Information and Digital Literacy in a High-Poverty Urban School: An I-LEARN Project

Delia Neuman, Allen Grant, Vera Lee, & Mary Jean Tecce DeCarlo
Drexel University, USA

Two teachers and 49 students aged 5 to 8 completed an inquiry-based project formulated around Neuman’s I-LEARN model, a learning model that builds on and expands traditional information-seeking models specifically to address the processes and outcomes of learning with information. The study’s results indicated that the model is a useful tool for helping young urban children understand and complete research projects. They also revealed that the 5- and 6-year old kindergarten students in the study—whose fairly young teacher had a background in school libraries—achieved higher levels of digital/information literacy than did the 7- and 8-year-old second-graders—whose veteran teacher did not have such a background. The school library had been closed because of financial constraints, and the findings have serious implications for educating urban students in other schools facing similar situations.

Background

The Fairmount School (a pseudonym) is one of two university-assisted schools (Borthwick et al., 2003; Harkavy et al., 2013; Thorkildsen & Stein, 1996) affiliated with Drexel University—a large, private university near downtown Philadelphia. Fairmount is located in a neighbourhood adjacent to Drexel that President Obama designated as one of the nation’s first five “Promise Zones” in order to make it eligible for efforts designed to address its extreme poverty. One in four children in the neighbourhood lives below the poverty level (Vargas, 2014). In 2012, 90% of Fairmount’s students were African-American; 95.2% were categorized as “economically disadvantaged”; and only 3% of the students in grades 3-8 (i.e., approximately ages 7 to 15) scored at the proficient level on the Pennsylvania System of School Assessment scores in reading and math (School District of Philadelphia, 2012).

As a troubled and under-performing school, Fairmount was threatened with closure when the School District of Philadelphia—facing a devastating financial crisis of its own—sought to shutter schools and eliminate teachers and other staff (including librarians) in order to save money. In the late fall of 2012, Fairmount worked with Drexel’s School of Education to create a school-improvement plan that committed Drexel resources, faculty, students, and staff to working with the school over a five-year period. In large part because of Drexel’s efforts, the school was removed from the District’s “closing” list early in 2013 and designated a “Promise Academy”—a status within the District that makes it eligible for increased funding, longer school days, additional professional development for teachers, and new faculty. Fairmount currently remains open and enjoys the contributions of many Drexel personnel.

The initial planning for this study occurred in Fall 2012, before the full extent of the school district’s financial crisis had become apparent. (Ultimately, 24 schools were closed at the end of the 2012-13 school year and 3,783 district employees lost their jobs (Strauss, 2013)—although some were later rehired.) At the time, the research team believed that the school library would be a vital part of our work. A previous grant had transformed the facility into a large, bright, well-designed...
space with new furniture and appropriate accouterments for an elementary-school library (e.g., a story area). A teacher who was finishing a degree in school librarianship was optimistic that she would become the school’s librarian when the library, closed for five years, re-opened. Volunteers from Drexel unpacked books that had been stored in boxes, weeded the collection, and shelved the resources. Early planning meetings for the study as well as events for the school community at large were held in the newly opened library.

By the time the study was implemented, however (Spring 2013), the library had been closed once again; the teachers who had agreed to work with the research team were uncertain about whether they would be among the limited number allowed to retain their jobs at the new Promise Academy; and the would-be librarian continued in her role as a kindergarten teacher. Against this chaotic background, an interdisciplinary team of researchers—with expertise in early-childhood education and technology integration, K-12 literacy, early literacy, and school libraries and information literacy—collaborated with four teachers on a study designed to determine the value and utility of the I-LEARN model for improving the digital and information literacies of young Fairmount students.

**Conceptual Framework**

The primary conceptual framework for the study was provided by the theoretical and empirical underpinnings of the I-LEARN model (Neuman, 2011a, 2011b)—a learning model that builds on and expands traditional information-seeking models specifically to address the processes and outcomes of learning with information. Other areas that contribute to an understanding of the study’s results include culturally responsive teaching, digital literacy, and collaborative action research.

Based on research and theory from both information science and instructional systems design, the I-LEARN model draws on insights offered in both seminal and recent works of a wide range of experts in each field—for example, from Anderson & Krathwohl, 2001; Buckland, 1991; Eisenberg & Berkowitz, 1990; Hill & Hannafin, 2001; Jonassen et al., 1993; Kuhlthau, 1993; Marchionini, 1995; Merrill, 1999; Wilson, 1999; and others. The model combines insights from both fields and from the learning sciences (e.g., Bransford et al., 2000) to provide a tool for the information-based learning that is both enabled and required by 21st-century resources, particularly digital ones. I-LEARN is based on the assumptions that curriculum-related learning is the primary reason for information seeking in schools and that knowing how to learn with information is a critical skill that students must acquire in order to learn in formal and informal environments throughout their lives. Ultimately, the model rests on the proposition that “expertise in accessing, evaluating, and using information is in fact the authentic learning that modern education seeks to promote” (American Association of School Librarians & Association for Educational Communications and Technology, 1998, p. 2).

I-LEARN encompasses six major stages, each with three associated elements, as displayed in Table 1.
Table 1. Elements of the I-LEARN model

<table>
<thead>
<tr>
<th>I: Identify</th>
<th>Choose a problem, topic, or question that can be addressed through information</th>
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<tbody>
<tr>
<td></td>
<td>• Activate a sense of curiosity about the world</td>
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<tr>
<td></td>
<td>• Scan the environment for a suitable topic within that world to investigate</td>
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<td></td>
<td>• Formulate a problem or question about that topic that can be addressed with information</td>
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<tr>
<td>L: Locate</td>
<td>Access information, either recorded or in the environment, related to the problem/topic/question through a variety of people and media</td>
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<tr>
<td></td>
<td>• Focus on what is to be learned</td>
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<td></td>
<td>• Find the information potentially useful for that learning</td>
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<tr>
<td></td>
<td>• Extract the most relevant and salient information for that learning</td>
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<tr>
<td>E: Evaluate</td>
<td>Judge the quality and relevance of the information found by ascertaining whether it has</td>
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<td></td>
<td>• Authority, as evidenced by the credibility of the source and/or author, internal logic, accuracy, etc.</td>
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<tr>
<td></td>
<td>• Relevance to the topic at hand, suitability in its level of depth for the question, and appropriateness to the topic</td>
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<td></td>
<td>• Timeliness, as evidenced by its currency or historicity (as appropriate to the topic) and its appropriateness in terms of its match with the learner’s developmental level</td>
</tr>
<tr>
<td>A: Apply</td>
<td>Use the information to generate a new understanding—that is, to learn</td>
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<td></td>
<td>• Generate a new understanding that has personal meaning</td>
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<tr>
<td></td>
<td>• Organize that learning in an appropriate cognitive structure (e.g., chronological, hierarchical, etc.)</td>
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<td></td>
<td>• Create an appropriate product to convey that structure</td>
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<tr>
<td>R: Reflect</td>
<td>Examine the adequacy of the process and product of learning and revise as appropriate</td>
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<td></td>
<td>• Analyze the quality of the process and of the product’s form and content</td>
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<tr>
<td></td>
<td>• Revise the product as necessary and determine how to improve the process for the next instance</td>
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<tr>
<td></td>
<td>• Refine the product, polishing it as appropriate</td>
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<tr>
<td>N: kNow</td>
<td>Instantiate the knowledge gained so it can be used in the future</td>
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<tr>
<td></td>
<td>• Integrate the new learning into existing knowledge</td>
</tr>
<tr>
<td></td>
<td>• Personalize the new knowledge by recognizing it as a personal, individual construct</td>
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<tr>
<td></td>
<td>• Activate the new knowledge by drawing upon it as necessary and/or appropriate to generate and answer new questions</td>
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Using the I-LEARN model successfully in a diverse urban environment requires an understanding of culturally responsive teaching—that is, of how to connect students’ I-LEARN instruction to their differing racial, ethnic, socioeconomic, and linguistic backgrounds. Villegas and Lucas (2002) developed a framework outlining the key characteristics that culturally responsive teachers exhibit—affirming and building upon students’ cultural wealth, connecting new knowledge with what students already know, and responding to students’ learning needs out of a keen understanding of their lives outside school. Moll et al.’s (1992) research with teachers in working-class Mexican communities yielded a prime example of culturally responsive teaching around the concept of “funds of knowledge,” which “represents a positive…view of households as containing ample cultural and cognitive resources with great potential utility for classroom instruction” (p. 134)

Using the model in today’s world also requires an understanding of how students develop the digital literacy skills that are part of a widening definition of being literate (International Reading Association, 2009; National Writing Project, 2010). Several studies have found that these skills are not part of most students’ instruction (Atkinson & Swaggerty, 2011; Kist et al., 2010), and others have noted that this gap is especially problematic for children in economically disadvantaged schools and neighborhoods. For example, Gormley and McDermott (2014) concluded that children in urban schools had fewer opportunities than their peers in suburban schools to use technology to foster their learning or share new knowledge. Because the teachers at Fairmount (as well as the research team) believe the area of digital literacy is critical for today’s students, digital portfolios were chosen as the products students would create to demonstrate their
understanding of I-LEARN. As one of the teachers noted, “we really did want this to have a strong technology component” (Ms. A, Fairmount kindergarten teacher, personal communication).

Finally, the principles of collaborative action research (CAR) provided a methodological framework for the study (Aspland et al., 1996). This particular variety of action research “focuses on creating climates of inquiry in communities of practice, often with different stakeholders functioning as co-researchers” (Mitchell, Reilly, & Logue, 2009, p. 345). Research on CAR suggests that this approach fosters meaningful interactions between teachers and university researchers and offers teachers control over a process of systematic inquiry (Johnson & Johnson, 2002). Thus, working closely together, the four members of the Drexel interdisciplinary research team and four Fairmount teachers working with students in kindergarten, first, and second grades collaborated to design and implement an inquiry project within the I-LEARN framework. The project was based around a curricular theme in social studies chosen by the teachers—“What Makes Philadelphia Special.” Over the course of four weeks, individual students conducted their research in both digital and non-digital resources and ultimately presented the results in digital portfolios.

**Research Goals and Questions**

A primary goal of the research was to validate the I-LEARN model, which is steeped in theory and research but which had not (at the time of the study) been systematically tested in practice. Thus, as a validation study, the research focused specifically on implementing the model itself rather than on comparing it to other approaches. Other goals of the research—to understand and support young students’ acquisition of information and digital literacy in an urban environment—are embedded in the three central research questions that guided the study:

- How can the I-LEARN model be used to support problem-based, information-rich learning at Fairmount School?
- What dimensions of digital literacy are most salient for young urban students and teachers?
- How can these dimensions be taught and evaluated?

**Methodology**

Designed as a mixed-methods study involving quantitative data from a survey and qualitative data from a focus-group interview with the teachers and from a review of students’ work, the study included well-known elements of action research as well: the investigation of instruction for the purpose of “improving practice,” encouraging teachers to become “continuous lifelong learners in their classrooms in respect to their practice,” and incorporating reflection as a vital process for improving teaching (Mettler, 2014, p. 13). As noted earlier, the situation at Fairmount School required intensive involvement by the research team in designing and implementing students’ activities as well as in conducting the study itself.

Fairmount employed six primary-level teachers during the research effort, and four expressed interest in participating in the project: two kindergarten teachers (Ms. A and Ms. D), one first-grade teacher (Ms. C.), and one second-grade teacher (Ms. B). At the project’s first professional-development session (held after school at Fairmount) the researchers presented the I-LEARN model and the generic rubric created as part of its development. The teachers decided to focus the project on the topic “What Makes Philadelphia Special” because it addressed the school district’s existing social-studies objectives and because several teachers had used it as the basis for previous projects and thought it would work well for this one. Also at this session, the teachers agreed with the researchers’ suggestion to modify the rubric to make it suitable for their young students.
Next, the researchers held two after-school professional-development sessions at Drexel (1) to introduce the Technological Pedagogical and Conceptual Knowledge (TPACK) survey (Koehler, 2011), which yields information about teachers’ levels of knowledge and skill related to integrating technology into instruction, and (2) to demonstrate two free digital-portfolio platforms that teachers might use for the project. Little Bird Tales (https://littlebirdtales.com) enables students to create digital tales using electronic tools designed for younger students, while Weebly (http://education.weebly.com) is designed for teachers to create websites for their classrooms and for individual students. All four teachers were also asked to complete the online TPACK survey through a link. The two kindergarten teachers (Ms. A and Ms. D) decided to use Little Bird Tales for the project, and the second-grade teacher (Ms. B) decided to use Weebly. As it turned out, the first-grade teacher (Ms. C) was unable to participate in the student-cantered part of the project, although she participated in the professional-development sessions and in the exit interview.

As the planning continued, it became apparent that the researchers would have to provide the technology resources necessary for the project. At the time, Fairmount had no computers for its elementary classrooms and only one computer lab, which was designated for older students, in the building. The team was able to acquire discarded central-processing units from one academic unit in the university, while information-technology specialists from another unit located used keyboards and screens and refurbished the machines and uploaded the software necessary to make the computers functional. A member of the research team, along with technical support staff from the university, delivered and set up the equipment. Ultimately, each of the four teacher volunteers received three or four machines for her classroom.

The student-cantered part study took place in April 2013 with Ms. A, Ms. B., and Ms. D. Ultimately, however, student data were collected only from Ms. A’s and Ms. B’s classes: Ms. D had accidentally deleted all her students’ work before the research team could access it. Ms. A’s class included 24 students (11 boys and 13 girls) who completed Little Bird Tales portfolios, while Ms. B’s class included 25 students (of whom 10 boys and 13 girls developed Weebly portfolios). Two research team members provided extensive support for the teachers throughout the project—helping students locate information on the Internet, assisting them in preparing their drafts, and scribing their work into the chosen platforms. This support was crucial in enabling the creation and collection of the student data. Finally, all four teachers participated in a focus-group interview at the conclusion of the project; the interview was recorded by the research team, transcribed by a transcription service, and verified by one of the researchers.

**Data Analysis**

Because only two teachers completed the TPACK survey, the research team decided that formal analysis of the data was not appropriate. Thus, the first step in the data analysis was the team’s joint development of a coding scheme based on the research questions to apply to the transcript of the focus-group interview. Each researcher used this scheme to code the transcript independently, and then the team reviewed the transcript together in order to establish inter-rater reliability and to develop consensus about the coding. This review resulted in a second set of codes (see Table 1), which the team then applied jointly for the final analysis of the transcript.
Table 2. Codes used to analyse focus-group data

<table>
<thead>
<tr>
<th>Coding Symbols</th>
<th>Coding Terminology</th>
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<tbody>
<tr>
<td>NPBL</td>
<td>Non-Project-Based Learning</td>
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<tr>
<td>DE</td>
<td>Design—The teachers’ creation of projects, lessons, assessments, selection of technology platform</td>
</tr>
<tr>
<td>IM</td>
<td>Implement—The teachers’ strategies for completing the project, the students’ strategies for completing the project.</td>
</tr>
<tr>
<td>EV</td>
<td>Evaluate—The teachers’ strategies for evaluating the project.</td>
</tr>
<tr>
<td>RU</td>
<td>Rubric—Using I-LEARN as a pedagogical tool not just an evaluative tool</td>
</tr>
<tr>
<td>MO</td>
<td>Steps of the I-LEARN Model</td>
</tr>
<tr>
<td>PBL</td>
<td>Project-Based Learning—Inquiry in response to a question or topic resulting in a product or performance.</td>
</tr>
<tr>
<td>IL</td>
<td>Information Literacy—Ability to access, evaluate, and use information</td>
</tr>
<tr>
<td>DL</td>
<td>Digital Literacy—Different ways of using technology to read/write and locate/share</td>
</tr>
<tr>
<td>CON</td>
<td>Context—Background/unanticipated benefit of the project</td>
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Next, the team focused on the student data. To facilitate this step, Ms. A and Ms. B had first interpreted the students’ responses by translating their spoken words and/or invented spelling so the researchers could understand it. Ms. B did not develop any additional materials to assess students’ achievement related to the project, but Ms. A provided students’ self-assessments of their work along with records of the interviews she had conducted with them about the project. Ms. A (with a small stipend paid from project funds) also anonymized all the student data for both groups and organized it so that the team could proceed efficiently. The research team created tables and Excel spreadsheets to organize all the non-electronic student data and also reviewed each student’s completed portfolio in detail. Each “Little Bird Tale” created by Ms. A’s students was accessed separately through the main website (see Figure 1), while each “Weebly” portfolio created by Ms. B’s students was reviewed by looking at its I-LEARN reflection page (Figure 2). “Sophia,” the name of the student on Figure 1, is a pseudonym, as are all the students’ names included in this research report.

![Philadelphia Story](image)

*By: Sophia*

*Figure 1. Little Bird Tales cover page*


Findings
All four teachers concluded that the I-LEARN model had been successful in supporting problem-based, inquiry learning for Fairmount’s young students. Commenting on the clear, step-by-step nature of the model, they praised it as “a model for processing information [that] help[s] guide students in the research process. Instead of doing something because they are being told to do something, they are doing something based on a process where they are making decisions” (Ms. A). Ms. B reported that the process offered an opportunity for her students to have ownership over their research because it allowed them to “have control over what it is they are learning. It makes it interesting. It makes it kid-friendly.” Even the teachers who did not supply student data for the study believed that the I-LEARN model turned the abstract nature of research from a mysterious concept into a concrete, specific, step-by-step process that even young students can understand and use to access, evaluate, and use information to learn.

Data related to Ms. A’s and Ms. B’s classes revealed that each teacher had taken a distinctive approach to the project—one that rested on her unique pedagogical style, understanding of her students’ developmental levels and learning needs, technology fluency, and understanding of inquiry. While the students in both teachers’ groups completed their projects successfully, the differences in the teachers’ backgrounds and approaches seemed to lead to very different levels of in-depth understanding and achievement in relation to information/digital literacy. Ultimately, Ms. B’s second graders were outshone by Ms. A’s kindergarteners.
Ms. B’s Approach

As Ms. B explained in the focus-group interview, she concluded early in the project that her second graders had limited background knowledge of and experience with places in Philadelphia outside their immediate neighbourhood. She led them in some opening discussions about what’s special about the city; but ultimately, as she said, “I fed them different things” rather than relying on their own inquiry skills. First, she limited students’ choices of projects to four topics that are very familiar to many Philadelphians and even to visitors to the city—the Philadelphia Zoo, the Liberty Bell, Fairmount Park, and Memorial Hall—rather than allowing them to Identify topics on their own, as suggested by the first stage of the I-LEARN model. Next, she printed out information (from a source she never identified) and distributed it as a handout rather than allowing students to Locate information themselves (the second stage) by searching independently for it. As Table 2 shows, her students’ comments about their information sources suggest a very limited range, and the criteria they used to Evaluate those sources (the third stage of I-LEARN) were limited as well. Analysis of the sources students identified in their portfolios suggested that few, if any, other sources were used: students identified “my teacher” and “printouts” as their main sources of information, and it was not clear that Ms. B had discussed any other sources they might use.

Table 3. Ms. B’s students’ responses about sources

<table>
<thead>
<tr>
<th>Information Sources Used</th>
<th>Criteria for Evaluating Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>“It is good because my teacher gave it to me”</td>
</tr>
<tr>
<td>“The paper from my teacher”</td>
<td>“Yes, it was good because people already wrote the information down from the same piece of paper.”</td>
</tr>
<tr>
<td>Chalkboard</td>
<td>“I know it’s good because my teacher put it on the board.” I find my information on the Internet. I find two sources”</td>
</tr>
<tr>
<td>The Internet</td>
<td></td>
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The professional-development sessions as well as classroom observations had revealed that Ms. B was tentative in her use of technology, so one of the researchers helped her develop the frameworks for individual students’ Weebly portfolios. When the time came for students to prepare their final products—part of the Apply stage of I-LEARN—some wanted to type their own notes into their portfolios; because Ms. B believed that their typing skills would have made the entry process too lengthy, however, the researcher helped the students upload their notes and insert stock photos of the places they had chosen for their topics (Figure 2). The researcher was also the one who asked each student to respond to the “Reflect” questions related to the I-LEARN project and typed their answers into their portfolios for them (see Figure 3).
In sum, it seems that Ms. B used the I-LEARN model to support her traditional, teacher-directed approach rather than as a robust tool for project-based, student-driven, inquiry learning. Although she joined her colleagues in praising the model, she did not use it to its full potential. Students did not have a say in identifying their topics, locating information, evaluating it independently, or applying it to create their own products. While they did engage in reflection, even that stage depended heavily on the researcher who helped the group throughout the project. Because Ms. B used no formal evaluation tools, there is only anecdotal evidence that the project helped students gain new knowledge.

**Ms. A’s Approach**

The “What Makes Philadelphia” project was typically done with first and second graders, and Ms. A had not previously completed it or any other research projects with her kindergarteners. However, she wanted to adapt the project so that she and her students could participate in the I-LEARN study. Like Ms. B, she quickly realized that “a lot of kids don’t even realize necessarily that they live in Philadelphia.” Her response to students’ learning needs, however, differed substantially from her colleague’s: she engaged the class in talking about their personal community, the people who live and work there, and the places they had visited with their families; she read aloud books about activities people could do and places they could go in the city. She had students brainstorm possible foci for their projects, leaving the choice of what to investigate entirely to them rather than assigning specific topics. All these strategies primed students for their research by activating their sense of curiosity about the world, scanning for ideas within that world that they could investigate, and formulating their own research topics—as described in the I-LEARN elements associated with the Identify stage.
Consistent with the elements associated with the Locate stage of the model, Ms. A brought in guest speakers to talk about topics of interest to the children, such as the important work that firefighters do for the city. She helped them understand that people—like the speakers and like the members of their own families—are important sources of information and explained that books and computer sites can be good sources as well. She had students draw pictures that represented three topics they might explore and identify three sources in which they might find useful information. Figures 4 and 5 show “Joan’s” ideas for topics and the sources she consulted (as decoded by Ms. A). “Joan” identified as topics pizza delivery, murals, the post office, and Philadelphia’s “restaurant week” (an event held in many American cities in which restaurants offer multi-course, fixed-price dinners at reduced prices). Her sources were people, murals, and a book. Students who wrote “computer” were assisted by one of the researchers in looking up topics on specific websites and in understanding the websites’ information (which was generally written at a level beyond their reading abilities).

Figure 4. “Joan’s” ideas for topics

Figure 5. “Joan’s” ideas for sources
As a result of her guided progress through the first two stages of the I-LEARN model, “Joan” ultimately chose to do her project about murals, which hold a special place in Philadelphia (see http://www.muralarts.org/). In terms of the Evaluate stage, she and her classmates generally relied on the teacher’s and the researcher’s expertise in determining authority, relevance, timeliness, etc.—although they were able to articulate some “evaluation” criteria of their own. Table 4 displays the sources they used and the criteria they cited.

**Table 4. Ms. A’s students’ responses about sources**

<table>
<thead>
<tr>
<th>Information Sources Used</th>
<th>Criteria for Evaluating Sources</th>
</tr>
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<tbody>
<tr>
<td>• Books</td>
<td>• “Using the computer because the computer goes faster than looking other places.”</td>
</tr>
<tr>
<td>• Radio</td>
<td>• “The books we read tell us stories about where we live and the people who live there.”</td>
</tr>
<tr>
<td>• TV</td>
<td>• “Going to the park [because] you can see and look around.”</td>
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<tr>
<td>• People (including family and teacher)</td>
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<tr>
<td>• Neighborhood murals</td>
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<tr>
<td>• Classroom materials (including “words on the chalkboard” and “centers’</td>
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</tr>
<tr>
<td>• The library</td>
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</tr>
<tr>
<td>• The “education store”</td>
<td></td>
</tr>
<tr>
<td>• Places in the community (including police, fire, and train stations)</td>
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</tbody>
</table>

For the “Apply” stage, students followed a model that Ms. A had developed by creating her own story on the Little Bird Tales platform about “What Makes Philadelphia Special.” Technologically fluent, she first uploaded pictures of places she had and her own family had visited in the city (doing this directly rather than using the platform’s tools) and recorded a story about her family’s adventures in Philadelphia (using the platform’s recording tool). Next, she gave the students a specific structure that made the final “tales” easier to design and produce. Then, she guided each student through that structure’s steps: creating his or her tale using clip art or the tools on the Little Bird Tales platform, writing a word at the bottom of the tale that described the illustration, and prompting each student to talk about what he or she had learned through the project about what makes Philadelphia special. She also had students identify the sources they had used and record that information with the platform’s recording tool. Thus, she addressed all the elements of this stage of the model by helping each student (1) generate a new understanding that had personal meaning, (2) organize it in a structure that was appropriate to the task and the content, and (3) create a product that conveyed new knowledge in a creative and satisfying way.

Ms. A guided the students through the “Reflect” stage by asking each student three questions and recording the answers: What was your favourite part of the project? What part do you think you did the best? The worst? What is your favourite source that you used? Why is [that source] a good way to learn about Philadelphia? While this process didn’t specifically address the “revision” and “refining” elements of this stage of I-LEARN, it clearly set the stage for helping students understand the importance of stepping back and reflecting on their work.

Finally, Ms. A provided a formal assessment of her students’ projects by scoring them according to a version of the generic I-LEARN rubric the teachers had adapted to meet the needs of their students (Figure 7). The teachers (primarily Ms. A) had simplified the descriptions of the measures for the stages to reflect the kinds of tasks and levels of achievement they believed to be appropriate for their young learners. As with the generic rubric (Neuman, 2011b), the “kNow” step is not included in this rubric because instructors would generally need another evaluation tool to assess the specific knowledge students displayed in projects, term papers, multimedia presentations, etc.
Analysis of students’ scores on the rubric indicated that the overall mean score for the class was 11.5 out of a possible 15 points. Ms. A assigned all her students a score of 3 for “Identifies a meaningful problem,” and the mean scores for the other stages are as follows: 2.17 for “Locates information …,” 1.86 for “Evaluates …,” 2.17 for “Applies …,” and 2.17 for “Reflects ….” These scores reveal that the students had relatively high and consistent scores for most of the measures but seemed to struggle with “Evaluate.” These results confirm school librarians’ well-known concern about students’ ability to evaluate information and suggest that developing specific strategies within the I-LEARN framework is necessary to address that concern.

In sum, Ms. A’s approach to the I-LEARN project represents a rich, detailed, and effective incorporation of the model into a project-based, inquiry approach to learning with information. While she intervened significantly at each step of the project, her intervention could be characterized as teacher-guided rather than teacher-directed. She carefully and systematically interwove structure and independence into a pattern that capitalized on students’ developing skills and knowledge while at the same time ensuring their success as “researchers.” In particular, to develop their digital and information literacies, she used the stages and elements of I-LEARN to support them in Identifying their own topics, in Locating information about those topics in a variety of sources, and in structuring both their conceptual and their technological development as they Applied their information to create well-structured digital portfolios, and in leading them to Reflect on their process and on what they had integrated into their kNowledge stores.

## Discussion

Despite the difficulties that faced Fairmount during the period of the study, participating teachers were enthusiastic collaborators in this research. Their commitment to their students was evident; their eagerness to acquire new equipment, advance their own professional development, and
become involved in a new way of doing things were especially admirable in light of the school’s limited resources and highly stressful environment. The students, too, were generally engaged in the project—working in an under-resourced school in a deeply impoverished neighbourhood to master unfamiliar technology as well as to learn new ideas about information and digital literacies.

Overall, the study’s results indicate that the students of both teachers who used the I-LEARN model were successful in understanding and completing problem-based, inquiry-focused projects. Ms. B—a veteran who is highly respected—followed a traditional instructional approach and used the model as a tool to support teacher-directed learning. Ms. A—a fairly new teacher who, coincidentally, also has a background in school libraries—followed a more contemporary approach and used the model to foster inquiry learning. Both teachers deemed the model a useful tool, and both groups of students profited from their I-LEARN experience. However, the counterintuitive finding that Ms. A’s 5- and 6-year old kindergarten students achieved higher levels of digital/information literacy than did Ms. B’s 7- and 8-year-old second-graders suggests that Ms. A’s understanding of information, information resources, and information seeking and use provided significant advantages that the second graders did not have.

The collaborative research design also proved beneficial: teachers were able to reflect on their experience and to offer important insights into project successes as well as suggestions for improvement. During the focus-group interview, Ms. A noted that—although her students had never before done an inquiry-based project—the model gave her an easy-to-use tool for guiding and supporting them in learning how to locate, evaluate, apply, and reflect on information related to specific questions. Ms. A also offered important feedback to the research team by identifying a challenging aspect of using the framework with young children: teachers need to be sure to provide ample instructional support to provide students with knowledge they might not have had before—e.g., the concept of “sources.” Thus, while the model might be a useful tool for independent learning for older learners, younger ones need considerable scaffolding to be successful in its use.

**Conclusion**

Most of today’s teacher educators—and school-librarian educators—would no doubt conclude that the student-centered approach taken by Ms. A is critical to students’ development as competent, independent, and productive adults. This teacher clearly understood the importance of building upon her students’ “funds of knowledge” (Moll et al., 1992) and of teaching in a way that made the project culturally relevant to them (Villegas & Lucas, 2002). It is also reasonable to assume that her background in school librarianship, combined with her recent training as a 21st-century teacher, positioned her to foster a sophisticated level of information and digital literacy even in such young students. Ms. B, by contrast, reflected a teacher-directed approach that provided far fewer opportunities for her second graders to develop to such a level.

One wishes, of course, that Ms. A had been able to “ply her trade” in a school library so that a wider array of students could profit from her expertise. Unfortunately, that was not possible in her school; nor is it possible in most schools in Philadelphia: although the actual number of schools and school librarians in the city is a moving target, figures published in April 2013 indicate that at that time only 11 of the city’s 212 public schools had libraries staffed by certified school librarians (McCorry, 2014).

Philadelphia is extreme, but it is not unique. Today, libraries in general and school libraries in particular face an unprecedented threat to their existence. Despite decades of compelling research that a library with solid resources and a certified librarian is highly correlated with student achievement (e.g., Kachel & Lance, 2013; Lance, 2002; Lance, Rodney, & Hamilton-Pennell, 2000; Lance, Welborn, & Hamilton-Pennell, 1993) not enough decision makers have seen the importance of that key finding. Two persistent beliefs—that “everything is on the Internet” and
that all information is essentially equivalent in value—defy logic but undermine the idea that it is
crucial for students to learn from well-trained experts how to access high-quality information, to
evaluate it against established criteria, and to apply it efficiently and effectively to answer
questions and solve problems.

These skills comprise the core of the I-LEARN model, and the study shows that even young
learners can use them as the basis for guided learning in school. More importantly, of course, the
skills comprise the kind of learning with information that the students in the study—and their
counterparts—will need throughout their lives to navigate our increasingly complex information
world. They are the information/digital literacy skills required to choose satisfying careers, to
make decisions in the voting booth, to determine the appropriate treatments for health issues, and
even to plan for retirement. Particularly for the generation to which these study participants
belong, they are critical and indispensable life skills.

This case study, although limited in scope and application, illustrates once again the
importance of providing information-and-digital-literacy instruction in schools to prepare students
for their adult lives. Because budgetary issues are likely to remain a significant issue for urban
schools and school libraries far into the future, however, the study’s major implication for the
school library field is a call to find a way to help learners develop information and digital literacies
even as the spaces we call “libraries” disappear completely, become only reading rooms or story-
telling venues, and rely more and more heavily on uncertified personnel. The consequences of this
trend for the children of poverty who make up the majority of urban public school students are
sobering. The question becomes, then, what can the field of school librarianship do?

References
American Association of School Librarians and Association for Educational Communications & Technology
Bloom’s taxonomy of educational objectives. New York: Addison Wesley Longman.
Atkinson, T., & Swaggerty, E. (2011). Empowering fourth-grade researchers: Reaping the rewards of Web
2.0 student-centered learning. Language Arts, 89 (2), 99-112.
Gormley, K., & McDermott, P. (2014). “We don’t go on computers anymore!” How urban children lose in
schools to transform American schooling: A report from the field, 1985-2012. Peabody Journal of
Education, 88(5), 525-540.
International Reading Association (2009). New literacies and 21st century technologies: A position statement of
the International Reading Association. Newark, DE: IRA.
and university research partnerships. Educational Action Research, 10(1), 67-82.


**Author Note**

Delia Neuman is Professor and Director of the School Library Media (SLiM) Program at Drexel University and an Affiliate Faculty Member in the School of Education. The authors have formed
an interdisciplinary research team to address issues of information and digital literacy in urban schools.

Allen Grant, Vera Lee, and Mary Jean Tecce DeCarlo are faculty members in Drexel’s School of Education.