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Evidence-based Technology Enhanced Alternative Curriculum in Higher Education

Arthur Recesso
Michael Hannafin
Feng Wang
Peter Rich
Craig Shepherd
Learning & Performance Support Laboratory
University of Georgia

National, State and Local Context

Current research underscores the importance of technology in teacher preparation programs (Handler 1993; Hill & Somers 2000; Wilson, 1996; Nicaise & Barnes 1996; Northrup & Little 1996). More than 300,000 computers per year are added to our schools, but preservice training programs have failed to adequately prepare future teachers, other than offering a course or series of courses to learn technology skills (Beaver 1990; Brook 1989; Roblyer 1994). In order for future teachers to truly the engage the learner and improve student achievement, technology must be infused throughout the continuum of teacher preparation.

Teacher preparation program have been characterized as the "weakest link" in infusing technology into the repertoire of future teachers (Means, 2000). The importance of computer-related pre-service teacher competencies has been detailed by several national organizations and research ers (Becker, 2000; CEC, 2001; Hasselbring et al., 2000; ISTE, 2001; Lahm & Nickels, 1999; Means; 2000; Roblyer, 1994; Widmer & Amberger, 1994). We seek changes in teacher preparation programs that better enable application to classroom teaching practices (Becker, 2000; Bielefeldt, 2001; Dede, 2000; Hasselbring, et al., 2000; Means, 2000).

Pre-service teachers need to experience integrating technology with authentic purpose, method, or meaning if they are to become effective users of technology in their classrooms (Means, 2000; Wild, 1996). The effective use of technology requires practical knowledge for classroom application as well as opportunities to apply such knowledge (Anderson & Becker, 2001; CEO Forum, 1999; OTA, 1995). According to Gabriel and MacDonald (1996), a pre-service teacher's decision to utilize technology to support teaching and learning is dependent upon their experience with technology: Opportunities to observe and use technology in pre-service programs increases the likelihood that technology will be used in classroom. Pre-service educators need to both model effective technology use and engage pre-service teachers in meaningful technology-based activities (Becker, 2000; Hasselbring, et al., 2000).

Unfortunately, most classroom technology uses have focused on low-level activities—both nationally (Moersch, 2001) and in State of Georgia (K-12 Technology Plan, June 2003). As evidence, the Levels of Technology Integration (LoTi) Framework is used to classify technology uses based on the integral nature of the activity and the extent to which students are challenged intellectually through the activities: 0 (Non-use), 1 (Awareness), 2 (Exploration), 3 Infusion, 4A (Mechanical Integration), 4B (Routine Integration, 5 (Expansion), and 6 (Refinement). According to recent studies, 71% of teachers nationally report LoTI teaching activities consistent with low-level uses (0-2), reflecting peripheral or supplementary instructional activities rather than a central strategy to improved student learning (XXX). According to NCREL's Range of Use chart, fewer than 10% of current teachers use technology centrally to promote higher-order thinking or provide authentic learning experiences (Level 4B or higher) (enGauge, 2000).Clearly, while we have made progress in preparing teachers to use technology, much of the activity is unlikely to impact students in meaningful ways. Recognizing this deficit, attention in Georgia and elsewhere has shifted toward promoting more meaningful uses of technology by both teachers and students—those from which greater payoffs in terms of student impact have been reported (K-12 Technology Plan, June 2003). Consistent with national trends, Georgia patterns for technology use tend to be low-level across both grade levels and teaching fields. Level 3 or higher LoTI uses—those most desired by the professional standards among teaching fields as well as Georgia's Department of

Education—range from 25-35% of teachers from elementary through high school teaching, and 26-30% in the core content teaching fields (Statewide Study of Instructional Technology Use, 2002). This falls far short of the goals specified in Georgia's latest Technology Plan, which target 80% of uses at or above Level 3, 40% at or above Level 4A, and 20% at or above Level 4B by 2006.

How do we prepare future educators for this formidable challenge? New teachers cannot enter the profession with "old" skills and perspectives, but must these and sample the creative and integral uses of technology valued and expected in a state committed to its students future. We cannot afford to leave behind either teachers or children. The University of Georgia (UGA) stands committed to an innovative, pervasive and systemic approach to technology in preservice teacher education—one that features evidence-based approaches in decision-making and assessment, addresses core educational experiences in both general education and teacher preparation, links these approaches to both state and national professional standards of certifying and standard-setting professional organizations, and optimizes the value of in-place reform effort to weave technology into the fabric of our program. **E-TEACH (Evidence-based Technology Enhanced Alternative Curriculum in Higher Education**) will: 1) assist with the redesign of classes in both University of Georgia College of Education and College of Arts and Sciences to integrate technology in core curriculum classes; 2) provide faculty development opportunities to support modeling and using technology appropriately; 3) help pre-service teachers learn to use student performance data to make informed decisions about technology; and 4) provide an integrated online system to support about all aspects of teaching and learning.

Project Thrusts

For purposes of this project, evidence-based practices involve the systematic and purposeful use of performance data in differentiated decision-making, such as using LoTi profile progress of teacher educators to determine professional development, integration, and support needs, using pre-to-post indicators of the same profiles as evidence of the effectiveness of the support provided, and using state or local tests to establish evidence of learning needs and the effects of programmatic interventions to improve student learning.

Each of the following four thrusts is framed within evidence-based decision making; the thrusts are interdependent and converge on student learning, defining a focal point of impact reflected in the project goals, activities, and evaluation plan.

- ***Curriculum refinement***. Faculty will revise core, content, and pedagogical courses while students and faculty use technology for teaching, learning, and improving practice. Adapting curricula with technology-based tools can enhance student performance when used with our knowledge about learning (Roberts & Barclay, 1998; NRC, 2002).
- ***Faculty development***. Faculty and preservice teachers will learn, then model, technology practices that engage students in learning, especially those typically challenging to students. To promote technology knowledge and skill transfer, faculty need to model effective use (Becker, 2000; Bielefeldt, 2001; Hasselbring, et al., 2000; Means, 2000).
- ***Technology integration***. Course activities will engage preservice teachers in the use of student performance data to make informed decisions related to the integration of technology. Learners develop a deeper understanding when they build and manipulate models in contexts that approximate the "real-world" (White & Frederiksen, 1998). For example, visualization and analytical tools used in math and science profoundly change the role of teachers and how students learn in the classroom (NRC, 2002, p.215).
- ***Ongoing support***. Faculty will utilize a continuous support system keyed to content, methods, and clinical experiences; preservice teachers will use this system throughout initial preparation and continue to access during field experiences and beyond.