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School Librarians and Teachers Embracing Community in Practice: Knowledge and Use of Digital Literacies and Media

❝Digital literacy skills empower students to become discerning consumers and producers of information, preparing them for the demands of a rapidly evolving digital world...❞

Abstract

Librarian researchers partnered with a university laboratory school to promote digital literacies to teachers through a community of practice using a librarian-teacher framework. Pre- and posttest surveys determined changes in digital literacy skills by school faculty and staff over one school year. Descriptive statistics indicate a positive change in faculty and staff familiarity with and use of digital content. Subgroup comparisons demonstrate large effect sizes for teacher familiarity with digital content by education level and position on the faculty. Administrative support at the school and university levels was vital in laying a solid foundation for this collaboration to develop and embed digital literacies into classroom instruction with expectations to foster growth in subsequent phases.

Engaging Community in Practice: Librarians and Teachers Embracing Knowledge and Use of Digital Literacies and Media

Communities of practice initiated by school librarians with teachers foster a supportive environment for sharing knowledge, expertise and resources. Through such communities, librarians and teachers can exchange ideas, strategies, and best practices for integrating information literacy skills and resources into the curriculum. This collaboration enhances instruction, promotes professional growth, and ultimately benefits students by providing them with richer learning experiences. University researchers in a Master of Library Science Program who had experience as school librarians engaged in a community of practice with teachers in a university-sponsored elementary school to promote digital literacies and media to faculty and staff.

The goal was to equip students with the skills to navigate, evaluate, and create digital content effectively. In today's information age, these abilities are essential for academic success, critical thinking, and responsible citizenship. Digital literacy skills empower students to become discerning consumers and producers of information, preparing them for the demands of a rapidly-evolving digital world, a critical issue relevant to school librarianship. This guiding assumption is so integral to the profession of school librarianship that the American Association of School Librarians (AASL) Standards (2018) state that "[e]ducators and learners must be proficient in their use of available information technology" (p. 14) as a common belief.

Integrating digital literacies and media into classroom activities poses a challenge for many schools, and perhaps more so for university laboratory schools, which are often limited by staffing and space. Educators in small schools may struggle to find the time and resources to embed digital literacies and media into classroom activities. Teachers may understand the need to integrate technological resources into instruction but may not have a meaningful model for practice. This phenomenological research examines such practices through a case study within an elementary laboratory school in a small city in the southern USA.

The University School (pseudonym) is a teacher-training laboratory school providing research-based instruction for 114 students in kindergarten through

fifth grade (ages 5-12). Faculty and staff at the University School address students' academic needs and physical, social, and emotional development through partnerships with community organizations and the sponsoring university. The school administration identified the need for more engaged use of technology in classroom instruction, creating a unique research opportunity: equip the school with digital resources and media, then explore how that access may influence teaching and learning. To address this need for technology-enabled professional learning, the researchers set out to build an innovative partnership between the university's library science program faculty and the school's administration, faculty, and staff.

The context for this study was a partnership between university education researchers and the leadership team at the University School to address gaps in teachers' digital literacy skills evidenced by the state's department of education's educator survey tool, the *Digital Learning & Media Inventory* (*DLMI*) (NC DPI (a), n.d.). Iterative survey results informed ways to improve access to digital resources, develop digital literacy skills, and provide data to track pedagogical modifications over time. This study aims to demonstrate how a university-school research-practice partnership positively influenced teacher professional development through the knowledge and use of digital learning competencies and digital media use in classroom instruction.

Literature Review

Evans and Baker (2016) show that access to digital resources is essential for teacher competency and student academic development. Moreover, Santos-Green and Chassereau (2023) demonstrate that university and school partnerships provide a rich context for scholars and practitioners to collaborate as a community of practice. School librarians can be mediating partners for teachers' access to digital media for developing digital competencies in the classroom. Teachers' access to digital resources ensures that students have access to contemporary learning technologies and concepts. This literature review connects the idea of the importance of school libraries as a central resource for teachers' access to digital technology for professional development and learning.

Access to Library Services and Digital Resources

Access to the specialized skills of a school librarian has long been known to contribute to student success. In 1963, Gaver performed a groundbreaking research study showing that a centralized library collection with a full-time, certified school librarian positively correlates to higher student achievement. Lance & Kachel (2018) also demonstrated a positive correlation between school library programs and student achievement by examining student demographics, school funding levels, teacher-pupil ratios, and teacher qualifications. Pribesh et al. (2011) confirmed that school libraries boost student achievement and contribute to closing the achievement gap between the majority US student population and underrepresented student learners.

Providing access to, knowledge of, and use of digital learning tools is one facet of the role of school librarians. Access to diverse reading materials through digital libraries provides opportunities for transformative literacy instruction, inquiry-based learning, and increased student engagement (Taylor, et al., 2020). Quality school library programs significantly impact student achievement at all levels as measured by scores on standardized reading and English tests (Burgin & Bracy, 2003). Scores increase when school libraries have more staffing, more open hours, newer books, more student expenditures for print and digital materials, and subscriptions to digital services (Burgin and Bracy, 2003). Wine (2020) also found that when students had a full-time certified school librarian, they scored significantly higher on math and reading tests than those who lacked a librarian. In a global society, qualified school librarians play a major role in providing professional development for faculty and staff, increasing access to instruction for digital literacy skills, which translates into improved student access to digital media (Clephane, 2014; Johnston & Green, 2021).

Prioritizing the curation of digital library resources and embedding them into content area instruction is enabled by collaborative practice, which re-imagines the provision of library services beyond the traditional library print collections (Moen, 2022). The COVID-19 pandemic highlighted the necessity of teaching digital literacy skills and providing access to digital media when school and school library closures

resulted in shifts to online and hybrid instruction and limited library access. Soulen and Tedrow (2022) found significant differences in the frequency of access to school library materials relative to the pandemic. The differences most significantly impacted elementary level students (6–10 years old) due to substantial changes in preferred platforms to access print and digital books (Soulen & Tedrow, 2023). To support virtual learning environments, best practices for school librarians include demonstrating leadership in planning and support of technology use through teacher professional development in communities of practice to advance multiple literacies for students (Lewis, 2021; Smith et al., 2022; Wake, et al., 2022).

University and Laboratory School Partnerships
Since the early days of modern educational systems, schools supported by universities have endorsed efforts to address the gap between scholarly theory and real-world practice. Beginning in 1896, at the University of Chicago, John Dewey (1859-1952) attempted to translate his abstract concepts into a more practical learning environment using the Dewey School as a laboratory comparable to those in science courses (Mayhew & Edwards, 1936). Today, universities and college-affiliated schools engage in teacher training, curriculum development, research, professional development, and experimentation to improve teacher professional development and student learning (International Association of Laboratory Schools, 2019).

In a laboratory school setting, partnerships between university and school faculty have been shown to increase educational opportunities using digital media. Herro, Qian, and Jacques (2017) found that integrating digital media in classroom learning could be increased through a university faculty-in-residence program. Participating teachers valued an ongoing relationship with the university faculty resident to increase technology use, leading to the incorporation of new pedagogical approaches to incorporate digital tools in classroom instruction. Herro et al. (2017) found that providing authentic field experiences, honoring the local educational context, and advocating a balanced collaboration between university faculty and schoolteachers were crucial actions to cre-

ating appropriate instructional support to positively impact both teacher and student learning.

Research shows that developing a long-term, mutualistic research-practice partnership focusing on professional development is key to building successful community partnerships between universities and K-12 schools (Coburn & Penuel, 2016; Hacker, 2013; Kelly, 2014; Penuel & Gallagher, 2017; Post et al., 2016). For this study, administrative backing at the school, university, and external stakeholder (e.g., the local public library) levels were essential. The researchers sought to develop a community of practice to develop digital learning competencies for teachers using the Herro, et al. (2017) model to increase technology use.

Professional Development for Digital Literacies and Media
Professional development for digital literacies empowers teachers to advance their pedagogy by creating a flexible learning environment for students (Yondler & Blau, 2023). According to Sadaf and Gezer (2020), the most reliable indicators of teachers' intentions are positive attitudes, perceptions of usefulness, and self-efficacy in digital literacy. Kui Xie, et al. (2023) demonstrated that as the commitment to stronger technology integrations shifts within the school environment, teachers also shift their own beliefs and practices for use of digital resource integration. Without professional development and knowledge of implementing technology into instruction, teachers struggle to unlock the potential for digital literacies to be used for higher level cognitive tasks (Taylor, et al., 2020). Thus, appropriate training and knowledge can impact student learning.

Librarian-Teacher Framework for Digital Learning Competencies in Community Practice
To conceptualize the endeavors of this study, the researchers developed the *Librarian- Teacher Framework for Digital Learning Competencies in Community Practice* (see Figure 1). This framework approaches the research with a conceptual lens that synthesizes the ideals of media literacy, community engagement, and communities of practice. The framework for this study embraces Zanin-Yost and Freie's (2020) stance

Figure 1: *The Librarian-Teacher Framework for Digital Learning Competencies in Community Practice*

that media literacy is essential to foster critical thinking in integrating legacy technologies with evolving technologies to facilitate digitally literate practices in teacher communities. Throughout this study, the librarian-researchers looked to Capse and Lopez's (2018) concept of community engagement to understand relationship-building as activism for strategically working with and in communities, conveying cultural competence, facilitating problem-solving, and engaging in collaborative teacher learning. The Wenger-Treyner model for communities of practice guides the intentional approach to developing professional learning within a group-oriented context that considers technology as a useful tool for reflective professional development (Wenger-Treyner, et al., 2023).

Research Questions

School librarians promote access to and use of digital literacies and media (Dawkins, 2020). As required by the state of North Carolina, school librarians and teachers use the *Digital Learning Competencies for Educators* instrument to integrate digital teaching and learning into their library and classroom instruction (NC DPI (b), n.d.). The state also provides digital resources for K-12 students such as ebooks, databases, encyclopedias, periodicals, learning media, archives, and historical and cultural resources. To understand teacher knowledge and use of these competencies and resources over time at the University School, the researchers posited the following questions:

RQ1: In what ways does a university-school community of practice centered on the use of digital resources influence teacher perceptions and practice of using a digital competencies framework to strengthen media literacy in classrooms?

RQ1(a): In what ways do professional development and related classroom activities centered on a digital learning competencies framework influence faculty knowledge and use of digital content?

RQ1(b): In what ways do professional development and related classroom activities centered on a digital learning competencies framework influence faculty knowledge and use of essential digital literacy skills?

RQ2: In what ways do educator communities of practice differ in knowledge and use of digital content and demonstration of digital literacy skills for students in classrooms based on educational background, position on the faculty, and years of experience?

Methods

The University School serves students in an urban neighborhood in a small city that is the hub of rural areas in its region of North Carolina. The local public university employs the school's administration, faculty, and staff, who were the participants of this study. There were 21 participants during the pre-testing phase of the study, that whittled down to 15 participants by the post-testing phase. The researchers distributed a survey to participants where demographics were collected for education level, position on the faculty, and years of instructional experience (see Appendix A). Most respondents had earned a bachelor's degree or higher, the minimal requirement for teaching in this state. Half of the respondents for the pre-testing phase (T1) were teachers, while 60% of respondents were teachers at the post-testing phase (T2) (see Appendix A). For both T1 and T2, most respondents had either 0-5 years or more than 20 years of instructional experience, representing educators at the beginning or near the end of their careers.

Data Sources

To assist in planning digital learning efforts, the school uses a survey instrument called the *Digital Learning & Media Inventory* (*DLMI*) to generate data about school media and technology programs for reporting outcomes to district and state-level stakeholders. Using the DLMI as a model, the researchers developed a survey to investigate faculty and staff levels of familiarity with and frequency of use of the *Digital Learning Competencies for Educators*, digital content, and digital literacy skills at the University School (Digital Teaching and Learning, n.d.). The survey consisted of 14 Likert response content items (including sub-items) on a scale of one to four and three demographic items. Of the total items on the survey, the researchers address five items in this study (see Figure 2).

University School faculty and staff were surveyed at T1. The results of this first survey determined the next steps for improving access to and use of digital literacy and media resources for University School faculty and staff. During the interim school year, the researchers provided interventions for teacher professional development and student classroom activities. The researchers conducted the same survey one year later to determine the change over time from T1 to T2.

Interventions

The researchers and the school leadership team collaboratively developed a 3-year plan to increase teacher knowledge and use of digital literacies and media in the classroom (see Appendix B). Interventions for teacher professional development included the Digital Learning Competencies for Educators, examples of online resources for teaching digital literacy skills, and providing access to and suggestions for the use of a state-sponsored online K-12 educational portal called NCWiseOwl, which provides access to credible and vetted online databases, magazines, primary sources, encyclopedias, and ebooks. Interventions for classroom instruction included the researchers working with 4th and 5th grade students (ages 9-11) to develop essential digital literacy

Item/Sub-Item	Response Options			
1. How familiar are you with the Digital Learning Competencies for Educators?	Not at all familiar	Somewhat familiar	Familiar	Very familiar
2. How familiar are you with the following digital content? NCWiseOwl*	Not at all familiar	Somewhat familiar	Familiar	Very familiar
3. How often do you use the following digital content at your school? NCWiseOwl*	Never	Sometimes	Often	Very often
4. How familiar are your students with these digital literacy skills- keyboarding, digital citizenship, and online safety?	Not at all familiar	Somewhat familiar	Somewhat familiar	Very familiar
5. How often do you teach your students these digital literacy skills- keyboarding, digital citizenship, and online safety?	Never	Sometimes	Often	Very often

Figure 2. Survey Content Items

*Note: At the time of this study, NCWiseOwl was a free online content portal for public school teachers and students in this state to access digital resources. It is now incorporated into a password-protected interface for proprietary usage.

skills as defined in the North Carolina Department of Public Instruction Digital Teaching & Learning Standards (i.e., keyboarding, digital citizenship, and online safety), a virtual author visit discussing how digital literacy skills are integrated into the writing process, and a virtual library field trip combining the use of school and public library resources for addressing digital literacies (NC DPI (b), n.d.).

Data Analysis

The pretest and posttest survey results were uploaded to a statistical analysis software package (SPSS) to examine the data using descriptive statistics. Change over time was determined by comparing mean responses on the two surveys. Subgroup comparisons supported an assumption that educators may vary in their knowledge and use of digital literacies and media based on their classroom experience, educational background, and position on the faculty.

Descriptive Statistics

Descriptive statistics are reported while comparing pretest to posttest data due to the varied composition of the faculty and staff over this study's period. As there was considerable attrition and hiring between T1 and T2, and since group variability is restricted to measuring differences between an individual's responses between time points, more robust analysis was deemed inappropriate. The small number of University School faculty and staff was limited; therefore, the sample of participants who completed both surveys was not large enough to provide valid results for determining significant differences over time. Rather, changes over time of +/- 10.0% or greater are noted as substantial differences.

Subgroup Comparisons

A series of independent samples t-tests examined the differences between subgroups by years of experience, education level, and teaching responsibilities. Homogeneity of variance was assumed due to small sample size and significance was set at p < .05.

Results

This study sought to demonstrate how a librarian-to-teacher community of practice improves teacher knowledge and use of digital learning competencies and media use in classroom instruction. Librarian researchers surveyed teachers to determine how professional development centered on digital learning competencies influenced knowledge and use of digital content and digital literacy skills. Educator subgroups differed in this knowledge and use of digital content and digital literacy skills based on educational background, position on the faculty, and years of experience.

Digital Content

To explore the first research question, "In what ways does a university-school community of practice centered on the use of digital resources influence teacher perceptions and practice of using a digital competencies framework to strengthen media literacy in classrooms?" with a focus on the sub-research question that specified digital content as a variable, descriptive statistics were generated from the survey instrument and analyzed using SPSS. Descriptive statistics indicate a substantial positive change of +0.39 in mean over time for faculty and staff familiarity with the Digital Learning Competencies for Educators from T1 (M = 1.81 SD = .750) to T2 (M = 2.20 SD = .862). Table 1 shows that teachers' familiarity with teacher technology standards increased over time once introduced to the content by a school librarian.

Descriptive statistics indicate a substantial positive change of +0.13 in mean over time for faculty and staff familiarity with NCWiseOwl from T1 (M = 2.14 SD = 1.014) to T2 (M = 2.27 SD = .704) (see Table 2).

Descriptive statistics also indicate a substantial positive change of +0.54 in the mean over time for the frequency of faculty and staff use of NCWiseOwl from T1 (M = 1.19 SD = .680) to T2 (M = 1.73 SD = 1.033) (see Table 3).

Tables 2 and 3, when triangulated with Table 1, illustrate that when school librarians are present and engaged in a school community, faculty and staff are introduced to useful resources and will increase their familiarity and use of those resources over time.

Digital Literacy Skills

Research question 1, with sub-question b, aims to investigate teacher/staff knowledge and frequency of

Table 1. Faculty and Staff Familiarity with Digital Content: Digital Learning Competencies for Educators

	T1 (n = 21)		T2 (n =15)		Mean Difference
	M = 1.81 SD = .750		M = 2.20 SD = .862		Δ +0.39
	Count	**Percent**	**Count**	**Percent**	**Change Over Time**
Not at all familiar	8	38.1%	3	20.0%	-18.1%
Somewhat familiar	9	42.9%	7	46.7%	+3.8%
Familiar	4	19.1%	4	26.7%	+7.6%
Very familiar	0	0.0%	1	6.7%	+6.7%

Table 2. Faculty and Staff Familiarity with Digital Content: NCWiseOwl

	T1 (n = 21)		T2 (n = 15)		Mean Difference
	M = 2.14 SD = 1.014		M = 2.27 SD = .704		Δ +0.13
	Count	**Percent**	**Count**	**Percent**	**Change Over Time**
Not at all familiar	7	33.3%	1	6.7%	-26.6%
Somewhat familiar	6	28.6%	10	66.7%	+38.1%
Familiar	6	28.6%	3	20.0%	-8.6%
Very familiar	2	9.5%	1	6.7%	-2.8%

Table 3. Faculty and Staff Frequency of Use of Digital Content: NCWiseOwl

	T1 (n = 21)		T2 (n = 15)		Mean Difference
	M = 1.19 SD = .680		M = 1.73 SD = 1.033		Δ +0.54
	Count	**Percent**	**Count**	**Percent**	**Change Over Time**
Never	19	90.5%	8	53.3%	-37.2%
Sometimes	1	4.8%	5	33.3%	+28.5%
Often	0	0.0%	0	0.0%	-
Very often	1	4.8%	2	13.3%	+8.5%

teaching of digital literacy skills by asking, "In what ways does a university-school community of practice centered on the use of digital resources influence teacher perceptions and practice of using a digital competencies framework to strengthen media literacy in classrooms?" with the sub-question focused on the variable, knowledge and use of essential digital literacy skills such as keyboarding, digital citizenship, and online safety.

For teacher perception of student familiarity with keyboarding skills (see Table 4), descriptive statistics indicate no change in the mean over time. For digital citizenship, there was a substantial positive change of +0.63 from T1 (M =1.50, SD = .889) to T2 (M = 2.13, SD = .915). Additionally, there was a substantial positive difference of +0.20 from T1 (M = 1.80, SD = .834) to T2 (M = 2.00, SD = .926) for online safety.

For the frequency of teaching keyboarding skills (see Table 5), descriptive statistics indicate a posi-

tive change of +0.05 from T1 (M =1.75, SD = .910) to T2 (M = 1.80, SD = .775). For the frequency of teaching digital citizenship skills, descriptive statistics indicate a negative change of -0.03 from T1 (M = 1.70 SD = .923) to T2 (M = 1.67 SD = 0.724). Additionally, for the frequency of teaching online safety skills, descriptive statistics indicate a positive change of +0.08 for online safety from T1 (M = 1.85, SD = .875) to T2 (M = 1.93, SD = .704).

Subgroup Comparisons

Research question 2 investigates ways that educator communities of practice differ in knowledge and use of digital content and demonstration of digital literacy skills based on educational background, position on the faculty, and years of experience. Results of independent samples t-tests for both the pretest and posttest were used to further examine differences among subgroups, demonstrating significant differences based on educational background, position on

Table 4. Faculty and Staff Perception of Student Familiarity with Digital Literacy Skills

	T1 (n = 20)		T2 (n = 15)		
	Count	Percent	Count	Percent	Change Over Time
Keyboarding	M = 2.20 SD = 1.005		M = 2.20 SD = .561		Δ 0.00
Not at all familiar	6	30.0%	1	6.7%	-23.3%
Somewhat familiar	6	30.0%	10	66.7%	+36.7%
Familiar	6	30.0%	4	26.7%	-3.3%
Very familiar	2	10.0%	0	0.0%	-10.0%
Digital Citizenship	M = 1.50 SD = 0.889		M = 2.13 SD = 0.915		Δ +0.63
Not at all familiar	14	70.0%	4	26.7%	-43.3%
Somewhat familiar	3	15.0%	6	40.0%	+25.0%
Familiar	2	10.0%	4	26.7%	+16.7%
Very familiar	1	5.0%	1	6.7%	+1.7%
Online Safety	M = 1.80 SD = 0.834		M = 2.00 SD = 0.926		Δ +0.20
Not at all familiar	9	45.0%	5	33.3%	-11.7%
Somewhat familiar	6	30.0%	6	40.0%	+10.0%
Familiar	5	25.0%	3	20.0%	-5.0%
Very familiar	0	0.0%	1	6.7%	+6.7%

	T1 (n = 20)		T2 (n = 15)		
	Count	Percent	Count	Percent	Change Over Time
Keyboarding	M = 1.75 SD = .910		M = 1.80 SD = .775		Δ +0.05
Never	10	50.0%	5	33.3%	-16.7%
Sometimes	6	30.0%	9	60.0%	+30.0%
Often	3	15.0%	0	0.0%	-15.0%
Very often	1	5.0%	1	6.7%	+1.7%
Digital Citizenship	M = 1.70 SD = .923		M = 1.67 SD = 0.724		Δ -0.03
Never	11	55.0%	7	46.7%	-8.3%
Sometimes	5	25.0%	6	40.0%	+15.0%
Often	3	15.0%	2	13.3%	-1.7%
Very often	1	5.0%	0	0.0%	-5.0%
Online Safety	M = 1.85 SD = 0.875		M = 1.93 SD = 0.704		Δ +0.08
Never	8	40.0%	4	26.7%	-13.3%
Sometimes	8	40.0%	8	53.3%	+13.3%
Often	3	15.0%	3	20.0%	+5.0%
Very often	1	5.0%	0	0.0%	-5.0%

the faculty, and years of experience.

Pretest Subgroup Comparisons.

Using the pretest results (see Appendix C), the researchers conducted a series of independent samples t-tests to determine whether there were differences by educator characteristics, including education level, teaching responsibilities, and experience level in educator familiarity with digital content, how often educators used digital content, student familiarity with online safety skills, how often educators taught digital citizenship skills, and how often educators taught online safety skills.

Comparing educators with an Associate's degree or B.A./B.S. degree (n = 11) (M = 2.55, SD = 1.036) to those with an advanced certificate, Master's degree or terminal degree (n = 9) (M = 1.78, SD = .833), differences in educator familiarity with NCWiseOwl digital content were found to be significant $t(18)$ = 1.796, p = .045, d = .951, a large effect size.

Also, comparing paraprofessional educators with an Associate's degree (n = 3) (M = 3.67, SD =5.77) to professional educators with a B.A./B.S. or higher (n = 17) (M = 1.94, SD = .827), significant differences were found for educator familiarity with NCWiseOwl digital content, $t(18)$ = 3.431, p = .001, d = .803, a large effect size.

Comparing beginning educators with 0-5 years of experience (n = 7) (M = 1.57, SD = 1.134) to more seasoned educators with 6 or more years of experience (n = 13) (M = 1.00, SD = .000), differences in how often educators used NCWiseOwl digital content were found to be significant, $t(18)$ = 1.862, p = .040, d = .655, a medium effect size. Comparing paraprofessional educators (n = 3) (M = 2.00, SD =1.732) to professional educators (n = 17) (M = 1.06, SD = .243), differences in how often educators used NCWiseOwl digital content were found to be significant, $t(18)$ = 2.420, p = .013, d = .621, a medium effect size. Comparing paraprofessional

educators (*n* = 3) (*M* = 2.67, *SD* = .577) to professional educators (*n* = 17) (*M* = 1.65, *SD* = .786), differences in student familiarity with digital literacy skills for online safety were found to be significant, *t*(18) = 2.127, *p* = .024, *d* = .766, a medium effect size.

Frequency of teaching several digital literacy skills varied by educator characteristics. Comparing classroom teachers (*n* = 10) (*M* = 2.10, *SD* = .994) to teacher assistants, support staff, and administrators (*n* = 10) (*M* = 1.30, *SD* = .675), differences in how often educators taught their students digital citizenship skills were found to be significant, *t*(18) = 2.105, *p* = .025, *d* = .850, a large effect size. Comparing classroom teachers (*n* = 10) (*M* = 2.20, *SD* =.919) to teacher assistants, support staff, and administrators (*n* = 10) (*M* = 1.50, *SD* = .707), differences in how often educators taught their students online safety skills were found to be significant, *t*(18) = 1.909, *p* = .036, *d* = .820, a large effect size. Also, comparing classroom educators (*n* = 15) (*M* = 2.07, *SD* = .884) to non-classroom educators (*n* =5) (*M* = 1.20, *SD* = .447), significant differences were found in how often educators taught online safety skills, *t*(18) = 2.079, *p* = .026, *d* = .807, a large effect size.

Posttest Subgroup Comparisons.
Using the posttest results (see Appendix D), the researchers conducted a series of independent samples *t*-tests to determine whether there were differences in education level, teaching responsibilities, and experience level in educator familiarity with the NC Digital Learning Competencies for Educators. Comparing paraprofessional educators holding an Associate's degree (*n* = 2) (*M* = 1.00, *SD* = .000) to professional educators holding a B.S. or B.A. or higher (*n* = 13) (*M* = 2.38, *SD* = .786), differences in educator familiarity with the *Digital Learning Competencies for Educators* were found to be significant, *t*(13) = -2.471, *p* = .014, *d* = .738, a medium effect size.

Student familiarity with several digital literacy skills varied by educator characteristics. Comparing classroom educators, including teachers and teacher assistants, (*n* =12) (*M* = 2.33, *SD* = .492) to non-classroom educators, including support staff and administrators, (*n* = 3) (*M* = 1.67, *SD* = .577),

differences in student familiarity with keyboarding skills were found to be significant, *t*(13) = 2.040, *p* = .031, *d* = .506, a medium effect size. Comparing classroom educators (*n* = 12) (*M* = 2.33, *SD* = .888) to non-classroom educators (*n* = 3) (*M* = 1.33, *SD* = .577), differences in student familiarity with digital citizenship skills were found to be significant, *t*(13) = 1.828, *p* = .045, *d* = .847, a large effect size. Comparing paraprofessional educators (*n* = 2) (*M* = 3.00, *SD* =.1.414) to professional educators (*n* = 13) (*M* = 1.85, *SD* = .801), differences in student familiarity with online safety skills were also found to be significant, *t*(13) = 1.759, *p* = .051, *d* = .863, a large effect size.

Discussion
Initial survey responses demonstrated the need to provide professional development centered on digital literacies and media for the faculty at the University School. Three professional development sessions for University School faculty and staff were held during this study. For the first session, participants reported on the results of the pretest survey and planned professional development activities. During the second session, participants discussed topics such as the state *Digital Teaching & Learning Standards* (NC DPI (b), n.d.) for classroom teachers and students, the newly-developed curated collection of free media resources, and how to use the digital resources provided on the NCWiseOwl platform. The third session involved a collaborative review of NCWiseOwl and resources for teaching three essential digital literacy skills: keyboarding, digital citizenship, and online safety. These sessions are examples of ongoing professional development in communities of practice, which, when situated in day-to-day work, can shift collective knowledge, understanding, and pedagogical outcomes (Farrell et al., 2022).

During the school year, honors college undergraduates and graduate assistants from the university provided weekly small group instruction in the 4th and 5th grades to introduce digital literacy skills such as keyboarding, digital citizenship, and online safety to the students. Additionally, to build relationships with the community, the researchers and undergraduate students hosted a table at the University School STEM Night and participated in Family Curriculum

Night. These activities gave the researchers time to engage with the school community, including the K-5 students and their families.

The researchers attempted to curate free resources from the worldwide web as a digital library, but the collection did not meet expectations. Initially, the intent was to place a link on the school webpage so that the school community could access these resources. However, resources in the public domain posed access problems for the nascent digital school library because items available freely online were often outdated, incompatible with students' age or interest levels, or did not align with the curriculum. There were also concerns about diversity, equity, and inclusion because resources whose content was controlled by others sometimes represented antiquated, inaccurate viewpoints and content which could generate misinformation to students. For these reasons, the digital library was placed only on faculty and staff desktops.

Fortunately, the digital collection was awarded funding from a university scholarship academy, which then allowed the researcher-librarians to purchase vetted resources to develop a more standardized digital library. Purchased e-books were placed on a Follett Shelf virtual educational platform, which had several advantages. Since the shelf did not require a circulation system, all e-books were selected with multi-user access to avoid the need for library management to borrow/download/return e-books. Materials were nonfiction and intentionally selected for curricular connections to be used for project-based learning activities. The disadvantage was that continued funding for the expansion of this digital library was not immediately attainable, prompting the researchers to investigate additional sources of revenue.

The data from this study confirms that a librarian's presence and engagement in a school community is crucial, as demonstrated by educators in the school exhibiting substantial positive change in familiarity and use of librarian-introduced digital literacies and media. This ongoing relationship between the librarians and teachers provides greater opportunity for the teachers using new pedagogical approaches and new digital tools (Herro, et al., 2016). Independent public schools with a small faculty and staff foster a familial culture that establishes a viable and sustainable community of practice where embedded librarians can contribute valuable knowledge and information for ongoing teacher professional development, particularly regarding digital literacy skills and classroom media use.

Overall, subgroup comparisons using pretest results demonstrate that educators more tied to the classroom were more likely to be familiar with and use digital resources and skills in daily instruction. Results show that these educators had more familiarity with the provided digital resources and were more likely to use these resources in the classroom, teach digital citizenship and online safety skills, and perceive greater levels of online safety skills in their students. School leaders, such as administrators and specialists, who are less involved in day-to-day instruction may be able to leverage their leadership skills to lend greater importance to digital learning competencies and encourage teachers to increase technology use in their classrooms. Additionally, "reverse mentoring" by newer-to-the-profession educators may encourage more seasoned faculty to explore digital skills and resources (Valle et al., 2022).

Discussion on Subgroup Comparisons

Subgroup comparisons of pretest and posttest results identified similarities and differences in familiarity and use of digital literacy and media. Significant differences were found by subgroup using both pretest and posttest results in several areas (Appendix D). Using the posttest data, a significant difference was found for educator familiarity with the *Digital Learning Competencies for Educators* by education level, a difference that was not found in the pretest results. Professional educators holding at least a bachelor's degree were more likely to be familiar with these digital learning competencies. This stands to reason as professional educators would have attended the professional development sessions held for this project which introduced these competencies to faculty. Professional educators would also be more likely to have attended a university educator preparation program that included exposure to these competencies.

A significant difference was found for student familiarity with digital literacy skills for online safety by educator's education level. Like the pretest results,

paraprofessional educators were more likely to see higher student familiarity with online safety skills than professional educators. The reasons for this are unexplained. However, it may be that professional educators with greater knowledge of child development and educational theory may be more aware of the need for robust online safety skills.

Significant differences were found for student familiarity with digital literacy skills for both keyboarding and digital citizenship by teaching responsibilities. Classroom educators, including teachers and teacher assistants, were more likely than their non-classroom counterparts, including support staff and administrators, to perceive higher student familiarity with keyboarding and digital citizenship. This stands to reason as classroom educators would be more familiar with students' daily experiences as they navigate the digital world.

Overall, posttest results indicate less variability among subgroups than pretest results. Exposure to the interventions within this study may provide a partial explanation for leveraging educators' knowledge and use of digital competencies in the first year of this three-year plan. Faculty education level and position/rank may determine teacher and student knowledge and use of digital content and literacy skills as subgroups showed large effect sizes in practical application. The potential exists to provide further professional development and classroom experiences to promote digital literacies and media for faculty, staff, and students at the University School.

COVID-19 Considerations

The first year of this study occurred while the University School community experienced the COVID-19 pandemic. Given that many students faced academic setbacks because of school closures, restrictions, and remote learning, the positive incremental results of this study are encouraging. Just as Kui Xie, et al. (2023) noted that changes in teachers' beliefs about integrating educational digital resources in K-12 classrooms lags behind institutional change and individual practice, overcoming a post-pandemic teacher resistance to digital, online, or virtual activities may be challenging. Encouraging the teachers to be more self-reliant when using digital content while working to embed digital resources and pro-

gramming into the school environment is key. As a result, the researchers expect to see more application of digital media and essential digital literacy skills in classrooms over the next few years, including emphasizing the importance of using credible resources, even for the youngest students.

Limitations

Limitations of this study include a small sample size which limits generalizability, and self-reporting by survey respondents, which may lead to bias. The researchers could not report significant differences between the surveys due to attrition and hiring between school years. Additionally, some survey respondents were not classroom teachers; therefore, their attendance at professional development and control over the teaching environment may been limited.

Future Directions

This university-school partnership continued through the completion of the established three-year plan, including professional development, selection of additional materials purchases for the digital school library, and classroom activities using students' essential digital literacy skills. Through this partnership, the researchers continued transforming teaching and learning by integrating more technology into cognitively complex tasks in the classroom (Taylor et al., 2020). This ongoing community engagement was an essential aspect to incorporating researcher-librarians as vital partners in a community of practice with teachers and the entire school community. The survey, which will be repeated at the close of the following two school years, will continue to track change to determine growth. Follow-up focus group interviews with teachers will provide rich descriptions of participant experiences.

Conclusion

Change is hard, and even harder when initiated by visitors in the building. However, integrating digital literacies and media into the school curriculum through a librarian-teacher community of practice is paramount to providing rigorous educational opportunities in a fast-changing digital landscape. Even with strong administrative support, overcoming the inertia of the status quo takes long-term dedica-

tion. This analysis shows that positive change has taken place over the first year of this collaboration, and further analysis of the data for Years 2 and 3 of this three-year plan may demonstrate more positive change as faculty, staff, and students became more adept at using digital literacies and media for lifelong learning.

The long-term goal of this university-school community of practice is to provide digital school library resources and services to the faculty, staff, and students at the University School, including developing digital literacies and curating digital media resources as a first step. Embedding these tools into everyday lessons will be the next challenge. The experiences of the researchers at this University School may serve as a model for small and underfunded schools worldwide who face challenges for providing digital literacies and media in a traditional school environment. The researchers anticipate continued engagement with this community in practice to embrace knowledge and use of digital literacies and media at the University School, ultimately influencing the academic growth of these students.

Acknowledgements

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Appendices

Appendix A: Survey Respondent Demographics

	T1 Spring 2021 (n =20)		T2 Spring 2022 (n=15)	
Education level				
Associate's degree	3	15.0%	2	13.3%
Bachelor's degree (B.A. or B.S.)	8	40.0%	3	20.0%
Master's degree	7	35.0%	7	46.7%
Advanced degree	2	10.0%	3	20.0%
(EdD, PhD, JD, or other advanced degree)				
Position				
Teacher	10	50.0%	9	60.0%
Teacher Assistant	5	25.0%	3	20.0%
Support Staff/Administration	5	25.0%	3	20.0%
Years of instructional experience				
0-5 years	7	35.0%	4	26.7%
6-10 years	3	15.0%	1	6.7%
11-15 years	2	10.0%	1	6.7%
16-20 years	3	15.0%	2	13.3%
More than 20 years	5	25.0%	7	46.7%

Note: One respondent did not complete the demographic items

Submission Requirements for *North Carolina Libraries*

Electronic articles can be submitted online at: http://www.ncl.ecu.edu

» To submit you must login; if needed you can register using the link in the header.

» APA or *Chicago Manual of Style*, most recent edition.

» We have a rolling deadline; articles are peer reviewed when received.

» Publication of accepted articles may be in upcoming or future issues.

» For additional information, contact the editor at: editor@nclaonline.org

Appendix B: 3-Year Plan

Year 1 SY 2021-2022		Year 2 SY 2022-2023		Year 3 SY 2023-2024	
Professional Development	**Instructional Application**	**Professional Development**	**Instructional Application**	**Professional Development**	**Instructional Application**
NC Digital Learning Competencies (Introduction)	Student learning centers for essential literacy skills •Keyboard, digital citizenship, online safety • EC Scholar/GA • $ student incentives	NC Digital Learning Competencies (Continued)	Project Based Learning (PBLS) projects with digital presentations • GA	NC Digital Learning Competencies (Continued)	PBL projects with digital presentations
Digital Content (Introduction) • NCWiseOwl • School Digital Library Resources •Public Library Resources	Field trips $ • EC Scholar/GA • Public Library • Bookmobile • Teacher Resource Center	Digital Content (Continued) • NCWiseOwl • School Digital Library Resources • Public Library Resources	Student essential digital literacy skills • Digital presentations • Email/online communication • GA	Digital Content (Continued) • NCWiseOwl • School Digital Library Resources • Public Library Resources	Student essential digital literacy skills Select (3) from computational thinking, web browsing, visual mapping, word processing, spreadsheets, databases
Student essential digital literacy skills •Keyboarding •Digital citizenship • Online safety	Author visit $ •EC Scholar/GA	Student essential digital literacy skills • Digital presentations • Email/online communications	• GA	Student essential digital literacy skills	
		Project-Based Learning (PBL) (Introduction) Using purchased books		Project-Based Learning (PBL) (Continued)	

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*Purchase Project Based Learning books for Year 2 Professional Development $

EC Scholars: East Carolina merit scholarship program which recognizes outstanding academic performance, commitment to community engagement and strong leadership skills.
GA: Graduate Assistant

$ Indicates funds provided by the university Engaged Outreach Scholarship Academy

Interventions consisted of professional development activities for faculty/staff and in-classroom learning experiences for students.

- Keyboarding demonstration table at Family STEM Night
- Grades 4-5 (ages 9-12) classroom small group digital literacies learning centers
- Digital literacies posters in classrooms and hallways
- Grades K-5 (ages 5-12) virtual field trip with local public library
- Grades 2-5 (ages 8-12) author virtual visit
- Curated digital library of free online resources for faculty/staff
- Curated digital library of purchased curriculum-related nonfiction interactive ebooks
- Ongoing monthly visits by public library bookmobile and bookmobile at Family Curriculum Night
- Faculty/staff professional developments for NC Digital Learning Competencies for Educators, digital content including NC WiseOwl and public library digital resources, and student essential digital literacy skills
- Faculty field trip to university Teacher Resource Center
- Purchase of Project Based Learning texts (Elliott, 2020) for University School faculty

Appendix C: Pretest Subgroup Comparisons

Pretest Comparisons

Educator familiarity with NCWiseOwl by education level

Associates or BA/BS	Advanced certificate, Master's, or terminal degree
(n=11)	(n=9)
$M = 2.55$, $SD = 1.036$	$M = 1.78$, $SD = .833$

Educator familiarity with NCWiseOwl by education level

Paraprofessional educators	Professional educators
($n = 3$)	($n = 17$)
$M = 3.67$, $SD = 5.77$	$M = 1.94$, $SD = .827$

Frequency of use NCWiseOwl by experience level

0-5 years of experience	6+ years of experience
($n = 7$)	($n = 13$)
$M = 1.57$, $SD = 1.134$	$M = 1.00$, $SD = .000$

Frequency of use NCWiseOwl by education level

Paraprofessional educators	Professional educators
($n = 3$)	($n = 17$)
$M = 2.00$, $SD = 1.732$	$M = 1.06$, $SD = .243$)

Student familiarity with online safety by educator's education level

Paraprofessional educators	Professional educators
($n = 3$)	($n = 17$)
$M = 2.67$, $SD = .577$)	$M = 1.65$, $SD = .786$

Frequency of teaching digital citizenship by teaching responsibilities

Classroom educators	Teacher assistants, support staff, or administrators
($n = 10$)	($n = 10$)
$M = 2.10$, $SD = .994$)	$M = 1.30$, $SD = .675$

Frequency of teaching online safety by teaching responsibilities

Classroom teachers	Teacher assistants, support staff, or administrators
(*n* = 10)	(*n* = 10)
M = 2.20, *SD* =.919	*M* = 1.50, *SD* = .707

Frequency of teaching online safety by teaching responsibilities

Classroom educators	Nonclassroom educators
(*n* = 15)	(*n* = 5)
M = 2.07, *SD* = .884	*M* = 1.20, *SD* = .447

Appendix C. Listing of Significant Pre-test Results

Appendix D: Posttest Subgroup Comparisons

Posttest Subgroup Comparisons

Educator familiarity with NC Digital Competencies for Educators by education level

Paraprofessional educators	Professional educators
(*n* = 2)	(*n* = 13)
M = 1.00, *SD*=.000	*M* = 2.38, *SD* = .786

Student familiarity with keyboarding by teaching responsibilities

Classroom educators	Non-classroom educators
(*n* =12)	(*n* = 3)
M =2.33, *SD* =.492)	*M* = 1.67, *SD* = .577

Student familiarity with digital citizenship by teaching responsibilities

Classroom educators	Non-classroom educators
(*n* = 12)	(*n* = 3)
M = 2.33, *SD* = .888	*M* = 1.33, *SD* = .577

Student familiarity with online safety by educator's education level

Paraprofessional educators	Professional educators
(*n* = 2)	(*n* = 13)
M =3.00, *SD* =.1.414	*M* = 1.85, *SD* = .801

Appendix D. Listing of Significant Post-test Comparisons