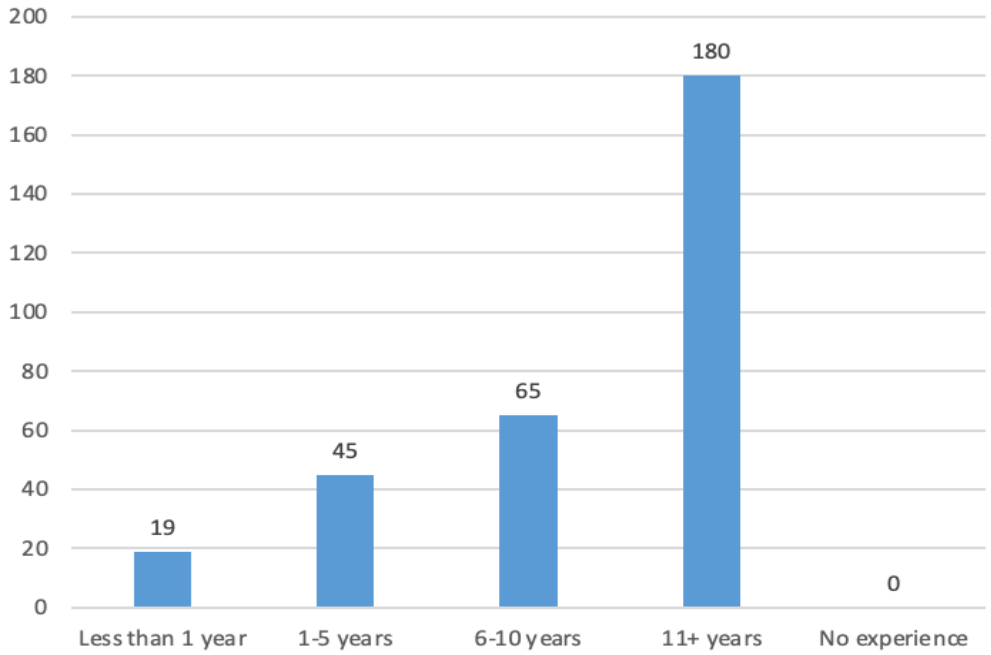


Figure 5

Years of Experience Providing Technology Support

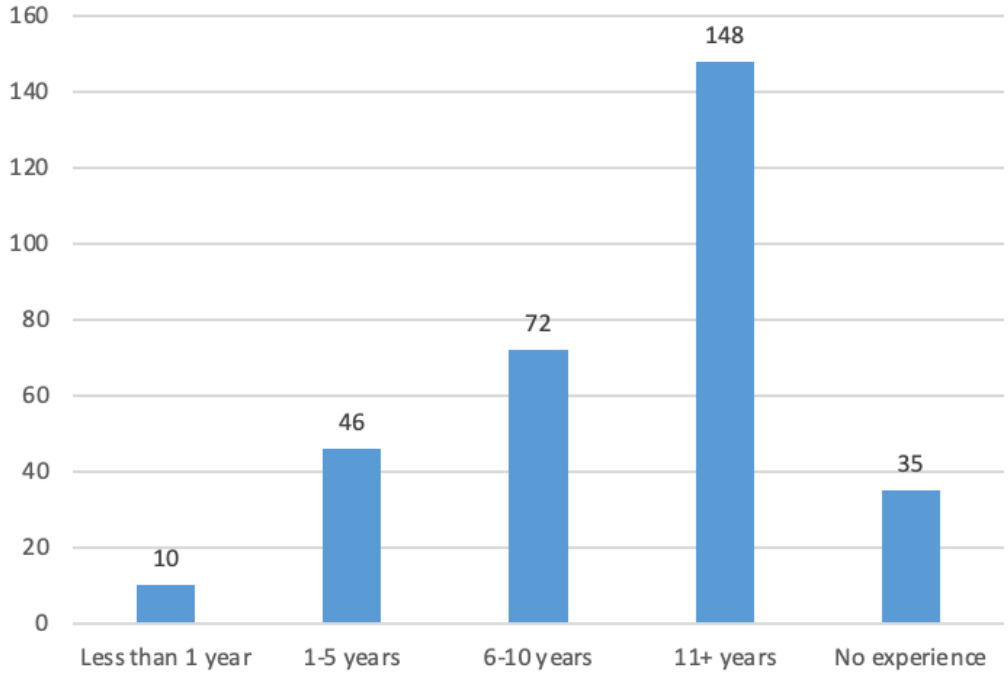


Figure 6

Ages Served

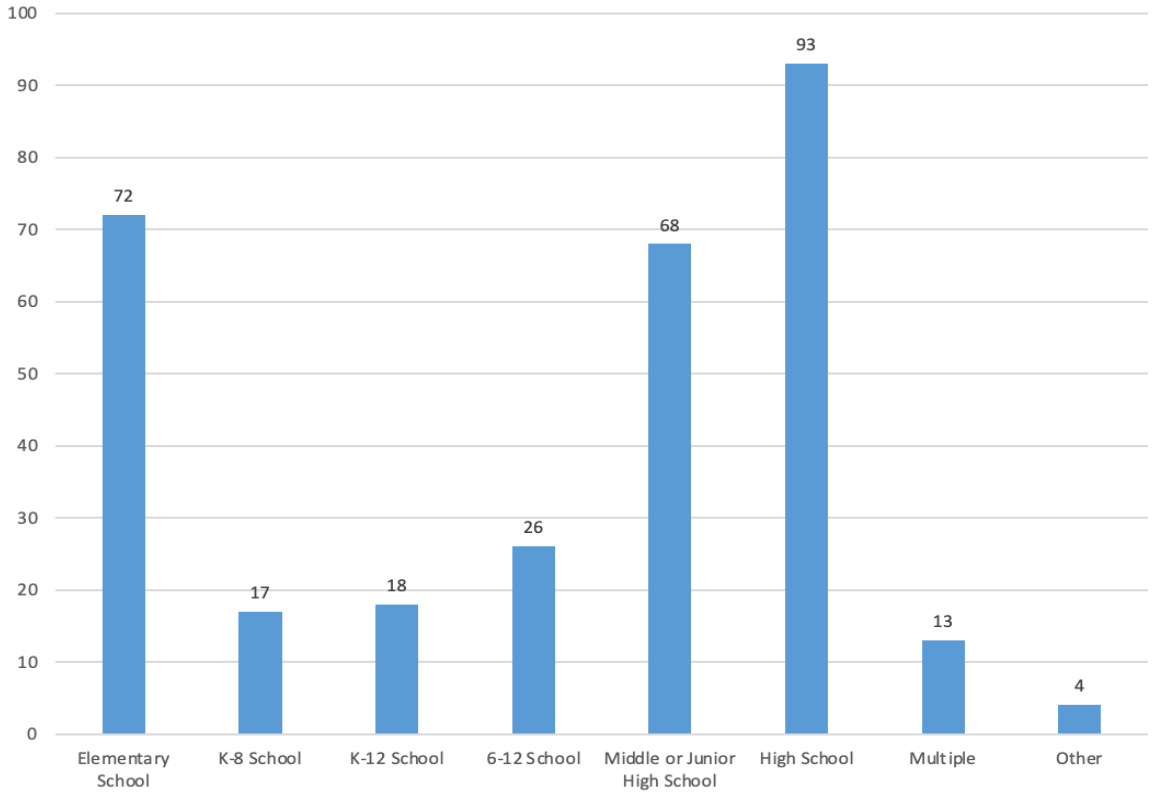


Figure 7

Fixed or Flexible Schedule

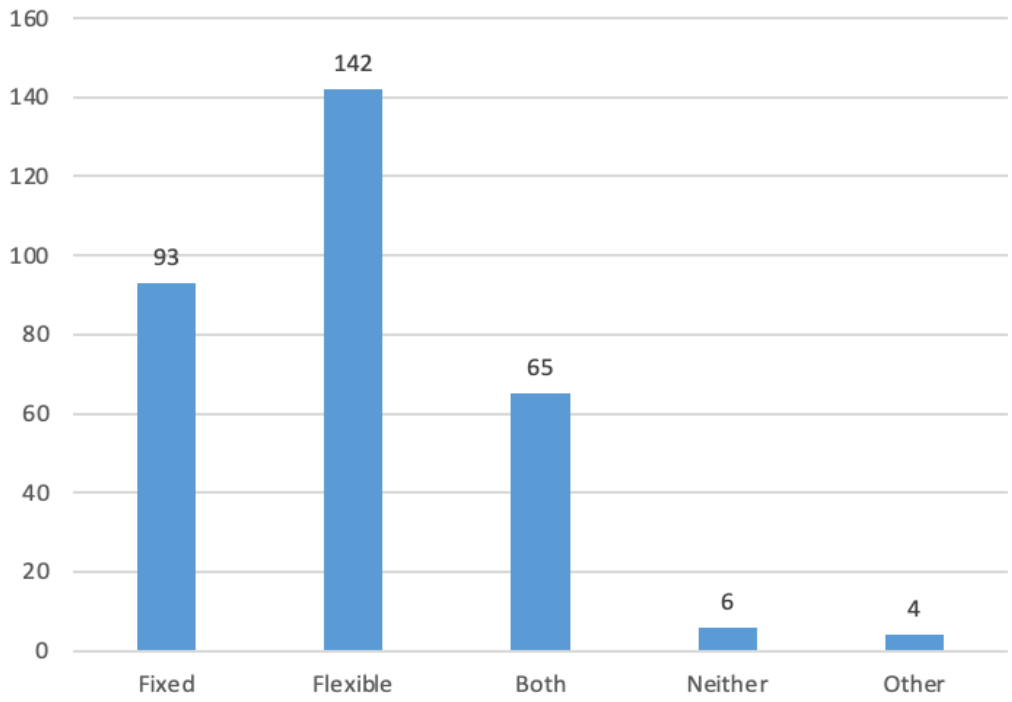


Figure 8

Familiarity with ISTE Standards

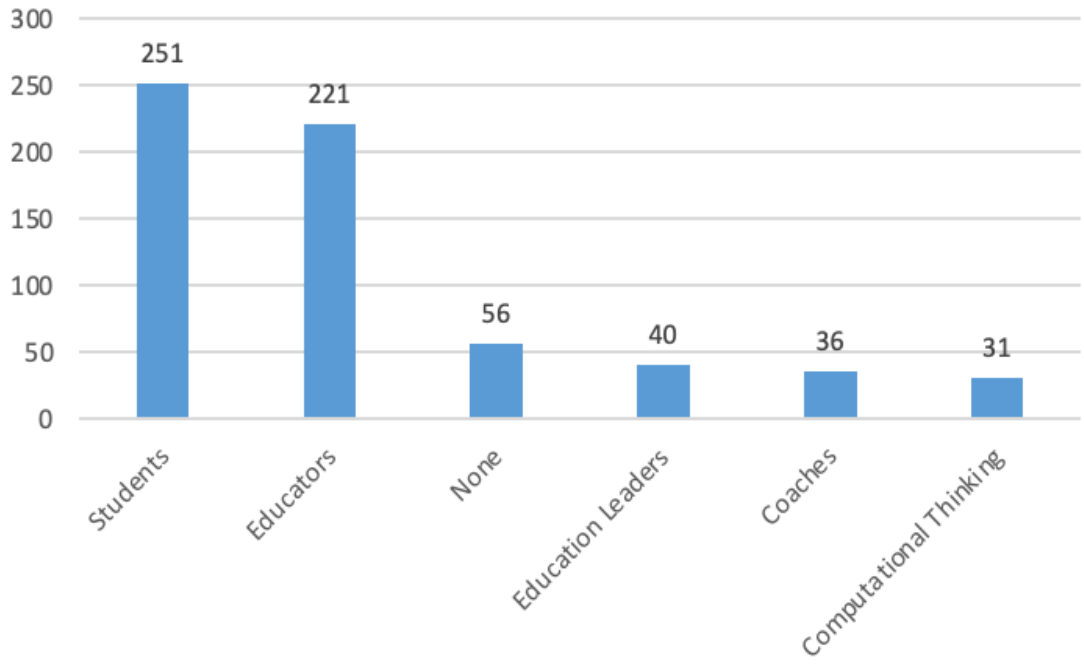


Figure 9

Interest Level in EdTech Coaching Responsibilities

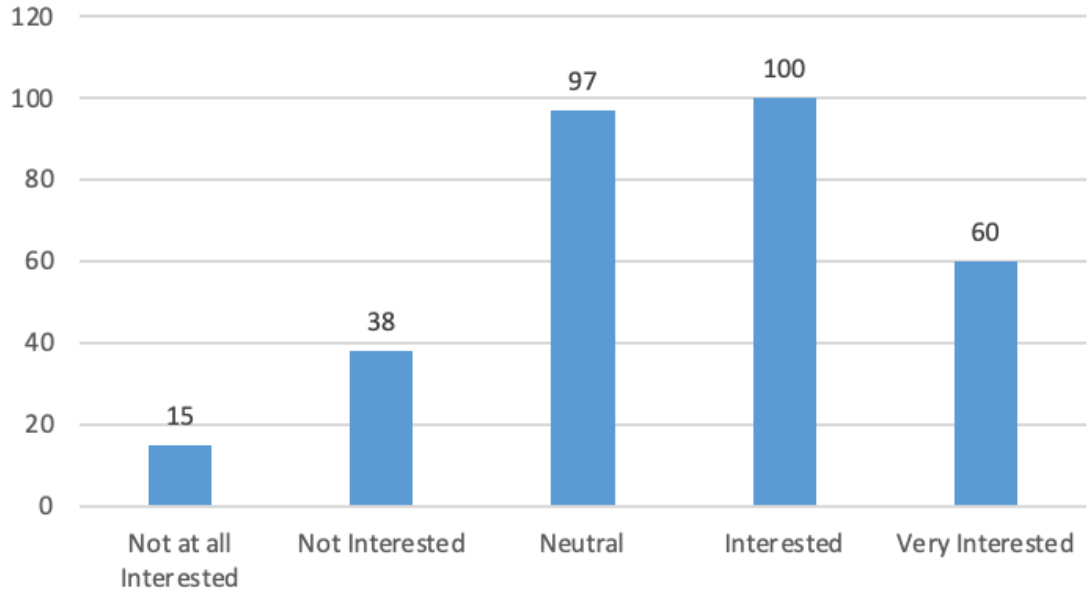
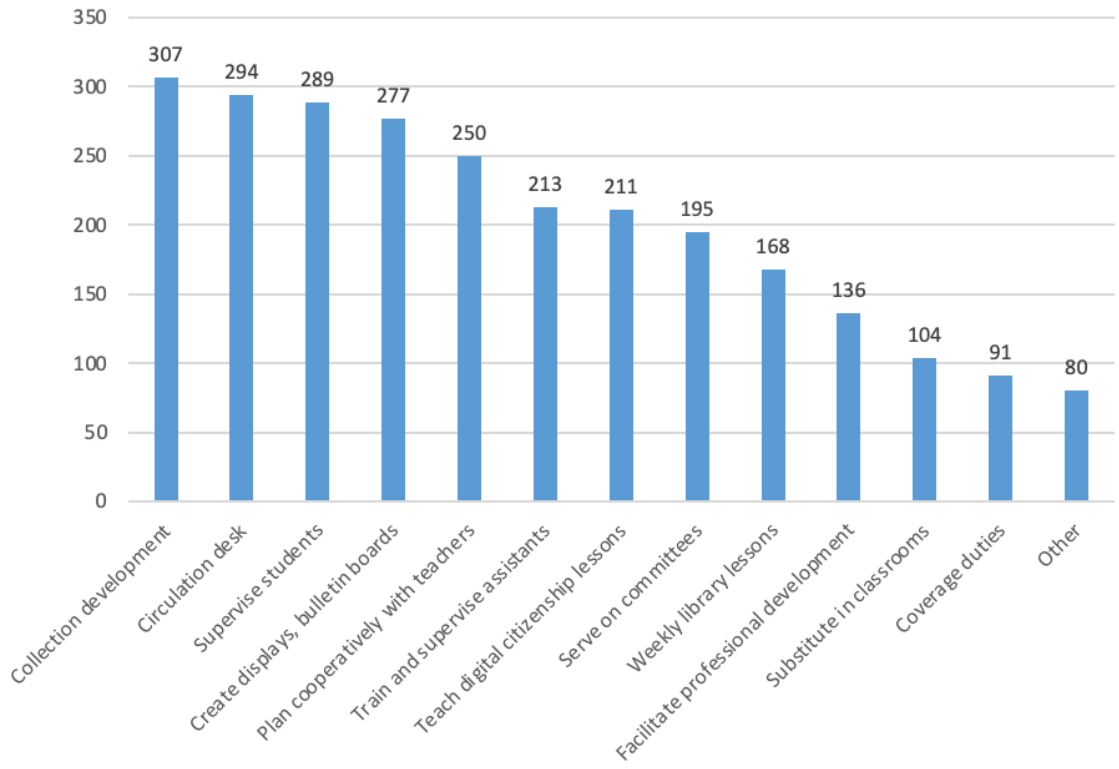


Figure 10

Primary Responsibilities of Current Position



Quantitative Data Analysis

Quantitative data was analyzed using IBM SPSS Statistics 29 software. Different statistical analyses were required to answer the three quantitative research questions in this study: (a) descriptive statistics, (b) one-way analysis of variance (ANOVA), (c) one-way multivariate analysis of variance (MANOVA), and (d) discriminant function analysis. For all tests, an alpha level of .05 was determined to measure statistical significance (Field, 2018).

Descriptive statistics were used to examine survey participants and included the following variables: mean scores of the "I can" ISTE Standards for Coaches indicators for each of the seven individual standards, mean scores for the overall ISTE Standards for Coaches combined, school librarian qualification, interest in adding EdTech coaching responsibilities, and outdated or unnecessary responsibilities. The descriptive statistics also included measures of central tendency and variability for several variables, specifically means and standard deviations.

Means and standard deviations were used to answer the first research question, "What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills?" By looking at the mean scores for each of the seven individual ISTE Standards for Coaches and the mean scores for the overall ISTE Standards for Coaches, it was determined that a higher mean score corresponded with a stronger level of perceived self-efficacy participants had for each standard and as an EdTech coach.

For research question one, construct means were computed for each of the seven categories of the ISTE Standards for Coaches to determine participants' mean scores in each of these areas, as well as for overall self-efficacy for the ISTE Standards for

Coaches to determine participants' overall confidence in their ability to perform the actions described in the ISTE Standards for Coaches. The construct means were developed through SPSS by combining respondents' Likert-scale responses for each indicator and creating a new mean score for each participant for each of the seven standards and an overall score for all standards combined. From this, means and standard deviations were calculated.

For research question two, "Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications?" a one-way ANOVA was used to analyze the data for this question because it is appropriate to determine whether there are any statistically significant differences between the means of two or more independent groups. The variables for this research question included the means of the individual and overall ISTE Standards for Coaches, and the groups were based on school librarian qualification. The data for this question comprised both categorical (qualification) and interval (mean scores) data. To control for Type I/Type II error for this question, power analysis was performed in G*Power Version 3.1.9.6 (Faul et al., 2007; Faul et al., 2009). To achieve a medium effect size (d = .25) and 95% power, which is considered acceptable for social science research, a total sample size of 252 was required. The survey results in this study yielded a total sample size of 311 participants, which met this threshold.

The necessary assumption checks were performed before running the one-way ANOVA for research question two. Those assumptions included: (a) one dependent variable that is measured on a continuous scale, (b) one independent variable that consists of two or more categorical, independent groups, (c) independence of observations,

meaning the participants cannot be a member of more than one group, (d) no significant outliers, (e) dependent variable should be approximately normally distributed, and (f) there is homogeneity of variances, meaning the variance is equal in each group of the independent variable (Laerd Statistics, 2018). Although there was concern with the normality of some of the data, including outliers and unequal group sizes, which will be addressed in Chapter 4: Results, there was justification to continue with statistical analyses for research question two.

Following the ANOVA, a one-way MANOVA was used to analyze the data for this question because it is appropriate to determine whether there are any statistically significant differences between the means of two or more independent groups with two or more dependent variables. An alternative to the one-way MANOVA would be running a one-way ANOVA for each dependent variable. Unfortunately, conducting multiple one-way ANOVAs increases the likelihood of introducing a Type I error. In addition, numerous one-way ANOVAs cannot determine if the independent variables are related to the combinations of the dependent variables. In contrast, the one-way MANOVA can help provide this insight (Warne, 2014).

Before running the one-way MANOVA, assumptions tests were run. Those assumptions included: (a) two or more dependent variables that are measured on a continuous scale, (b) one independent variable that consists of two or more categorical, independent groups, (c) independence of observations, meaning the participants cannot be a member of more than one group, (d) no significant outliers, (e) multivariate normality, meaning the variables are normally distributed, (f) no multicollinearity, meaning the dependent variables are moderately correlated with each other, (g) linear

relationship between the dependent variables for each group of the independent variable, (h) adequate sample size, (i) homogeneity of variance-covariance matrices, meaning there are similar variances and covariances, and (j) homogeneity of variances, meaning there are equal variances between the groups of the independent variable (Laerd Statistics, 2018). Although there was concern with the normality of some of the data, including outliers and unequal group sizes, which will be addressed in Chapter 4: Results, there was justification to continue with statistical analyses for research question two.

Following the MANOVA, a discriminant function analysis was used as a post hoc test to determine the functions that distinguish the qualification groups from one another on dependent variable scores (Warne, 2014). The ANOVA and MANOVA use categorical independent variables and continuous dependent variables. In contrast, discriminant function analysis uses continuous independent variables and categorical dependent variables, so it is essentially MANOVA in reverse. Discriminant function analysis can predict group membership and find the parameters that divide the groups by identifying one or more linear combinations of the variables (Huberty & Olejnik, 2006). Discriminant function analysis separates samples into ≥ 2 classes based on the distance between class means and variance within each class. Discriminant function analysis utilizes the assumption checks from the original one-way MANOVA analysis and does not require further assumption testing.

For research question three, “Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)?” a one-way ANOVA was used to analyze the data for this question because it is appropriate to determine whether there are any statistically significant

differences between the means of two or more independent groups. The variables for this research question included the means of the individual and overall ISTE Standards for Coaches were used, and the groups were based on the age of students served. Similar to research question two, the data for this question comprises both categorical (ages served) and interval (mean scores) data. To control for Type I/Type II errors for this question, power analysis was performed in G*Power Version 3.1.9.6 (Faul et al., 2007). To achieve a medium effect size (d = .25) and 80% power, a total sample size of 240 was required. The survey results in this study yielded a total sample size of 311 participants, which meets this threshold.

The necessary assumption checks were performed before running the one-way ANOVA for research question three. Those assumptions included: (a) one dependent variable that is measured on a continuous scale, (b) one independent variable that consists of two or more categorical, independent groups, (c) independence of observations, meaning the participants cannot be a member of more than one group, (d) no significant outliers, (e) dependent variable should be approximately normally distributed, and (f) there is homogeneity of variances, meaning the variance is equal in each group of the independent variable (Laerd Statistics, 2018). Although there was concern with the normality of some of the data, including outliers and unequal group sizes, which will be addressed in Chapter 4: Results, there was justification to continue with statistical analyses for research question three.

Similar to research question two, the one-way ANOVA was followed by a one-way MANOVA to provide additional information. Before running the one-way MANOVA, assumptions tests were run. Those assumptions included: (a) two or more

dependent variables that are measured on a continuous scale, (b) one independent variable that consists of two or more categorical, independent groups, (c) independence of observations, meaning the participants cannot be a member of more than one group, (d) no significant outliers, (e) multivariate normality, meaning the variables are normally distributed, (f) no multicollinearity, meaning the dependent variables are moderately correlated with each other, (g) linear relationship between the dependent variables for each group of the independent variable, (h) adequate sample size, (i) homogeneity of variance-covariance matrices, meaning there are similar variances and covariances, and (j) homogeneity of variances, meaning there are equal variances between the groups of the independent variable (Laerd Statistics, 2018). Although there was concern with the normality of some of the data, including outliers and unequal group sizes, which will be addressed in Chapter 4: Results, there was justification to continue with statistical analyses for research question three.

As with research question two, a discriminant function analysis was used as a post hoc test following the MANOVA for research question three.

Qualitative Data Analysis

Qualitative methods were used to answer the fourth research question, “Are school librarians interested in incorporating the role of EdTech coach into their current position?” and the fifth research question, “What responsibilities do school librarians need to give up to manage their workload?” The data for these questions was harvested from the participant responses to the five open-ended survey questions designed for this purpose. The researcher and an independent coder performed the data analysis. The independent coder was a doctoral graduate from the School of Education at the same

institution as the researcher and was aware of the purpose of the study and the hypotheses for the two qualitative research questions.

Qualitative data was analyzed using the Delve Tool (Twenty to Nine LLC, 2023), an online qualitative research software used to code and analyze data. Delve was used to explore the data collected for this study's two qualitative research questions. Coding is the process of organizing open-ended survey responses into segments before determining the meaning of the data (Rossman & Rallis, 2017). Qualitative coding allows researchers to interpret and organize survey responses and interpretations into meaningful categories and theories (Creswell & Creswell, 2018). Analyzing qualitative data starts with open coding, where the researcher is open to anything that might reveal itself in the data (Merriam, 2009). These codes help to construct categories. After coding the data, the researcher groups and categorizes the codes into like codes. This process of sorting items is called axial coding (Corbin & Strauss, 2007).

For the first coding round, participants' answers to the five open-ended survey questions were uploaded into the Delve data analysis application and organized by survey question. From there, each participant's response was broken into excerpts, and those excerpts were coded. The codes were not predetermined; they were developed as the excerpts were read, and similar responses emerged naturally. For the second coding round, codes were organized into similar categories within Delve. The researcher and independent coder organized the codes into categories for one qualitative survey question separately and then switched files to perform axial coding for the other question. The researcher and independent coder met to discuss their differences and determine the best fit for any excerpts tagged with multiple categories. Finally, the excerpts that supported

each category were synthesized into a composite narrative. This narrative is presented in Chapter 4: Results.

Because of the self-report nature of the data in this study and the subjectivity of the analysis and interpretation by the researcher and independent coder (Creswell & Creswell, 2018), steps were taken to increase the trustworthiness of the findings, including triangulating quantitative and qualitative results, providing a "rich, thick description" of the experiences of the survey participants, and including "negative or discrepant information"(Creswell & Creswell, 2018, pp. 200-201).

Summary

An exploratory mixed-methods research design was used, which included survey development and validation, as well as the collection, analysis, and synthesis of quantitative and qualitative data to answer the five research questions. These methods helped to fulfill the purpose of this study, which is to examine the role of librarians as EdTech coaches through the lens of the self-efficacy theory (Bandura, 1977) and the ISTE Standards for Coaches. The results of the data analysis are presented in Chapter 4: Results.

Chapter 4: Results

The purpose of this chapter is to summarize the results of the quantitative and qualitative data analyses described in Chapter 3: Methods. The results are presented in the order of the research questions:

1. What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills?

H_1: School librarians will have a high level of self-efficacy as EdTech coaches.

H_0: School librarians will not have a high level of self-efficacy as EdTech coaches.

2. Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications.

3. Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)?

H_1: There is a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

H_0: There is not a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High).

4. Are school librarians interested in incorporating the role of EdTech coach into their current position?

5. What responsibilities do school librarians need to give up to manage their workload?

Quantitative data was analyzed using IBM SPSS Statistics 29 software. Different statistical analyses were used to inspect the data collected for this study's three quantitative research questions, including descriptive statistics, ANOVA, MANOVA, and discriminant function analysis.

The one-way ANOVA examines if there are any statistically significant differences between the means of two or more independent groups (Field, 2013). The one-way ANOVA controls for errors, so the chance of incorporating Type I errors remains low (Laerd Statistics, 2018). The one-way MANOVA extends the one-way ANOVA to include two or more dependent variables (O'Brien & Kaiser, 1985). The one-way ANOVA assesses differences in groups for one continuous variable, and the one-way MANOVA assesses differences in groups for multiple continuous variables. Essentially, the one-way MANOVA combines two or more dependent variables to form a new dependent variable to emphasize the differences between the groups of the independent variable (Field, 2013). With this new composite variable, statistical significance is tested between the groups.

Discriminant function analysis is helpful as a post-hoc test to the one-way MANOVA to see how groups are separated (or discriminated) based on several predictors. Discriminant function analysis examines which variables are the best predictors of a particular outcome. It is conceptually the one-way MANOVA reversed. In a one-way MANOVA, the independent variables are the groups, and the dependent variables are the predictors, whereas, in discriminant function analysis, the independent

variables are the predictors, and the dependent variables are the groups (Poulsen & French, 2008). Discriminant function analysis helps determine if a combination of variables can be used to predict group membership.

For all statistical tests, an alpha level of .05 was determined to measure statistical significance (Field, 2013.

Normality Tests

Before statistical analyses were conducted, construct means were developed through SPSS by combining respondents' Likert-scale responses for each indicator and creating a new mean score for each participant for each of the seven standards and an overall score for all standards combined. From this, means and standard deviations were calculated. From there, normality tests were run on the data because normally distributed data is a common assumption for many statistical tests (Field, 2013).

Normality tests were run with the following variables entered: the self-efficacy for each of the seven ISTE Standards for Coaches (2019), overall self-efficacy for the ISTE Standards for Coaches, EdTech interest, school librarian qualification, and ages of students served.

In box plots, data points more than 1.5 box lengths from the edge of their box are considered outliers, and data points more than three box lengths away from the edge of their box are considered extreme outliers (Field, 2013). There were seven outliers for Standard 1: Change Agent, one of which was an extreme outlier; there were six outliers for Standard 2: Connected Learner; there were three outliers each for Standard 3: Collaborator and Standard 4: Learning Designer, there were eight outliers for Standard 5: Professional Learning Facilitator; there were three outliers for Standard 6: Data-Driven

Decision-Maker; there were six outliers for Standard 7: Digital Citizen Advocate, one of which was an extreme outlier; and there were four outliers for the overall mean score of all ISTE Standards for Coaches combined, as assessed by inspection of the boxplots. Outliers can arise due to data entry errors or sampling problems. However, natural variation can also produce outliers and those outliers are more common in larger sample sizes (Field, 2013). Outliers can be addressed by transforming the affected variables or including them in the analysis in their original state (Laerd Statistics, 2018). Outliers were further explored and seven of those outliers came from the same respondent. That person selected strongly disagree for every indicator within each of the seven individual standards. Those quantitative results were supported by their written responses stating, “I did not sign up [to be an EdTech coach], I'm not trained for that, & my district doesn't give us appropriate & effective training to do that.”

Another respondent was responsible for seven outliers, and they, too, selected strongly disagree for all indicators and provided feedback that supported their quantitative results:

> Unfortunately, I spend most of time fixing laptops and loaning out laptops to supplement a lack of IT help. So, computer science not instructional technology should be studied [...] People need to realize that most states require school librarians to be certified teachers too, but most librarians are only being used to help IT.

Transforming outliers is done to correct for distributional problems or to account for a lack of linearity or unequal variances (Field, 2013). Some common data transformations include log transformation, which can correct for positive skew, positive kurtosis,

unequal variances, and lack of linearity and is useful for reducing the right tail of distribution; square root transformation, which can correct for positive skew, positive kurtosis, unequal variances, and lack of linearity, and is useful for bringing large scores closer to the center; reciprocal transformation, which can correct for positive skew, positive kurtosis, and unequal variances and is useful for reducing the impact of large scores but it will also reverse the scores; and reverse score transformation, which can correct for negative skew and is useful for correcting negatively skewed data, for samples with zeros and negative numbers as part of their scores.

For this study, there was no multicollinearity, meaning the dependent variables were moderately correlated with each other and there was a linear relationship between the dependent variables, therefore, if outliers would have been transformed, the square root transformation would have been a good option (Field, 2013). However, because the qualitative data so strongly supported the quantitative scores, the outliers were retained to avoid artificially skewing the results in a positive direction. Both quantitative and qualitative data showed that there is a portion of the sample population who are not interested in EdTech coaching.

Mean scores for school librarian qualification, ages of students served, ISTE Standards for Coaches 1-6, and overall self-efficacy for the ISTE Standards for Coaches were normally distributed with skewness and kurtosis z-scores within an acceptable ±2.58 boundary. Skewness and kurtosis are used to ensure that the distribution of scores is approximately normal. Positive skewness values can indicate too many low scores in the distribution, and too many negative values can mean too many high scores. Positive kurtosis values can indicate a pointy and heavy-tailed distribution; negative values can

mean the scores have a flat and light-tailed distribution (Field, 2018). Mean scores were not normally distributed for ISTE Standard for Coaches 7: Digital Citizen Advocate, with skewness of -1.49 (*SE* = .138) and kurtosis of 5.45 (*SE* = 0.276). With a sample of *N* = 311, it is important to remember that skewness and kurtosis are not always helpful for large sample sizes because they will often show as significant even when the skew and kurtosis are not too different from normal (Field, 2018). None of the variables were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). No transformations were performed, and statistical analysis continued as planned for this dataset.

Research Question One

Research question one: What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills? To answer this question, descriptive statistics were run on the mean scores of the individual ISTE Standards for Coaches and the overall mean score of all standards combined. Table 2 shows the results of the descriptive statistics.

Table 2

Mean Scores of Overall and Individual ISTE Standards for Coaches

ISTE Standard for Coaches	*M*	*SD*
Standard 1: Change Agent	3.98	0.74
Standard 2: Connected Learner	4.14	0.74
Standard 3: Collaborator	4.13	0.69
Standard 4: Learning Designer	3.95	0.80

Standard 5: Professional Learning Facilitator	3.67	0.89
Standard 6: Data-Driven Decision-Maker	3.60	0.91
Standard 7: Digital Citizen Advocate	4.26	0.63
Overall Standards	3.98	0.66

Note. $N = 311$.

The results revealed that the school librarians ($N = 311$) had an overall mean score of $M = 3.98$ ($SD = 0.66$). For the individual ISTE Standards for Coaches, the highest mean score was for Standard 7: Digital Citizen Advocate, $M = 4.26$ ($SD = 0.63$). The next highest mean score was for Standard 2: Connected Learner, $M = 4.14$ ($SD = 0.74$); followed by Standard 3: Collaborator, $M = 4.13$ ($SD = 0.69$); Standard 1: Change Agent, $M = 3.98$ ($SD = 0.74$); Standard 4: Learning Designer, $M = 3.95$ ($SD = 0.80$); Standard 5: Professional Learning Facilitator, $M = 3.67$ ($SD = 0.89$); and Standard 6: Data-Driven Decision-Maker, $M = 3.60$ ($SD = 0.91$).

Summary of Findings for Research Question One

The hypothesis for research question one was that school librarians will have a high level of self-efficacy as EdTech coaches. School librarians had an overall mean score of $M = 3.98$ ($SD = 0.66$); using the 5-point Likert scale where one is strongly disagree and five is strongly agree, the mean score would fall in the category of neither agree nor disagree, just slightly below agree. School librarians' mean scores of the individual standards of the ISTE Standards for Coaches fell between 3.60 and 4.26. The results showed that school librarians had a medium to high level of self-efficacy (as measured by their responses to the "I can" statements in the survey) as EdTech coaches.

Therefore, the researcher can reject the null hypothesis for this research question and accept the alternative hypothesis that school librarians will have a high level of self-efficacy as EdTech coaches. The possible implications of these findings will be discussed in Chapter 5: Discussion.

Research Question Two

Research question two: Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications? To answer the second research question, ANOVA, MANOVA, and discriminant function analysis were run on mean scores of both the individual ISTE Standards for Coaches as well as the overall mean score of all standards combined, along with the qualification as a school librarian for all participants. ANOVA was used because it is the appropriate statistical test to determine if there are any statistically significant differences between the means of two or more independent groups.

The necessary assumption checks were performed before running the one-way ANOVA for research question two. The first assumption is that the dependent variable is measured on a continuous scale. The dependent variable was the combined overall mean score of the ISTE Standards for Coaches. It was measured on a Likert scale from one to five, with one being strongly disagree and five being strongly agree. The second assumption is that one independent variable consists of two or more categorical, independent groups. Participants were classified into three groups: Master in Library Science (n = 196), school library endorsement (n = 78), and other, as described in Chapter 3: Methods (Figure 1; n = 37). The third assumption is independence of observations, meaning the participants cannot be members of more than one group.

Survey participants could only select one option for qualification, and those options made up the three groups. The fourth assumption is that there were no significant outliers. There were three outliers, all in the Master of Library Science group, none of which were extreme outliers. Two of the three outliers came from respondents who selected strongly disagree for every indicator, and their quantitative results were supported by their written responses. To avoid artificially skewing the results in a positive direction, and because the qualitative responses supported the quantitative data, a decision was made to retain the outliers.

The fifth assumption is that the dependent variable should be approximately normally distributed. Data was normally distributed for the other group, as assessed by the Shapiro-Wilk test ($p > .05$), but not normally distributed for the Master in Library Science or school library endorsement groups ($p < .001$, $p = .044$, respectfully). The sixth assumption was that there is homogeneity of variances, meaning the variance is equal in each group of the independent variable (Laerd Statistics, 2018). There was homogeneity of variances, as assessed by Levene's test for equality of variances ($p = .723$). A one-way ANOVA is considered "robust" to violations of normality (Laerd Statistics, 2018). Additionally, there was a rationale for not removing the outliers, as stated earlier. All other assumptions were met, so a decision was made to proceed with the one-way ANOVA.

A one-way ANOVA was conducted to determine if there was a difference in mean scores for groups of school librarians based on their qualifications. Mean scores were higher in the school library endorsement group ($M = 4.1$, $SD = 0.6$), followed by the other group ($M = 4.0$, $SD = 0.7$), and then the Master in Library Science group ($M = 3.9$,

SD = 0.7). Still, the difference between these groups was not statistically significant, $F(2, 308) = 1.751$, $p = .175$ (Table 3).

Table 3

Results of ANOVA for Self-Efficacy Based on School Librarian Qualification

Qualification	*M*	*SD*
Master in Library Science	3.93	0.68
School Library Endorsement	4.09	0.59
Other	4.02	0.60

Note. $p = .175$; $\eta^2 = .011$; $f(2, 311) = 1.751$.

The one-way ANOVA is an omnibus or combined test that looks at the big picture. It cannot tell researchers which specific groups were significantly different from each other, only that at least two groups were different (Laerd Statistics, 2018). Therefore, the one-way ANOVA was followed by a one-way MANOVA to provide additional information. While standard post hoc tests, such as the Tukey test, would help illustrate the differences, the one-way MANOVA provides more detailed information, mainly when multiple dependent variables (such as the seven individual ISTE Standards for Coaches) exist. One-way MANOVA is a one-way ANOVA that has been extended to be applied to studies with two or more dependent variables (Warne, 2014).

Before running the one-way MANOVA, additional assumption tests were run. The first assumption is that two or more dependent variables are measured on a continuous scale. The dependent variables were the mean scores of the seven individual ISTE Standards for Coaches. They were measured on a Likert scale from one to five,

with one being strongly disagree and five being strongly agree. The second assumption is that one independent variable consists of two or more categorical, independent groups. Participants were classified into three groups: Master in Library Science, school library endorsement, and other. The third assumption is independence of observations, meaning the participants cannot be members of more than one group. Survey participants could only select one option for qualification, and those options were for the three groups. The fourth assumption is that there were no significant outliers. There were 28 outliers in the Master of Library Science group across the seven individual ISTE Standards for Coaches, two of which were extreme outliers. Fourteen of the outliers in the Master of Library Science group came from two respondents; both participants selected strongly disagree for every indicator, and their quantitative results were supported by their written responses. There were seven outliers in the school library endorsement group and three outliers in the other group, none of which were extreme outliers. To avoid artificially skewing the results in a positive direction, and because the qualitative responses supported the quantitative data, a decision was made to retain the outliers.

The fifth assumption is there needs to be multivariate normality, meaning the variables are normally distributed. Data was normally distributed for Standard 1: Change Agent for the other group (p = .074), Standard 3: Collaborator for the other group (p = .062), and Standard 4: Learning Designer for the other group (p = .082), as assessed by Shapiro-Wilk test (p > .05). Data was not normally distributed for all other ISTE Standards for Coaches and qualification groups (p < .05). The sixth assumption is that there should be no multicollinearity, meaning the dependent variables are moderately correlated with each other. There was no multicollinearity, as assessed by Pearson

correlation (all greater than $r = .510$, $p < .001$). The seventh assumption is that there is a linear relationship between the dependent variables for each group of the independent variable. There was a linear relationship based on visual inspection of the scatterplot matrix for each independent variable group. The eighth assumption is that there is an adequate sample size. To control for Type I/Type II error for this question, power analysis was performed in G*Power Version 3.1.9.6 (Faul et al., 2007; Faul et al., 2009). To achieve a medium effect size ($d = .25$) and 95% power, which is considered acceptable for social science research, a total sample size of 252 was required. The survey results in this study yielded a total sample size of 311 participants, which met this threshold. The ninth assumption is that there is homogeneity of variance-covariance matrices, meaning there are similar variances and covariances. There was homogeneity of variance-covariances matrices, as assessed by Box's test of equality of covariance matrices ($p = .003$). The tenth and final assumption is that there is homogeneity of variances, meaning there are equal variances between the groups of the independent variable for each dependent variable (Laerd Statistics, 2018). There was homogeneity of variances, as assessed by Levene's test for equality of variances ($p > .05$). A one-way MANOVA is considered "robust" to violations of normality (Laerd Statistics, 2018). Additionally, there was a rationale for not removing the outliers. All other assumptions were met, so a decision was made to proceed with one-way MANOVA.

A one-way MANOVA was run to determine the effect of school librarian qualification on the mean scores for the seven ISTE Standards for Coaches. Participants with a school library endorsement rated their overall self-efficacy for the ISTE Standards for Coaches higher than those with a qualification of other, followed by participants with

a Master in Library Science (*M* = 4.1, *SD* = .595; *M* = 4.02, *SD* = .599 and *M* = 3.9, *SD* = .683, respectively). There was a statistically significant difference between the groups on the combined dependent variables, which are the seven individual ISTE Standards for Coaches, $F(14, 602) = 1.763$, $p = .041$; Pillai's Trace = .079; partial $\eta^2 = .039$. Further inspection of the individual standards shows no statistically significant difference in the mean scores of Standard 1: Change Agent between school librarian qualifications (Tables 4 and 5), $F(2, 307) = .987$, $p = .374$; partial $\eta^2 = .006$, Standard 2: Connected Learner $F(2, 307) = 1.70$, $p = .184$; partial $\eta^2 = .011$, Standard 3: Collaborator $F(2, 307) = .609$, $p = .544$; partial $\eta^2 = .004$, Standard 4: Learning Designer $F(2, 307) = 1.498$, $p = .225$; partial $\eta^2 = .010$, Standard 5: Professional Learning Facilitator $F(2, 307) = 2.828$, $p = .061$; partial $\eta^2 = .018$, and Standard 7: Digital Citizen Advocate $F(2, 307) = .080$, $p = .924$; partial $\eta^2 = .001$. There was, however, a statistically significant difference in the mean scores of Standard 6: Data-Driven Decision-Maker between school librarian qualifications, $F(2, 307) = 5.464$, $p = .005$; partial $\eta^2 = .034$. These results suggest that qualification could impact how school librarians rate themselves on Standard 6: Data-Driven Decision-Maker.

Table 4

Means of the Individual ISTE Standards for Coaches Based on Qualification

	Master in Library Science		School Library Endorsement		Other	
	M	*SD*	*M*	*SD*	*M*	*SD*
Standard 1: Change Agent	3.94	.779	4.08	.655	4.01	.688

Standard 2: Connected Learner	4.12	.760	4.26	.675	4.01	.760
Standard 3: Collaborator	4.09	.732	4.20	.619	4.15	.614
Standard 4: Learning Designer	3.90	.815	4.08	.777	3.96	.711
Standard 5: Professional Learning Facilitator	3.58	.894	3.85	.849	3.75	.928
Standard 6: Data-Driven Decision-Maker	3.47	.952	3.77	.785	3.91	.852
Standard 7: Digital Citizen Advocate	4.26	.660	4.29	.620	4.26	.509

Note. $df(2, 307)$.

Table 5

Results of MANOVA Based on School Librarian Qualification

	F	*p*	η2
Standard 1: Change Agent	.987	.374	.006
Standard 2: Connected Learner	1.700	.184	.011

Standard 3: Collaborator	.609	.544	.004
Standard 4: Learning Designer	1.498	.225	.010
Standard 5: Professional Learning Facilitator	2.828	.061	.018
Standard 6: Data-Driven Decision-Maker	5.464	.005	.034
Standard 7: Digital Citizen Advocate	.080	.924	.001

Note. $df(2, 307)$.

Tukey post-hoc tests showed that for Standard 6: Data-Driven Decision-Maker, the school library endorsement group had a statistically significantly higher mean score than participants in the Master in Library Science group ($p = .037$). Participants in the other group also had a statistically significantly higher mean score than the Master in Library Science group ($p = .022$).

In addition to the Tukey post hoc test, discriminant function analysis was also used as a post hoc test following the MANOVA. MANOVA uses categorical independent variables and continuous dependent variables, whereas discriminant function analysis uses continuous independent variables and categorical dependent variables. Discriminant

function analysis can predict group membership and find the parameters that divide the groups by identifying one or more linear combinations of the variables (Huberty & Olejnik, 2006). For research question two, discriminant function analysis examines whether the seven predictors, the individual standards configured as a composite score, predict the school librarian qualification group classification. Discriminant function analysis utilizes the assumption checks from the original one-way MANOVA analysis and does not require further assumption testing.

The discriminant analysis was conducted to predict the qualification of survey participants. Predictor variables were mean scores of the individual ISTE Standards for Coaches. Significant mean differences were observed for only one variable, Standard 6: Data-Driven Decision-Maker (p = .005). While the log determinants were fairly similar (Table 6), Box's M indicated that the assumption of quality of covariance matrices was violated (p = .003). However, this problem is not regarded as serious, given the large sample size. The discriminant function revealed a significant association between groups and predictors.

Table 6

Results of Box's Test of Quality of Covariance Matrices Based on Qualification

Qualification	Log Determinant
Master in Library Science	-9.547
School Library Endorsement	-10.580
Other	-12.147

Pooled Within-Groups	-9.804

Note. $F(56, 37342) = 1.592$, $p = .003$; Box's M = 94.257.

The first function explained 70.8% of the variance, canonical $R^2 = .06$. In contrast, the second explained only 29.2%, canonical $R^2 = .02$. In combination, these discriminant functions significantly differentiated the groups, $\Lambda = 0.92$, $\chi^2(14) = 24.43$, $p = .041$, but removing the first function indicated that the second function did not significantly differentiate the groups, $\Lambda = 0.98$, $\chi^2(6) = 7.21$, $p = .302$. Closer analysis of the structure matrix revealed only two significant predictors, namely Standard 6: Data-Driven Decision-Maker (.772) and Standard 5: Professional Learning Facilitator (.456). The cross-validated classification showed that overall, 62.6% of cases were correctly classified.

Another way to interpret the discriminant analysis results was to describe each group in terms of its profile, using the group means of the predictor variables (Burns & Burns, 2008). These group means are called centroids (Figures 11-13). The survey participants with mean scores near the centroid are predicted to belong to that group. Overall, the seven predictors, the individual ISTE Standards for Coaches, predict group classification of school librarian qualification.

Figure 11

Master in Library Science Group Canonical Discriminant Functions Plot

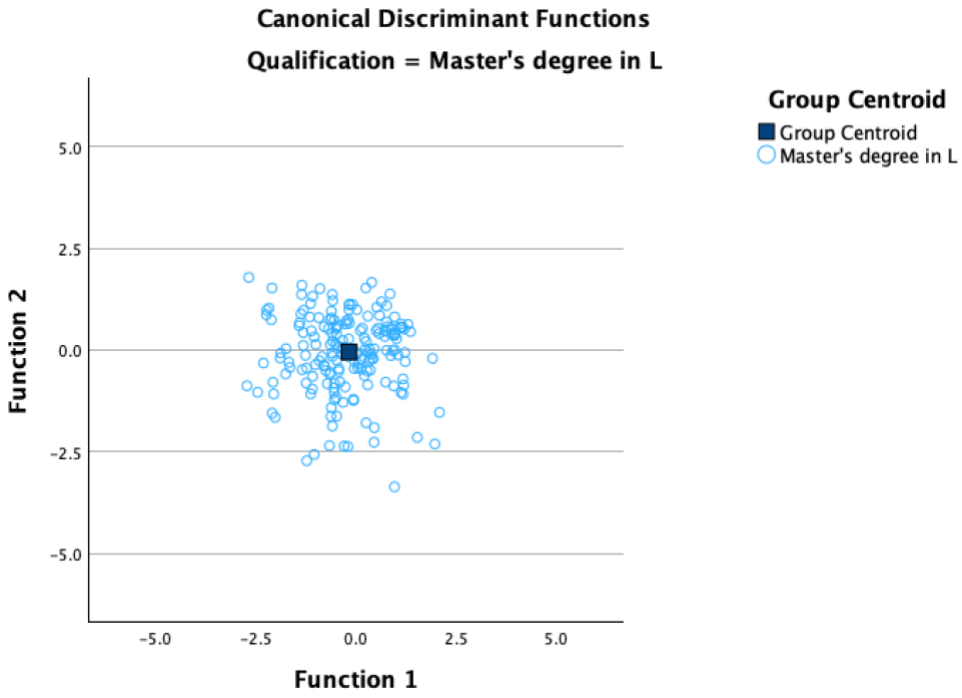


Figure 12

School Library Endorsement Group Canonical Discriminant Functions Plot

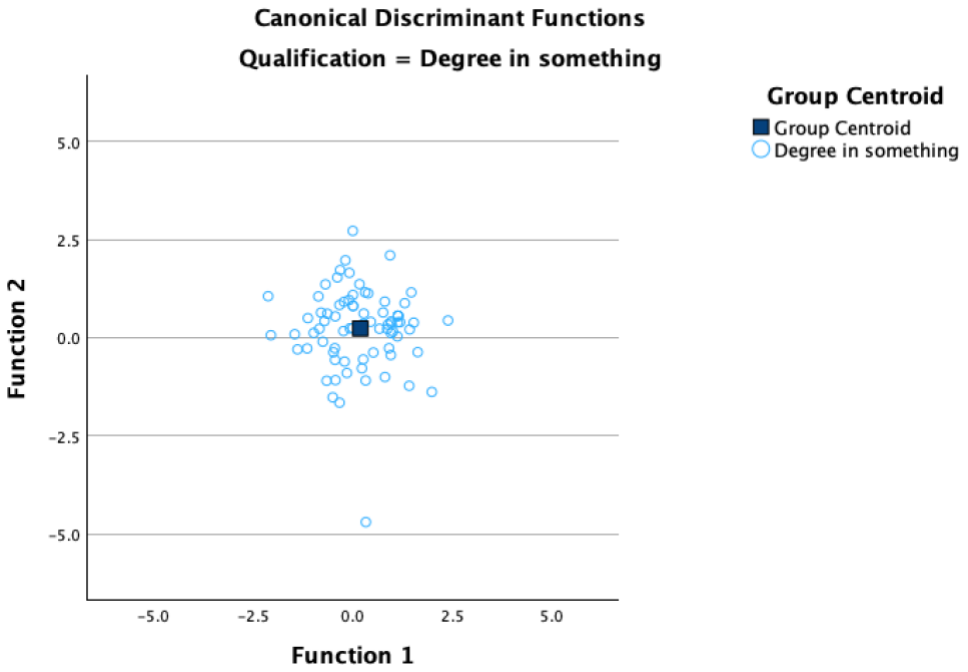
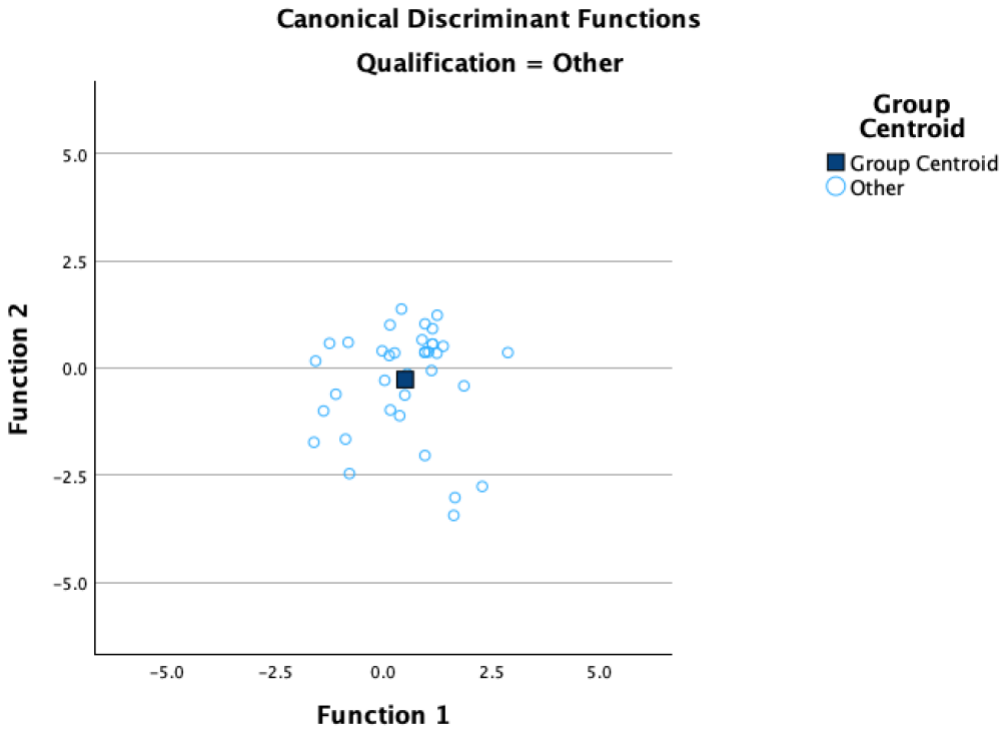


Figure 13

Other Qualification Group Canonical Discriminant Functions Plot



Summary of Findings for Research Question Two

The hypothesis for research question two was that there is a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications. The initial one-way ANOVA results showed no statistically significant difference between the groups. However, there was a statistically significant difference between the groups for the combined variable on the follow-up one-way MANOVA test. Furthermore, discriminant function analysis results supported the results of the MANOVA and revealed additional details about the statistically significant differences between the groups. Therefore, the researcher can reject the null hypothesis for this research question and accept the alternative hypothesis that there is a difference in self-efficacy with

EdTech coaching among school librarians based on their qualifications. The possible implications of these findings will be discussed in Chapter 5: Discussion.

Research Question Three

Research question three: Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)? To answer the third research question, ANOVA, MANOVA, and discriminant function analysis were run on mean scores of both the individual ISTE Standards for Coaches as well as the overall mean score of all standards combined, along with the ages served for all participants. For the first phase of this question, ANOVA was used because it is the appropriate statistical test to determine if there are any statistically significant differences between the means of two or more independent groups.

The necessary assumption checks were performed before running the one-way ANOVA for research question three. The first assumption is that the dependent variable is measured on a continuous scale. The dependent variable was the combined ISTE Standards for Coaches' overall mean score. It was measured on a Likert scale from one to five, with one being strongly disagree and five being strongly agree. The second assumption is that one independent variable consists of two or more categorical, independent groups. Participants were classified into eight groups: elementary school (n = 70), K-8 school (n = 17), K-12 school (n = 17), 6-12 school (n = 20), middle school (n = 62), high school (n = 93), multiple ages, as described in Chapter 3: Methods (Figure 6) (n = 5), and other, as described in Chapter 3: Methods (Figure 6) (n = 27). The third assumption is independence of observations, meaning the participants cannot be members of more than one group. Survey participants could only select one option for the ages

served, and those options were the eight groups. The fourth assumption is that there were no significant outliers. There were four outliers: one in the elementary group, two in the K-12 group, and one in the high school group. Two of the four outliers came from respondents who selected Strongly Disagree for every indicator, and their quantitative results were supported by their written responses. To avoid artificially skewing the results in a positive direction, and because the qualitative responses supported the quantitative data, a decision was made to retain the outliers.

The fifth assumption is that the dependent variable should be approximately normally distributed. Data was normally distributed for the K-8 school, K-12 school, 6-12 school, middle school, multiple, and other groups, as assessed by the Shapiro-Wilk test ($p > .05$) but not normally distributed for the elementary or high school groups ($p = .001$, $p < .001$, respectfully). The sixth assumption was that there is homogeneity of variances. There was homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p = .050$)—the Levene test checks for equal variances in the groups. The mean values of the individual groups do not influence the result of the Levene test, only the variance within the groups. Levene's test is stable against violations of normal distribution, and with some groups not being normally distributed in this study, Levene's test was ideal for testing the equality of variances. One-way ANOVA is considered "robust" to violations of normality (Laerd Statistics, 2018). Additionally, there was a rationale for not removing the outliers. All other assumptions were met, so a decision was made to proceed with one-way ANOVA.

A one-way ANOVA was conducted to determine if there was a difference in mean scores for groups of school librarians based on ages served. Mean scores were

highest in the 6-12 school group (M = 4.14, SD = 0.6), followed by the K-8 school group (M = 4.13, SD = 0.6), then the high school group (M = 4.11, SD = 0.7), followed by the middle school group (M = 4.03, SD = 0.5), then the multiple ages group (M = 3.91, SD = 0.6), followed by the K-12 school group (M = 3.88, SD = 0.4), then the elementary school group (M = 3.82, SD = 0.7), and lastly the other group (M = 3.71, SD = 0.8), and the differences between the groups is statistically significant, $F(7, 303) = 2.226$, $p = .032$ (Table 6).

Table 7

Results of ANOVA for School Librarian Self-Efficacy Based on Ages Served

Ages Served	*M*	*SD*
Elementary	3.82	0.71
K-8	4.13	0.56
K-12	3.88	0.37
6-12	4.14	0.56
Middle	4.03	0.53
High	4.11	0.69
Multiple	3.91	0.62
Other	3.71	0.78

Note. $p = .032$; $\eta^2 = .049$; $f(7, 311) = 2.23$.

The one-way ANOVA does not show differences between the groups, only that a difference exists. To learn more about the differences between mean scores of the individual standards, the one-way ANOVA was followed by a one-way MANOVA. ANOVA examined the differences between one continuous dependent variable (overall mean score) and an independent group variable (eight groups based on ages served). MANOVA extends this by examining multiple dependent variables (each of the seven ISTE Standards for Coaches) and the independent group variable (ages served). In addition, MANOVA also bundles the dependent variables into a weighted composite variable.

Before running the one-way MANOVA, additional assumption tests were run. The first assumption is that two or more dependent variables are measured on a continuous scale. The dependent variables were the mean scores of the seven individual ISTE Standards for Coaches. They were measured on a Likert scale from one to five, with one being strongly disagree and five being strongly agree. The second assumption is that one independent variable consists of two or more categorical, independent groups. Participants were classified into eight groups: elementary, K-8, K-12, 6-12, middle, high school, multiple ages, and other. The third assumption is independence of observations, meaning the participants cannot be members of more than one group. Survey participants could only select one option for ages served and those options were the eight groups. The fourth assumption is that there were no significant outliers. There were 15 outliers in the elementary group across the seven individual ISTE Standards for Coaches, one of which was an extreme outlier. Six of those outliers came from the same respondent. There were 14 outliers for the K-12 group, seven of which were extreme outliers. There were ten

outliers for the high school group, none of which were extreme outliers. Seven of those outliers came from the same respondent. There were five outliers for the K-8 group, one of which was an extreme outlier. There were five outliers for the other group, none of which were extreme outliers. There were four outliers for the 6-12 and middle school groups, none of which were extreme outliers. Finally, there were two outliers for the multiple ages group, neither extreme.

The fifth assumption is that there needs to be multivariate normality, meaning the variables are normally distributed. Data was normally distributed for Standard 1: Change Agent for the K-12 (p = .181), 6-12 (p = .169), middle (p = .060), multiple (p = .857, and other (p = .274) groups. Data was normally distributed for Standard 2: Connected Learner for the K-8 (p = .077), K-12 (p = .118), and 6-12 (p = .085) groups. Data was normally distributed for Standard 3: Collaborator for 6-12 (p = .075), multiple (p = .429), and other (p = .259) groups. Data was normally distributed for Standard 4: Learning Designer for K-8 (p = .144), multiple (p = .814), and other (p = .231) groups. Data was normally distributed for Standard 5: Professional Learning Facilitator for K-8 (p = .228), K-12 (p = .167), 6-12 (p = .366), multiple (p = .967), and other (p = .652) groups. Data was normally distributed for Standard 6: Data-Driven Decision-Maker for K-8 (p = .338), K-12 (p = .115), 6-12 (p = .441), multiple (p = .069), and other (p = .334) groups. Data was normally distributed for Standard 7: Digital Citizen Advocate for K-12 (p = .304) and multiple (p = 1.00) groups. Data was not normally distributed for all other ISTE Standards for Coaches and ages served groups (p < .05). The sixth assumption is that there should be no multicollinearity, meaning the dependent variables are moderately correlated. There was no multicollinearity, as assessed by Pearson correlation (all greater

than $r = .572$, $p < .001$). This means that each dependent variable (the individual standards) is different enough but still correlated to retain all standards. The seventh assumption is a linear relationship between the dependent variables for each independent variable group. There was a linear relationship based on visual inspection of the scatterplot matrix for each independent variable group. The eighth assumption is that there is an adequate sample size. To control for Type I/Type II error for this question, power analysis was performed in G*Power Version 3.1.9.6 (Faul et al., 2007; Faul et al., 2009). To achieve a medium effect size ($d = .25$) and 80% power, a total sample size of 240 was required. The survey results in this study yielded a total sample size of 311 participants, which meets this threshold. The ninth assumption is that there is homogeneity of variance-covariance matrices, meaning there are similar variances and covariances. There was homogeneity of variance-covariances matrices, as assessed by Box's test of equality of covariance matrices ($p = .001$). Box's M determines if two or more covariance matrices are similar. Levene's test is similar but is best for non-normal samples and assesses if the variances are similar. With unequal sample sizes, Box's M was followed by Levene's, and the results showed that there was homogeneity of variances on all standards except 1 and 4 ($p > .05$), meaning that for those two standards, the variances are not significantly different from each other. This follow-up test also fulfilled the tenth and final assumption that there is homogeneity of variances. One-way MANOVA is considered "robust" to violations of normality (Laerd Statistics, 2018). Additionally, there was a rationale for not removing the outliers. All other assumptions were met, so a decision was made to proceed with one-way MANOVA.

A one-way MANOVA was run to determine if ages served make a difference to the mean scores of the seven individual ISTE Standards for Coaches. The 6-12 group had the highest overall self-efficacy mean score, followed by participants serving students in K-8, then high school, middle school, multiple ages, K-12 school, elementary school, and other (*M* = 4.1, *SD* = .056; *M* = 4.1, *SD* = .561; *M* = 4.1, *SD* = .690; *M* = 4.0, *SD* = .529; *M* = 3.9, *SD* = .621; *M* = 3.9, *SD* = .372; *M* = 3.8, *SD* = .714; and *M* = 3.7, *SD* = .784, respectively, see Appendix I). There was not a statistically significant difference between the ages of students served on the combined dependent variables, which are the seven individual ISTE Standards for Coaches, $F(56, 2107) = 1.215$, $p = .134$; Pillai's Trace = .219; partial $\eta^2 = .031$.

Further inspection of the individual standards shows no statistically significant difference in the mean scores of Standard 2: Connected Learner between ages of students served, $F(7, 302) = 1.86$, $p = .077$; partial $\eta^2 = .041$, Standard 5: Professional Learning Facilitator $F(7, 302) = 1.84$, $p = .079$; partial $\eta^2 = .041$, Standard 6: Data-Driven Decision-Maker $F(7, 302) = .833$, $p = .560$; partial $\eta^2 = .019$, and Standard 7: Digital Citizen Advocate $F(7, 302) = 1.67$, $p = .116$; partial $\eta^2 = .037$. However, there was a statistically significant difference in the mean scores of Standard 1: Change Agent between the ages of students served, $F(2, 307) = 2.74$, $p = .009$; partial $\eta^2 = .060$, Standard 3: Collaborator $F(7, 302) = 2.09$, $p = .044$; partial $\eta^2 = .046$, and Standard 4: Learning Designer $F(7, 302) = 2.30$, $p = .027$; partial $\eta^2 = .051$ (Table 7). This means that the ages served could have had an impact on how school librarians rate themselves on Standard 1: Change Agent, Standard 3: Collaborator, and Standard 4: Learning Designer.

Table 8

Results of MANOVA Based on Ages Served

	F	*p*	η2
Standard 1: Change Agent	2.101	.065	.033
Standard 2: Connected Learner	1.161	.328	.019
Standard 3: Collaborator	1.725	.128	.028
Standard 4: Learning Designer	1.332	.251	.021
Standard 5: Professional Learning Facilitator	1.907	.093	.030
Standard 6: Data-Driven Decision-Maker	1.233	.294	.020
Standard 7: Digital Citizen Advocate	1.440	.210	.023

Note. *df*(5, 304).

Tukey post-hoc tests showed that for Standard 1: Change Agent, participants in the high school group had a statistically significantly higher mean score than participants in the elementary group ($p = .040$).

In addition to the Tukey post hoc test, discriminant function analysis was also used as a post hoc test following the MANOVA. For research question three, discriminant function analysis examines whether the seven predictors, the individual standards configured as a composite score, predict the group classification of ages served. Discriminant function analysis utilizes the assumption checks from the original one-way MANOVA analysis and does not require further assumption testing.

The discriminant analysis was conducted to predict the ages served of survey participants. Predictor variables were mean scores on the individual ISTE Standards for

Coaches. Significant mean differences were observed for three variables: Standard 1: Change Agent (p = .009), Standard 3: Collaborator (p = .044), and Standard 4: Learning Designer (p = .027). While the log determinants were fairly similar (Table 9), Box's M indicated that the assumption of quality of covariance matrices was violated (p < .001). However, this problem is not regarded as serious, given the large sample. The discriminant function revealed a significant association between groups and predictors.

Table 9

Results of Box's Test of Quality of Covariance Matrices Based on Ages Served

Ages Served	Log Determinant
Elementary	-8.516
K-8	-13.176
K-12	-15.882
6-12	-14.662
Middle	-10.483
High	10.930
Multiple	Too few cases to be non-singular
Other	-10.955
Pooled Within-Groups	-9.814

Note. $F(268, 21013) = 1.879$, $p < .001$; Box's M = 355.667.

The discriminant function analysis revealed seven discriminant functions because there are eight variables, and discriminant function analysis looks at the distances between those eight variables, providing seven distances. The first explained 36.6% of the variance, canonical $R^2 = .07$; the second explained 32.6%, canonical $R^2 = .06$; the third explained 14.2% of the variance, canonical $R^2 = .03$; the fourth explained 11.0% of the variance, canonical $R^2 = .02$, the fifth only explained 3.5% of the variance, canonical $R^2 = .007$, the sixth explained 2.1% of the variance, canonical $R^2 = .004$, and the seventh explained .0% of the variance, canonical $R^2 = <.001$.

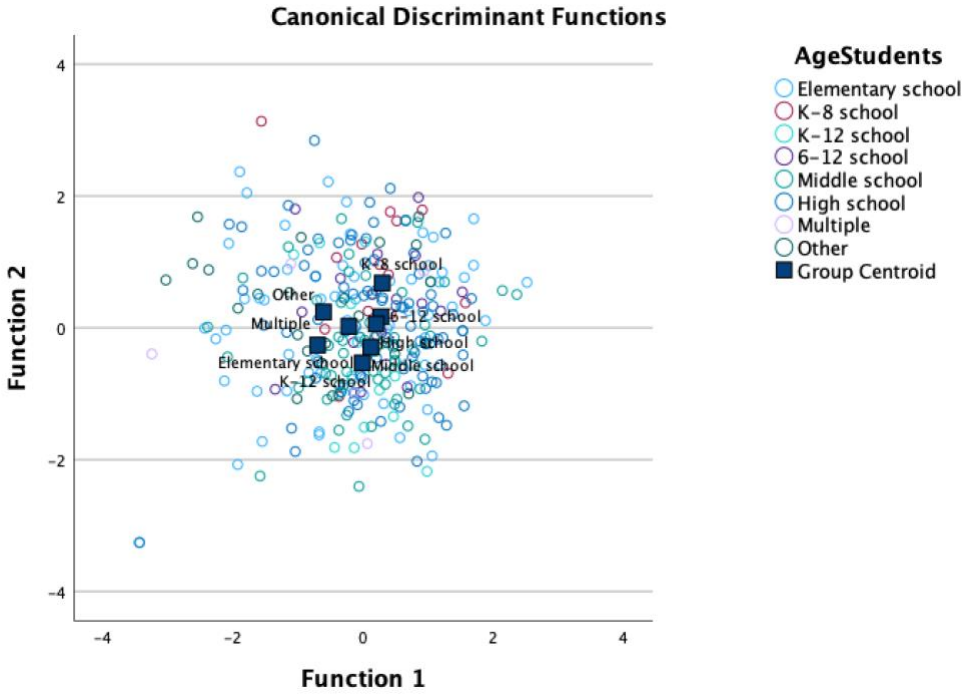
In combination these discriminant functions significantly differentiated the treatment groups, $\Lambda = 081$, $\chi^2(49) = 61.88$, $p = .102$, but removing the first function indicated that the second function did not significantly differentiate the treatments groups, $\Lambda = 0.88$, $\chi^2(36) = 39.44$, $p = .319$, removing the first two functions indicated that the third function did not significantly differentiate the treatments groups, $\Lambda = 0.94$, $\chi^2(25) = 19.37$, $p = .779$, removing the first three functions indicated that the fourth function did not significantly differentiate the treatments groups, $\Lambda = 0.97$, $\chi^2(16) = 10.46$, $p = .842$, removing the first four functions indicated that the fifth function did not significantly differentiate the treatments groups, $\Lambda = 0.99$, $\chi^2(9) = 3.55$, $p = .939$, removing the first five functions indicated that the sixth function did not significantly differentiate the treatments groups, $\Lambda = 0.996$, $\chi^2(4) = 1.34$, $p = .854$, and removing all but the seventh function did not significantly differentiate the treatments groups, $\Lambda = 1.0$, $\chi^2(1) = .004$, $p = .952$. Closer analysis of the structure matrix revealed six significant predictors, namely Standard 1: Change Agent (-.492), Standard 2: Connected Learner (.788), Standard 4: Learning Designer (.491), Standard 5: Professional Learning

Facilitator (-.386), Standard 6: Data-Driven Decision-Maker (.832), and Standard 7: Digital Citizen Advocate (-.949). The cross-validated classification showed that overall, 26.8% were correctly classified.

The discriminant analysis results described each group's profile using the group means of the predictor variables (Figure 14). The survey participants with mean scores near the centroid are predicted to belong to that group. Overall, the seven predictors, the individual ISTE Standards for Coaches, do not predict group classification of ages served.

Figure 14

Ages Served Canonical Discriminant Functions



Summary of Findings for Research Question Three

The hypothesis for research question three was that there is a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served

(Elementary, K-8, Middle, High). The initial one-way ANOVA results showed a statistically significant difference between the groups. There was also a statistically significant difference between the groups for the combined variable on the follow-up one-way MANOVA test. Furthermore, discriminant function analysis results revealed additional details about the statistically significant differences between the groups. Therefore, the researcher can reject the null hypothesis for this research question and accept the alternative hypothesis that there is a difference in self-efficacy with EdTech coaching among school librarians based on the ages of students served. The possible implications of these findings will be discussed in Chapter 5: Discussion.

Research Question Four

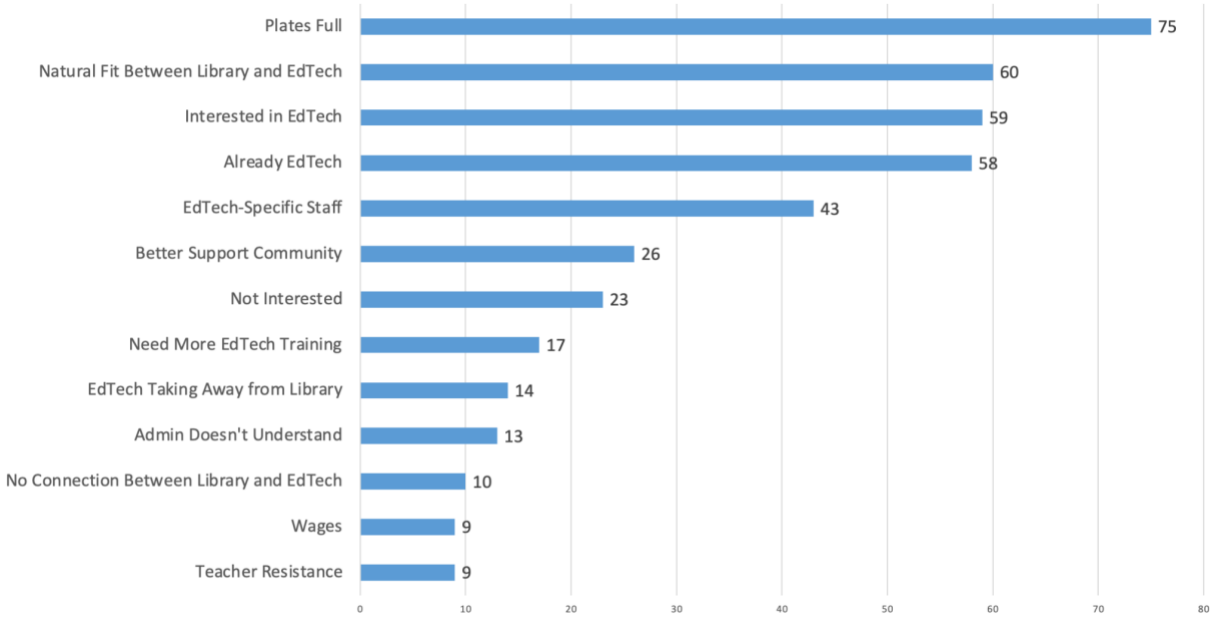
Research question four: Are school librarians interested in incorporating the role of EdTech coach into their current position? Within the School Librarian EdTech Coaching Survey, two of the 43 survey items asked participants about their interest in incorporating the role of EdTech coach into their current position. One of the questions asked participants to rate their interest on a Likert scale from one to five, with one being not at all interested and five being very interested. Of the 311 participants, 310 (99.7%) responded to the Likert-scale item ranking their interest level. One-hundred and sixty participants (51.6%) answered that they were interested or very interested in adding EdTech coaching responsibilities to their role, while 53 participants (17.1%) were not interested and 97 (31.3%) were neutral. These results were shared in Figure 9 in Chapter 3.

Participants were also given the opportunity to provide further explanation to the previous question regarding their interest level, and 271 participants (87.0%) provided a

written response. Responses were coded and resulted in a total of 430 coded passages which were sorted into the following 13 categories that were developed as like-responses in the data started to emerge: (a) the school librarian's plate is too full to add any additional responsibilities (*n* = 75), (b) the school librarian sees a natural fit between the school librarian role and the EdTech coach role (*n* = 60), (c) the school librarian has expressed interest in adding EdTech coaching responsibilities to their work (*n* = 59), (d) the school librarian already has EdTech coaching responsibilities (*n* = 58), (e) the school has EdTech-specific staff who are dedicated to working with the school community (*n* = 43), (f) adding EdTech coaching responsibilities would allow the school librarian to better serve their school community (*n* = 26), (g) the school librarian has expressed they are not interested in adding EdTech coaching responsibilities to their work (*n* = 23), (h) the school librarian would need more EdTech training before taking on additional responsibilities (*n* = 17), (i) EdTech coaching responsibilities would take away from the job of the school librarian and/or the school library program (*n* = 14), (j) administrators do not fully understand the role of school librarians (*n* = 13), (k) the school librarian thinks there is no connection between the school librarian role and the EdTech coach role (*n* = 10), (l) the school librarian is concerned there would be resistance from teachers (*n* = 9), and (m) the school librarian expressed concerns over wages and compensation with the added EdTech coaching responsibilities (*n* = 9) (Figure 15).

Figure 15

Additional Thoughts on Interest in EdTech Coaching Responsibilities



Those categories were further organized into three overarching themes directly related to the research question: (a) interested in EdTech coaching responsibilities (*n* = 203), (b) not interested in EdTech coaching responsibilities (*n* = 90), and (c) barriers to adding EdTech coaching responsibilities (*n* = 123). The three themes and corresponding categories are below, followed by direct quotes from the participants. Direct quotes are not specifically linked to the individual respondents.

Theme 1: Interested in EdTech Coaching Responsibilities

Survey participants were asked to reflect on their interest in incorporating the role of EdTech coach into their current position. Through the responses provided, Table 6 displays four categories pointing to an interest in adding EdTech coaching responsibilities (*N* = 203). These categories include: (a) the school librarian sees a natural fit between the school librarian role and the EdTech coach role (*n* = 60), (b) the school librarian has expressed interest in adding EdTech coaching responsibilities to their work (*n* = 59), (c) the school librarian already has EdTech coaching responsibilities (*n* = 58),

and (d) adding EdTech coaching responsibilities would allow the school librarian to better serve their school community (*n* = 26).

Table 10

Interested in EdTech Coaching Responsibilities Thematic Findings

Theme	Categories	*n*
Interested in EdTech Coaching Responsibilities	The school librarian sees a natural fit between the school librarian role and the EdTech coach role	60
	The school librarian has expressed interest in adding EdTech coaching responsibilities to their work	59
	The school librarian already has EdTech coaching responsibilities	58
	Adding EdTech coaching responsibilities would allow the school librarian to better serve their school community	26

Note. N = 203.

Natural Fit.

When asked to share thoughts on their interest in incorporating EdTech coaching responsibilities into their role, participants shared their rationale for why it was a natural fit. Many responses used the words “natural fit,” as well as: helpful, overlap, integration, information, access, and hand-in-hand. One participant provided a brief but powerful statement:

Technology and information are in a symbiotic relationship. [Today], one does not exist without the other.

Interest in Adding EdTech Coaching.

Various participant comments were categorized as expressing interest in adding EdTech coaching responsibilities to their work. Many participants shared their interests and rationale or the barriers preventing them from transforming their roles. These barriers are covered in depth in a later section. Some participants expressed their desire to continue learning and growing in their profession; others cited an urge to evolve the role of the school librarian and the school library program. One participant stated:

I would be interested in incorporating the role of EdTech Coach into my current librarian position as a result of the evolution of technology in education and the necessity to continue to evolve the profession and showcase that librarians have always encompassed duties as it relates in advancing student learning.

Current EdTech Coaching Responsibilities.

When asked to share their interest in incorporating EdTech coaching responsibilities into their role, several participants stated they are already doing this work, either officially or unofficially. One participant shared that, in their decades-long career as a school librarian, they have served as an EdTech coach since the introduction of technology in schools. Another participant stated:

We perform the role of EdTech coach already and giving it formal guidelines and standards would help further define it for others.

Better Serve School Community.

As mentioned in past categories, school librarians often expressed a hope to help others, resulting in an ability to serve their school community better. Many participants shared their desire to collaborate with teachers and develop more meaningful connections through coaching. Some participants also noted that, by helping the teachers, they can further support their students.

Theme 2: Not Interested in EdTech Coaching Responsibilities

Another theme emerged in reading through survey responses that indicated other school librarians were not interested in adding the EdTech coaching responsibilities to their workload. Table 9 displays four categories demonstrating a lack of interest in adding EdTech coaching responsibilities ($N = 90$). These categories include: (a) the school has EdTech-specific staff who are dedicated to working with the school community ($n = 43$), (b) the school librarian has expressed they are not interested in adding EdTech coaching responsibilities to their work ($n = 23$), (c) EdTech coaching responsibilities would take away from the job of the school librarian and the school library program ($n = 14$), and (d) the school librarian thinks there is no connection between the school librarian role and the EdTech coach role ($n = 10$).

Table 11

Not Interested in EdTech Coaching Responsibilities Thematic Findings

Theme	Categories	*n*
Not Interested in EdTech Coaching Responsibilities	The school has EdTech-specific staff who are dedicated to working with the school community	43

	The school librarian has expressed they are not interested in adding EdTech coaching responsibilities to their work	23
	EdTech coaching responsibilities would take away from the job of the school librarian and/or the school library program	14
	The school librarian thinks there is no connection between the school librarian role and the EdTech coach role	10

Note. N = 90

Dedicated EdTech-Specific Staff.

When asked to share their interest in incorporating EdTech coaching responsibilities into their role, participants shared that there were already EdTech-specific staff. So, there was no need for the school librarian to take on that role. Some participants stated that the EdTech coach works in the building full-time, whereas others are one person shared across several buildings. One participant stated that, by taking on their role, they would step on the toes of the EdTech-specific staff. Another participant shared that their district's technology standards are much different than their library standards and each had their own professional experts.

Not Interested in Adding EdTech Coaching.

A large number of the participant responses in this section were very brief. Some of the notable responses include:

1. "Technology is not a strong suit of mine."
2. "Don't I have enough to do?"
3. "I am to foster literacy and access to literature."
4. "The librarian should be a librarian—not a breakfast server or bus monitor or Grade 5 substitute."

One participant stated:

> Adding the role of EdTech coach into my job right now would be too much to do on top of my other duties. There are not enough hours in the day to feel like I can successfully manage my classes, my student needs, and my collection. Adding something else would be the straw that broke the camel's back. We can't keep adding roles to the [school librarian] without something else having to give.

Take Away From School Library Program.

When asked to share thoughts on their interest in incorporating EdTech coaching responsibilities into their role, participants indicated that the role of school librarian was overshadowed by the role of EdTech in schools. Multiple participants stated they were being pulled away from their work to help with EdTech. It was diminishing the value of the school librarian and the entire school library program. One participant stated: However, I fear that the role of school librarian is becoming that of tech support and tech management instead, which leaves less time for the higher level collaborations, teaching, and learning that should be the mainstays of the profession.

No Connection.

Similar to the other categories where the participant indicated they were not interested in EdTech coaching responsibilities, these responses emphasized that the work of an EdTech coach does not fall under the purview of a school librarian. One participant shared:

I chose to focus on creating safe library environments that foster the love of independent reading and creating [lifelong] readers. EdTech coach deals with different standards...I focus on Model Library Standards. I also feel as classroom teachers use technology daily in the lessons, that "tech" types of lessons should be embedded in their daily teaching, not just a "shot in the arm" from the Teacher Librarian. I would also not expect an EdTech coach to develop the collections in my library, weed, promote books, order books, and collaborate with teachers on literacy.

Theme 3: Barriers to Adding EdTech Coaching Responsibilities

A third theme emerged that did not align with an interest or non-interest but rather barriers to adding EdTech coaching responsibilities to the school librarian role. Table 8 displays five categories that highlight these barriers (N = 123). These categories include: (a) the school librarian's plate is too full to add any additional responsibilities (n = 75), (b) the school librarian would need more EdTech training before taking on additional responsibilities (n = 17), (c) administrators do not fully understand the role of school librarians (n = 13), (d) the school librarian is concerned there would be resistance from teachers (n = 9), and (e) the school librarian expressed concerns over wages and compensation with the added EdTech coaching responsibilities (n = 9).

Table 12

Barriers to Adding EdTech Coaching Responsibilities Thematic Findings

Theme	Categories	*n*
Barriers to Adding EdTech Coaching Responsibilities	The school librarian's plate is too full to add any additional responsibilities	75
	The school librarian would need more EdTech training before taking on additional responsibilities	17
	Administrators do not fully understand the role of school librarians	13
	The school librarian is concerned there would be resistance from teachers	9
	The school librarian expressed concerns over wages and compensation with the added EdTech coaching responsibilities	9

Note. N = 123

Plate Is Too Full.

When asked to share thoughts on their interest in incorporating EdTech coaching responsibilities into their role, whether interested or not interested, many participants shared that their plates were too full to add any additional responsibilities. Some participants stated they do not have time to add extra responsibilities and cannot keep up with their current responsibilities, especially as library aides and assistant positions are being cut. One participant shared:

> There are not enough hours in a school day to teach all the students everything they need to know to be ready for middle school. [The survey] listed many of the unseen things that we librarians are responsible for. These don't change, but have been added to. For example, collection development now includes vetting and subscribing to databases, along with convincing the technology folks to add that subscription database to our list of "safe" websites. I would love to collaborate more with teachers, but they do their planning time when their students are in [library class].

Need More EdTech Training.

When asked to share their interest in incorporating EdTech coaching responsibilities into their role, some participants expressed interest but felt they lacked the necessary training. Some participants were not interested and also cited a lack of training. Additionally, some participants shared that they would need to be trained to serve as an EdTech coach before considering the additional responsibility. One participant shared:

> I think there would have to be a lot of [professional development] for the [people] who become EdTech coaches, and a well developed rationale and plan for why it's necessary.

Another participant stated:

> I am excited to begin this process because the content is relevant and important to progressing public education and I think it will help me learn how and why to integrate EdTech into my practice as well as helping my colleagues.

Administrators Do Not Fully Understand.

There was a common thread among several participant responses regarding the school administrators' misunderstanding of school librarians and school library programs. Various participants shared that their administrators have an outdated view of what the school librarian should do. One participant wrote, “I'm tired of fighting ignorance in this capacity.”

Another participant elaborated by sharing:

> Many [administrators] still expect a library that looks like theirs did when they were in school, but are surprised when it is not, and many [administrators] do not have a vision of what they want; or what it could be if they truly utilized their school librarian’s potential.

Yet another participant shared:

> I think the librarian is the most underutilized teacher in the building. I believe most teachers (at least at the [high school] level) do not even know that [school librarians] have a teaching certificate. I have also found that most administrators have no idea what our job entails nor do they embrace the possibilities of what we could contribute.

Resistance From Teachers.

Another barrier to school librarians serving as EdTech coaches is the concern over teacher resistance. Participants shared that many teachers would not have the time to devote to an additional form of professional development. In addition, multiple participants felt that teachers do not value EdTech and would resist this type of collaboration. Participants shared their concerns:

1. I have made some attempts at this, but haven't made much headway.
2. Teachers are reluctant to give up instructional time to incorporate curriculum that does not directly align with their responsibilities and classes.
3. They are not interested in collaboration or coaching.

Concerns Over Wages and Compensation.

Lastly, one barrier to school librarians taking on EdTech coaching responsibilities involves concerns over wages and compensation. Several participants indicated they were already being asked to do too much within their paid hours without additional responsibilities. Other participants stated they would only be interested in additional responsibilities if they received additional wages (e.g., a stipend). One participant shared, "I feel like it's something I already do, and it would be nice to be recognized and compensated as such." Another participant stated:

> EdTech principles are directly involved with library work, but since we are glorified babysitters who are paid a wage that is not adequate, it's impossible to integrate yet another meaningful piece into our work.

Summary of Findings for Research Question Four

The qualitative results for research question four provided greater insight into school librarians' feelings about incorporating the role of EdTech coach into their current position. These results revealed that many school librarians are interested in adding EdTech responsibilities and feel that it is a natural fit for their role and that this extension would allow them to serve their school community better. However, some librarians are not interested in adding EdTech responsibilities and feel that this change would take away from their current role or that there is no connection between serving as an EdTech

coach and their work as a librarian. Also, many school librarians, regardless of interest level, identified barriers to adding EdTech responsibilities to their current role. The possible implications of these findings will be discussed in Chapter 5: Discussion.

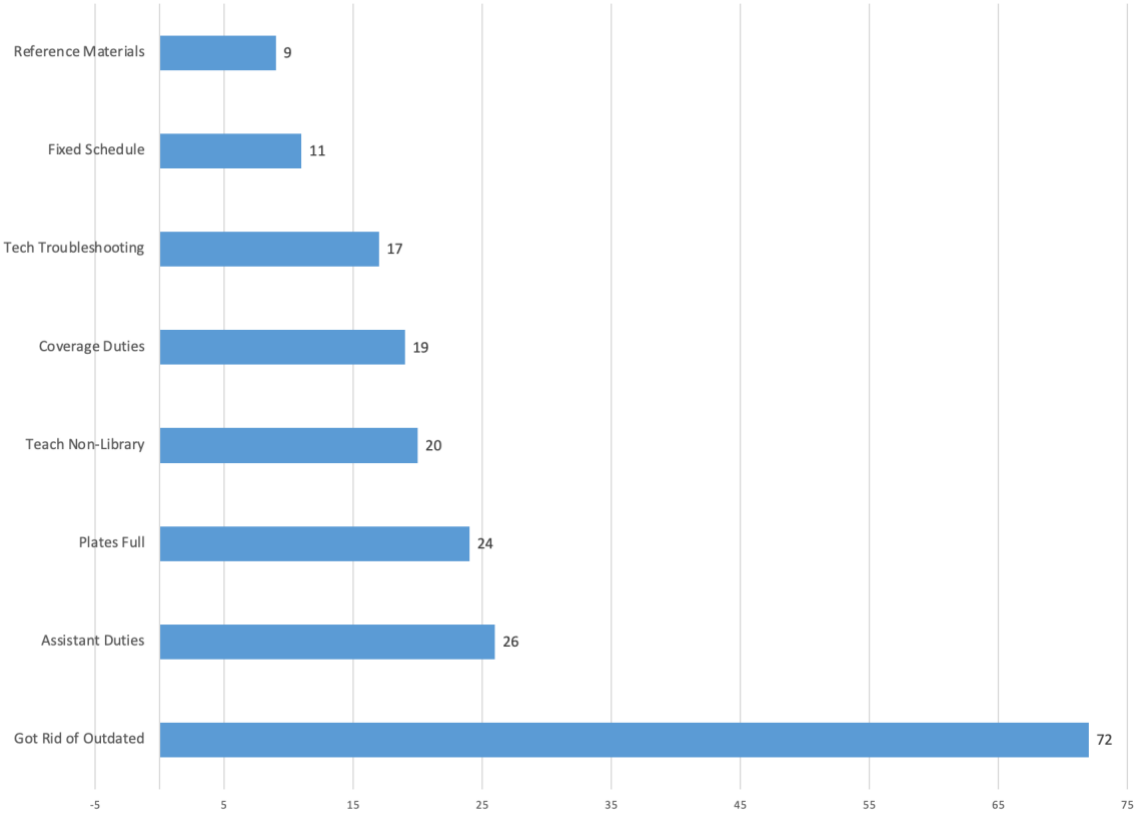
Research Question Five

Research question five: What responsibilities do school librarians need to give up to manage their workload? Within the School Librarian EdTech Coaching Survey, two of the 43 survey items asked participants about shifting outdated responsibilities. One of the questions asked participants to indicate if there are responsibilities that are part of their current workload that may no longer be serving them or their students. Of the 311 participants, 310 (99.7%) responded to the single-select question, with 86 participants (27.7%) responding yes and 144 (46.5%) responding no; the rest were unsure (n = 80; 25.7%). As a whole, the respondents felt their responsibilities were not outdated. Participants were also given the opportunity to provide further explanation to the previous question regarding outdated responsibilities; 179 participants (57.7%) provided a written response. Responses were coded and resulted in a total of 141 coded passages which were sorted into the following nine categories that were developed as like-responses in the data started to emerge: (a) the school librarian feels they and their administration have got rid of any outdated responsibilities (n = 72), (b) the school librarian's time is taken up doing library assistant duties (n = 26), (c) the school librarian's plate is too full whether responsibilities have been updated or not (n = 24), (d) the school librarian is responsible for regularly teaching non-library-related courses (n = 20), (e) the school librarian is responsible for coverage duties (n = 19), (f) the school librarian is responsible for doing technology inventory and providing technology

troubleshooting (*n* = 17), (g) the school librarian and school library program is set on a fixed schedule (*n* = 11), and (h) the school librarian is responsible for managing reference materials (*n* = 9; Figure 16).

Figure 16

Outdated Responsibilities



Those categories were further organized into four overarching themes directly related to the research question: (a) the school librarian is responsible for non-library-related duties (*n* = 56), (b) the school librarian is responsible for traditional library activities (*n* = 46), (c) the school librarian's plate is too full whether responsibilities have been updated or not (*n* = 24), and (d) the school librarian feels they and their administration has got rid of any outdated responsibilities (*n* = 72). The four themes and

corresponding categories are further explained below, including direct quotes from the participants. Direct quotes are not specifically linked to the individual respondents.

Theme 1: Non-Library-Related Duties

Survey participants were asked to reflect on their current responsibilities and if those duties were outdated and no longer serving their staff and students. Through the responses provided, Table 9 displays three categories pointing to non-library-related duties taking up their time (N = 56). These categories include: (a) the school librarian is responsible for regularly teaching non-library-related courses (n = 20), (b) the school librarian is responsible for coverage duties (n = 19), and (c) the school librarian is responsible for doing technology inventory and providing technology troubleshooting (n = 17).

Table 13

Non-Library-Related Duties Thematic Findings

Theme	Categories	*n*
Non-Library-Related Duties	The school librarian is responsible for regularly teaching non-library- related courses	20
	The school librarian is responsible for coverage duties	19
	The school librarian is responsible for doing technology inventory and providing technology troubleshooting	17

Note. N = 56.

Teaching Non-Library-Related Courses.

When asked to share thoughts on their current responsibilities, participants stated that teaching non-library-related courses took a great deal of time and prevented them from completing other library-related work. One participant shared that they also taught careers, technology, and computer science in addition to their school library work. Another participant indicated that their teaching of non-library curriculum prevented them from helping teachers with research units. A participant also shared:

> I am the sole person writing our Advisory curriculum and deploying it to students and teachers. This seems like it should be a counselor's job, or even a committee of Advisory teachers instead. It takes away time from the Library and building relationships with teachers and students.

Coverage Duties.

When asked to reflect on shifting responsibilities, participants indicated that, in addition to teaching non-library-related courses, another duty that took them away from both library-specific tasks and taking on EdTech responsibilities was the need to provide coverage throughout the school. One participant shared that they were often pulled away to cover for office staff and provide carpool duty. Other participants stated they had daily lunch and recess duties that accounted for a large part of their day. Participants also shared that they were responsible for supervising the in-school suspension class. One participant shared:

> Much of my day is filled by recess duty supervision (almost 4 hours per week). That is time away from library duties. Additionally, I am on a subbing rotation

> and have to push into classes I do not serve in either a library or technology capacity.

Technology Inventory and Troubleshooting.

One area of responsibilities that school librarians indicated took their time but felt outdated was overseeing technology inventory and providing basic technology troubleshooting. Participants pointed to a model where the school library was the hub of all technology; therefore, the library staff were tasked with housing and circulating devices. One participant stated:

> There really needs to be a dedicated technology support staff member at sites to facilitate use of and access to technology. At this point it has been lumped in with school library duties to the point where it becomes difficult to meet school library standards, let alone technology standards.

Theme 2: Traditional Library Activities

In their reflection on current responsibilities, participants shared responses that fell into the theme of traditional library activities. While some participants noted that not only are all of the traditional duties of a school librarian still relevant, there are always new duties being added. Other responses indicated that some responsibilities felt outdated. Table 10 displays three traditional library work categories that limit school librarians from shifting their duties (N = 46). These categories include: (a) the school librarian's time is taken up doing library assistant duties (n = 26), (b) the school librarian and school library program is set on a fixed schedule (n = 11), and (c) the school librarian is responsible for managing reference materials (n = 9).

Table 14

Traditional Library Thematic Findings

Theme	Categories	*n*
Traditional Library Activities	The school librarian's time is taken up doing library assistant duties	26
	The school librarian and school library program is set on a fixed schedule	11
	The school librarian is responsible for managing reference materials	9

Note. N = 46

Library Assistant Duties.

There was no question in any of the responses regarding the importance of well-staffed circulation desks, supervising students, processing materials, and the other functions that keep a school library running. Participants voiced concern about the lack of library assistants who could complete those tasks, leaving the school librarian available to complete other work. One participant stated, "I don't have a regular assistant, so I am often doing daily tasks that take away from larger planning." Another participant shared:

> Library support staffing is no longer funded so too much of my position is spent scheduling the spaces, supervising students, processing books, circulating books, fines & fees, greeting, pass-checking, printing, etc. rather than focusing as much on many of the "I can" statements in this survey.

Fixed Schedule.

When asked to share thoughts on responsibilities that no longer serve school librarians, participants shared that, while not a responsibility in and of itself, the traditional library fixed schedule was outdated. Fixed scheduling is the traditional model where the library is only open to classes during their scheduled “library time,” and the teachers generally leave the students, using it as a preparation. Through the survey, one participant shared, “My role has shifted and adapted to changing responsibilities but the district does not allow the necessary time to fully enact these changes outside of my fixed schedule.”

Managing Reference Materials.

Several participants shared that many responsibilities shifted due to the Covid-19 pandemic, and none were more evident of that shift than the need and use of reference materials. One participant stated, “Reference instruction has shifted to mostly online but we still have mostly analog lessons (especially for things like almanacs, atlases, etc.).”

Participants shared that school librarians were still responsible for purchasing, cataloging, and storing textbooks regularly despite moving away from physical textbooks. Another participant shared:

> I think the reference section as a physical resource needs to be replaced by curated technology. The idea of reference questions as they used to be is obsolete. It's now going from "give a man a fish" to "teach a man the skills to effectively find their own answers."

However, another participant noted that a complete shift away from print resources could be detrimental:

> The non-fiction and reference book sources have certainly evolved to become less relevant for student research, but students do check out non-fiction for personal interests, so NOT having access to books in school libraries is a mistake in my opinion.

Theme 3: Plate Is Too Full

One theme that emerged in various responses was that school librarians' workload was immense, and their plates were full despite changes to current or past responsibilities. Table 11 displays one category related to school librarians' plates being too full (*N* = 24).

Table 15

Plate Is Too Full Thematic Findings

Theme	Categories	*n*
Plate Is Too Full	The school librarian's plate is too full whether responsibilities have been updated or not	24

Note. N = 24

Plate Is Too Full.

A theme throughout survey responses was that school librarians' plates were too full. The responses to the shifting outdated responsibilities were no different. Participants shared that their plates were still full despite responsibilities evolving with the school librarian's role. One participant shared:

I haven't so much had responsibilities shift as had responsibilities added; it's getting almost to the point that it's difficult for one person to accomplish, even with a part time

clerk. I'm worried that I'm neglecting the book/encouraging reading parts of my job for tech support and coaching parts that are more of a priority for administration.

Another participant stated:

I am responsible for all of the following: lesson plans, technology repairs, technology decisions, [professional learning community] leader, grant writer, scheduler for building, military liaison for students, book repairs, book purchases, library committee, student relations, substitute teaching, in school suspension, teaching classes, tech security, password manager, morning monitor, [Response to Intervention] coordinator and group leader, and the list goes on and on. Most have no help or bearing on students and take time away from them.

Theme 4: Got Rid of Any Outdated Responsibilities

Finally, participants shared that through advocacy, leadership, and coordination with the administration, they had gotten rid of any outdated responsibilities, and everything they were doing was for the betterment of the library program, the teachers, the students, and the school community. Through the responses provided, Table 12 displays one category related to outdated responsibilities being removed ($N = 72$).

Table 16

Got Rid of Any Outdated Responsibilities Thematic Findings

Theme	Categories	*n*
Got Rid of Any Outdated Responsibilities	The school librarian feels they and their administration has got rid of any outdated	72

responsibilities

Note. N = 72

Gotten Rid of Outdated Responsibilities.

Participants shared that they continually evaluated their responsibilities along with the role of the school library program to keep things current and relevant. One participant shared, “I have spent years doing away with the outdated responsibilities that my position came with.” Another participant recognized the need for administrative support to update roles and responsibilities, stating “I am fortunate to be able to shift and redefine my role within reason on a regular basis.” Yet another participant stated:

> I agree that the need has shifted and evolved. I feel that my role has evolved along with the needs. I disagree that there are things we do that are no longer needed. I am constantly checking in with teachers and students.

Summary of Findings for Research Question Five

The qualitative results for research question five provided greater insight into school librarians' thoughts and feelings about the responsibilities they would need to give up to manage their workload if EdTech responsibilities were added. This question revealed several tasks that prevent school librarians from shifting their work, including non-library-related duties and library assistant work. Others shared that, even if their workload is still relevant, their plates are too full to take on other work. Still, other respondents shared that they have kept their workload relevant and eliminated outdated tasks. The possible implications of these findings will be discussed in Chapter 5: Discussion.

Summary

Descriptive statistics, one-way analysis of variance, one-way multivariate analysis of variance, and discriminant function analysis were used to compare and analyze qualitative data for three of the five research questions, and open coding was used to analyze the two qualitative research questions. These analyses yielded findings that provided answers for all five of the research questions. The interpretations and inferences from these findings are further discussed in Chapter 5: Discussion.

Chapter 5: Discussion

The purpose of this exploratory mixed-methods study was to assess school librarians' self-efficacy in the skills to serve as EdTech coaches using the ISTE Standards for Coaches (2019) as a contextual framework. In this study, school librarians were surveyed to examine their self-efficacy on the individual standards of the ISTE Standards for Coaches and provide additional thoughts on their interest in serving as EdTech coaches and what responsibilities would need to shift in their workload. The results of this study may provide some insight into school librarians' interest and self-efficacy in serving as EdTech coaches and how schools could shift responsibilities to make the most of their existing human resources. This chapter covers conclusions, limitations of the study, a discussion of the implications for future practice, and recommendations for future research.

Research Question One: What is the perceived level of self-efficacy of school librarians regarding their EdTech coaching skills?

School librarians were asked to score their self-efficacy for each indicator of the ISTE Standards for Coaches. If they rated themselves high, it was inferred that their perceived self-efficacy as an EdTech coach would also be high. The findings for research question one support the hypothesis that school librarians would have a high level of self-efficacy as EdTech coaches, with the data showing a medium to high level of overall self-efficacy. One participant stated:

> I would be interested in incorporating the role of EdTech coach into my current position as I am highly qualified (recently received a Masters in Educational Technology and a certification as an Instructional Technology Specialist) and I

enjoy collaborating with teachers and helping teachers and students become more literate digital citizens.

It did come as a surprise that mean score was not higher, given that the demographic data showed approximately half (45.3%; *n* = 141) of the participants in this study had some form of EdTech responsibilities as part of their workload and 17.0% (*n* = 53) had EdTech coaching as part of their workload. These findings support prior research, which found that school librarians had a high level of self-efficacy (Ash-Argyle et al., 2014; Thompson, 2021). Granted, those studies examined school librarian self-efficacy. However, none of those studies focused specifically on the self-efficacy of school librarians as EdTech coaches, making the findings in the current study novel in this area. Along with the findings of this study that showed school librarians had a medium to high level of self-efficacy as EdTech coaches, additional research has also shown that school communities already believe school librarians are responsible for some of the tasks found within the ISTE Standards for Coaches, such as teaching digital citizenship (Dawkins, 2020; Phillips & Lee, 2019) and, interestingly, in the current study, school librarians ranked their self-efficacy highest for Standard 7: Digital Citizen Advocate. An essential difference between the past and current studies is that the past studies examined the work of school librarians in how they taught and interacted with students, not how they collaborated with teachers. Of the 27 survey respondents in the current study who indicated they teach students digital citizenship lessons, only two mentioned working cooperatively with teachers on digital and information literacy, either as coaches or by providing professional development.

On the other end of the spectrum, school librarians had the lowest self-efficacy for Standard 6: Data-Driven Decision Maker, which may be a result of many administrators misunderstanding and underutilizing their school librarians (Johnston, 2012; Lewis, 2019, 2021; Pickett & Combs, 2016). School librarian preparation programs focus on leadership development, but studies have shown that administrators do not understand the role of school librarians, nor do they give librarians leadership roles (Baker et al., 2020; Church, 2008, 2010). Leadership generally comes with access to higher-level information, including student data. School librarians are often not involved in grading, setting student achievement goals, or collaborating with the teachers on planning driven by qualitative or quantitative student data. With school librarians frequently serving the entire student population, they could be a powerful source of information if they were to be included in student data-driven conversations and decisions. Taken a step further, if school librarians had access to data and also served as EdTech coaches, they could impart that high-level view of the school to the teachers they are serving. Sadly, that is not the current reality. One survey participant shared:

> Many admin still expect a library that looks like theirs did when they were in school, but are surprised when it is not, and many admin do not have a vision of what they want; or what it could be if they truly utilized their school librarians potential.

These findings help to illustrate the need to continue revisiting school administrator preparation programs (Smith, 2011) and the importance of utilizing school librarians as valued leaders for students and teachers. Many administrators once worked as classroom teachers, making it easier for them to see their work through the perspective

of a teacher. Unless the administrators also served as school librarians during their career, they could benefit from a deep dive into the opportunities afforded the school by a skilled librarian and strong, supported school library program.

Although there are connections to past research, this study's findings are mainly novel because the specific topic has not been studied. In addition, the descriptive statistics conducted in the current study cannot be used to establish causation. However, the means reveal that school librarians could have a high level of self-efficacy as EdTech coaches, given further statistical analysis. The Implications for Research and Practice section of this chapter will further discuss this.

Research Question Two: Is there a difference in self-efficacy with EdTech coaching among school librarians based on their qualifications?

The findings for research question two support the hypothesis that there would be a statistically significant difference in self-efficacy among the school librarian groups based on their qualification. Although the demographic data showed that the largest participant group was the Master in Library Science, this group had the lowest overall self-efficacy. The findings showed that school librarians with a school library media endorsement had the highest overall self-efficacy. The school library endorsement group also had the highest self-efficacy for every individual standard except for Standard 6: Data-Driven Decision-Maker, where the other group had the highest score.

These findings suggest that the school library media endorsement group have more confidence to be EdTech coaches. It could be that having a degree in something other than library science, and perhaps specifically a degree in elementary or secondary

education, allows school librarians to bring several areas of expertise to the table instead of a deep focus on library science.

An array of studies highlight the importance of highly qualified school librarians and the impact they make on student achievement (Gretes, 2013; Kimmel et al., 2019; Lance & Horschire, 2011, 2012; Lance & Kachel, 2018; Lewis, 2021; Small et al., 2009; Thompson et al., 2021) but there is no current research that has examined the differences between school librarian pathways. With each state setting its requirements to become a school librarian, there is a wide array of what it means to be a qualified school librarian. This study presents the self-efficacy of school librarians as EdTech coaches and examines the differences between those mean scores based on their path to becoming a school librarian.

Although the statistical analyses conducted in the current study cannot be used to establish causation, the results reveal that differences in qualification may impact a school librarian's self-efficacy with serving as an EdTech coach, given further statistical analysis. The Implications for Research and Practice section of this chapter will further discuss this.

Research Question Three: Is there a difference in self-efficacy with EdTech coaching among school librarians based on the age of students served (Elementary, K-8, Middle, High)?

While the 6-12 group had the highest overall self-efficacy, there was no clear trend between ages served and level of self-efficacy. The elementary group had low overall self-efficacy, so it would make sense to suggest that school librarians serving younger students have a different focus. However, this assumption was disproved by

looking at the K-8 group, who scored on the higher end of overall self-efficacy and scored the highest on three individual standards.

The findings from the overall mean scores make interpretation difficult, but continuing to look at the individual standards can help provide interesting information. The differences in mean scores for the different ages served groups could highlight the different skills held by school librarians serving different ages of students. The findings showed that the high school group scored the highest on Standard 5: Professional Learning Facilitator. This result could be because high school librarians are often tasked with working with multiple teachers across multiple subjects on research and information literacy skills (Ash-Argyle & Shoham, 2012; Latham et al., 2013). The high school group scored highest on Standard 5: Professional Learning Facilitator. This finding was not surprising because high school librarians often co-teach and work with fellow teachers (Croft, 2022). With many elementary school librarians responsible for teaching digital citizenship classes, it makes sense that the K-8 group scored the highest on Standard 7: Digital Citizen Advocate (Dawkins, 2020).

Much like the lack of research around the qualifications of school librarians, there is also a lack of information about school librarians and the impact of different ages served. Traditionally, school librarian programs, either certification or a Master in Library Science, covers the entire range of students from birth through the end of high school (AASL, 2010; Elkins, 2018; Everhart & Dresang, 2007; Hanson-Baldauf & Hassell, 2009; Kimmel et al., 2019). Training to serve specific age ranges comes with teaching certification, a common requirement for school librarians. While there is a lack of corresponding research, the findings for research question three support the hypothesis

that there would be a statistically significant difference in self-efficacy among the school librarian groups based on the ages served.

Although the statistical analyses conducted in the current study cannot be used to establish causation, the results reveal that differences in ages served may impact a school librarian's self-efficacy with serving as an EdTech coach, given further statistical analysis. The Implications for Research and Practice section of this chapter will further discuss this.

Research Question Four: Are school librarians interested in incorporating the role of EdTech coach into their current position?

After gathering data on the self-efficacy of school librarians as EdTech coaches, it was also important to gauge their interest in taking on this role. A majority of participants stated they would be interested in adding an EdTech coaching role into their work (51.6%, $n = 160$). As mentioned earlier, some school librarians are already doing the work of EdTech coaches and, therefore, indicated they selected "neutral," potentially impacting the overall level of interest. For those who did express interest in serving as an EdTech coach, some respondents (19.3%, $n = 60$) shared that they saw a natural fit between their work as a school librarian and that of an EdTech coach. This interest and connection support the research already done to connect the ISTE Standards and school library standards (AASL, 2018a; Cooper, 2015; Lewis, 2019; Wine, 2016). Others noted that their interest in adding the role of EdTech coach would allow them to serve their school community better (8.6%, $n = 26$). One survey participant remarked:

> I think the school librarian is a great resource for EdTech considering we keep up to date with current/emerging trends in literature and technology, so I'd like to see

> how learning more about edtech can help me better instruct teachers and students in accessing, using and applying technology to everyday learning.

Other research studies also support participants' interest in serving as an EdTech coach, showing that school librarians are interested in taking on new roles, stepping into leadership positions, and leading new initiatives (Johnston, 2012; Lance & Kachel, 2021). The past research also parallels the findings in that barriers prevent a shift while the interest is there. Johnston (2012) noted that the obstacles keeping school librarians from pursuing new interests included a lack of time, not being in a leadership role, lacking funding, and inadequate staffing to complete the work. Many of these same barriers were present in the findings of this study. The lack of time was seen as a significant barrier to many participants (24.1%, $n = 75$) and brought out frustration in some:

> As the school librarian, I already have more than one role as both teacher and librarian. While I can and enjoy Edtech coaching, I cannot do every single thing well, and adding more roles is not the answer. I am leaving my position and they are hiring 3 part time people to replace me (90 hours of work time for my 40 hour position). I think that says it all

While the participants showed an overall interest in adding the role of EdTech coach, having an overwhelming workload, even before adding in additional responsibilities, could be attributed to administrators not fully appreciating the role of school librarians. This lack of understanding has been well documented in past research (Baker et al., 2020; Bamberger et al., 2020; Church, 2008, 2010; Gross, 2022; Lance & Kachel, 2021; Lewis, 2019; Pickett & Combs, 2016; Shannon, 2009) and is mirrored in

the findings of this study. While school administration does not understand the librarian's role and how to make the most of their human resources, which is widespread, it is a solvable problem. Others have written about updating the curriculum of educational leadership preparation programs to help future principals and superintendents understand their human assets, particularly around school librarians (Croft, 2022). This change could help address another barrier identified in this study: some teachers were resistant to collaborating with school librarians, a finding supported by past research (Lewis, 2021). Administrators are at the forefront of elevating particular school community members into leadership positions. Teachers will see this if they value school librarians as leaders, and their understanding may shift. Like with administrators, teacher certification programs need to highlight the various roles in the school and how they impact their teaching, their students, and the school community as a whole.

Lastly, participants of this study shared concerns about the hurdles that come with having a fixed schedule. Not only do fixed schedules prevent school librarians from collaborating with teachers during their planning periods, but they also limit the time the librarian can leave the library to co-teach (Bishop, 2007; McGregor, 2006). One survey participant shared that, despite keeping up with changing trends and following their interests, they are restricted by the schedule:

> My role has shifted to adapt to changing responsibilities but the district does not allow the necessary time to fully enact these changes outside of my fixed schedule.

Another survey participant had a change in their schedule, and it helped them to see what is possible when moving from a fixed to a flexible schedule:

> The things that have always been important to me actually took center stage during COVID. Partnering with teachers to solve instructional problems, providing physical and digital resources, general tech support, and working with students were absolutely important then and now. However, one of the reasons I felt successful was that I was able to break away from a fixed schedule where all I was providing was planning time coverage for classroom teachers. When I can set my own schedule, meet with teachers to plan as needed, and be available to students at the point of need, then I feel like I'm doing my best work

Interestingly, elementary librarians more often operate on a fixed schedule than high school librarians. This schedule difference could explain some of the variation in mean scores between the two groups. The fixed schedule prevents school librarians from collaborating with classroom teachers during their prep time, so working together would require additional time outside the school day. This could contribute to some teachers' resistance to working with their librarians.

While not the majority of survey participants, some respondents (17.0%, n = 53) are not interested in adding EdTech coaching responsibilities to their work. For those not interested, some indicated there are already staff in their school communities who are specifically hired to do the work of an EdTech coach (13.8%, *n* = 43). With an EdTech team already in place at some schools, select participants did not indicate their level of interest in EdTech coaching, potentially skewing the overall level of interest; for instance, one participant noted, "I said neutral because we have an EdTech coach on staff, in addition to an instructional facilitator."

Previous findings (Bamberger et al., 2020; Hill & Prestebak, 2022) have shown that some schools have to choose between a school librarian and EdTech staff. Other survey respondents shared concern that, by taking on the role of EdTech coach, this additional work would take away from the school library program, and therefore, have little or no interest in serving as an EdTech coach.

These qualitative results added information and context to the quantitative results. This chapter's Implications for Research and Practice section will share more insights from these findings.

Research Question Five: What responsibilities do school librarians need to give up to manage their workload?

In order to even consider school librarians adding the EdTech coaching responsibilities to their already full role, it was necessary to assess how to shift their current responsibilities. The survey provided participants with an excerpt from a 2016 article by Lois Wine, in which the author found that the role of a school librarian is continuously evolving and that responsibilities have shifted immensely over time. The survey asked participants if there were responsibilities that were no longer serving the librarians or their community. Several participants (46.3%, n = 144) did not think their work was outdated, and 80 (25.7%) were unsure. These results were surprising when coupled with one survey participant response:

> It would be great if the library certification could be updated to incorporate more tech. It's pretty much just "learn on your own" or get a second certification on your own dime. The library certification programs are where change needs to happen.

With the large number of respondents who think that school librarians are keeping abreast of the changes in education and growing with the school, this comment was a surprise. The need for updates to school librarian preparation programs will be discussed further in Implications for Theory, Research, and Practice. Many participants (23.2%, *n* = 72) indicated they had already gotten rid of outdated responsibilities but were being spread too thin by continuing to take on additional duties. Past research supports the findings that those additional responsibilities could keep school librarians from embracing new initiatives (Elkins, 2018; Lance, 2018; Lance & Kachel, 2018).

School librarians are being required to teach non-library classes, substitute for classroom teachers, and spend a large amount of time covering things like recess and lunch duty. These findings, both in prior research and this study, emphasize the idea that school librarians are unvalued by administrators who are taking them away from where they are needed most, as library, information, and collaboration experts (Baker et al., 2020; Bamberger et al., 2020; Church, 2008, 2010; Gross, 2022; Lance & Kachel, 2021; Lewis, 2019; Pickett & Combs, 2016; Shannon, 2009).

This devaluing of school librarians also shows up in the EdTech responsibilities that school librarians have, which are often limited to basic troubleshooting and tracking device inventory, which take a great deal of time and underutilize their skills. With a plethora of past research on the skills of school librarians as EdTech leaders (Dawkins, 2020; Huett & Neubauer, 2019; Johnston, 2012, 2015; Lewis, 2021) and the strong self-efficacy as EdTech coaches found in this study, it is clear there is a disconnect between what school librarians are capable of doing and what they are tasked with as part of their position.

In addition to providing basic EdTech assistance, school librarians are impacted by the reduction of library assistants (8.4%, *n* = 26). School librarians are being tasked with this work, which is not only taking them away from their work but also keeping them from exploring new tasks like EdTech coaching. One participant shared, “I am doing two people's jobs right now. I desperately need a well-trained assistant who can help manage the data, spaces, and objects that make up the physical and virtual library.”

One lingering task that some school librarians indicated felt was outdated and no longer necessary was the need to manage reference materials (2.9%, *n* = 9). Library assistants could manage this work, but, as noted above, it is falling more and more on the shoulders of school librarians. With a shift away from print materials for resources like atlases and dictionaries, school librarians still have to teach how to use print resources to align their curriculum to state standardized tests. The survey responses did not convey that school librarians are not interested and skilled at teaching how to use reference materials but, instead, that they want to teach those skills in the format the students and teachers are accessing them (Lester, 2023).

These qualitative results added information and context to the quantitative results data, and more insights from these findings will be shared in the Implications for Research and Practice section of this chapter.

Study Strengths

A strength of this study was the large sample size (*N* = 311), with representation from 14 states and a wide range of school librarian credentials and grade levels served. Another strength was that this study featured the creation of a survey instrument designed to collect data about self-efficacy with the ISTE Standards for Coaches. This is the first

published study to apply the ISTE Standards for Coaches as an evaluation tool. Finally, the mixed-methods approach allowed for quantitative data followed by qualitative data for greater context, and these findings supported each other. The Limitations and Implications for Future Research section will further discuss the implications of these aspects of the study.

Limitations and Implications for Future Research

A potential limitation of this study involved the sample. While the sample size was large, the only people invited to participate were school librarians who were members of the Library Media ListServ, the AASL Member Forum, or one of the 14 state school librarian associations who chose to participate. Being a member of one of these organizations could indicate that these participants are actively involved in advances in the field. Being members of online communities and listservs could also imply they are more comfortable and technologically savvy in an online environment. Reaching additional school librarians through alternative outreach methods in a future study could be beneficial.

Another aspect of the current study's sample that could be a potential limitation was the requirement to be a practicing school librarian. The survey excluded any school librarians who were not practicing and, therefore, left out anyone who was either in between positions, had moved into another role, or had retired from the field of librarianship. Those school librarians could have valuable insight, and including them in a future study on the same topic is advised. Additionally, practicing non-credentialed school librarians were excluded. Future research could survey non-certified librarians who serve in this role.

Another potential limitation is that this study did not investigate the effect of demographic variables, such as the participant's geographic location, socioeconomic conditions, or the schools where the participants worked. Although the sample size of 311 participants was large and the data collection methods involved email services that represented a wide range of geographic areas and potentially a wide range of socioeconomic conditions, this data was not collected and, therefore, not analyzed. This impacts the generalizability of the results in that we are not able to interpret the results through those lenses. It is possible that different geographic regions and settings (urban, rural, remote, etc.) could impact the self-efficacy of the participants. In addition, the level of resources available to school librarians based on the school's socioeconomic status could provide valuable information on the readiness of school librarians to serve as EdTech coaches. Future research should involve collecting and analyzing geographic and socioeconomic demographic variables to determine their impact.

Another potential limitation is related to the ages served question and the number of age bands. Respondents from the validation phase of the survey stated they did not fit into the original options for ages served, so more categories were added. This resulted in seven age bands plus an other option. Future research could broaden the ages served bands to less groups with larger numbers of participants.

Other potential limitations are all related to the survey instrument itself. There was no prior validated survey instrument to measure the self-efficacy of school librarians within the context of the ISTE Standards for Coaches. While the survey created for this study did go through instrument validation, it did not do well in the PCA. ISTE was contacted to inquire how the standards were developed or if they have conducted any

studies on using the standards as a measurement tool; however, they did not respond. Because retaining the ISTE Standards for Coaches as they were written was important for this study, none of the individual components were added to, removed, or edited in any way. Future research should include a partnership with ISTE to create a valid and reliable measurement tool. In addition, alternative methods of validation such as linear discriminant analysis or exploratory factor analysis, which may focus on separability as opposed to variance and underlying latent constructs, may be useful.

Another potential limitation is the structure of the survey itself. The School Librarian EdTech Coaching Survey was developed according to research-based guidelines for designing measurements of self-efficacy, which indicated that the task should be phrased in terms of can-do currently as opposed to will-do in the future (Bandura, 2006; Chen et al., 2001). Five survey respondents made statements about the wording of the survey questions in an open-ended question at the end of the survey. Those participants shared that asking someone if they can do something differs from asking if they are allowed to do a specific task. Some participants noted they scored their self-efficacy lower when they had the skills to complete a task but were prevented by any number of barriers. Future studies could look at other ways to capture school librarians' feedback while adhering to the guidelines for developing a self-efficacy survey. Lastly, some participants shared that they were close to retirement or frustrated with their position and unwilling to take on any new responsibilities. These participants overwhelmingly ranked their self-efficacy across all or many standards and indicators at a 1 (strongly disagree). Those scores were included in the data analysis without removal or transformation and could have impacted the overall mean scores. It could be helpful to

find ways to capture these valuable thoughts without skewing the overall scores and opinions of the sample.

Implications for Research and Practice

The findings in this study yield several implications for research and practice. While the findings in this study add additional information to the role of ever-evolving school librarians, additional research studies could provide important information. By the time national-level data is collected, cleaned, analyzed, and published, it is often quite outdated. Employment rates of school librarians from the National Center for Education Statistics are three years old, and so much has changed throughout the Covid pandemic. Collecting real-time data on the employment rates of school librarians, library assistants, and instructional and technology coordinators is essential. With this data, it would also be helpful to examine the responsibilities of those roles, particularly with the technology-specific roles, to determine who, if any, is serving as EdTech coaches. This data would also help illustrate the number of school librarians juggling the roles of the librarian and the library assistant.

Another research study that could be valuable when looking at the role and responsibilities of school librarians would be to evaluate school librarian preparation programs. Both what is being taught and what the strengths and opportunities are for both the Master in Library Science programs and school library certification programs. This study could also examine the term “qualified school librarian.” School librarian qualifications vary by state, so there is no standardized definition of a qualified librarian. Creating a shared definition for this term could be helpful for school librarians and others hiring and working with school librarians. This term could be revisited while analyzing

school librarian preparation programs. Prior research shows that school librarians have the skills to serve as leaders, and the findings exhibit a strong level of self-efficacy as EdTech coaches. However, some participants called for needed updates on school librarian preparation programs.

School librarian preparation programs are not the only ones needing a thorough review. School librarians have the skills and confidence to be EdTech coaches. However, they are prevented from doing so because overwhelming workloads burden them, so their school administrators often misunderstand and underappreciate them. No shortage of prior research shows that administrators and teachers do not fully understand the role of school librarians (Baker et al., 2020; Bamberger et al., 2020; Church, 2008, 2010; Gross, 2022; Lance & Kachel, 2021; Lewis, 2019; Pickett & Combs, 2016; Shannon, 2009) and an evaluation and update to administration preparation programs is needed. Even adding current information about school librarians' role in teacher preparation programs could be beneficial.

While this study is based on school librarians' self-efficacy through the lens of the ISTE Standards for Coaches, a partnership with ISTE could be an important next step in any related studies or proposed changes to practice. As mentioned in Chapter 1, there is much written about the ISTE Standards and school librarianship (e.g., Cooper, 2015; Lewis, 2019; Wine, 2016) including crosswalks between the ISTE Standards and several library standards (Cooper, 2015; AASL, 2018a) but it would be helpful to work with ISTE and ALA to do a formal crosswalk between the ISTE Standards for Coaches and the ALA/AASL/CAEP School Librarian Preparation Standards. This crosswalk could assist those who evaluate current school librarian preparation programs.

In addition, the ISTE Standards were not designed as survey instruments or tools to measure effectiveness; they were designed as frameworks for providing guidance on best practices for technology integration. A helpful implication for practice would be to work with ISTE to expand the work that has been done (Vucaj, 2020) and create measurement tools for the standards so that they can be used for future research.

Finally, data showed that school librarians were losing their jobs while EdTech coaching jobs were rising. This study shows that school librarians have a high level of self-efficacy in serving as EdTech coaches, and many already have responsibilities in that role. If the barriers outlined in Chapter 4 could be removed by helping administrators and teachers understand the importance and value of school librarians, they could take advantage of this important human resource. One survey participant spoke about the changing role of the school librarian and how to make that shift potentially:

> As [S. R.] Ranganathan states in his Five Laws of Library Science, "The library is a living organism," and as such it should always be evolving and changing to best serve its community. That said, there needs to be a balance of honoring past traditions, teaching our students where we've come from, so that they can understand how we've gotten to where we are and make plans for the future. The library is also forward thinking in this way. Rather than just being a repository for books, libraries today need to also offer their students experiences and opportunities that will broaden their understanding of the global world we live in.

There are many exciting opportunities for additional research and changes to practice on this topic. Most importantly, with the shifting landscape of schools, school librarians have overwhelmingly indicated that they are prepared and willing to

demonstrate their immense value and skills as EdTech coaches if given the opportunity and necessary support.

References

Abdi, H., & Williams, L. J. (2010). Principal component analysis. *Wiley Interdisciplinary Reviews: Computational Statistics, 2(*4), 433-459. https://doi.org/10.1002/wics.101

Adair, H. F., Crane, A. B., & Gross, E. A. (2023). Information literacy in context: Skill development in pre-and in-service school librarians. *Peabody Journal of Education, 98*(1), 132-157. https://doi.org/10.1080/0161956x.2023.2160118

Ahlfeld, K. (2019). They paved paradise: School librarians and school libraries are disappearing and we won't know what we've lost until it's gone. *Journal of Library Administration, 59*(8), 927-938. https://doi.org/10.1080/01930826.2019.1661747

Albion, P. R. (1999). Self-efficacy beliefs as an indicator of teachers' preparedness for teaching with technology. In J. Price, J. Willis, D. Willis, M. Jost, & S. Boger-Mehall (Eds.), *Proceedings of SITE 1999—Society for Information Technology & Teacher Education International Conference* (pp. 1602-1608). Association for the Advancement of Computing in Education. https://core.ac.uk/download/pdf/11039629.pdf

American Association of School Librarians. (2009a). *Empowering learners : Guidelines for school library programs*. American Library Association.

American Association of School Librarians. (2009b). *Standards for the 21st-century learner in action*. American Library Association.

American Association of School Librarians. (2010). *ALA/AASL standards for initial preparation of school librarians.* American Library Association.

https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aasleducation/schoollibrary/2010_standards_with_rubrics_and_statements_1-31-11.pdf

American Association of School Librarians. (2018a). *National school library standards crosswalk.* https://standards.aasl.org/wp-content/uploads/2018/08/180828-aasl-standards-crosswalk-iste.pdf

American Association of School Librarians. (2018b). *National school library standards for learners, school librarians, and school libraries.* American Library Association. https://alastore.ala.org/content/national-school-library-standards-learners-school-librarians-and-school-libraries-aasl

American Association of School Librarians, & Association for Educational Communications and Technology. (1988). *Information power: Guidelines for school library media programs*. American Library Association.

American Association of School Librarians & Association for Educational Communications and Technology. (1998). *Information power: Building partnerships for learning*. American Library Association.

American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1999). *Standards for educational and psychological testing*. American Educational Research Association. https://www.aera.net/Portals/38/1999%20Standards_revised.pdf

American Library Association. (1920). *Standard library organization and equipment for secondary schools of different sizes*. American Library Association. https://ia802607.us.archive.org/13/items/libraryo00natistandardrich/libraryo00natistandardrich.pdf

American Library Association. (2022). *Online code of conduct.* American Library Association. https://www.ala.org/online-code-of-conduct

American Library Association, American Association of School Librarians, and Council for the Accreditation of Educator Preparation. (2019). *ALA/AASL/CAEP school librarian preparation standards*. www.ala.org/aasl/sites/ala.org.aasl/files/content/aasleducation/ALA_AASL_CAEP_School_Librarian_Preparation_Standards_2019_Final.pdf

Ash-Argyle, R., & Shoham, S. (2012). Librarians' leadership efficacy, training, and school involvement: Collaboration between teachers and school librarians in Israel. *School Libraries Worldwide, 18*(1), 1–17. https://doi.org/10.29173/slw6825

Ash-Argyle, R., & Shoham, S. (2014). Professional self-efficacy and role perception of school librarians and their impact on the development of students' information literacy: An evidence-based study. *Journal of Information Literacy, 8*(2). https://doi.org/10.11645/8.2.1894

Baker, S., Decman, J., & Willis, J. M. (2020) Talk or walk: School principals and shared instructional leadership. *School Leadership Review, 15*(1). https://scholarworks.sfasu.edu/slr/vol15/iss1/17/

Bakhshaei, M., Hardy, A., Francisco, A., Noakes, S., & Fusco, J. (2018). *Fostering powerful use of technology through instructional coaching*. Digital Promise. http://hdl.handle.net/20.500.12265/48

Bakhshaei, M., Seylar, J., Ruiz, P., & and Vang, M. C. (2020). *Prevalence of coaching and approaches to supporting the valuable role of edtech coaches during the*

covid-19 pandemic: A national survey. Digital Promise. https://digitalpromise.org/wp-content/uploads/2020/08/Natl-COVIDCoachingResponseSurveyReport.pdf

Bamberger, C., Bryan, C., Campbell, J., & Schultz, A. (2020, July 3). As COVID-19 budget cuts loom, relevance of school librarians put to the test. *Education Week.* https://www.edweek.org/teaching-learning/as-covid-19-budget-cuts-loom-relevance-of-school-librarians-put-to-the-test/2020/07

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychology Review, 84*(2), 191-215. https://doi.org/10.1037/0033-295x.84.2.191

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American psychologist, 37*(2), 122. https://doi.org/10.1037/0003-066x.37.2.122

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology, 4*(3), 359. https://doi.org/10.1521/jscp.1986.4.3.359

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Macmillan. https://doi.org/10.5860/choice.35-1826

Bandura, A. (2002). Growing primacy of human agency in adaptation and change in the electronic era. *European Psychologist, 7*(1), 2-16. https://doi.org/10.1027//1016-9040.7.1.2

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan, & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Information Age Publishing. https://www.infoagepub.com/products/Self-Efficacy-Beliefs-of-Adolescents

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices*. University of South Florida. https://digitalcommons.usf.edu/cgi/viewcontent.cgi?article=1002&context=oa_textbooks

Bishop, K. (2007). *The collection program in schools: Concepts, practices, and information sources* (4th ed.). Libraries Unlimited.

Burns, R. P., & Burns, R. A. (2008). *Business research methods and statistics using SPSS*. Sage. http://studysites.uk.sagepub.com/burns/chapters.htm

Carson, C. H. (1993). The development of a scale to measure the self-efficacy of school library media specialists. *School Library Media Quarterly, 21*(3), 165-70. https://eric.ed.gov/?id=EJ464309

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*(2), 245-276. https://doi.org/10.1207/s15327906mbr0102_10

Chen, G., Gully, S. M. & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods, 4*(1), 62-83. https://doi.org/10.1177/109442810141004

Church, A. P. (2008). The instructional role of the library media specialist as perceived by elementary school principals. *School Library Media Research, 11*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol11/SLMR_InstructionalRole_V11.pdf

Church, A. P. (2010). Secondary school principals‘ perceptions of the school librarian‘s instructional role. *School Library Research, 13*.

https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol13/SLR_SecondarySchool_V13.pdf

Church, A. P. (2011). School librarians as teacher leaders. *Delta Kappa Gamma Bulletin, 77*(3), 10. http://www.deltakappagamma.org/NH/DKGbulletinspring2011.PDF#page=10

Cockcroft, M. (2023, February 21). Under pressure: Survey provides insight into librarians' job satisfaction. *School Library Journal*. https://www.slj.com/story/Under-pressure-insight-into-librarians-Job-Satisfaction-from-LJ-SLJ-survey-school-and-youth-services-libraries

Cooper, O. P. (2015). How ISTE's standards for technology coaches inform AASL's standards for school librarians. *TechTrends, 59*(3), 48-53. https://doi.org/10.1007/s11528-015-0852-z

Corbin, J. M., & Strauss, A. (2007). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Sage.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage. https://doi.org/10.1080/15424065.2022.2046231

Croft, M. L. (2022). How school librarians can partner with K-12 school district leadership to support school libraries. *Knowledge Quest 50*(4), 58-60. link.gale.com/apps/doc/A697577823/AONE?u=anon~a33b8dc0&sid=googleScholar&xid=a52182bf

Dawkins, A. (2020). Digital citizenship, digital legacy, and school librarians. *Library Technology Reports, 56*(5), 17-21. https://journals.ala.org/index.php/ltr/article/view/7386/10170

Douglas, T. (2017, April 1). *Understanding the roles of tech, instructional coaches and how they are evolving*. ISTE. https://www.iste.org/explore/entrsekt/Understanding-the-roles-of-tech%2C-instructional-coaches-and-how-they-are-evolving

Drennan, G., & Moll, I. (2018). A conceptual understanding of how educational technology coaches help teachers integrate iPad affordances into their teaching. *Electronic Journal of e-Learning, 16*(2), pp122-133. https://academic-publishing.org/index.php/ejel/article/view/1862

Elkins, A. J. (2018). Mind the gaps: School librarians' job descriptions and the professional standards for school librarians in the United States. *School Libraries Worldwide, 24*(1), 87-98. https://doi.org/10.29173/slw8219

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research & Development, 53*(4), 25–39. https://doi.org/10.1007/bf02504683

Ertmer, P., & Ottenbreit-Leftwich, A. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42*(3), 255-284. https://doi.org/10.1080/15391523.2010.10782551

Everhart, N., & Dresang, E. (2007). Integrating research results and National Board Certification standards into a leadership curriculum for school library media

specialists. *Journal of Education for Library and Information Science, 48*(4), 272-283. https://www.jstor.org/stable/40323793

Everhart, N., & Johnston, M. P. (2016). A proposed theory of school librarian leadership: A meta-ethnographic approach. *School Library Research, 19*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol19/SLR_ProposedTheory_V19.pdf

Farmer, L. S. J. (2006). Library media program implementation and student achievement. *Journal of Librarianship and Information Science, 38*(1), 21–32. https://doi.org/10.1177/0961000606060957

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.

Foltos, L. (2013). *Peer coaching: Unlocking the power of collaboration*. Corwin Press.

Friedman, I. A., & Kass, E. (2002). Teacher self-efficacy: A classroom-organization conceptualization. *Teaching and Teacher Education, 18*, 675–686. https://doi.org/10.1016/s0742-051x(02)00027-6

Fuller, M. T. (2020). ISTE standards for students, digital learners, and online learning. In *Handbook of research on digital learning* (pp. 284-290). IGI Global. https://doi.org/10.4018/978-1-6684-7540-9.ch045

Gall, M., Gall, J., & Borg, R. (2007). *Educational research: An introduction* (8th ed.). Pearson Education.

Gavigan, K., Pribesh, S., & Dickinson, G. (2010). Fixed or flexible schedule? Schedule impacts and school library circulation. *Library & Information Science Research, 32*(2), 131-137. https://doi.org/10.1016/j.lisr.2009.10.005

Gliem, J. A., & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales.* Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education. http://pioneer.chula.ac.th/~ppongsa/2900600/LMRM08.pdf

Gomez, F. C., Trespalacios, J., , Y. C. & Yang, D. (2022). Exploring teachers' technology integration self-efficacy through the 2017 ISTE standards. *TechTrends, 66*, 159–171. https://doi.org/10.1007/s11528-021-00639-z

Gonzales, M. M., & Jackson, I. (2020). Going the distance: What school administrators can learn from one-to-one laptop schools. *Journal of School Administration Research and Development, 5*, 55-60. https://doi.org/10.32674/jsard.v5is1.2795

Gretes, F. (2013). *School library impact studies: A review of findings and guide to sources*. Harry & Jeanette Weinberg Foundation. https://massteacher.org/-/media/massteacher/files/employment-licensure/librarytaskforce/wd-28-summary-library-impact-studies.pdf?la=en

Gross, E. A. (2022, November). It doesn't mean what you think it means: Perceptions of the school librarian and their work. In *IASL Annual Conference Proceedings*. https://doi.org/10.29173/iasl8554

Haeffner, C. N. (2020). *Factors Influencing the Self-Efficacy of the Novice School Librarian*. University of Nebraska at Omaha. https://digitalcommons.unomaha.edu/studentwork/3686/

Hanson-Baldauf, D., & Hassell, S. H. (2009). The information and communication technology competencies of students enrolled in school library media certification programs. *Library & Information Science Research, 31*(1), 3-11. https://doi.org/10.1016/j.lisr.2008.03.003

Haynes, L., Baylen, D., An, Y. J., Bradford, G., & d'Alba, A. (2014). Learning assessments and program evaluation connected to ISTE standards for coaches: Preparing instructional technology coaches for K-12 teachers. In M. Searson & M. Ochoa (Eds.), *Proceedings of SITE 2014--Society for Information Technology & Teacher Education International Conference* (pp. 1764-1767). Association for the Advancement of Computing in Education. https://www.learntechlib.org/primary/p/131029/

Hill, J., & Prestebak, J. (2022). Will Minnesota Principals Continue to Hire School Librarians?. *St. Cloud State University*. https://repository.stcloudstate.edu/cgi/viewcontent.cgi?article=1001&context=ed_wps

Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. *Journal of Research on Technology in Education, 43*(4), 343-367. https://doi.org/10.1080/15391523.2011.10782576

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal, 93*(4), 355–372. https://doi.org/10.1086/461729

Huberty, C. J., & Olejnik, S. (2006). *Applied MANOVA and discriminant analysis*. (2nd ed.). Wiley. https://wiley.com/en-us/Applied+MANOVA+and+Discriminant+Analysis,+2nd+Edition-p-9780471468158

Huett, K., & Neubauer, B. (2019). Design and development of a graduate online course to prepare teachers and school librarians to lead computational thinking in K-12 contexts. In *Society for Information Technology & Teacher Education International Conferenc*e (pp. 290-295). Association for the Advancement of Computing in Education. https://doi.org/10.4018/978-1-7998-1479-5.ch013

International Society for Technology in Education. (2019). *ISTE standards for coaches*. International Society for Technology in Education. https://www.iste.org/standards/iste-standards-for-coaches

International Society for Technology in Education. (2020). *Transform learning through technology: A guide to the ISTE standards for coaches*. International Society for Technology in Education.

International Society for Technology in Education. (2022). *The ISTE standards*. International Society for Technology in Education. https://www.iste.org/iste-standards

Israel, M., Ray, M. J., Maa, W. C., Jeong, G. K., Lee, C. E., Lash, T. & Do, V. (2018). School-embedded and district-wide instructional coaching in K-8 computer science: Implications for including students with disabilities. *Journal of Technology and Teacher Education, 26*(3), 471-501. https://www.learntechlib.org/primary/p/181938/

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14-26. https://doi.org/10.3102/0013189x033007014

Johnston, M. P. (2012). School librarians as technology integration leaders: Enablers and barriers to leadership enactment. *School Library Research, 15*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol15/SLR_School_Librarians_as_Technology_Integration_Leaders_V15.pdf

Johnston, M. P. (2015). Blurred lines: The school librarian and the instructional technology specialist. *TechTrends, 59*(3), 17-26. https://doi.org/10.1007/s11528-015-0849-7

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 32-36. https://doi.org/10.1007/bf02291575

Kazu, I. & Erten, P. (2014). Teachers' technological pedagogical content knowledge self-efficacies. *Journal of Education and Training Studies, 2*(2), 126-144. https://doi.org/10.11114/jets.v2i2.261

Kimmel, S. C., Mardis, M. A., Pribesh, S., Pasquini, L. A., Schulz-Jones, B., Jones, F. R., Wine, L. D., & Colson, L. M. (2019). The preparation and certification of school librarians: Using causal educational research about teacher characteristics to probe facets of effectiveness. *School Library Research, 22*. https://files.eric.ed.gov/fulltext/EJ1232279.pdf

Knight, J. (2006). Instructional coaching. *The School Administrator, 63*(4), 36-40. https://www.aasa.org/SchoolAdministratorArticle.aspx?id=9584

Knight, J. (2007). Instructional coaching: A partnership approach to improving instruction. *Corwin*.

Knight, J. (2008). Instructional coaching. In J. Knight (Ed.), *Coaching: Approaches and perspectives* (pp. 29-55). Corwin.

Kwon, K., Ottenbreit-Leftwich, A. T., Sari, A. R., Khlaif, Z., Zhu, M., Nadir, H., & Gok, F. (2019). Teachers' self-efficacy matters: Exploring the integration of mobile computing device in middle schools. *TechTrends, 63*(6), 682-692. https://doi.org/10.1007/s11528-019-00402-5

Laerd Statistics. (2018). One-way ANOVA in SPSS Statistics. *Lund Research*. https://statistics.laerd.com/spss-tutorials/one-way-anova-using-spss-statistics.php

Lance, K. C. (2018). School librarian, where art thou?. *School Library Journal, 64*(3), 36–44. https://www.slj.com/story/school-librarian-art-thou

Lance, K. C., & Hofschire, L. (2011). Something to shout about: New research shows that more librarians means higher reading scores. *School Library Journal, 57*, 28-33. https://www.slj.com/story/something-to-shout-about-new-research-shows-that-more-librarians-means-higher-reading-scores

Lance, K. C., & Hofschire, L. (2012). *Change in school librarian staffing linked with change in CSAP reading performance, 2005 to 2011*. Colorado State Library, Library Research Service. https://www.lrs.org/documents/closer_look/CO4_2012_Closer_Look_Report.pdf?lrspdfmetric=no

Lance, K. C., & Kachel, D. E. (2018). Why school librarians matter: What years of research tell us. *Phi Delta Kappan, 99*(7), 15–20. https://doi.org/10.1177/0031721718767854

Lance, K. C., & Kachel, D. E. (2021). *Perspectives on school librarian employment in the United States, 2009-10 to 2018-19*. SLIDE: The School Librarian Investigation—Decline or Evolution?. https://libslide.org/publications/perspectives/

Lance, K. C., Kachel, D. E., Breevoort, L., Gerrity, C., & Ellis, D. (2023). *Voices of decision-makers how district & school leaders decide about school librarian employment*. SLIDE: The School Librarian Investigation—Decline or Evolution?. https://libslide.org/wp-content/uploads/2023/09/Voices-MASTER.pdf

Lance, K. C., & Schwartz, B. (2012). How Pennsylvania school libraries pay off: Investments in student achievement and academic standards. In *Online Submission*. https://files.eric.ed.gov/fulltext/ED543418.pdf

Latham, D., Gross, M., & Witte, S. (2013). Preparing teachers and librarians to collaborate to teach 21st century skills: Views of LIS and education faculty. *School Library Research, 16*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol16/SLR_PreparingTeachersLibrarianstoCollaborate_V16.pdf

Lester, K. (2023). Reflections on traditional practices of the school librarian. *Knowledge Quest, 51*(3), 6-8. https://search.proquest.com/openview/deacb60c0a84376a8b8e95636411210a/1?pq-origsite=gscholar&cbl=6154

Lewis, M. (2016). Professional learning facilitators in 1: 1 program implementation: Technology coaches or school librarians?. *School Libraries Worldwide*, 13-22. https://doi.org/10.29173/slw6913

Lewis, M. A. (2019). Administrators' instructional leadership perspective of the role of instructional coaches and teacher librarians: A comparative examination. *School Libraries Worldwide, 25*(2), 16-33. https://doi.org/10.29173/slw8240

Lewis, M. A. (2021). Enabling school librarians to serve as instructional leaders of multiple literacies. *School Library Research 24*. https://doi.org/10.29173/iasl8284

Luppicini, R. (2005). A systems definition of educational technology in society. *Educational Technology & Society, 8*(3), 103-109. https://www.jstor.org/stable/10.2307/jeductechsoci.8.3.103

Marsh, J. A., Sloan McCombs, J., & Martorell, F. (2010). How instructional coaches support data-driven decision making: Policy implementation and effects in Florida middle schools. *Educational Policy, 24*(6), 872–907. https://doi.org/10.1177/0895904809341467

McBride, A. (2021). *The edtech coaching primer: Supporting teachers in the digital age classroom*. International Society for Technology in Education.

McGregor, J. (2006). Flexible scheduling: Implementing an innovation. *School Library Media Research, 9*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol9/SLMR_FlexibleScheduling_V9.pdf

McIver, J., & Carmines, E. G. (1981). *Unidimensional scaling* (Vol. 24). Sage. https://doi.org/10.4135/9781412986441

Meeuwse, K., & Mason, D. (Eds.). (2018). *Personalized professional learning for educators: Emerging research and opportunities*. Information Science Reference. https://doi.org/10.4018/978-1-5225-2685-8

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass. https://www.proquest.com/docview/2134302163/$N?sourcetype=Books

Montiel-Overall, P. (2005). Toward a theory of collaboration for teachers and librarians. *School Library Media Research, 8*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol8/SLMR_TheoryofCollaboration_V8.pdf

National Policy Board for Educational Administration. (2002). *Standards for advanced programs in educational leadership for principals, superintendents, curriculum directors, and supervisors.* National Policy Board for Educational Administration. https://www.mpea.org/images/forms/ELCC_Standards_5-02.pdf

Niederhauser, D. S., & Perkmen, S. (2008). Validation of the intrapersonal technology integration scale: Assessing the influence of intrapersonal factors that influence technology integration. *Computers in the Schools, 25*(1-2), 98-111. https://doi.org/10.1080/07380560802157956

O'Brien, R. G., & Kaiser, M. K. (1985). MANOVA method for analyzing repeated measures designs: an extensive primer. *Psychological bulletin, 97*(2), 316. https://doi.org/10.1037//0033-2909.97.2.316

Ottenbreit-Leftwich, A., Liao, J. Y. C., Sadik, O., & Ertmer, P. (2018). Evolution of teachers' technology integration knowledge, beliefs, and practices: How can we

support beginning teachers' use of technology?. *Journal of Research on Technology in Education, 50*(4), 282-304. https://doi.org/10.1080/15391523.2018.1487350

Ozer, E. & Bandura, A. (1990). Mechanisms governing empowerment effects: A self-efficacy analysis. *Journal of Personality and Social Psychology, 58*(3), 472-486. https://doi.org/10.1037/0022-3514.58.3.472

Pickett, J., & Combs, J. P. (2016). What school principals need to know about libraries: implications for practice and preparation. NCPEA Education Leadership Review, 17(2). https://files.eric.ed.gov/fulltext/EJ1124034.pdf

Phillips, A. L., & Lee, V. R. (2019). Whose responsibility is it?: A statewide survey of school librarians on responsibilities and resources for teaching digital citizenship. *School Library Research, 22*. https://files.eric.ed.gov/fulltext/EJ1218561.pdf

Poulsen, J., & French, A. (2008). Discriminant function analysis. *San Francisco State University*. https://docplayer.net/14088191-Discriminant-function-analysis-da.html

Reid, D. B. (2019). How school principals enable instructional coaches: Evidence from New Jersey. *Education Leadership Review, 20*(1), 87-100. https://files.eric.ed.gov/fulltext/EJ1234930.pdf

Richey, R.C. (2008) Reflections on the 2008 AECT definitions of the field. *TechTrends, 52*(1), 24-25. https://doi.org/10.1007/s11528-008-0108-2

Rossman, G. B., & Rallis, S. F. (2017). *An introduction to qualitative research: Learning in the field*. (4th ed.). Sage. https://methods.sagepub.com/book/an-introduction-to-qualitative-research-4e

Rubio, D. M., Berg-Weger, M., Tebb, S. S., Lee, E. S., & Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social work research, 27*(2), 94-104. https://doi.org/10.1093/swr/27.2.94

Schad, M. L., Greene, M. D., & Jones, M. (2021). A review of theory, theoretical and conceptual frameworks in educational technology. *International Journal on E-Learning, 20*(2), 187-198. https://www.learntechlib.org/primary/p/218631/

Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 15-31). Academic Press. https://doi.org/10.1016/b978-012750053-9/50003-6

Sezgin, F. & Erdogan, O. (2015). Academic optimism, hope, and zest for work as predictors of teacher self-efficacy and perceived success. *Educational Sciences: Theory & Practice, 15*(1), 7-19. https://doi.org/10.12738/estp.2015.1.2338

Shannon, D. M. (2009). Principal's perspectives of school librarians. *School Libraries Worldwide, 15*(2), 1–22. https://doi.org/10.29173/slw6790

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports, 51*(2), 663-671. https://doi.org/10.2466/pr0.1982.51.2.663

Showers, B., & Joyce, B. (1996). The evolution of peer coaching. *Educational Leadership, 53,* 12-16. https://pedagogyofconfidence.net/wp-content/uploads/2021/08/joyce_showers_peer_coaching.pdf

Small, R. V., Snyder, J., & Parker, K. (2009). The impact of New York's school libraries on student achievement and motivation: Phase I. *School Library Media Research, 12*.

https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol12/SLMR_ImpactofNewYork_V12.pdf

Smith, D. (2011). Educating preservice school librarians to lead: a study of self-perceived transformational leadership behaviors. *School Library Media Research, 14*. https://www.ala.org/aasl/sites/ala.org.aasl/files/content/aaslpubsandjournals/slr/vol14/SLR_EducatingPreservice_V14.pdf

Stewart, P., & Deans, M. (2020). Practices and barriers of inter-professional collaboration with teacher-librarians and teachers: A content analysis. *School Libraries Worldwide, 26*(1), 166-180. https://doi.org/10.29173/slw8255

Stock-Kupperman, G. (2015). Cohort-based technology training: A collaboration with faculty grounded in diffusion of innovation and faculty learning community theories. *Collaborative Librarianship, 7*(3), 6. https://digitalcommons.du.edu/cgi/viewcontent.cgi?article=1060&context=collaborativelibrarianship

Stroup, L., DeWolf, M., & Lincoln, M. (2010). School librarians as digital librarians: The Michigan teacher network project. *Knowledge Quest, 39*(2), 70. https://doi.org/10.1177/0961000613493920

Suhr, D. D. (2005). Principal component analysis vs. exploratory factor analysis. *SUGI 30 Proceedings, 203*(230), 1-11. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=936e76d8f2203cb534a3952d3ea7032fc57f8ad0

Tschannen-Moran, M., & Barr, M. (2004). Fostering student learning: The relationship of collective teacher efficacy and student achievement. *Leadership and Policy in Schools, 3*(3), 189–209. https://doi.org/10.1080/15700760490503706

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research, 68*(2), 202–248. https://doi.org/10.3102/00346543068002202

Thompson, J. (2021). Cultivating our self-efficacy as school librarians. *Knowledge Quest, 50*(2), 50-52. https://eric.ed.gov/?id=EJ1292860

Thompson, J., Barthlow, M., & Paynter, K. (2021). School librarians' teacher self-efficacy: A predictor of reading scores?. *School Library Research, 24*. https://files.eric.ed.gov/fulltext/EJ1292860.pdf

Tomko, G., & Pendharkar, E. (2023, April 27). What the numbers say about the drop in librarians. *Education Week*. https://www.edweek.org/teaching-learning/districts-lost-school-librarians-over-the-pandemic/2023/04

Trust, T. (2017). 2017 ISTE Standards for Educators: From teaching with technology to using technology to empower learners. *Journal of Digital Learning in Teacher Education, 34*(1), 1-3. https://doi.org/10.1080/21532974.2017.1398980

Twenty to Nine LLC. (2023). *Delve* [online qualitative analysis software]. Available from delvetool.com.

U.S. Department of Education, National Center for Education Statistics (2021). *Table 213.20. Staff employed in public elementary and secondary school systems, by type of assignment and state or jurisdiction: Fall 2019.* https://nces.ed.gov/programs/digest/d21/tables/dt21_213.20.asp?current=yes

Valenza, J. K., Boyer, B., Mohamad, G., Bushby, R., & Elliott, E. D. (2023). We Were the Glue: Contributions, Compromises, and Continuing Concerns of School Librarians during the COVID-19 Pandemic. *Online Submission*. https://files.eric.ed.gov/fulltext/ED626437.pdf

van Dinther, M., Dochy, F., Segers, M., & Braeken, J. (2013). The construct validity and predictive validity of a self-efficacy measure for student teachers in competence-based education. *Studies in Educational Evaluation, 39*(3), 169-179. https://doi.org/10.1016/j.stueduc.2013.05.001

Van Ostrand, K., Seylar, J., & Luke, C. (2020). Prevalence of coaching and approaches to supporting coaching in education. Digital Promise. https://digitalpromise.dspacedirect.org/bitstream/handle/20.500.12265/91/Prevalence_of_Coaching_Report.pdf

Vucaj, I. (2020). Development and initial validation of Digital Age Teaching Scale (DATS) to assess application of ISTE Standards for Educators in K–12 education classrooms. *Journal of Research on Technology in Education, 54*(2), 226-248. https://doi.org/10.1080/15391523.2020.1840461

Warne, R. T. (2014). A primer on multivariate analysis of variance (MANOVA) for behavioral scientists. *Practical Assessment, Research & Evaluation, 19*(17). http://pareonline.net/getvn.asp?v=19&n=17

Weber, K. J. (2017). *School librarians' self-efficacy in the multiple literacies: A mixed-methods study*. Northern Illinois University. https://eric.ed.gov/?id=ED583227

Wine, L. D. (2016). School librarians as technology leaders: An evolution in practice. *Journal of Education for Library and Information Science, 57*(2), 207–220. https://files.eric.ed.gov/fulltext/EJ1096706.pdf

Yang, S. (2020, September). An investigation on the current situation of information-based learning ability of primary and secondary school students based on ISTE student standard. In *2020 International Conference on Modern Education and Information Management* (ICMEIM) (pp. 401-405). IEEE. https://doi.org/10.1109/icmeim51375.2020.00097

Yorio, K. (2019, April 30). While Spokane school librarians brace to lose jobs, state passes new budget. *School Library Journal*. https://www.slj.com/?detailStory=spokane-school-librarians-prepare-to-lose-jobs-as-state-passes-new-budget

Yu, C., & Prince, D. L. (2016). Aspiring school administrators' perceived ability to meet technology standards and technological needs for professional development. *Journal of Research on Technology in Education, 48*(4), 239-257. https://doi.org/10.1177/0192636506295392

Zimmerman, B. J. (1995). Self-efficacy and educational development. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 202–231). Cambridge University Press. https://doi.org/10.1017/cbo9780511527692.003

Zhao, Y., & Watterston, J. (2021). The changes we need: Education post COVID-19. *Journal of Educational Change, 22*(1), 3-12. https://doi.org/10.1007/s10833-021-09417-3

Appendices

Appendix A

School Librarian EdTech Coaching Survey

You are invited to participate in a survey as part of a research project examining the self–efficacy of school librarians as educational technology (EdTech) coaches. As a school librarian, your voice and participation will be valuable in this research. The study has been approved by the Seattle Pacific University's Institutional Review Board, [IRB# xxx]. For more detailed information, see this Informed Consent [attached].

The purpose of this study is to examine the role of librarians as EdTech coaches through the lens of the self-efficacy theory and the International Society for Technology in Education (ISTE) Standards for Coaches. Specifically, do librarians believe themselves to be prepared to serve as EdTech coaches? Your answers will be kept strictly confidential, and the proposed study involves no known risk.

To participate in this study, you must be

(a) a current, practicing school librarian or library media specialists,

(b) (b) at least 18 years old, and

(c) willing to complete a survey between the dates of May 1, 2023, and June 30, 2023.

By proceeding to answer the questions in the survey, you indicate that you have understood to your satisfaction the information regarding your participation in this

research project and agree to participate in this study. If you do not wish to participate in this study, you may exit the survey at any time. In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities.

Your answers should reflect your current state of experience. Please try to answer all questions if you are able. There is no right or wrong answer. At the end of the survey is a link if you would like to be entered into a drawing for one of two $25 Amazon Gift Cards as a token of appreciation for taking the time to complete this survey.

To complete the survey, click here: https://forms.office.com/r/aFcmHyLpAf

1. I consent to participate in the survey.

1. Yes

2. No

Demographic Questions

2. Are you a current, practicing school librarian?

1. Yes

2. No

3. What is your qualification as a school librarian?

1. Master's degree in Library Science

2. Degree in something other than Library Science, plus state-level school library certificate or endorsement

3. Other

4. Age:

1. 21-29

2. 30-35

3. 36-40

4. 41-47

5. 48-55

6. 56+

5. Years of experience as a school librarian:

1. Less than 1 year

2. 1-5 years

3. 6-10 years

4. 11+ years

6. Years of experience providing technology support:

1. No experience providing technology support

2. Less than 1 year

3. 1-5 years

4. 6-10 years

5. 11+ years

7. Gender:

1. Male

2. Female

3. Non-binary

4. Transgender

5. My gender is not listed. My gender is ____.

6. Prefer not to state

8. Currently working in (ages of students):

1. Elementary School

2. K-8 School

3. K-12 School

4. Middle School

5. 6-12 School

6. High School

7. Other

9. Currently working in (setting):

1. Public school

2. Private school

3. Other

10. Does your school library/libraries operate on a fixed or flexible schedule?

1. Fixed schedule

2. Flexible schedule

3. Neither

4. Both

5. Other

Directions: Please rate your confidence in your ability to engage in the following activities, using the 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree.

7. I can help educators create a shared vision and culture for using technology to learn and accelerate transformation through the coaching process (4.1.a.)

8. I can model facilitation of equitable use of digital learning tools and content that meet the needs of each learner (4.1.b.)

9. I can cultivate a supportive coaching culture that encourages educators and leaders to achieve a shared vision and individual goals (4.1.c.)

10. I can recognize educators across the organization who use technology effectively to enable high-impact teaching and learning (4.1.d.)

11. I can connect leaders, educators, instructional support, technical support, domain experts and solution providers to maximize the potential of technology for learning (4.1.e.)

12. I can pursue professional learning that deepens expertise in the ISTE Standards in order to serve as a model for educators and leaders (4.2.a.)

13. I can actively participate in professional learning networks to enhance coaching practice and keep current with emerging technology and innovations in pedagogy and the learning sciences (4.2.b.)

14. I can establish shared goals with educators, reflect on successes and continually improve coaching and teaching practice (4.2.c.)

15. I can establish trusting and respectful coaching relationships that encourage educators to explore new instructional strategies (4.3.a.)

16. I can partner with educators to identify digital learning content that is culturally relevant, developmentally appropriate and aligned to content standards (4.3.b.)

17. I can partner with educators to evaluate the efficacy of digital learning content and tools to inform procurement decisions and adoption (4.3.c.)

18. I can personalize support for educators by planning and modeling the effective use of technology to improve student learning (4.3.d.)

19. I can collaborate with educators to develop authentic, active learning experiences that foster student agency, deepen content mastery and allow students to demonstrate their competency (4.4.a.)

20. I can help educators use digital tools to create effective assessments that provide timely feedback and support personalized learning (4.4.b.)

21. I can collaborate with educators to design accessible and active digital learning environments that accommodate learner variability (4.4.c.)

22. I can model the use of instructional design principles with educators to create effective digital learning environments (4.4.d.)

23. I can design professional learning based on needs assessments and frameworks for working with adults to support their cultural, social-emotional and learning needs (4.5.a.)

24. I can build the capacity of educators, leaders and instructional teams to put the ISTE Standards into practice by facilitating active learning and providing meaningful feedback (4.5.b.)

25. I can evaluate the impact of professional learning and continually make improvements in order to meet the schoolwide vision for using technology for high-impact teaching and learning (4.5.c.)

26. I can assist educators and leaders in securely collecting and analyzing student data (4.6.a.)

27. I can support educators to interpret qualitative and quantitative data to inform their decisions and support individual student learning (4.6.b.)

28. I can partner with educators to empower students to use learning data to set their own goals and measure their progress (4.6.c.)

29. I can inspire and encourage educators and students to use technology for civic engagement and to address challenges to improve their communities (4.7.a.)

30. I can partner with educators, leaders, students and families to foster a culture of respectful online interactions and a healthy balance in their use of technology (4.7.b.)

31. I can support educators and students to critically examine the sources of online media and identify underlying assumptions (4.7.c.)

32. I can empower educators, leaders and students to make informed decisions to protect their personal data and curate the digital profile they intend to reflect (4.7.d.)

Directions: Please select all that apply.

33. What are the primary responsibilities of your current position?

1. Plan and teacher weekly library lessons.
2. Supervise students in the library
3. Perform circulation desk duties, readers advisory, and reference services.
4. Perform collection development duties.
5. Create displays, bulletin boards, and other visual elements for the library.
6. Train and supervise assistants and/or volunteers.

7. Teach digital citizenship lessons.

8. Plan cooperatively with teachers.

9. Facilitate professional development for teachers.

10. Serve on school/district committees.

11. Substitute for classroom teachers.

12. Perform lunch room, recess, and other coverage duties.

13. Other.

34. I currently have EdTech responsibilities as part of my school librarian position.

1. Yes (If yes, please explain your EdTech responsibilities).

2. No

3. Unsure

35. Are you familiar with the International Society for Technology in Education (ISTE)?

1. Yes (If yes, are you familiar with: ISTE Standards for Students, ISTE Standards for Educators, ISTE Standards for Education Leaders, ISTE Standards for Coaches, ISTE Standards for Computational Thinking, None)

2. No

3. Unsure

Directions: Please rate the following statement using the 5-point Likert scale, from 1 = strongly disagree to 5 = strongly agree.

36. What is your interest in incorporating the role of EdTech coach into your current school librarian position?

37. Why would you be interested or not interested in incorporating the role of EdTech coach into your current school librarian position? (text box)

38. In a 2016 article by Lois Wine, the author found that the role of a school librarian is continuously evolving and responsibilities have shifted immensely over time. The current workload of librarians may be outdated and in need of an updated review, especially in light of all of the changes to education with the impact of Covid-19 (Zhao & Watterston, 2021). Are there responsibilities that are part of your current workload that may no longer be serving you or your students?

1. Yes
2. No
3. Unsure

39. Please use this space if you would like to explain your response to the last question about shifting responsibilities (text box).

40. Is there anything else you would like to share? (text box)

Thank you for completing the survey!

If you would like to be entered into a drawing for one of two $25 Amazon gift cards, your email address will be requested. In order to keep your responses confidential, please click the link below to share your email address on this separate form Drawing for Gift Card.

Appendix B

ISTE Standards for Coaches

SECTION 4: COACHES

4.1. Change Agent

Coaches inspire educators and leaders to use technology to create equitable and ongoing access to high-quality learning. Coaches:

- 4.1.a. Create a shared vision and culture for using technology to learn and accelerate transformation through the coaching process.
- 4.1.b. Facilitate equitable use of digital learning tools and content that meet the needs of each learner.
- 4.1.c. Cultivate a supportive coaching culture that encourages educators and leaders to achieve a shared vision and individual goals.
- 4.1.d. Recognize educators across the organization who use technology effectively to enable high-impact teaching and learning.
- 4.1.e. Connect leaders, educators, instructional support, technical support, domain experts and solution providers to maximize the potential of technology for learning.

4.2. Connected Learner

Coaches model the ISTE Standards for Students and the ISTE Standards for Educators and identify ways to improve their coaching practice. Coaches:

- 4.2.a. Pursue professional learning that deepens expertise in the ISTE Standards in order to serve as a model for educators and leaders.
- 4.2.b. Actively participate in professional learning networks to enhance coaching practice and keep current with emerging technology and innovations in pedagogy and the learning sciences.
- 4.2.c. Establish shared goals with educators, reflect on successes and continually improve coaching and teaching practice.

4.3. Collaborator

Coaches establish productive relationships with educators in order to improve instructional practice and learning outcomes. Coaches:

- 4.3.a. Establish trusting and respectful coaching relationships that encourage educators to explore new instructional strategies.
- 4.3.b. Partner with educators to identify digital learning content that is culturally relevant, developmentally appropriate and aligned to content standards.
- 4.3.c. Partner with educators to evaluate the efficacy of digital learning content and tools to inform procurement decisions and adoption.
- 4.3.d. Personalize support for educators by planning and modeling the effective use of technology to improve student learning.

4.4. Learning Designer

Coaches model and support educators to design learning experiences and environments to meet the needs and interests of all students. Coaches:

- 4.4.a. Collaborate with educators to develop authentic, active learning experiences that foster student agency, deepen content mastery and allow students to demonstrate their competency.
- 4.4.b. Help educators use digital tools to create effective assessments that provide timely feedback and support personalized learning.
- 4.4.c. Collaborate with educators to design accessible and active digital learning environments that accommodate learner variability.
- 4.4.d. Model the use of instructional design principles with educators to create effective digital learning environments.

4.5. Professional Learning Facilitator

Coaches plan, provide and evaluate the impact of professional learning for educators and leaders to use technology to advance teaching and learning. Coaches:

- 4.5.a. Design professional learning based on needs assessments and frameworks for working with adults to support their cultural, social-emotional and learning needs.
- 4.5.b. Build the capacity of educators, leaders and instructional teams to put the ISTE Standards into practice by facilitating active learning and providing meaningful feedback.
- 4.5.c. Evaluate impact of professional learning and continually make improvements in order to meet schoolwide vision for using technology for high-impact teaching and learning.

4.6. Data-Driven Decision-Maker

Coaches model and support the use of qualitative and quantitative data to inform their own instruction and professional learning. Coaches:

- 4.6.a. Assist educators and leaders in securely collecting and analyzing student data.
- 4.6.b. Support educators to interpret qualitative and quantitative data to inform their decisions and support individual student learning.
- 4.6.c. Partner with educators to empower students to use learning data to set their own goals and measure their progress.

4.7. Digital Citizen Advocate

Coaches model digital citizenship and support educators and students in recognizing the responsibilities and opportunities inherent in living in a digital world. Coaches:

- 4.7.a. Inspire and encourage educators and students to use technology for civic engagement and to address challenges to improve their communities.
- 4.7.b. Partner with educators, leaders, students and families to foster a culture of respectful online interactions and a healthy balance in their use of technology.
- 4.7.c. Support educators and students to critically examine the sources of online media and identify underlying assumptions.
- 4.7.d. Empower educators, leaders and students to make informed decisions to protect their personal data and curate the digital profile they intend to reflect.

Appendix C

Survey Validation Feedback

Name and Position	Feedback
Sarah D., Director of Libraries	Such a cool survey. I'm a bit on the fence about where to go with my answers. I feel like I COULD do much of what is listed in the survey, but I have roadblocks at my school, and I find that in my role, some teachers do not really want to partner with me or hear new suggestions. ***I can add a statement at the beginning of the self-efficacy statement to make this more clear.*** Maybe that's what your whole survey is about! Any suggestions on how to proceed?
Carmen C., Library Information Specialist	I took the survey and just jotted notes as I went. I didn't see anything glaring and there wasn't one particular question that stood out.

	#15 and #27 ask about the ISTE Standards. Maybe explain the acronym or present it in a way that someone might think "Oh yeah" I remember. ~~***Look to see if I spell out ISTE.***~~ #17 and 18# are these questions only related to technology or any field? I assumed tech, but it's not stated. *I can't change the wording of this question because it is an ISTE standard* #30 I just wrote tech only? I assume this meant something similar to the note above. *I can't change the wording of this question because it is an ISTE standard* #31 Not clear if you are asking about data gathered via technology. *I can't change the wording of this question because it is an ISTE standard*

	#36 Responsibilities? Do you want to know what we actually do or what is in our contract? For example, I do extra things other librarians aren't expected to do. *There is an option for "other" listed* By the way, this is the direction our district was going a few years ago. The idea was for us to stay relevant in order to secure our place on each campus. We got a new director and they started moving those duties away. For the larger schools, it was a relief but for me and another few small schools, we continue the responsibility.
Sara H., Middle School Librarian	I just completed the librarian survey that Jen Harlan forwarded to me. It was difficult for me to answer the questions because they asked if 'I can' do a number of things. ***I can add a statement at the beginning of the self-efficacy statement to make this more clear.*** Yep, I can, but I

	most often don't have the opportunity. So while I can, I don't. I hope that's okay. 😬. Also, I am the only librarian for two different middle schools so my schedule limits how often I am in each building. In the list of duties to select, I did select 'other' because the thing I do the most wasn't listed: teach library lessons as requested, not weekly. *This was changed in the survey.* I'm on a flexible schedule ~~***(I should add fixed or flexible schedule to the survey - ask Liz how to phrase this)***~~ and teachers generally have to book me out weeks in advance for their requested topics. I try to model appropriate EdTech strategies so teachers will ask me to assist in that area more. Hope my information helps you!
Jennifer N., Elementary Librarian	Question 3: This was difficult for me to answer. I have a BA in Education with a K-12 endorsement in Library Science. Option 2 read – Degree in something else?

	Should there be another option? *I re-read this question and it seems the respondent should have selected the second option.* Question 42: The question asked if our duties serve our students and ourselves (all of the duties you listed are necessary to maintain a functioning library). I was unsure of how to answer this as all of the duties I do ARE necessary BUT are left to me to complete as I have no assistance. Are you trying to capture data on our duties and time? I wonder if you would also want to know if the Librarian has an assistant and for what period of time a day/week? *Are all of the duties truly required to keep a functioning library? I think that's an important aspect to consider.* I wonder if you would want to know more about each person's schedule? Time spent teaching a day and whether they have a

	fixed or flexible schedule, planning time , do they have a scheduled library maintenance time, so that you have a picture of their schedule and whether it's feasible to add in EdTech coaching? I will tell you that I have no additional time to add on coaching so most of the questions were not relevant to my job. No, other studies have been done about time, it's re-thinking what needs to be done as part of a librarian's job and if they have the skills to serve as an EdTech coach. Also, would you want to know about each person's current professional development in EdTech? ***Possibly, this is a potential addition to the survey. No, I want to see if current practicing school librarians, in general, have these skills. Not those that have gone above and beyond with specialized training.***
Linsey K., High School Teacher-Librarian	(not totally sure what this one means) 20.I

	can partner with educators to evaluate the efficacy of digital learning content and tools to inform procurement decisions and adoption (4.3.c.) *I can't change the wording of this question because it is an ISTE standard* 24 & 25--not clear as to how these are different--ah, now I see. Maybe bold the verbs at the beginning of the sentence to differentiate? *I can't change the wording of this question because it is an ISTE standard* (very wordy and therefore, a bit confusing. Can any modifiers be eliminated?) 28.I can evaluate the impact of professional learning and continually make improvements in order to meet the schoolwide vision for using technology for high-impact teaching and learning *I can't change the wording of this question*

	because it is an ISTE standard

Appendix D

Peer Review of Survey Questions

- Informed Consent
  - I found the last line of the first paragraph confusing: "For more detailed information, see this Informed Consent." Do you need this line?
- I think there should be a heading for this section: Informed Consent
- I do like the folding in of the "official consent statement" to be simply continuing with the survey. It is so much simpler and seems more modern. Is that okay with IRB? I wonder why other Informed Consent statements explicitly make you choose "yes" or "no"... I wonder if there is a psychology-based rationale behind it.
- Question about librarians' current duties:
  - This is a very long list. I started to experience what is called "survey fatigue" when considering all of the choices and ended up choosing most of them, based on what I remembered about my duties. Is there a way to shorten this list by combining some of the choices or creating categories of duties with a few examples in parentheses?
- What is the purpose of this question? How will you use the answers?
- Qualitative Questions?
  - I only saw one open-ended question, the one about EdTech duties.

Appendix E

Library Media ListServ Permission to Post

ListServ Question

Becky Johnson <baputz@gmail.com> Wed, Jul 20, 2022 at 2:41 PM
To: LM_NET-request@listserv.syr.edu

Hello,

I am a doctoral student doing my dissertation on school librarians. I was wondering if it would be appropriate to use the listserv to invite school librarians to take a survey for my dissertation? I would not post the survey on the listserv but invited those who are interested to participating to contact me directly for the waiver and survey.

Let me know your thoughts and if there are specific guidelines.

Thank you,
Becky Johnson

ListServ Question

Blythe Allison Bennett <babennet@syr.edu> Thu, Jul 21, 2022 at 7:09 AM
To: Becky Johnson <baputz@gmail.com>

Hi Becky,

Yes, that would be fine and thank you for checking in. I hope you get some good participation. You can send it to the list address and it will go into review and then I can approve it. Just know that attachments can't be sent on LM_NET, so a link is better.

Blythe

Blythe Allison Bennett

Program Manager, Library and Information Science/School Media | School of Information Studies

Syracuse University

245B Hinds Hall

Syracuse, New York 13244

t (315) 443.5445 e babennet@syr.edu

(she/her/ella)

ischool.syr.edu

Appendix F

American Library Association Online Code of Conduct

https://www.ala.org/online-code-of-conduct

Posts featuring sexual, violent, or discriminatory content are prohibited.

Intimidation, stalking, sustained disruption, inappropriate physical or virtual contact, or unwelcome attention, including sexual attention are not permitted.

Foster useful and dynamic discussions and engage in a respectful dialogue. Accept critique and offer it constructively; approach discussions with an open mind and be willing to learn. Thousands of people may eventually see the messages you post, which may stay online in perpetuity and be seen by colleagues, employers, and patrons alike.

Respect intellectual property and give credit where it is due. It is the user's responsibility to obtain permission for any material they post that is not their own. Please include copyright notices where appropriate, ask for creator information where unknown, and be prepared to include credits if they are found after you post.

No endorsement or any promotion of any local, state, or federal candidates for political office is allowed. Neither is encouraging boycotts. These limits are because of IRS restrictions for tax-exempt organizations; detailed information can be found on the ALA Legal Framework page.

Promotion of paid products, events, or services not initiated by the American Library Association is not allowed. We encourage the sharing of nonpaid opportunities that may benefit the community. However, we ask that you do not spam. Be conscious of the number of times that you share the same opportunity and be thoughtful of the number of communities where this information is shared. When sharing your opportunity, we ask that you not just aim for reach within our community but also seek to ensure that your opportunity matches the specific needs of that community's members.

Job Postings are Restricted to the ALA Job Community or ALA JobLIST. We recommend the use of the ALA JobLIST career center for a greater variety of career-related services. If you do choose to post an opportunity Connect, it can be placed in our ALA Jobs community only.

Ensure your content is as accessible as possible. Use alt text for images, caption video content where possible, and use high-contrast color schemes when using color. To learn more about accessibility, helpful resources include the DLF Guide to Creating Accessible Presentations, Contrast Ratio, and the World Wide Web Consortium (W3C) Accessibility page.

Post as yourself. Do not impersonate any other people or entities that you are not affiliated with.

Foster useful and dynamic discussions and engage in a respectful dialogue. Accept critique and offer it constructively; approach discussions with an open mind and be willing to learn. Thousands of people may eventually see the messages you post, which may stay online in perpetuity and be seen by colleagues, employers, and patrons alike.

Respect freedom of expression. We encourage spirited discussion and debate. Disagreeing with an idea is different from attacking an individual, especially since discussion topics can sometimes be challenging. ALA promotes genuine inquiry that can build trusting relationships and a safe, respectful, and supportive environment, even in times of complex change. Every member is on an individual journey of education and understanding, and should communicate candidly and respectfully about difficult topics. Be willing to acknowledge privileges and to learn from the community.

Consider and take responsibility for the impact of communications. Impact matters more than intent, especially when the absence of nonverbal cues or voice tone means that statements (humor in particular) can easily be interpreted as aggressive or negative.

Listen as much as you share and remember that other participants may have expertise you are unaware of. Make sure conversations are inclusive, and practice active listening.

When you see content that is problematic, you may address it either publicly or privately. Acknowledge that your response is part of a respectful discussion. Pointing out factually erroneous or offensive comments keeps the space safe and helps build a stronger community. These are opportunities to educate – and to learn.

Speak from your own experience and avoid making generalizations. If you're not sure whether something is correct, you can ask the community for resources.

Respect other people's pronouns – often seen in their profile or signature – preferred names, and forms of address. Consider using gender-neutral collective nouns/pronouns when addressing groups. For example, try "everyone" or "folks" instead of "guys."

Share inspiring content. You are encouraged to share content that uplifts and explores the profession. For instance, news stories about events, examples of successful library programming, and strategies for troubleshooting are appreciated.

Appendix G

Survey Invitation Posts

Initial Post

Hello, school librarian leaders!

I am a doctoral candidate with Seattle Pacific University. You are invited to take part in my dissertation research study examining the self–efficacy of school librarians as educational technology (EdTech) coaches. The purpose of this paper is to examine the role of librarians as EdTech coaches through the lens of the self-efficacy theory and the International Society for Technology in Education (ISTE) Standards for Coaches. Specifically, do librarians believe themselves to be prepared to serve as EdTech coaches?

Who should complete the survey? Current, practicing school librarians and library media specialists.

How long will the survey take to complete? The survey should take about 20 minutes to complete.

What does the survey involve? The survey involves likert-scale, multiple choice, and one open-ended questions.

To complete the survey, click here: [Insert Microsoft Forms link]

Participants who complete the survey can opt to be entered into a raffle to win one of two $25 Amazon gift cards.

Thank you for your assistance with this research project. Your participation will help generate new knowledge to benefit the school library profession.

Sincerely,

Becky P. Johnson

Doctoral Candidate, Seattle Pacific University

Follow-Up Posts

Hello, school librarian leaders!

Thank you to all of you who have already completed the School Librarian EdTech Coaching survey!

I am a doctoral candidate with Seattle Pacific University. You are invited to take part in my dissertation research study examining the self–efficacy of school librarians as educational technology (EdTech) coaches. The purpose of this paper is to examine the role of librarians as EdTech coaches through the lens of the self-efficacy theory and the International Society for Technology in Education (ISTE) Standards for Coaches. Specifically, do librarians believe themselves to be prepared to serve as EdTech coaches?

Who should complete the survey? Current, practicing school librarians and library media specialists.

How long will the survey take to complete? The survey should take about 20 minutes to complete.

What does the survey involve? The survey involves likert-scale, multiple choice, and one open-ended questions.

To complete the survey, click here: [Insert Microsoft Forms link]

Participants who complete the survey can opt to be entered into a raffle to win one of two $25 Amazon gift cards.

Thank you for your assistance with this research project. Your participation will help generate new knowledge to benefit the school library profession.

Sincerely,

Becky P. Johnson

Doctoral Candidate, Seattle Pacific University

Appendix H

Email to Individual State School Library Associations

Becky Putzier <becky@digitaledleadership.org> Mon, May 15, 2023 at 3:36 PM
To: info@nyla.org

Hello. My name is Becky Johnson and the reason I'm writing is because I am currently working on my dissertation and studying the self-efficacy of school librarians as EdTech coaches. I was wondering if you would be willing to share my survey link with your school librarian network through NYLA? If so, the information and link are below:

Hello, school librarian leaders! I need your voice!

I am a doctoral candidate with Seattle Pacific University. You are invited to take part in my dissertation research study examining the self-efficacy of school librarians as educational technology (EdTech) coaches.

The purpose of this paper is to examine the role of librarians as EdTech coaches through the lens of the self-efficacy theory and the International Society for Technology in Education (ISTE) Standards for Coaches. Specifically, do librarians believe themselves to be prepared to serve as EdTech coaches?

Who should complete the survey? Current, practicing school librarians and library media specialists.
How long will the survey take to complete? The survey should take about 20 minutes to complete.
What does the survey involve? The survey involves likert-scale, multiple choice, and open-ended questions.
To complete the survey, click here: https://forms.office.com/r/aFcmHyLpAf

Participants who complete the survey can opt to be entered into a raffle to win one of two $25 Amazon gift cards.

Thank you for your assistance with this research project. Your participation will help generate new knowledge to benefit the school library profession.

Sincerely,
Becky P. Johnson, becky@digitaledleadership.org
Doctoral Candidate, Seattle Pacific University
https://www.linkedin.com/in/beckypjohnson/

Appendix I

Means of the Individual ISTE Standards for Coaches Based on Ages Served

	Elementary		K-8		K-12		6-12		Middle		High		Multiple		Other	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Standard 1: Change Agent	3.77	.856	4.12	.721	3.93	.234	4.25	.527	4.04	.638	4.13	.732	3.84	.792	3.66	.829
Standard 2: Connected Learner	4.06	.862	4.24	.695	3.90	.437	4.30	.494	4.15	.677	4.29	.728	3.80	.730	3.85	.829
Standard 3: Collaborator	3.98	.769	4.47	.537	3.97	.475	4.28	.600	4.10	.605	4.26	.734	4.00	.771	3.96	.660
Standard 4: Learning	3.78	.867	4.22	.684	3.92	.508	4.08	.791	4.03	.654	4.08	.811	3.70	.855	3.56	.908

Designer																
Standard 5: Prof Learning Facilitator	3.46	.908	3.69	.870	3.71	.564	3.77	.693	3.78	.787	3.83	.975	3.67	.527	3.30	1.02
Standard 6: Data-Driven Decision-Maker	3.44	.934	3.55	.799	3.55	.726	3.74	.876	3.69	.849	3.67	.936	4.07	1.21	3.44	1.08
Standard 7: Digital Citizen Advocate	4.17	.545	4.40	.545	4.04	.494	4.39	.529	4.29	.549	4.37	.596	4.25	.559	4.03	.878