Editorial: Technology Leadership for the Teacher Education Initiative

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Abstract

Teacher education leaders must attend to leadership practices that set direction, develop people, and redesign their programs of teacher education in order to develop technology, pedagogy, and technology knowledge and skills in preservice teachers. A planning framework to be used at the 2012 National Technology Leadership Summit is presented here. It highlights focus group results from deans and other college of education leaders as to the context-specific products and processes they would need to create at the local level.

Editorials in the two previous issues of this journal (Bull et al., 2012; Dilworth et al., 2012) dealt with the foundation and implementation of the Teacher Education Initiative (TEI), which is focused on developing an innovative professional development opportunity for teacher educators to enhance the "preparation of future teachers to use technology in effective ways to teach students" (Bull et al., 2012, p.1).

While technology can support changes in how teacher educators teach and future teachers learn to teach (Dilworth et al., 2012), teaching with technology is a "wicked problem" in that it has "incomplete, contradictory, and changing requirements" (Koehler & Mishra, 2008, p.10). New ways of confronting this complexity must address core knowledge base components that include content, pedagogy, and technology.

These components have been used as the foundation for a technology, pedagogy, and content knowledge (TPACK) framework (earlier referred to as technological pedagogical content knowledge, or TPCK; see Koehler & Mishra, 2008; Mishra & Koehler, 2006; Pierson, 1999). A solid understanding of the interactions of these components can produce effective teaching with technology, even as they play out differently within diverse settings. To ensure this result, however, the critical role of leadership in making such changes must be considered.

In order to facilitate a systematic, coordinated approach within each college or university participating in the TEI, the National Technology Leadership Coalition (NTLC; http://ntlcoalition.org) and the American Association of Colleges for Teacher Education's Innovation and Technology Committee are collaborating with Microsoft's Partners in Learning Higher Education to develop materials for the leaders of schools, colleges, and departments of education to guide the process of embedding TPACK into their teacher education programs.

Incorporating and modeling TPACK within a teacher education curriculum will likely require an ongoing change process in most institutions. To ensure the success of this endeavor, technology leaders—including deans, department heads, technology support personnel, and faculty already skilled in using technology—must be an integral part of the process.

Key Leadership Functions

At a recent TEI event at the University of North Carolina, a 12-person focus group comprised of deans and key leadership staff from multiple institutions provided input about the resources they needed to integrate the TPACK construct successfully into their teacher preparation programs. The focus group discussion was organized around a framework of three key leadership functions associated with improved student outcomes (Day, Sammons, Leithwood, Kington, 2008; Leithwood, Harris & Hopkins, 2008; Leithwood & Jantzi, 2008; Leithwood & Riehl, 2003). See the appendix for an expanded description of each function.

1. Leaders must articulate a vision and create shared meanings about it, as well as identify the performance expectations for moving in that direction. They must also determine what data to collect and monitor in order to help them track the school's performance and progress towards that vision.
2. Leaders must develop members' capacity to move in the set direction by providing individualized support and opportunities to learn, as well as modeling.
3. Leaders must support members' movement in the desired direction by providing appropriate conditions and incentives, rather than barriers and inhibitors to progress.

The focus-group members outlined a number of resource needs, tools, and knowledge necessary for full-scale redesign of their programs, categorized by key leadership function. This input was used to sketch the contents of a TEI Leadership module that could support teacher education and technology leaders to systemically and systematically embed TPACK in teacher education programs. Finally, activities were identified for next steps at the national level that will support the production of the TEI Leadership module. These will be discussed and refined at the 2012 National Technology Leadership Summit in October.

1. Establish a Vision to Set Direction

School of education leaders must establish a vision that sets a direction for embedding TPACK into their teacher education programs. Because a vision is unlikely to inspire if communicated in top-down fashion, all stakeholders need to be engaged in setting goals that are personally compelling and achievable, even if challenging. The teacher education faculty are likely best positioned to relate how the knowledge and skills inherent in TPACK will best fit in the courses and field experiences of their program, as well as to identify the knowledge and skills they, themselves, require to create these learning experiences for their students. Thus, setting expectations for performance and monitoring progress is required on two levels to understand both how the preservice teachers and the teacher education faculty are making progress toward the goals. In Table 2 the third column highlights these sorts of college-level, context-specific products or processes. The first two columns identify the bases for such work and ways the TEI initiative might scaffold work at the college level.

Table 1
Setting Institutional Direction for TPACK

National Level Supports Needed	TEI Resources Needed	College-Level, Context-Specific Products and Processes Needed
Research-based rationale for TPACK.	Journal articles and other resources, such as cases and websites.	Strategy to share rationale and develop shared goals with their faculty for teacher candidates' TPACK development.
Identify concurrence between common core standards and TPACK. Identify for each content area and licensure program the key technologies that research shows best serves it in terms of the core aims of the disciplines and where technology is within it, as well as how technology is shaping the future of the discipline. Develop a process to incorporate emerging and future technologies.	Outline a research-based progression of learning experiences to develop TPACK in preservice teachers. Illustrate with lesson plans and a discussion of how these key technologies support standards and add value to teaching and learning. Create processes for mapping developmental progression of TPACK based learning across the preservice curriculum.	Establish program-level coherence necessary to create TPACK, specifically relating learning experiences with technologies in arts and sciences, methods and technology courses, and field experiences. Determine two-way means of communication tools and routines for implementation.
Identify technology-related materials within accreditation requirements to aid colleges of education within a state to coordinate state-level and accreditation requirements.	Illustrate application of validated measures of TPACK for beginning, developing, and proficient levels with videos and scoring criteria and rationale.	Set performance expectations for preservice teachers. Set performance expectations for faculty members.

Map TPACK and TEI to a variety of standards, including CAEP and its Specialized Professional Association standards, INTASC standards, Common Core standards, and the edTPA. Identify validated measures of TPACK and their relative advantages and limitations.	Illustrate review of student work to determine how it might illustrate preservice teachers' TPACK development.	Monitor performance of faculty and preservice teachers with established measures so as to determine readiness as well as progress made towards goals and accreditation needs.
Note. CAEP = Council for the Accreditation of Teacher Education. INTASC = Interstate Teacher Assessment and Support Consortium. edTPA was formerly the Teacher Performance Assessment.		

2. Develop Faculty Members to Accomplish Vision

Whereas the vision identifies the preservice teacher TPACK outcomes to be developed through program experiences, teacher education leaders must also plan for how to develop faculty members' capacities and preparedness to revise and deliver that program. Faculty members will likely vary in their levels of prerequisite knowledge and, as implied by the content-specific nature of TPACK, the sorts of technologies and technology-supported teaching they will embed into their courses will vary as well.

Because learning requires active construction of knowledge and faculty members typically have responsibility for knowledge production, teacher education leaders can consider how data collection and analysis and the subsequent production of findings about the work underway is incentivized by tenure and promotion requirements. The third column of Table 2 highlights the faculty development products and processes to be developed in the local context of the college, whereas the first two columns identify the bases for such work and how the TEI initiative might support it.

3. Redesign the Organization to Support Members' Work Toward the Vision

Teacher education leaders may need to redesign the organization so it enables and supports both the preservice teachers' and the faculty members' work necessary to achieve the vision. This assumes that the role of the college's culture and structure is to promote student and faculty success and that structuring the college as a learning organization and establishing professional learning communities could be a means for developing the shared norms and values as well as the skills and knowledge needed to include TPACK in programs.

Redesigning organizational supports also provides a chance to consider how better to align program elements with the arts and sciences as well as the K-12 schools where preservice teachers complete their field placements. See Table 3 for suggestions of the specific types of products and processes necessary at the college level, as well as TEI supports.

Table 2
Developing Faculty Members' TPACK Understanding

National Level Supports Needed	TEI Resources Needed	College-Level, Context-Specific Products and Processes Needed
Outline a research-based progression of learning experiences that develop TPACK in faculty members. Identify measures and reflection tools to identify faculty proficiency with technology, their own TPACK levels, and their ability to teach for TPACK Identify successful strategies for faculty development at the school, college and department level.	Illustrate how to differentiate learning experiences depending upon faculty technology comfort and expertise Provide models and scaffolds for short and long term planning to support backwards mapping the cultural, technological, curricular, and support level challenges, opportunities, and instructional strategies inherent in the faculty development process	Apply TEI materials within local context of content-area specific resources and expectations to create faculty development that produces TPACK. Relate learning efforts needed by individual faculty to their institution's annual reviews and tenure and promotion requirements.
Identify how NTLC member organizations can support professional learning communities.	Create online-facilitated learning and mentoring opportunities to connect faculty members who have a need to learn with appropriate sources of expertise within NTLC member organizations. Identify exemplary K-12 schools or teachers in each content area to help faculty stay abreast of what is going on in the classroom with technology integration.	Develop TPACK professional learning communities on campuses Gauge the depth and strength of the professional learning communities developing among faculty in support of TPACK.

Table 3
Redesigning the Education School's Support Environment For TPACK

National Level Supports Needed	TEI Resources Needed	College-Level, Context-Specific Products and Processes Needed
Identify successful practices to use with NTLC member organizations. AACTE's state affiliates can create affinity groups among institutions that face the same challenges in bringing TPACK to fruition. Identify technology-based tools for collaboration and coordination among schools and colleges.	Outline campus-wide responsibilities for ongoing integration of TPACK initiatives. Create a collaborative learning environment with resource banks of materials teacher educators can use at their sites and a venue for the sharing of conversations around the change process.	Tie planning for TPACK to strategic planning and relate it to goals at the individual, program-wide, college, and university levels. Work across any existing silos between the school of education and the arts and sciences.
Identify research-based recommendations for technical and instructional support levels and configurations	Provide data collection tools for use at sites to determine strength and depth of technical and instructional support.	Survey faculty as to their support needs and modify technical and instructional support structures accordingly.
Outline research-based responsibilities and standards for leadership practices and how they may be distributed among various roles such as deans, department chairs, and technology support staff	Provide case scenarios showing various configurations of leadership using different tools, routines and structures in their leadership practices.	Engage faculty and education school leaders in determining clear and coordinated roles and responsibilities.
Use AACTE's state affiliates to advocate and support TPACK based initiatives and policies. Develop AACTE national conference themes targeted at TPACK research and implementation activities.	Establish and use channels of communication to disseminate key state and national information.	Engage collaborators in the AACTE affiliate and regional chapters. Petition state-level leaders and/or accreditation agencies to consider how suspending requirements might foster innovation and engagement around the TPACK concept.

Conclusion

Ultimately, the TEI materials for leaders will be created with an eye to flexible and wide-ranging application across a variety of programs that can be built upon in a collaborative community of implementers, ultimately resulting in a best-practices resource. The resources could be colocated on the TEI site and on the AACTE web portal, inviting new

additions across postsecondary institutions of all types. It is anticipated that the first leadership TEI workshop will be part of AACTE's 2013 conference.

Although the TEI project will aggregate and disseminate models, assessment tools, and resources to support innovation in the teacher preparation and faculty development processes at the institutional level, bringing about change in an organization is sociocultural as well as technical work. The leadership focus group also advocated for greater dialog among college leaders. Future planning for the TEI should include methods for collaboration between programs. They can then more effectively foster the development of the new understandings needed to solve this wicked problem regionally and nationally to foster the emergence of professional learning communities online and at key national conferences and regional meetings.

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Appendix
Three Core Sets of Leadership Practices[a]

Setting Direction	Developing People	Developing the Organization
• Identify and Articulate a Vision: Put forth efforts to establish visions that embody best thinking about teaching and learning and inspire ambitious goals. • Create Shared Meaning: Foster clear whole-group development, understanding and acceptance of goals to promote unified actions. • Define High Performance Expectations: Help faculty members to think analytically and critically about where the school is and where it seeks to be, and then arouse a sense of determination to close that gap. • Monitor Performance: Establish via inquiry and reflection, critical and constructive questioning multiple indicators of progress and determine how followers will be held accountable through assessment. • Communicate: Facilitate two-way interchanges with stakeholders using intentional strategies.	• Provide Individual Support and Consideration: Acknowledge the stresses inherent in school change and support faculty through the process, recognizing how individual perception of change affects the overall well-being of the organization. Recognize that meeting the needs of the individual faculty, such as through supporting, mentoring, recognizing, and rewarding, is a way to increase human capital in the overall organization. • Facilitate and Develop Intellectual Stimulation: Enable faculty to gain mastery over desired outcomes through professional development. Facilitate or encourage faculty to examine assumptions (through reflection, analysis of data and other resources of information) about work and reconsider how to best perform. • Model Desired Behavior: Pay attention to leading by example, often marked by intentionally displaying behavior that is aligned with the school's values and goals.	• Strengthening School Culture: Foster culture to include shared norms or values, or mutual trust internal to the school organization. Celebrating successes and accomplishments. • Modify Organizational Structure: Further organizational vision by modifying organizational structures such as recruiting and selecting, appraising performance, or allocating budget. Buffer faculty from excessive and distracting demands on their attention. • Build Collaborative Processes: Utilize processes to gather input from multiple and diverse stakeholders within the organization. Foster collaborative decision-making with broad participation. • Facilitate Community Building: Utilize processes to build relationships and network with the community external to the organization.

[a]Adapted from Day, Sammons, Leithwood, & Kington, 2008; Leithwood, Harris & Hopkins, 2008; Leithwood & Jantzi, 2008; Leithwood & Riehl, 2003.