Making the case for the leadership role of school librarians in technology integration

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Abstract

Purpose – The purpose of this study is to determine the self-perceived impact of technology training on the transformational leadership practices of pre-service school librarians who participated in a Master's degree program in library and information studies focusing on leadership development.

Design/methodology/approach – A concurrent triangulation mixed method design was implemented using two paper-based self-administered surveys. The first survey measured transformational leadership behaviors. The second obtained demographic variables and the participants' perceptions of the skills they learned in each of the five transformational leadership dimensions.

Findings – The results indicate that the leadership curriculum taught the participants how to be transformational leaders by using technology. The participants also use technology in a way that is significantly different from other teachers in Florida. Moreover, it is important to teach practical applications for integrating technology.

Research limitations/implications – This study was limited to a cohort of 30 pre-service school library media specialists from six Florida counties.

Social implications – However, there are several practical implications. First, school library training programs can help change the perceptions of school librarians by teaching them to lead through technology integration. Next, school districts should support technology integration by developing infrastructures to support their success. Finally, project-based experiences with feedback provide the best opportunities for teaching educators how to implement technology.

Originality/value – The results provide evidence that it is possible for degree programs to train school librarians to excel as technology integration leaders. Placing emphasis on this role can help change the perceptions of school librarians. These outcomes strengthen current knowledge of the technology integration role of school librarians.

Keywords Librarians, Continuing professional development, Schools, Information technology, United States of America

Paper type Research paper

Introduction

In the Fall of 2006, 30 teacher-leaders began the Project LEAD program at the Florida State University College of Information. Participation in the program offered the participants a unique opportunity because Project LEAD is the first research-based leadership program for school librarians in the USA (Everhart and Dresang, 2007). The
participants of this study were the first to matriculate through the degree program as a cohort. Project LEAD, which was funded by an IMLS grant, emphasizes the implementation of the most recent guidelines of the American Association of School Librarians (2009) as found in *Empowering Learners: Guidelines for School Library Media Programs*. Moreover, Project Lead is similar to other teacher education programs, in that it is built on the tenets of the guidelines for certification, by the National Board for Professional Teaching Standards (2008). Both sets of guidelines present blueprints for exemplary pedagogy and leadership behaviors in professional practice.

According to the American Association of School Librarians (2009), “The school library program is built by professionals who model leadership and best practices for the school community” (p. 45). The Project LEAD program taught the participants to model best practices and to exhibit leadership by emphasizing the principles of transformational leadership (Bass and Bass, 2008; Burns, 2003). These concepts were embedded into the curriculum via assignments and activities that required the participants to produce evidence of their leadership behaviors by interacting with both the school communities in which they taught and their cohort of peers, and introspectively by practicing reflective writing.

On the completion of the program, a mixed-methods study (Smith, 2009) was conducted to determine the factors that impacted the level of self-perceived transformational leadership potential in these pre-service school librarians who had participated in a master’s degree program in library and information studies focusing on leadership. On analysis of the data, it became apparent that technology as a leadership tool in school reform was a recurring theme. Although the data presented here is a subset of the initial results, the implications reflect issues regarding professional development in technology for teachers, technology integration in school reform, and the preparation of school librarians to assume leadership roles in school reform by using technology integration.

The advent of a new presidential administration that seeks to improve education has awakened a renewed urgency to understand best practices for school reform. The American Recovery and Reinvestment Act allocated a substantial amount of funding to education. The Act includes initiatives to improve teacher effectiveness, innovation through technology, and efforts to gather information to improve student learning (The White House, 2009). This new emphasis has brought about new efforts to implement systems of accountability in education where the practices of educators are seen as the foremost key to change.

**Literature review**

*Professional development in technology and teachers*

The world has rapidly become dependent on technology. The needs of youth have evolved to reflect this change. Today’s youth are fluent in the use of technology in their everyday lives. They thrive in an environment where technology is second nature (Cooper, 2005; Dresang, 1999; Levin and Arafeh, 2002). “And they’re connected to one another by a common culture. Major aspects of their lives—social interactions, friendships, civic activities—are mediated by digital technologies” (Palfrey and Gasser, 2008). When teachers do not acknowledge the need for technology in the
learning environment, these “digital natives” experience a disconnect with their teachers (Levin and Arafeh, 2002).

It is essential for technology to effectively meet students’ needs and keep them actively engaged during instruction. Consequently, technology has been interwoven into the fabric of education. Unfortunately, educators still require a substantial amount of professional development to understand how technology can be applied to teaching. For example, in a study about K-12 distance education, it was found that teachers were confident in their knowledge of content and pedagogy but that they were hesitant in their ability to apply technology to teach their subject areas (Archambault and Crippen, 2009). This was particularly unfavorable because these teachers were responsible for teaching students online, yet they had not fully grasped the technology.

In another study, pre-service teachers, who were themselves, digital natives, were found to be ill prepared in their ability to implement technology in the classroom (Lei, 2009). Despite being digital natives, it was reported that a majority of them used computers for social networking purposes rather than for learning-related activities. These pre-service teachers were fluent in their use of computers for basic functions such as word processing, but lacked the knowledge to link Web 2.0 technology to classroom activities. Consequently, the study revealed that even digital natives need instruction in how to transition to teachers who use advanced and assistive technologies in the classroom. These studies illustrate that teachers do not embrace technology when they do not feel proficient in using them.

School districts have implemented strategies for providing professional development in technology for teachers. According to the National Center for Education Statistics (2009), 95 percent of the school districts responding to a national survey reported that they provide professional development for technology integration. Still, only 58 percent believe their teachers are adequately prepared to integrate technology into instruction. Perhaps it has been reported that teachers are not ready to integrate because of the types of professional development teachers are not required to attend. For example, the National Center for Education Statistics (2009, p. 18) also revealed that 84 percent of the reporting school districts did not oblige their teachers to attend professional development to learn how to collaborate with technology. Teachers in 68 percent of the reporting districts were not required to attend professional development in using technology to access or manipulate data to guide instruction, while 63 percent did not require teachers to learn how to assess and evaluate students with technology. In addition, 42 percent of the responding school districts indicated that their technology funding is not adequate (National Center for Education Statistics, 2009, p. 20). The combination of these factors implies that technology integration is a choice, not a requirement in schools.

Educational technology and school reform
While research indicates that effective implementation of technology in classrooms is still in its infancy (Archambault and Crippen, 2009; Levin and Arafeh, 2002; National Center for Education Statistics, 2009), technology has been indicated as a catalyst for school reform (Holland, 2001; The White House, 2009). According to Culp et al. (2005), the theme of transforming education through technology has been present in policy reports since 1995. During this time, policy makers began concentrating on technology as a tool for driving school reform as the internet became integrated into aspects of
daily life including civic, education, and business. During the twenty-first century, policy makers’ attention has been directed toward using research to connect technology with educational professional practices.

Matzen and Edmunds (2007) concluded that technology improves the professional practices of teachers by moving them from structuralism to student-centered constructivist activities. Their findings also state, “When teachers see technology modeled using constructivist compatible, student-centered approaches, they are more likely to use it that way” (p. 427). Conversely, the constructivist use of technology may depend on the type of professional development teachers receive. The findings of Matzen and Edmunds (2007) are substantial because the National Center for Education Statistics (2000) noted that the implementation of technology in classrooms has been fostered by technological professional development that typically fails to focus on integrating technology into the curriculum as well as how to use it. Moreover, the more time teachers spend on professional development in technology, the more capable they feel using technology in the classroom. However, follow-up training is offered even less often than initial training. In addition, teachers’ feelings of preparedness are directly related to their use of technology during instruction.

Researchers have identified several components of school reform through technology implementation that can be utilized by teachers who are comfortable using technology for instruction (Holland, 2001). These components include the implementation of assignments where teachers become facilitators for student learning, collaboration between teachers, flexible scheduling, and peer support for learning and implementing technology. There is also a need for a supportive infrastructure that includes support for teacher initiative and involvement. Holland (2001, p. 260) asserts, “Though technology in and of itself creates new and stimulating learning environments for teachers and students, without the necessary supporting infrastructure … it will be difficult if not impossible for technology to realize its potential as a catalyst for school reform”. Developing an infrastructure is necessary because of the stability it can provide. The need for stability through technology infrastructure is supported by the research of Bain (2004). According to Bain (2004), reform in schools is not about whether reform is intended; it is about changes that actually occur inside of classrooms. Conversely, without changes within classes, there is no reform. Classroom practices must manifest themselves as common cultures in professional practices that are based on research-driven beliefs and values used to create classroom tools. Bain (2004) maintains, “When the latter occurs consistently across classes, teachers and students, the conditions exist for the development of genuine educational technologies that can assist teachers, students, parents and administrators” (p. 168).

One case illustrating how instructional technology can be implemented across classes, teachers, and students was documented in the state of Florida (Everhart et al., 2009). Digital Harmony, a program supported by the Florida State University College of Communication and Information, was designed to connect middle school students with instruction technology in their homes. The program was implemented in a school in dire need of sustainable, culture-altering reform. In the year prior to the implementation of Digital Harmony, the school received a failing grade from the state’s Department of Education. Digital Harmony was successful because the city commissioner who developed the program collaborated with school and community
stakeholders to jointly work toward a vision of technological literacy and decrease the
digital divide inside of the community. While technology integration may not have
been the sole factor in the school’s dramatic reform, it is difficult to deny that
technology was a factor that contributed to the school’s improved test scores, grades,
and increased enrollment.

Transformational leadership in schools
The implementation of the Digital Harmony program by the city commissioner can be
likened to an act of transformational leadership, a bottom-up approach to leadership.
This form of leadership accentuates the ability of any individual within an
organization to act as a leader. Hence, individuals who have not been officially
appointed as leaders in an organization or a school can be empowered to implement
reform. Subsequently, it becomes less of a necessity to define the difference between
formal leaders and followers (Uhl-Bien, 2003).

Several characteristics of transformational leaders have been identified (Bass and
Bass, 2008; Burns, 2003; Kouzes and Posner, 2007). Transformational leaders are role
models who help to create shared visions by encouraging the individuals around them
to achieve goals. They take risks to find proactive ways to solve problems. Most
importantly, transformational leaders approach leadership by addressing individual
strengths and needs. This approach transforms organizations by changing the
underlying beliefs and assumptions that form cultures. Therefore, it can be seen as a
behavior.

Transformational leadership and its culture altering behaviors, are considered to be,
an effective form of leadership for schools because administrators are often required to
create change in resistant environments (Cohen, 2003). Transformational leadership
enables principals to empower school stakeholders such as teachers, community
leaders, parents, and students, which serves numerous purposes. First, this
empowerment encourages reform commitment because individual interests are
synced with the needs of the organization. Secondly, catering to the needs of teachers
and other stakeholders produces harmony within the school. Specifically, teachers
experience job satisfaction, which has a positive impact on students (Griffith, 2004),
who then benefit from the synergy that occurs. Finally, transformational leadership
creates long-term reform because of the distributed leadership and commitment. In
instances where principals leave their schools, the reforms they began continue
because they are deeply ingrained in the culture of the school.

School librarians and technology leadership
One group of school stakeholders in an advantageous position to act as leaders in
technology integration is school librarians. The guidelines for school librarians
suggest that they lead by engaging in activities such as becoming curriculum leaders,
collaborating with teachers, and connecting school communities with technology
(American Association of School Librarians, 2009). Often, school librarians can assume
these roles because they are not assigned to specific classrooms and can interact with
entire schools. Consequently, numerous studies have shown that school librarians can
be leaders within schools by collaborating and becoming curriculum leaders (School
Libraries Work, 2008). Moreover, Brewer and Milam (2006) have demonstrated that
school librarians are technologically savvy and often have the responsibility of promoting technology within schools.

Jacobskind et al. (2000) and Dutt-Doner et al. (2005) have documented how school librarians can be instrumental in assisting teachers to integrate technology. The school librarians in these studies were able to create positive changes within their schools by taking primary roles in assisting students and staff to acquire information skills. These are skills, which the teachers, and students most likely would not have gained, without the help of the school library, media specialist. Still, in spite of the proven value of this role, the guidelines describing it, and the difficulty of achieving it, there is a void of specific research-based strategies defined for performing the role of leader in technology integration.

Research and educational policy fail to connect school librarians with the larger educational community. For example, as mentioned in the previous studies, technology is an area where school librarians undoubtedly excel as leaders; yet in 2004 the US Department of Education issued the National Education Technology Plan, which is devoid of any mention of school librarians. In addition, the Total Package for Student Learning (T-PaCK), a body of research accepted by teacher education and technology organizations, does not explicitly assign a role to school librarians. The philosophy of this body of research is that a teacher who is able to negotiate relationships between technology, pedagogy, and content exemplifies a level of expertise that exceeds those of a subject area specialist (Koehler and Punya, 2008). The T-PaCK philosophy is so widespread, there are two journals centered on it, and in fact, its goals are quite similar to the standards that school librarians are supposed to achieve for nation board certification. The disconnect between school librarians, from such a widely accepted body of research, is even more ironic, because it is widely known, that school librarians, are an integral part of technology within schools (Brewer and Milam, 2006). The lack of presence in these national indicators make it evident that school librarians must assume a more proactive role in becoming transformational leaders in school reform through technology integration.

**Statement of purpose and research questions**

The purpose of this study was to determine the self-perceived impact of technology training on the transformational leadership practices of pre-service school librarians who participated in a master’s degree program in library and information studies focusing on leadership development. The following research questions guided the investigation.

1. How did technology training facilitate leadership development in the participants?
2. How did the participants report using technology for school reform?
3. How did the participants’ use of technology differ from the typical teacher’s reported use of technology in the state of Florida?

**Methodology**

**Population**

In total, 30 teacher-leaders from six counties in the state of Florida were chosen to participate in Project LEAD. The Project LEAD directors assessed the leadership
potential of the teacher-leaders by awarding them points on a sliding scale for their scores on a questionnaire, a leadership rubric completed by their principals, and their grade point averages. The teacher-leaders were also allotted points if they met certain diversity criteria pertaining to their ethnicity, age, the subjects they taught, and their gender. The teacher-leaders with the highest scores were admitted into the program as a cohort and are the population in this study.

Data collection and analysis
A concurrent triangulation mixed method design with a purposive sample was used to implement this study. This type of methodology was chosen since the participants were chosen because they were leaders. A statistical analysis may not have revealed the subtle similarities and differences between the participants. A closed-ended survey would not have divulged these differences.

The participants were mailed two paper-based self-administered surveys along with a cover letter. The first survey was the Leadership Practices Inventory (LPI) that measures transformational leadership (Abu-Tineh et al., 2008; Brown and Posner, 2001).

The LPI is a valid and reliable instrument (Brown and Posner, 2001; Fields and Herold, 1997) that has been used in many contexts including education (Koh, 2008; Laflin, 2009). The instrument measures the five transformational leadership dimensions: Modeling the Way, Enabling Others to Act, Encouraging the Heart, Enabling Others to Act, Inspiring a Shared Vision, and Challenging the Process. These areas support the types of leadership goals taught during the Project LEAD program.

The second survey was supplemental and was designed by the researcher. It included closed and open-ended questions. These questions were designed to obtain demographic variables and the participants’ perceptions of the skills they learned in each of the five transformational leadership dimensions. Pre-existing data from the Florida Innovates (2008) technology integration survey was also collected.

Nvivo software was used to code the qualitative data collected on the second survey into themes. The differences between the study population’s mean scores on the LPI were compared to the national population norms reported by Kouzes and Posner (2007) by using SPSS to complete a t-test. The results were used to answer research question 1.

Findings
The first significant finding of this study was that there were significant differences between the mean scores of the self-perceived leadership practices of the study population and the national population in two areas of transformational leadership. Table I shows that the study population scored significantly higher on the subscales – Modeling the Way, \( t(47.01) = 3.865, p = 0.001 \) (two-tailed) and Enabling Others to Act, \( t(49.39) = 2.610, p = 0.014 \) (two-tailed). The qualitative analysis revealed that the participants learned technology skills that helped them to exemplify each of the five transformational leadership dimensions identified by Kouzes and Posner (2007). The frequency of responses was reported in the following order: Challenging the Process (66.7 percent), Inspiring a Shared Vision (53.3 percent), Encouraging the Heart (33.3 percent), Enabling Others to Act (26.7 percent), and Modeling the Way (26.7 percent).

Leadership training for school librarians was the purpose of the Project LEAD program. According to their responses, the respondents reported acquiring methods...
that allowed them to feel comfortable with being placed in leadership roles. They were confident that they could create positive impacts on their schools because of the leadership skills they learned. One participant wrote, “I feel that I learned what a leader is, what they do, and how to use that knowledge when I become a media specialist”. The qualitative statements support the quantitative findings and confirm that the Project LEAD curriculum was effective in teaching the students how to be transformational leaders.

The participants’ comments also demonstrate that the Project LEAD curriculum taught them to be transformational leaders by using technology. The development of new technology skills was highly recognized among the respondents. During the degree program, they were introduced to a multitude of Web 2.0 applications. Many of the students considered applying these applications to be part of their risk taking behavior because extensively using technology to enhance their teaching skills was something they were not accustomed to doing. A respondent commented, “One of the things I saw missing at my school was integrating technology into instruction. Project LEAD classes taught me how to use technology and encouraged me to share the technology integration with my school staff and administration”.

Their technology skills became a tool for engaging students, volunteering for new projects, and improving the resources available to students, faculty, and staff. The respondents specified that their new skills helped them to strengthen interactive lessons for students. For example, one wrote, “I try new technology more readily. I am not afraid to fail if it helps me learn to succeed”. Social networking sites such as Facebook and Twitter became popular amid the Project LEAD cohort. Their new technology skills complemented their information sharing techniques as they began creating blogs, podcasts, listserves, web sites, and wikis. Their new sites have been used as a way to network with their community, friends, and other professionals, indicative of the respondents’ advanced usage of their technology skills in a leadership capacity.

Another finding of this study was that the Project LEAD students use technology in a way that is significantly different from other teachers in Florida. This result supports Ertmer’s (2005) suggestion that one way to help teachers use technology is to expose them to methods of using the technology that are immediately applicable to instruction. Figure 1 displays the frequency of the uses of technology described by the Project LEAD students. Florida Innovates (2008) provided data regarding the percentage of schools reporting more than 50 percent of teachers using technology for a variety of purposes. Figure 2 displays data from Florida Innovates (2008).

<table>
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<th></th>
<th>Test value</th>
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<th>t</th>
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<th>Sig. (two-tailed)</th>
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<td>0.899</td>
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<tr>
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<td>46.83</td>
<td>0.611</td>
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<td>0.546</td>
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<tr>
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<td>51.76</td>
<td>2.610</td>
<td>29</td>
<td>0.014*</td>
</tr>
<tr>
<td>Encouraging</td>
<td>47.05</td>
<td>49.26</td>
<td>1.740</td>
<td>29</td>
<td>0.092</td>
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</tbody>
</table>

**Table I.**
Project LEAD students’ LPI subscales compared with national norms

**Note:** *Significant at p < 0.05*
The figures show noticeable differences in the common types of activities used by the Project LEAD students and typical Florida teachers. According to the Florida Innovates data, typical teachers in Florida are still using technology tools a majority of the time for basic tasks such as sending e-mails to people within their school districts and completing administrative work. The findings signify that the Project LEAD students do mimic these activities. On the contrary, the training they have received, has also helped them to attempt more complex tasks with technology. These activities include collaborating, advocating for technology integration, and providing research and technology training.
The responses of the students also support the assertion that teachers need to be taught specific strategies for integrating technology into the classroom (Ertmer, 2005; Matzen and Edmunds, 2007). If they are not taught they are less likely to grasp how to use the technology they have learned. A respondent wrote, “I have become increasingly confident with technology and feel I can lead other teachers in using multimedia applications”. Moreover, since the training the teachers received in this program was acquired over an extended period-of-time, the teachers were afforded technology professional development that went beyond initial training. This was especially helpful for helping them realize how to use the technology they learned.

The responses of the participants also point to three barriers to integrating technology into the classroom. First, it was students indicated that their school administrators and environments were not receptive to trying new strategies. This response echoes the sentiments of a number of participants. “My administration is very careful and not willing to take risks with online and web 2.0 applications. I have suggested them”. Second, prior to Project LEAD, the students did not have the knowledge they needed to implement technology into the classroom. This is one example of a response: “I feel I have gained the education needed to meet the information needs of my students and teachers. I have gained information regarding resources in the real and virtual worlds”. Many of them were not aware of Web 2.0 tools and how they could be used to enhance their professional experiences. Once they were introduced to the tools, they created innovative ways to use them. Finally, they lacked the confidence to integrate technology. “I try new technology more readily. I am not afraid to fail if it helps me learn to succeed”. Confidence seemed to be closely aligned with their knowledge of technology tools.

It is evident that the participants were using technology before they began the program. Each participant had to describe their use of technology on the questionnaire they completed before entering the program. Likewise, it is obvious that the Web 2.0 tools the participants learned had an immediate impact on their professional practices. Because some of the teachers did not feel confident in using technology, felt their administrators did not support technology integration, or were not aware of Web 2.0 tools, this study concurs with other research finding that an infrastructure needs to be developed to support technology integration inside of schools (Holland, 2001).

Florida teachers work in a high stakes test environment. It is likely that the administrators who did not want to implement new technology were concerned about creating changes that might have confused students. However, an existing infrastructure probably would have already kept these participants and their administrators up-to-date on Web 2.0 technology integration. In this case, the administrators may have been more receptive to change.

Suggestions, recommendations, and implications
The role of higher education in technology integration

In 1983, the landmark report, A Nation at Risk declared that all students should receive instruction in the four core subjects as well as computer science (United States Department of Education, 1983). In 2001, No Child Left Behind reiterated the need for students to be technologically literate. Still, the United States Department of Education (2008) recently noted that effective educators are an essential component for education reform. Yet, the same report remarked that little is actually known about how to develop exemplary teachers.
Research has indicated that a great deal of teachers receive technology professional development from institutions of higher education (National Center for Education Statistics, 2000). This study proves that educator preparation programs can place a great emphasis on technology integration and create a substantial impact on how technology is integrated into schools. After all, colleges and universities are responsible for preparing teachers to be effective in the classroom. The current state of technology integration in schools makes the case that this type of instruction needs more emphasis during degree programs and continuing education courses.

Creating an infrastructure for technology integration
Institutions of higher education are not solely responsible for technology professional development. Once educators have learned how to use technology tools, they need a place in which to practice them. Some of the participants encountered obstacles when they tried to integrate their knowledge of technology into their schools. This decreased the effect of the reforms that could have taken place. For this reason, this study shows that the establishment of an infrastructure to support teachers begins with administrators who are receptive to change. An act as simple as lifting filters for selected Web 2.0 tools and web sites can be the beginning of an infrastructure that supports teachers in creating student-centered learning activities.

Professional development and technology integration
A national survey found that teachers had a tendency to use technology for presentations and for providing students with access to information (Becker, 2001). Nearly a decade later, Florida Innovates (2008) depicted similar results. This study shows that sustained professional development can make a difference in the pedagogy of teachers. Many of the participants cited increased confidence as a result of completing the Project LEAD degree program (Smith, 2009). The assessment used to screen for leadership dispositions was an indicator that all of the participants had the potential to be school library, media leaders before they began the program. However, their lack of confidence was a symptom of their need for professional development in areas such as technology integration.

It is well known that technology professional development is offered by a majority of school districts (National Center for Education Statistics, 2009). Nevertheless, as evidenced by this study, the knowledge gained from these short term experiences often fail to make educators confident in their use of technology for instructional purposes. According to the findings of this study, sustained, project-based experiences with feedback provide the best opportunities for teaching educators how to implement technology.

Technology training does not necessarily have to be face-to-face. Nor does the training have to be for expensive technology. Project LEAD, a distance-learning program, was highly effective in teaching students how to implement free resources found online. Tools such as Blackboard and Moodle are cost-effective ways of providing professional development at a distance.

School librarians as transformational leaders in technology integration
T-PaCK offers a possibility to fill research gaps relating to the leadership role of school librarians in technology. However, school librarians have not been addressed in this
body of research. Still, technology integration is a familiar role for school librarians, which has been emphasized by the American Association of School Librarians (2007). The association explained that “Technology skills are crucial for future employment needs. Today’s students need to develop information skills that will enable them to use technology as an important tool for learning, both now and in the future” (p. 2). The American Association of School Librarians’ opinion is mirrored by the National Board for Professional Teaching Standards, the International Society for Technology in Education, the Association for Education Communications and Technology, and the National Council for the Accreditation of Teacher Education.

Schein (2004) asserts that reform occurs in organizations when cultures are changed. Cultures are the products of assumptions, beliefs, and behaviors. Each school has its own specific culture. However, the actions of the participants in this study are examples of how small changes can whittle away at longstanding behaviors within schools. In the case of technology integration, the summation of small changes can equal lasting reform.

Conclusion
The process used to educate the participants of this study was groundbreaking in that it was able to accomplish something that has never been attempted before. Project LEAD was the first research-based leadership curriculum for school librarians. The curriculum successfully taught the participants how to be transformational leaders. One area in which the participants reported learning an abundance of transformational leadership skills was technology integration. The program has been able to connect research, professional practices, and the theories supporting the guidelines for school librarians by teaching these skills. Inasmuch, this study documents the program participants’ ability to connect technology, pedagogy, and content.

While this study has shown how professional development in Web 2.0 tools can lead to an increase in transformational leadership, more research studies should be conducted in response to the findings. For instance, the Project LEAD students have shown that a structured curriculum can be used to teach pre-service school librarians to lead through technology. Further research is needed to examine how they will perform in this leadership capacity after they graduate. In regards to classroom teachers, what methods of professional development are needed to make them comfortable with technology integration? Can extended professional development delivered at a distance, infused with feedback, and practical classroom activities, assist teachers with technology integration? How are teachers and school librarians applying Web 2.0 tools to instruction? Lastly, what progress have institutions of higher education made in preparing teachers to integrate technology? Surely exploring these essential inquiries will aid educators in teaching twenty-first century skills to “digital natives”.

References


**Further reading**


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