

School Technology Leadership: Theory to Practice

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Abstract

Technology leadership is an emerging specialty area in Educational Leadership programs. This article describes the School Technology Leadership Initiative, an innovative graduate-level curriculum that addresses the technology needs of school administrators by synergistically blending national standards, situated learning theory, blended instruction, and technology tools. Implications and starting points are suggested for university preparation programs interested in better addressing the technology leadership needs of school leaders.

Introduction

The preparation of K-12 school administrators by university educational leadership programs is a fairly recent phenomenon. In the 1950s about 125 universities offered graduate programs in school administration, while today there are nearly 400 institutions. An additional 100 or more institutions offer educational administration licensure coursework (Lilley, 1995; McCarthy, 1999). During this time the structure and content of university educational leadership programs has changed dramatically. A multitude of curricular options that would have been unimaginable a few decades ago are now available to prospective administrators. Topics such as teacher leadership, women in leadership, special education administration, and leadership for social justice are now commonplace. These new offerings and programmatic emphases reflect the changing demographics of our nation's school leaders, teachers, and students and the influence of philosophy, social psychology, critical theory, and other social sciences on educational leadership theory and practice (Leithwood & Duke, 1999).

An emergent field within the increasingly diversified world of educational leadership is technology leadership. As schools strive to excel in the "Information Age," they need leaders who are versed in the potential and pitfalls of information and communication technologies (ICTs) for our nation's students. Many researchers and educational organizations have noted that strong leadership is an essential element of successful technology-based school reform (Anderson & Dexter, 2005; Byrom & Bingham, 2001; Gibson, 2002; Martin, Gersick, Nudell, & Culp, 2002; National School Boards Foundation, 2002; United States Department of Education, 2005). In fact, professional standards documents from the Interstate School Leaders Licensure Consortium (1996), the National Policy Board for Educational Administration (2002), and the International Society for Technology in Education (2002) underscore the importance of technology-related administrative competency. While the need for technology-literate school leaders is widely recognized, programs that prepare such individuals are in short supply. Few districts sufficiently train practicing administrators to facilitate the effective uses of technology in schools or to use technology meaningfully to improve the efficiency and effectiveness of their own administrative work (Consortium for School Networking, 2004; Dawson & Rakes, 2003; Riedl, Smith, Ware, Wark, & Yount, 1998). University educational leadership programs also have been slow to adapt to schools' burgeoning needs for technology-savvy administrators

(McLeod, 2004; (McLeod, S., Logan, J., & Allen, J., 2002). The result is a large-scale absence of effective technology integration and a resultant lack of impact on student learning. We recognized this gap and developed the School Technology Leadership Initiative (STLI), an innovative academic program that includes a graduate certificate for school technology leaders. Although the STLI targets a wide range of technology leadership needs in schools[1], the focus of this article is on our curriculum. We will describe how we anchor technology leadership learning and practice in the National Educational Technology Standards for Administrators (NETS-A)[2], blended instruction (i.e., a hybrid model of face-to-face and online learning), situated learning theory, and the modeling of technology integration.

Standards, Pedagogy, and Technology of the STLI

The six NETS-A standards, which represent a national consensus of knowledge, skills, and dispositions necessary for effective technology leadership in schools (ISTE, 2002), include:

- I. Leadership and Vision;
- II. Learning and Teaching;
- III. Productivity and Professional Practice;
- IV. Support, Management, and Operations;
- V. Assessment and Evaluation; and
- VI. Social, Legal, and Ethical Issues.

The STLI curriculum is mapped to the NETS-A to ensure comprehensive coverage of the breadth and depth of the standards.[3] The recent literature acknowledging that the NETS-A are useful guidelines for the training of school administrators (e.g., Anderson & Dexter, 2005; Ury, 2003) bolsters our decision to base the curriculum on the NETS-A. After embracing the NETS-A as the theoretical and curricular framework, we selected a delivery model that met the needs of our future students, school technology leadership practitioners. The STLI offers its curriculum as a blended-model program employing both face-to-face and online instructional strategies (Bleed, 2001; Wonacott, 2002; Young, 2002). The STLI schedules its face-to-face instruction in July when school leaders have the greatest availability and leverages online learning environments during the academic school year so participants can continue to work in their school leadership positions. Participants are admitted into a cohort that fosters a community of practitioners that assists participants in their transition to the online environment (Lawrence, 2002; Smith & Robinson, 2003; Wenger, 1998). This social connection created during the initial face-to-face experience helps alleviate feelings of social isolationism (Aragon, 2003) and promotes student retention. This approach meets the needs of students as they balance their work with their professional development experience.

Pedagogically, we developed the STLI program from a situative perspective on learning and knowledge. In this way, learning and knowledge transfer occur when learners interact with course material that is contextually connected to their practice, collaborate within a supported community of practice, and mediate their learning with tools (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991; Putnam & Borko, 2000). Accordingly, the STLI curriculum situates leaders' learning in school-based technology leadership issues, nurtures the community of leaders established during the face-to-face summer experience, and supplies necessary tools to conceptually and practically engage in technology leadership. Technological tools are necessary components to develop school leaders' understanding of why and how they will use technology. To achieve this level of understanding, across our coursework we (a) demonstrate how technological tools can amplify or transform practices, (b) model technology-infused instruction, (c) model technology-supported leadership practices, and (d) assist participants in identifying promising technology tools for management and operational needs. School leaders who see and experience the possible contribution of technologies for their work become highly motivated to learn and integrate technological tools.[4]

Translating Theory Into Practice

In this section, we demonstrate how these four anchoring theories – the NETS-A, blended instruction, situated learning theory, and technology integration – combine synergistically in the School Technology Leadership curriculum. Specifically, we will describe the instructional

approaches in four STLI courses: a two-credit data-driven decision-making course sequence and a two-credit course sequence on facilitating technology integration in the classroom. The data-driven decision-making (DDDM) courses are designed to address the two NETS-A performance indicators concerning the utilization of data for student and school improvement. Participants in the first online course participate in a series of readings and asynchronous threaded discussions that ground them in the essential concepts and best practices of DDDM. These discussions furnish students an opportunity to bridge their academic learning with the practices that are occurring, or not occurring, in their local school organizations. Participants also engage in a series of self-paced multimedia tutorials designed to teach technological skills necessary to collect, organize, analyze, and report student data. These tutorials have been extremely well-received by participants and enable them to immediately impact their organizations. In the second face-to-face DDDM course, participants complete additional readings and tutorials before arriving on campus. Participants learn advanced data manipulation tools, mental frameworks, and technologies for data-driven school reform within district-level leadership structures. With the help of our corporate partners, students also gain hands-on experience using district-level summative and formative assessment data management programs such as TetraData's EASE-e Analysis Suite and Renaissance Learning's Renaissance Place information systems.

The Facilitating Technology Integration in the Classroom courses tackle the NETS-A standard of Learning and Teaching. In the first face-to-face course, participants immerse themselves in a range of K-12 technology-supported, subject-specific lessons in a technology exploration activity. This exploration is accompanied by extensive discussions, readings, and activities that help participants define the concept of 'technology integration,' explore approaches to assessing the quality and quantity of integration, examine effective professional development approaches, and acknowledge current practices in their settings related to technology integration vision, assessment, and professional development. MindGenius concept-mapping software is used to document class discussions, such as small group investigations of technology integration concepts across the Technology Counts reports by Education Week, and to capture participants' prior knowledge on topics such as assistive technologies.

In the ensuing online course, participants study one assessment framework in depth, share it with colleagues in a focus group, and reflect upon its role in facilitating effective technology integration in their educational setting. In addition to asynchronous threaded discussions, the instructor uses a streaming, narrated PowerPoint presentation to summarize components of several technology integration assessment approaches and to demonstrate how to use the Replacement, Amplification, and Transformation (RAT) continuum (Hughes, 2000) to analyze technology-supported lessons. Participants then use RAT to analyze lessons from their own setting or from repositories of video-illustrated, technology-supported lessons.[5] Participants also conduct a focus group with colleagues and facilitate discussion about the RAT framework, its usefulness, and contextual and personal issues that bar or facilitate technology integration. The course culminates with participants sharing their focus group experience, comparing and contrasting results across settings, and identifying progress steps for their institution. These four course examples illustrate how the anchoring theories – the NETS-A, blended instruction, situated learning theory, and technology integration – combine synergistically in the School Technology Leadership curriculum. The next section provides several implications and suggestions for educational leadership programs based these anchoring theories.

Implications

For educational leadership programs that wish to better meet the technology needs of preservice and practicing administrators, we offer the following suggestions. First, faculty can begin reading the STLI weblog to familiarize themselves with current issues and information sources related to this topic.[6] Second, programs can begin discussions with local K-12 experts, school systems, and educational technology corporations about incorporating technology-related topics into existing university courses, including guest speakers, site visits, and technology demonstrations. Third, programs can organize and co-sponsor with school districts, state leadership associations, and state departments of education technology-oriented conferences, workshops, institutes, and other professional development opportunities. Finally, the current shortage of technology-knowledgeable faculty never will be resolved until the field as a whole acknowledges its

existence and the importance of remedying the situation. Educational leadership faculty need to have explicit discussions at national conferences about how to build the technology leadership capacity of current and future faculty to better address the needs of school administrators in our increasingly technological society.

Conclusion

We described a theoretically-rich school technology leadership curriculum anchored in standards that we hope serves as a curricular solution and a set of ideas around which discussions might manifest for the emergent field of K-12 technology leadership. Daley's (2001) research indicates that professionals create meaningful knowledge by situating their learning within their professional work. The STLI's curricular content, instructional format, and theory to practice stance culminates in individual and institutional change. In fact, the evaluation of the STLI participants' learning and development as technology leaders reveals statistically significant change in participants' knowledge, skills, and abilities as technology leaders in their educational settings (Anandan, Cederquist & Walton, 2004). The four anchoring theories – the NETS-A, blended instruction, situated learning theory, and technology integration – enhances the STLI participants' abilities to transparently move between theoretical and practical issues in the field of technology leadership.

Endnotes

[1] The STLI's Website, <http://www.schooltechleadership.org>, provides a complete description of the STLI's three-prong goals of curriculum, communication, and outreach. Although this article focuses on the curriculum, other facets of the STLI include communication and outreach. STLI's goal of communication is exemplified through a premier weblog for educational technology leaders (<http://www.schooltechleadershipblog.org/>), a listserv with nationwide reach, and videoconferencing communications. The STLI also partners with corporate and educational partners, and it provides outreach in the form of a Postsecondary Partners Program (P3) through which the STLI shares syllabi, readings, teaching techniques, and other learning resources with Educational Leadership programs across the nation. The current fifteen universities involved in the P3 Program are working to create new curricular structures, better integrate technology content and tools into existing courses, and offer new professional development opportunities for their local school leaders.

[2] For the full version of the National Educational Technology Standards for Administrators (NETS-A), see http://cnets.iste.org/administrators/a_stands.html.

[3] Select the STLI Curriculum link at <http://www.schooltechleadership.net/AEX/> for an overview of the STLI's curriculum. This overview provides information about the learning modules, curricular strand, NETS-A performance indicators, credits, semester, delivery method, and instructor.

[4] Select the Mindmap of Technology Tools link at <http://www.schooltechleadership.net/AEX/> for a concept map of technology tools integrated into the STLI coursework.

[5] As an example of a repository of video-illustrated, technology-supported lessons, see In Time's website at <http://www.intime.uni.edu>.

[6] Access the STLI's weblog at <http://www.schooltechleadershipblog.org/> for recent news from various educational technology leadership sources.

References

- Anandan, T., Cederquist, H., & Walton, L. (2004). Evaluation of the School Technology Leadership Initiative: External evaluation report #2 (American Institutes of Research). Washington, DC: American Institutes of Research.
- Anderson, R. E., & Dexter, S. (2005). School technology leadership: An empirical investigation of prevalence and effect. *Educational Administration Quarterly*, 41(1), 49-82.
- Aragon, S. R. (2003). Creating social presence in online environments. *New Directions for Adult and Continuing Education*, 100, 57-68.
- Bleed, R. (2001). A hybrid campus for the new millennium. *Educause Review*, 36(1), 16-24.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-41.

- Byrom, E., & Bingham, M. (2001). Factors influencing the effective use of technology for teaching and learning: Lessons learned from the SEIR-TEC intensive site schools. Durham, NC: SouthEast Initiatives Regional Technology in Education Consortium.
- Consortium for School Networking. (2004). Digital leadership divide: Without visionary leadership, disparities in school technology budgets increase. Washington, DC: Consortium for School Networking.
- Daley, B. J. (2001). Learning and professional practice: A study of four professions. *Adult Education Quarterly*, 52(1), 39-54.
- Dawson, C. & Rakes, G. C. (2003). The influence of principals' technology training on the integration of technology into schools. *Journal of Research on Technology in Education*, 36(1), 29-49.
- Gibson, I. W. (2002). Leadership, technology, and education: Achieving a balance in new school leader thinking and behavior in preparation for twenty-first century global learning environments. *Journal of Information Technology for Teacher Education*, 11(3), 315-334.
- Hughes, J.E. (2000). Teaching English with technology: Exploring teacher learning and practice. Unpublished doctoral dissertation, Michigan State University, East Lansing.
- Interstate Leaders Licensure Consortium. (1996). Standards for school leaders. Washington, DC: Council of Chief State School Officers.
- International Society for Technology in Education. (2002). National educational technology standards for administrators. Washington, DC: Author.
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York: Cambridge UP.
- Lawrence, R. L. (2002). A small circle of friends: Cohort groups as learning communities. *New Directions for Adult and Continuing Education*, 95, 83-92.
- Leithwood, K., & Duke, D. L. (1999). A century's quest to understand school leadership. In J. Murphy & K. S. Louis (Eds.), *Handbook of research on educational administration* (2nd ed.), (pp. 45-72). San Francisco, CA: Jossey-Bass.
- Lilley, H. E. (1995). *Educational administration directory - 1994-1995*. Morgantown, WV: West Virginia University.
- Martin, W., Gersick, A., Nudell, H., & Culp, K. M. (2002). *An evaluation of Intel Teach to the Future: Year two final report*. New York, NY: Center for Children and Technology.
- McCarthy, M. M. (1999). The evolution of educational leadership preparation programs. In J. Murphy & K. S. Louis (Eds.), *Handbook of research on educational administration* (2nd ed.), (pp. 119-139). San Francisco, CA: Jossey-Bass.
- McLeod, S. (2004, December). Where are the administrators? The need for leadership in K-12 technology. Presentation given at the TIES Education Technology Conference, Minneapolis, MN.
- McLeod, S., Logan, J., & Allen, J. (2002, April). Preparing school administrators to use and facilitate the use of information technology: A study of educational leadership programs. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.
- National Policy Board for Educational Administration. (2002). Standards for advanced programs in educational leadership for principals, superintendents, curriculum directors, and supervisors. Washington.
- National School Boards Foundation. (2002). Are we there yet? Research and guidelines on schools' use of the Internet. Retrieved February 17, 2005, from <http://www.nsb.org/thereyet/fulltext.htm>.
- Putnam, R. T., & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning? *Educational Researcher*, 29(1), 4-15.
- Riedl, R., Smith, T., Ware, A., Wark, A., & Yount, P. (1998). *Leadership for a technology-rich educational environment*. Charlottesville, VA: Society for Information Technology and Teacher Education. (ERIC Document Reproduction Service No. ED421128)
- Smith, S. J. & Robinson, S. (2003). Technology education through collaborative cohorts. *Remedial and Special Education*, 24(3), 154-61.
- United States Department of Education. (2005). *Toward a new Golden Age in American education: How the Internet, the law, and today's students are revolutionizing expectations* (National Education Technology Plan 2004). Retrieved on February 17, 2005 from <http://www.NationalEdTechPlan.org>.
- Ury, G. G. (2003). Missouri public school principals' computer usage and conformity to technology standards. Unpublished doctoral dissertation, University of Missouri, Columbia.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, England: Cambridge UP.
- Wonacott, M. E. (2002). Blending face-to-face and distance learning methods in adult and career-technical education. Practice application brief No. 23. (ERIC Document Reproduction Service No. ED470783).
- Young, J. (2002). 'Hybrid' Teaching Seeks to End the Divide Between Traditional and Online Instruction. *The Chronicle of Higher Education*, Information Technology Section A33. Retrieved January 12, 2005 from <http://chronicle.com/free/v48/i28/28a03301.htm>.