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Mutual Support Between Learning Community Development and Technology Integration: Impact on School Practices and Student Achievement

Traditional schools are notorious for being isolated, inflexible, and reluctant to change. This lack of professional dialogue among educators remains a significant barrier to successful school improvement, resulting in teachers’ practices becoming stagnant and student achievement suffering. The K20 Center for Educational and Community Renewal at the University of Oklahoma addresses this barrier through research and professional development focused on teaching and learning innovations. Knowledge gained from these research activities is transferred to network schools through professional development for K–12 teachers, principals, superintendents, and other key stakeholders. This article describes the K20 Center’s research-based systemic change model, which moves beyond a conceptual framework to actually improving teacher quality and student success.
ANY OF AMERICA’S SCHOOLS today remain characterized as bureaucracies with top-down leadership that hinders collaboration and professional learning (Darling-Hammond, 1997, Fullan, 1991). To improve these traditional school structures, the framework of the K20 Center for Educational and Community Renewal at the University of Oklahoma has developed a research-based framework and systemic reform model. This model builds leadership capacity of members of the school community for transformation into a professional learning community (PLC) through job-imbedded professional development and technology innovations.

The K20 model utilizes technology integration to involve a school’s individuals and teams in a collaborative learning model. Technology integration processes enhance collective learning that contributes to the development of a community (Burns, 2002; Dexter, Seashore, & Anderson, 2002; Riel & Fulton, 2001; Williams, Atkinson, O’Hair, & Applegate, 2007). As teachers work together toward technology integration, they collectively gain knowledge, share best practices, and work collaboratively to build leadership capacity. Through intensive professional development around technology integration, mutually supportive, and reciprocal relationships are created to support learning community development and increased student learning (Williams, 2006). This article presents the strategies and implementation of the K20 Center’s statewide reform efforts.

Founding of a School–University Network

The K20 school–university partnership began in 1995 as the Oklahoma Networks for Excellence (ONE), and its goals centered on creating networks for democratic education. For 6 years, teacher representatives from 12 urban, suburban, and rural schools met monthly to share best practices through collaborative discussions and school site visits. Conferences provided opportunities for intentional professional networking (Lieberman, 1996) to address common challenges. The lessons learned from this school–university network provided the foundation for the K20 Center’s framework, which is based on the principles of inquiry, discourse, equity, authenticity, leadership, and service (IDEALS) and the 10 practices of high-achieving schools (O’Hair, McLaughlin, & Reitzug, 2000). These research-based practices support school members in developing learning communities in which all members learn together and engage in renewal (Cate, Vaughn, & O’Hair, 2006).

Through the early work of ONE, the significance of the administrator’s role was identified. In 2001, the K20 Center was awarded the Bill and Melinda Gates Foundation state leadership development grant to provide professional development to 800 school leaders. Two former school administrators and the K20 Center Director coordinated the leadership project, Oklahoma’s Achievement for Collaboration and Technology Support (OK-ACTS). To consider various viewpoints and build ownership for the project, an advisory board of representatives from the university, executive directors of the associations for school boards, administrators, teachers, and career technology centers, and a committee of principals and superintendents was established. This board set criteria for participation, planned and examined professional development content, and monitored the project.

Beginning With Leaders

In 2002, head principals and superintendents began attending the year-long OK-ACTS Phase I leadership professional development. As an incentive, leaders were given a laptop computer at the initial 2-day seminar. Many of them believed that the focus would be on technology skill development, but because of lessons learned, the focus of the 75-hr professional development was democratic leadership and school change focused on the IDEALS and Ten Practices framework using technology integration strategies. Sessions involved the participants in activities that illustrated the impact of school improvement practices, such as building leadership capacity (Lambert,
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2003), leading technology integration using The National Educational Technology Standards for School Administrators (Technology Standards for School Administrators Collaborative, 2001), and utilizing effective technology activities such as Active Learning with Technology modules (Adams et al., 2000).

School leaders who had completed OK-ACTS Phase I served as cluster coaches for a group of 20 participants. In this role, they acted as mentors, assisting the participants, conducting periodic meetings, and communicating by telephone and e-mail to facilitate school renewal, shared leadership, and technology integration (Joyce & Showers, 2002). After the seminar, and with on-going support, the leaders participated in follow-up cluster meetings, administered a school technology assessment, and wrote an action plan for implementing one of the Ten Practices. This action plan provided evidence of the practice in their school, obstacles to be addressed, and strategies to advance this practice (Reitzug & O’Hair, 2002). The action plans were assessed for evidence of the practices in the school utilizing the STARSS-LS rubric (Cate, 2002), which evaluated structures, technology, authenticity, research, staff development, stakeholders, leadership, and service. The K20 staff provided suggestions, questions, and resources as reflective feedback.

At the end of the first seminar in 2002, one rural superintendent voiced concern in the evaluation report, “I am a little disappointed that our sessions have been more dedicated to leadership than technology.” Yet, as he worked through the shared leadership process, he found that his district was changed through increased stakeholder involvement that resulted in the development of a community foundation. In their action plan, he reflected, “The Technology Team has moved from a group who met annually to one that meets in various forms throughout the school year to encourage inquiry and discourse among faculty, staff, students, parents, and community.” At a later regional meeting, the principal from this district voluntarily shared how rewarding the process had been for their school community and how reflective questions and feedback, received from the K20 staff on their action plan, had caused them to refine their school improvement strategies. As a result, they continued their participation in the K20 Center network.

During the leadership phase of the systemic reform model, administrators review examples in practice of leadership theories and analyze school reform implementation strategies. They discuss challenges and successes as they progress through their own learning in small groups and teams. Because the readiness and experiences of leaders varied, their learning was supported by K20 Center facilitators, who provided technical assistance with technology and school change processes, resources, and connections. By the end of the year, the leaders reported that the networking, support, and resources were more valuable to them than the laptop they had received. They further reported significant increases in their implementation of the IDEALS, technology integration, and shared leadership (Cate & O’Hair, 2007).

Fostering Whole School Change

After completing the OK-ACTS Phase I Leadership program, school administrators became eligible to apply for a competitive grant, known as Phase II. The K20 reform model focused on sustaining leadership development by assisting administrators in building the capacity of their school community to implement the systemic change framework. One of OK-ACTS Phase I funding partners, Oklahoma Educational Technology Trust, provided a long-term commitment to enhance student learning through technology. Through a partnership between Oklahoma Educational Technology Trust and the K20 Center, the competitive Grants-to-Schools project assisted OK-ACTS Phase I leaders in developing PLCs and integrating technology into teaching and learning in their schools. Awards for grant recipients included $40,000 to $50,000 in technology equipment, $4,000 for staff release time, and year-long professional development provided by the K20 Center.
Grant Writing Promotes School Change

The grant application process required school leaders to extend their experiences from Phase I by working with teachers, parents, and community members to collaboratively develop a plan for implementing three of the 10 practices of high achieving schools (O’Hair et al., 2000) and integrating technology to enhance student learning. Because of the importance of a common vision, schools were required to address the practice of shared vision. Applicants chose two additional practices, based on a technology survey and their school’s needs. In addition to the narrative, the grant required a description of requested technology and how technology would facilitate the grant goals, action plans for selected practices, identification of the learning team, and evidence of faculty, community, and district support. The grant applications were subjected to a multi-faceted review process that utilized the STARSS-LS (Cate, 2002) rubric as the scoring criteria, in addition to adequacy and appropriateness of the technology, rationale of the grant narrative, and potential for impacting student learning. The results of these reviews were employed to select the grant recipients and to provide feedback for non-recipients.

Creating Technology-Enriched Learning Communities

The collaboration between the K20 staff and the school faculties began with an initial meeting to plan professional development for implementing each school’s grant goals. The purpose of the professional development was to enhance student achievement by creating technology-enriched learning communities, where technology was used as an effective tool that is tightly linked to content standards and seamlessly integrated into ongoing classroom instruction. Faculty at each school received over 40 hr of professional development in regular monthly sessions, which administrators were expected to attend and support. This job-embedded professional development utilized an on-going, constructivist design that targeted grant goals and the school’s selected practices.

The K20 staff facilitated sessions through which the knowledge, skills, and dispositions of teachers and administrators were developed and through which the learning community was strengthened and coordinated with the whole school focus (King & Newmann, 2000). During the sessions, the professional development process modeled the use of technology for authentic teaching and learning, rather than focusing solely on the technology. The content of the sessions combined best pedagogical practices with specific technology competencies, such as word processing, use of database programs, spreadsheet programs, interactive whiteboards, presentation stations, and in some cases, basic computer use. Teachers were supported in developing authentic lessons that would integrate technology into student learning experiences that engage critical thinking skills and have relevance beyond the classroom. The K20 Staff also provided technical assistance, such as assembling equipment or dealing with network issues. The content and format of the professional development sessions are included in Table 1.

Network Learning

Professional development sessions occurred mostly at the school sites. This was supplemented by networking activities with other grant schools, which extended the school–university partnership. Networking opportunities involved quarterly meetings; site visits; focus groups; and continued communication with teachers via e-mail, videoconferences, and telephone conversations. The K20 Center’s Annual Winter Institute of High Achieving Schools also afforded opportunities for administrators, teachers, and business and community members to attend sessions that featured examples of classroom applications of technology or strategies for promoting PLCs.

During the fourth quarterly meeting, learning teams from all grant schools shared successes and implementation of grant goals. School teams assessed their goals by analyzing data and reflected on their progress. Because transforming a
Table 1
Whole School Change Professional Development

<table>
<thead>
<tr>
<th>Month</th>
<th>Professional Development Focus</th>
<th>Proposed Time</th>
<th>Session lengths vary including:</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td>Professional development sessions include:</td>
<td></td>
<td>• full day</td>
</tr>
<tr>
<td></td>
<td>• IDEALS Overview/PLC (Hord, 1997; O’Hair, McLaughlin, &amp; Reitzug, 2000)</td>
<td></td>
<td>• 1/2 day</td>
</tr>
<tr>
<td>September</td>
<td>• Vision of Core Learning Principles (Glickman, 1993)</td>
<td></td>
<td>• two-hour blocks</td>
</tr>
<tr>
<td>October</td>
<td>• Authenticity (Adams et al., 2000; Newmann &amp; Wehlage, 1995)</td>
<td></td>
<td>• planning periods</td>
</tr>
<tr>
<td>November</td>
<td>• Problem solving and inquiry</td>
<td></td>
<td>• after school sessions</td>
</tr>
<tr>
<td></td>
<td>• Cooperative processing</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>• Planning for technology integration</td>
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<td></td>
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<tr>
<td></td>
<td>• Learning team development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>Based on decisions from planning, professional development sessions include:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>• Equipment use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>• Lesson development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>• Integration of technology into instructional strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>• Technology specific training</td>
<td></td>
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<tr>
<td></td>
<td>• Data-driven decision making</td>
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<tr>
<td></td>
<td>• Examining student work</td>
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<td></td>
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<tr>
<td></td>
<td>• Curriculum development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>Celebration, Sharing, and Planning for Sustainability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. ©2003 K20 Center.

School culture is a highly complex, multivariate process (Cate et al., 2006) that takes from 3 to 5 years (Fullan, 1991), the school teams discussed plans to sustain and deepen their development as a technology-enriched learning community. Following the initial grant year, the K20 staff continued to assist the schools in their reform efforts through professional development and additional networking opportunities.

Changing Schools and School Districts

Before becoming involved in the K20 Center’s systemic reform program, many of the schools were characterized by traditional school structures and top-down leadership that harbored isolation and stagnant teaching practices, negatively impacting learning and school change (Darling-Hammond, 1997; Schmoker, 2006). Through the job-embedded professional development focused on building leadership capacity and ongoing reflection, continuous support, and networking, the faculties became involved in shared practices for systemic school improvement and change. As teachers began participating in discourse about student needs and collaborating about technology integration, they redefined their personal vision for learning and professional growth. In each of the 97 participating schools, a wide range of technology expertise existed. One teacher emphasized that it would not be permissible for a teacher to be unfamiliar with his or her content, but “since technology is a newer generation tool, it gives us an opportunity to not know everything and encourages us to become learners with the students.” The learning team and students supported and instructed other teachers, and professional development provided opportunities for teachers and students to learn together.

This continued practice of learning together during the technology integration process pro-
duced a generative model between learning and leadership that increased the schools’ capacity for change (Hord, 1997; Huffman & Hipp, 2003; Newmann, King, & Young, 2000; Sergiovanni, 1994). As teachers were brought together for the common purpose of technology integration, they collectively learned and collaborated, sharing best practices for increased student achievement. The collaborative culture provided opportunities to develop new solutions and created contexts that generated new knowledge and conditions where people were continually learning how to learn together (Senge, 1990). Through these experiences, leadership capacity and shared decision making were elevated. Increased levels of trust promoted risk-taking, honest communication, and commitment for the shared vision. In the schools, faculty's learning influenced their leadership and, reciprocally, their leadership influenced learning (Atkinson, 2005; Cate et al., 2006; Williams, 2006). As this model for generative learning was expanded to the classroom, teaching practices improved and student learning, not teaching, became the central focus. While teachers became more confident in using technology, students were excited about having increased access and authentic, technological experiences.

Teachers reported that technology increased overall student engagement. One teacher commented, “The extra layer of interactivity that technology brings as an instructional tool changes the way the students perceive information forever.” Several teachers emphasized that technology and collaboration involved the students in their own learning process, which motivated them. In technology-integration activities, students were active participants, rather than passive recipients of information. One teacher shared her belief that “the technology is helping the students transfer their knowledge among the content areas and helping them make connections.” The collaboration and technology integration improved students’ standardized test results, class performance, discipline, attendance, and dropout rates. Pre- and postsurvey data demonstrated that students received greater technology access, and were more motivated, engaged, and involved in their own learning (Williams et al., 2007).

Building on Success

Both leadership and whole school change programs demonstrated success. The Bill and Melinda Gates Foundation evaluation report ranked the leadership program as third in the nation for systemic, substantive change that impacts student learning (National Staff Development Council, 2004) and the whole school change program showed significant increases in PLC indicators such as shared vision, collective learning, and peer observations (Southwest Educational Development Laboratory, 2004). One measure of a school’s progress toward its educational goals is the State of Oklahoma’s accountability measure, Academic Performance Index, a formula for determining Adequate Yearly Progress as required by No Child Left Behind Act of 2001 (U.S. Department of Education, 2001). The Academic Performance Index index formula varies by school level, but includes student achievement data (80–90%), attendance (10%), and other factors, such as graduation rate and dropout rate. For
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the past 4 years, K20 partner schools have a 74% greater increase in the Academic Performance Index than the state’s average increase (Education Oversight Board, 2005).

Mutually Supportive Relationships

Supporting previous research that technology integration contributed to the development of a PLC, K20 Center studies (Atkinson, 2005; Cate et al., 2006; Williams, 2006) have provided evidence that learning community development and technology integration are mutually influential, reciprocal, and supportive. The K20 Center systemic reform model has demonstrated that, by building technology-enriched learning communities, administrators, teachers, and, perhaps most important, students flourish. A shared need of the teachers to learn about technology integration, coupled with the support through the university–school network, contributed to the development of PLCs and the transformation of the schools’ cultures into a more collaborative and technology-based system. Technology made collaboration simpler and faster with the use of e-mail, video conferencing, and Web sites; and as collaboration and communication spread, more teachers became interested in using technology. This finding supported the National Research Council (2002) report that emphasized that these strategies assisted in overcoming teachers’ sense of isolation. The significant relationships between learning community development and technology integration supported and motivated teachers to become focused on continuous growth and systemic change for substantive school improvement, indicative of a learning organization (Senge, 1990).

Impact of the K20 School–University Network

Through the K20 Center’s school–university partnership, a state-wide network has developed to improve opportunities for school leaders, teachers, students, and communities in Oklahoma. Almost 1,200 superintendents and principals have participated in this leadership project since 2001. The Phase II grant project, from 2002 through 2007, has impacted over 2,600 teachers and 40,000 students in 97 schools or districts across Oklahoma. Both projects have continued funding until 2012. Many leaders and schools initially participated in the projects to receive the technology. The technology provided the vehicle to reexamine and collaborate about a school’s vision of teaching and learning. However, participants indicated that, as valuable as the technology was, they most valued the development of the learning community and the shared learning and relationships built among the network schools.

Note

1. This research was supported by the Bill and Melinda Gates Foundation and the Oklahoma Educational Technology Trust. The Trust equips Oklahoma common school students with the technology and technological skills necessary to compete in the global marketplace. The Trust provides funds for computer and telecommunications equipment, infrastructure, leadership, and professional development to implement and advance integration of technology into classroom instruction. AT&T Oklahoma provided $30 million in initial funding for the Trust in 2001. The Oklahoma Educational Technology Trust has funded over $1.6 million to provide laptop computers and professional development for Oklahoma school superintendents and administrators participating in Phase I leadership training provided by Oklahoma Achievement through Collaboration and Technology Support. Oklahoma Educational Technology Trust’s 10-year (2002–2012), $13.5 million Phase II grant initiative provides individual school site and/or district competitive grants. Oklahoma Educational Technology Trust is administered by Communities Foundation of Oklahoma and the Oklahoma Achievement. Opinions reflect those of the authors and do not necessarily reflect those of the granting agencies.
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