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ABSTRACT

This document contains the papers on faculty development from the SITE (Society for Information Technology & Teacher Education) 2002 conference. Topics covered include: integration for ESL (English as a Second Language) success; changing roles of college faculty; inducing reflection on educational practice; a joint instructional technology and library needs assessment program; making technology meaningful to faculty; bringing peer review to World Wide Web-based educational resources; preparing tomorrow's teachers using technology; effectively integrating technology into the curriculum through faculty development; empowering higher education faculty to use technology; faculty development for moving from classrooms to learning spaces; faculty of education staff development; engaging teachers in building curriculum webs; faculty development using a problem-based learning methodology; operationalizing a technology standard with proficiency skill sets; expanding teachers' literacy in science and mathematics; using video ethnographics for professional development of educators; changing the role of the teacher; weekly instructional technology teacher training; motivational processes in the integration of technology into teacher education; surviving Web-based professional development; the University of San Diego (California) Web group; technology and careers; evolving with technology in the preparation of teachers; a guide to publishing in technology journals; a student-faculty mentoring initiative; a model for faculty development and online course design; a collaborative faculty technology development initiative; coaching faculty for technology integration; grant writing information and the Internet; implementing and sustaining a successful faculty development initiative in a college of education; two staff development programs; evidence for campus transformation through instructional technology faculty development; integrating technology into adjunct faculty curriculum; a center-based approach to assessing the integration of technology within a context of change; higher education and technology integration into the learning environment; providing faculty development on instructional technology at multiple campuses; familiarizing teachers with multimedia cases; improving technology-based presentation skills; and evolution of faculty Web page and video skills. Several brief

summaries of conference presentations are also included. Most papers contain references. (MES)

Faculty Development
(SITE 2002 Section)

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FACULTY DEVELOPMENT

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Providing continual and detailed faculty development for all teachers is now absolutely vital as every teacher's role has shifted to meet the demands of a rapidly changing society. A growing commitment in some PK-12 school districts and institutions of higher learning is creating a stronger need for effective faculty development.

American education must be transformed to meet the needs of an emerging information society as new communications technologies impact higher education. Attaining this goal requires that teachers meet professional standards. Today's society needs a workforce that can apply knowledge, reason analytically, and solve problems. Faculties must be trained to determine the most appropriate tools for design, support and delivery of courses. The challenge for continuing professional development and renewal to adapt to this changing environment has become critical. Faculty must use recently acquired knowledge and new skills to adapt existing courses to implement new technologies. The standards for teachers supporting these new skills have been developed by the professional organizations governing accreditation in each academic field (NCATE, 2001).

Both the International Society for Technology in Education (ISTE) and the National Council for the Accreditation of Teacher Education (NCATE) have specified the technology skills that teachers are expected to have when they enter the teaching field. These organizational standards provide the foundation for the professional development programs designed for higher education faculty. ISTE suggests that teachers be able to meet these standards: apply tools for enhancing their own professional use and productivity, use technology in communicating, collaborating, conducting research and solving problems, promote legal and ethical use of technology, use technology to support their instruction, and plan the delivery of instructional activities that integrate technology (ISTE, 1998).

The papers included in this section address various approaches available to meet the professional development challenge of these new standards. The papers represent the four areas of long papers, short papers, interactive sessions, and institutional sessions. The 26 long papers cover general informational clusters as diverse as pre-service and preK-12 initiatives in professional development, online and other distance education initiatives in staff development, campus models for faculty development, program implementation strategies and technologies, and case studies and research in faculty development. Specific topics range from "Technology Integration in Teacher Education: Changing the Way Learners Think About and Do Their Work" and "Integration for ESL Success: TESOL Standards, Multiple Intelligences and Technology" to "Tracking a Faculty Online Course Impact" and "Project Merlot: Bringing Peer Review to Web-based Educational Resources". Additional detailed papers cover a center-based approach to assessing the integration of technology within a context of change, perspectives of coaches and players in faculty technology development, and the use of a problem-based learning methodology for faculty development.

The 23 short papers cover topics on the changing roles of college faculty, using a questionnaire to induce reflection on educational practice, making technology meaningful to faculty, a peer mentoring program that empowers higher education faculty to use technology to enhance teaching and learning. Papers concerning Web-based instruction in undergraduate nursing education, a joint instructional technology and library needs assessment program, the transition period between technology and careers, and faculty adoption of technology are also presented.

Three interactive session papers are included. Michael Uttendorfer of New York Institute of Technology describes "Adding "FLASH" to your Faculty Development Program." David Deorgi of California State University at Bakersfield discusses "Operationalizing a Technology Standard with Proficiency Skill Sets" and faculty from the University of Alabama at Birmingham contribute "Technology Committee Function: Holly Jolly Technology Folly."

The two institutional session papers are entitled "Re-creating Curriculum Integrity through Professional Development in the Information Age" from the East Windsor Regional School District and "Evidence for Campus Transformation Through Instructional Technology Faculty Development" at Southeast Missouri State University.

This diverse collection of Faculty Development papers describes effective initiatives and innovative models that have been designed and conducted to improve the use and integration of technology at institutions of higher education and PreK-12 educational settings worldwide. Taken as a group, the methods and models provided will aid in the effective training of faculty and will address the critical need for continuing professional development and renewal to adapt to the rapidly changing technological environment.

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Faculty Development with Technology Integration: A qualitative analysis of faculty mentoring.

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Abstract

The Modeling Instruction With Modern Information and Communications Technologies (MIMIC) Project was funded through a U.S. Department of Education Preparing Tomorrow's Teachers to Use Technology (PT3) Implementation Grant. The MIMIC Project focused on faculty development in the integration of technology in pre-service teacher education. A classroom teacher as mentor / faculty member as mentee approach served as the model for faculty development. Data was collected from both technology mentors and faculty participants. This data included qualitative components including; implementation plans, monthly log data, and journals. Project evaluation activities were conducted to address both formative and summative evaluation questions that examined the validity and impact of the project. The evaluation was designed to provide performance feedback throughout the grant period, allowing the project staff to monitor progress towards the desired outcomes

A comprehensive sequence of qualitative evaluation activities were implemented to insure that the goals proposed by the Mimic Project were addressed satisfactorily. A monthly review form tracked project activities and verified if planned activities occurred as scheduled. Progress notes were recorded and used to modify planned activities. Mentors together with each faculty member prepared an implementation plan and maintained notes on support provided. This qualitative data was used to modify mentoring plans. Logs of technology activities implemented by participating faculty and supervising teacher provided qualitative data documenting technology use by the participants.

This paper examines the results of qualitative analysis of participant journals, implementation plans and monthly logs. Content analysis and data management analysis was implemented using NUDIST. Patterns indicated in the data analysis pointed to critical factors for increasing the level of faculty modeling of technology in pre-service teacher education.

Integration for ESL Success: TESOL Standards, Multiple Intelligences and Technology

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Abstract: English language learners need an education that builds upon their strengths and acknowledges their differences while developing their English language proficiency. They also need opportunities to develop information technology skills that will prepare them for the increasingly technological job market. The TESOL standards for Pre-K-12 ESL students make it possible for ELLs to achieve the standards for academic subjects while developing English language skills. Teachers incorporating MI theory for ELL instruction support the rich diversity of cultures and languages in the classroom, provide a framework that enhances teaching and help students develop all of their intelligences. The integration of technology, TESOL's standards, and Multiple Intelligences supports learning differences, promotes technological competency and develops English language skills across the curriculum. Preparing preservice teachers who can integrate technology, TESOL standards and the theory of Multiple Intelligences provides their future students with an equitable education.

Introduction

English language learners (ELLs) generally differ in native language, cultural heritage, social experiences, and prior learning from native English speakers. They need an education that builds upon their strengths and acknowledges their differences while developing their English language proficiency. In addition, they need opportunities to develop the information technology skills that will prepare them for the increasingly technological job market. By 2006, half of all jobs will be in information technology or will require information technology skills (Carvin, 2000). In order to provide English language learners with the opportunity for a viable economic future, we must prepare them to become technologically competent.

To cultivate teachers who can meet the needs of a variety of students, teacher educators must rethink and reassess preservice teacher education. Teacher education graduates should go into their classrooms with a repertoire of professional skills and instructional methods, an understanding of second language acquisition and cultural diversity, expertise in second language teaching methods, and competency in the effective integration of technology. Our graduates should be able to teach students who differ in cognitive strengths, cultural background and language proficiency. Preparing preservice teachers to integrate technology, TESOL standards and the theory of Multiple Intelligences (MI) provides their students with an equitable education that supports learning differences, promotes technological competency and develops English language skills across the curriculum.

Diversity in Schools

Within the United there are 176 languages spoken at home (Grimes, 2000). In addition, there are some 154 indigenous American languages (Estes, 1999). Between 1979 and 1995, the number of school age children who spoke a language other than English and who had difficulty speaking English rose from 1.3 million to 2.4

million (Federal Interagency Forum on Child and Family Statistics, 2000). While not all Hispanic children are limited English proficienct, they comprised three-quarters of all students in Limited English Procient programs (ERIC Clearinghouse on Urban Education, 2001).

Each cultural group has its own set of learning expectations and its own emphasis on what should be learned (Hopkins, 1998). Gardner asserts that learning characteristics are the consequences of cultural, motivational, and experiential factors that can be enhanced when teachers teach to students' strengths in the Multiple Intellligences (MI) (as cited in Ghosn, 1997).

Federal and state mandates require accommodation for the needs of English language learners (ELLs). Yet only 76.8 percent of limited English children in public and non-public schools were in programs designed to meet their educational needs (NCBE, 1998). The remaining 23.2 percent percent received little or no support for their English learning needs. Teachers who are not trained in second language teaching methodologies often find themselves with ELLs in their classrooms. But only 20 percent of classroom teachers report feeling well prepared to meet the needs of limited English proficienct students or those from diverse cultural backgrounds (National Center for Education Statistics, 1999).

Information Technology

By 2006, half of all jobs will be in information technology or will require information technology skills (Carvin, 2000). Education, as preparation for constructive citizenship, requires the preparation of technologically competent individuals who can locate, manipulate, and organize information to solve problems, create new knowledge and produce useful outcomes.

Children vary in their access to technology. For example, there is a 50 percent gap in computer ownership between households earning $14,000 or less and those earning from $50,000 or more (Nickell, 2001). Many ELLs are from homes where the income level is at or below the poverty line. Eighteen percent of Hispanic children use a computer at home as compared to 52 percent of White children (ERIC Clearinghouse on Urban Education, 2001). Similarly, the proportion of rural Native American households with access to computers is 26.8 percent, almost half that of the national average (Luening, 2000). Only 2 percent of children living in poor, rural households have Internet access (Children's Partnership, 2000). Children from the poorest households and living with adults with the least schooling are the least likely to have Internet access at home. Moreover, because eighty-seven percent of documents on the Web are in English (The Children's Partnership, 2000), the web is largely inaccessible to an estimated 32 million Americans who are non-English speakers (Children's Partnership, 2000).

For ELLs, schools are a primary location for accessing information technologies and for developing computer skills. However, schools with the largest concentration of children in poverty had a 9:1 ratio of students to computers as compared to the national school ratio of 5:1 (Cattagni & Westat, 2001). In high-income areas, 74 percent of classrooms have Internet access, in low income areas 39 percent of classrooms do (Carvin, 2000). Teachers in poor inner-city and rural schools have less technology training than those in wealthier schools (Kleiman, 2000). Thus, children in the poorest regions of our nation have the least access to computers and the Internet at school. Many of these children are ELLs.

Though there are few studies on ELL children using information technologies, the research suggests that the integration of technology can improve academic achievement, promote English and native language proficiency, augment positive self-concepts, enhance motivation, stimulate positive attitudes towards learning, and foster higher level thinking (Diaz, 1984; Knox & Anderson-Inman, 2001; Meskill, Mossop & Bates, 1998)

Information Technologies, Multiple Intelligences and TESOL Standards

Information technologies provide varied entry points to learning that match the learners cognitive strengths and intelligences, as well as language proficiency level. Technology combined with cooperative learning not only increases instructional effectiveness and efficiency, but also promotes positive social interactions (Johnson, Johnson, & Stanne, 1986; Schlechter, 1990). Cooperative learning at the computer enhances ELLs' communication skills (Steinberg, 1992), meets the needs of those with strong verbal/linguistic and interpersonal intelligences, and develops social and collaborative skills. Partner and small group work offers an authentic purpose for oral communication, as well as peer support for academic content and development of technological competencies. Multimedia, computers and the World Wide Web can address the

multiple intelligences through varied forms of input and output. For example, they relay text, music, video, photographs, and visual art. Voice recognition and digital sound recording allow for oral/aural input and output, while graphics provide ELLs with comprehensible input.

Teaching that incorporates MI theory helps support the rich diversity of cultures and languages in the classroom while providing a framework that enhances teaching and helps students develop all of their intelligences. Information technologies combined with MI theory enrich students' learning experiences and induce students to want to learn because the learning activities appeal to their personal intellectual strengths.

The Teachers of English to Speakers of Other Languages (TESOL) standards for Pre-K-12 ELLs "articulate the developmental English language needs of English language learners and highlight special instructional and assessment considerations that must be given" so that these children may "benefit from and achieve the high standards proposed for other subjects" (TESOL, 1997, p.2). The TESOL standards are guidelines that help teachers address the challenges accompanying the increasing numbers of English language learners.

Content and language instruction that incorporates technology and TESOL standards has multiple benefits for ELLs. The integration of TESOL standards with MI theory and information technologies provides a structured, intentional approach to the development of second language proficiency across the curriculum while enriching the learning experience. This integration ensures an equitable education by providing access to technology for authentic purposes to those students least likely to have that access outside their school. MI theory and technology afford numerous entry points into the academic content while the TESOL standards allow teachers to plan for students' English language growth in a variety of contexts and for a variety of purposes.

Activities	Description	Multiple Intelligences	TESOL Standards
Graph tally results of observed transportation (e.g., walking, cars, trucks, buses, bicycles)	In small groups students tally traffic passing their school at different times of day. Tallies are graphed using *The Graph Club*. Students compare the amount and type of traffic from different times of the day.	Verbal/linguistic Logical/mathematical Visual/spatial Interpersonal	G2, S2 Descriptor: Analyze, synthesize and infer from information Compare and contrast information Progress Indicators: Research information on academic topics Construct a chart/graph synthesizing information (TESOL, 1997, p. 87)
Gather weather data, take digital photographs, write and illustrate a report using *KidPix* and digital pictures.	For two weeks students observe cloud formations and gather data outdoors using thermometers, rain gages, and an anemometer,. They compare their findings to local weather on *Intellicast* (http://www.intellicast.com/). Key Pals compare weather and exchange photographs of local topography in their respective countries.	Verbal/linguistic Logical/mathematical Visual/spatial Bodily/kinesthetic Interpersonal Intrapersonal Naturalist	G1, S1 Descriptor: Share and request personal information Use non-verbal communication Progress Indicators: Correspond with Key Pals Volunteer information about self (TESOL, 1997, p. 71)

Figure 1: Sample activities integrating information technologies, MI theory and TESOL Standards

Figure 1 illustrates how learning activities can integrate technology, MI theory and the TESOL Standards across disciplines. These sample activities address content area knowledge, higher level thinking, and

problem solving, while building on students' intelligences and developing English language skills. Integrated activities such as these make learning meaningful, transferable and engaging because they complement students preferred ways of learning, develop weaker intelligences, and engage students in genuine communication. Technology in this approach becomes a viable means to attain information, reconstruct knowledge, and demonstrate learning. Technology thus serves as a means to an end, rather than as the end itself.

Teacher Education

Given the rich diversity in America's classrooms and the continuing inequitable access to technology, teacher education programs must prepare future teachers to meet the needs of their diverse students. Preservice teachers not only need to spend time in multicultural classroom settings, but they must demonstrate professional skills, instructional flexib ility and the ability to apply a variety of methodological approaches. Because future teachers will likely have ELLs in their classrooms, all preservice teachers should know and be able to use a number of second language teaching methods. Preservice teachers must not only be familiar with the TESOL standards, but be able to apply them in classroom instructional activities.

Graduates of our teacher education programs should translate theory into practice, including MI theory and language acquisition theory. This ability can be fostered by explicitly drawing attention to their own learning and to their instructor's modeling of effective instructional practices. Preservice teachers do not readily perceive how their instructors apply theory to teaching while they are immersed in the process of learning. To see the link between theory and practice being modeled by education faculty, preservice teachers must be observers, not just participants. Education faculty should help preservice teachers reflect on what they observe and see how teachers' instructional behaviors are linked to theory. For example, the instructor may ask the class which theories underlie the learning activity they have just participated in and which multliple intelligences were addressed during the class period. In short, the teacher educator must make explicit what is implicit in their own teaching and serve as models of good teaching.

Preservice teachers also need to know more than how to use a computer and run software applications. Such knowledge can be gained outside the College of Education. Computer knowledge and competency does not readily translate into effective integration of technology in the classroom. In order for preservice teachers to understand how technology becomes a part of effective instruction, they must see inservice teachers and education faculty using technology. They must discuss what they observe school teachers and university faculty doing with technology in the classroom, understand what are essential and what are nonessential uses of technology, and evaluate the educational value and appropriateness of software applications and Internet sites. They must learn how to use technology to meet educational objectives. And they must have opportunities to practice planning and using technology for instruction.

Similarly future teachers need to learn how to effectively connect technology with the diversity and multiplicity of intelligences. Teacher educators should model the integration of technology, TESOL standards and MI theory in their own teaching. In learning how to create lesson plans, preservice teachers can assess the quality of online teacher-created lessons in terms of appropriateness of technology integration, support for multiple intelligences, incorporation of TESOL and state standards, and provision for linguistically and culturally diverse learners. This assessment develops awareness of how lessons can be adapted or improved to meet the needs of diverse learners. Once preservice teachers understand how technology, TESOL standards and multiple intelligences can be integrated, they can begin to plan and implement such lessons.

Attaining the goal of graduating teachers who can teach to a diversity of learners, help ELLs expand their second language proficiency, and use technology in pedagogically sound and effective ways is not easy. It requires faculty and administrative commitment, faculty development, technological resources and conscientious planning. But ultimately, the integration of technology, TESOL standards and multiple intelligences is a win-win educational experience for preservice students and, in turn, for their future students.

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Vocation or Profession?
The Changing Roles of College Faculty

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The emergence of online course software such as BlackBoard, Prometheus, and Web-CT has made it relatively easy for faculty to add a web-based component to their traditional classroom courses and it has fostered the evolution of new pedagogical strategies and formats including web-enhanced, hybrid, and completely asynchronous instruction. As a result it is likely that faculty are investing significant time to develop materials and modify pedagogy so that it is appropriate for and compatible with these new instructional modalities. Therefore in important ways the demands on contemporary college faculty are changing and along with these changes have come new roles with very different expectations. This paper investigates the impact of these changes and explores faculty perceptions of how the work of the professoriate is evolving in an age of rapid technological change.

A colleague recently asked the following question, "Do you use *BlackBoard* or a blackboard'? A few years ago the question would have seemed absurd. No longer. Today instructional technologies such as *BlackBoard*, are fostering new and for some confusing opportunities to re-engineer their courses. For faculty in our own institution, the University of Wisconsin Colleges, the pace of technological innovation is breathtaking.

At the beginning of each year we are confronted with new options, new opportunities, and new reasons to feel overwhelmed. This year for instance our IT staff held short courses on everything from *Outlook* to *Acrobat* and from *BlackBoard* to *Win2K*. Pity the poor faculty member who is struggling just to stay on top of work in his own discipline. Now he must juggle .doc files, Ethernet cables, and the virtual "F" drive on the server. No wonder, among our peers, prescriptions for Prozac are skyrocketing.

Simply put, the job we took some twenty-five years ago and the job we have now display some superficial similarities, but in important ways they are very different. Yes, we still teach or try to teach that bunch of teens that seems to miss many of our jokes and fails to appreciate our sartorial brilliance. But today we compete with MTV, AOL Instant Messenger and cell phones that ring during our classes. It is tempting to ask, "is it for me"? Of course change is inevitable, but that doesn't make it desirable.

So what has happened in those twenty-five years? Well, the PDP-11 down the hall with those large 8" floppies has been replaced by the *iBook* on a desktop with *Wi-Fi*. The floppy is or should be nearly extinct, and the web, merely a twinkle in the eyes of Tim Berners-Lee back in the frontier days of the late '80s, has emerged and become pervasive, indeed inescapable.

Today, who or what does not have a www address? BB is thinking about getting one for his fox-terrier, www.zeke.org. Cable modems, and DSL have replaced those 56k guys which in turn have replaced modems that not that long ago operated at an incredible bandwidth of 28.8 k! Now our T1's sometimes bog down and seem slow! The alphabet soup of technology pervades the college quad; mp3s, XP, 10.1, urls, jpeg, gifs and we suppose, a few gaffs. Don't get it? Well, "you've got trouble, my friend, trouble right here in River City" as the *Music Man* once said. Trouble indeed. Just try to remember the Chinese symbol for misfortune can also mean opportunity.

Sometimes we feel like novice carpenters who have just picked up a shiny, new *Craftsman* toolkit at the local *Sears* store. Look at all those wrenches, ratchets, pliers and planes. Nice to have, for sure, but what the heck do we do with all this stuff?

The sociologist down the hall has a beautiful array of *PowerPoint* slides; the graphic artist in Southview loves *Photoshop*, and the PE fellow across the way does kinematic analysis on his laptop. And the math folks upstairs, they do mysterious things with *MathCAD*, *Maple*, and Macs. The English tutors pride themselves on their virtual writing lab. The philosopher among us has a club on-line and the psychologist will confess to using *BlackBoard* for

just a few things. What is the point? Simply this: information/instructional technology (IT) is seeping into our lives, changing what we do, and more importantly, how we do it. Are you college professors? Yes, but sometimes we wonder.

Steve Jobs, CEO of Apple Computer, once characterized the computer as a "bicycle for the mind." Like a physical bicycle, a computer can transport you anywhere you choose to go. Problem is, you have to have a destination before you can get there. So, where are we going and how will we know when we have arrived? The multiplicity and diversity of applications makes instructional technology tough to define. It is difficult to distill its essence, assess its influence, and quantify its impact.

We recently surveyed our faculty to learn about their experiences with and perceptions of information technology. One hundred fifteen surveys were completed representing twenty percent of the sample. We discovered that about seventy-five percent of our faculty use some form of IT and that their response to it has generally been favorable. Although faculty indicate that IT enhances their teaching, they also note that it takes additional time, that technical support has been lacking, and that it can be difficult to navigate. On the other hand, our faculty appear to value their increased accessibility, e-forums for discussion, and the ability to put materials on the web where students can get at them 24/7. And yet at the same time, they complain about the lack of institutional recognition combined with not so subtle pressure to use IT, persistent network glitches, the absence of adequate evaluation, and the emphasis on "WHAT we can do; instead of WHY we are doing it."

Computers and more importantly, the WAN and LAN infrastructure gives us easy access to distributed resources, wherever those resources may physically reside. Text, graphics, images, audio, and video files are just a mouse-click away. It is no longer an exaggeration to say that, "the world is at our fingertips." But another equally appropriate aphorism comes to mind, "the world is what we make it." Given immediate access to an exponentially expanding electronic universe, sometimes it is tough to discriminate a meaningful signal from what often appears little more than a sea of random noise. Sometimes it is tough to separate the wheat from the chaff.

Perhaps that is why we seem to struggle with technological stress. We wrestle with computer-driven constructivism, worry about courses as commodities, fear the art of teaching will be lost among the ruins of technology, and mourn the loss of physical presence. And yet, however dissatisfied, disaffected, disillusioned, and disheartened, we still come to class on Monday. We still cherish the possibilities of the classroom.

Just as some of our courses have assumed a hybrid character, combining face-to-face meetings with Internet-mediated time-out-of-class; arguably, our roles as teachers have also become an amalgam, requiring not only disciplinary expertise, but a not inconsequential level of technical skill as well. *BlackBoard* or blackboard; vocation or profession? Perhaps the answer is somewhat less important than the question. Teaching and learning remain quintessentially human endeavors. Yes, *XP* is cool, *Wi-Fi* (802.11b to the cognoscenti) really rocks, and the web can be a wonderland. Some things have changed but the most important things have not.

Whether we are thinking about adopting a textbook or constructing a web site; choosing a compelling software application or finding a new anthology, the task remains much the same. As teachers our job to identify the best resources whatever form they may take, discover the most effective ways to use them, and then continuously evaluate their impact. In this as in so many other endeavors, sound analytical skills and good old common sense make an unbeatable combination.

It is easy to be seduced by technology, and to be infatuated with the thrill of "connectivity." There is a certain undeniable sex appeal in a shiny new laptop, a colorful array of *PowerPoint* slides, a well-constructed web site emerging from the ether, and evidently, a cell phone that rings during class!

In the hands of an artisan the most primitive of tools can yield a masterpiece; after all, Shakespeare wrote with a quill. But even with a 1.2 GHz Pentium and a broadband connection, a monkey probably couldn't do very much of note. Just as tools don't make a carpenter, technology doesn't make a teacher. Carpenter or teacher, the tools can make a tough job a bit easier, but in the final analysis it isn't the tools that make a difference; it is what we do with them that counts.

Inducing Reflection on Educational Practice with a Questionnaire Tool

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Abstract: In order to encourage the acceptance of student course ratings by faculty and to provoke reflection, a questionnaire tool was developed that allows faculty to select questions that closely fit their personal subjective theories on education and their specific educational practice. As a first stimulus for reflection, frameworks are introduced that need to be used in the tool to describe educational practice and subjective theories. As a second stimulus for reflection, feedback on subjective theories and educational practice is given. The hypothesis was that the questionnaire tool hightens the commitment of faculty to the evaluations results and enlarges the impact of student course ratings on faculty's thinking.

Introduction

Student course ratings are often used to enhance professional development. One of the common problems in the use of student course ratings is a failure to tune the questionnaire to the educational practice and subjective theories of faculty. The proposed questionnaire tool is designed to be flexible and adaptive to the specific needs of the users.

Faculty accept results of evaluation better when they feel committed to the evaluation and when they have a perception of high usability of the evaluation instrument (Waeytens, Elen & Lowyck, 1999). To heighten the commitment to the evaluation, contribution of faculty to the evaluation process is maximised. In the questionnaire tool, faculty decide themselves whether they want an evaluation, which aspects will be questioned and what exact questions will be posed. To heighten the perception of usability, the content of the questionnaire needs to be in accordance with the way the user perceives reality (Smyth, 1990). In the questionnaire tool, faculty are invited to express their subjective theory. This theory will influence the questionnaire that will be the result of using the questionnaire tool.

The challenge is not only to help faculty accept student course ratings as important feedback on their specific educational practice. The challenge is also to help faculty reflect on their educational practice, so that a student course rating can be a starting point to improve teacher thinking. Indeed, reflection upon professional educational action can be an important learning activity and a motor for improvement of teacher thinking (Clarke, 2000). As a first stimulus for reflection, the tool introduces frameworks that need to be used by the faculty to describe their educational practice and subjective theories. As a second stimulus for reflection, feedback on their subjective theories and educational practice is given.

Description of the questionnaire tool

The questionnaire tool consists of three modules. These modules are organised linearly, but strolling back and forth is encouraged through hyperlinks. At the end of the tool, which is the end of the third module, feedback can be given that refers the user to the first module, which makes the tool circular.

The first module consists of a measurement of subjective theory. This measurement is based on Samuelowicz and Bain's (1992) dimensional model about conceptions of teaching. This model proposes five constituent dimensions that underlie a global dimension reaching from student centred to teacher centred. For the tool these dimensions were extended to eleven dimensions, based on an overview of literature. These dimensions were transposed to eleven forced choice items. After filling out the forced choice items, users receive integrated feedback on different levels. The feedback consists of textual feedback on three clusters of items (items about

knowledge, the teaching process and educational goals). At the most basic level a textual elaboration is given for every forced choice item. After this feedback, faculty can loop back to the forced choice items to change their answers.
The second module consists of an analytic scheme with the form of a hierarchical network to describe educational practice. The parent nodes are organised in a global scheme of interconnected elements within a learning environment: student characteristics, educational goals, information, teaching methods, evaluation and student activity. Faculty is invited to indicate all the relevant aspects in the hierarchical network underlying this global scheme.
The third module combines both information sources (subjective theory and description of educational practice) in order to propose relevant questions for the faculty to compose a questionnaire. For every selected element of the analytic scheme, the list of questions is shown that is congruent with the subjective theories of the faculty. If faculty do not find their choice in the list, they can choose to select a question that is not congruent with their subjective theory. At that point they are suggested to check and change their answers in the first module of subjective theory. In this way, the system is circular since the faculty is redirected to the first module when their selection of questions deviates from the measurement of subjective theory. Users can also decide to go back to the second module and change their description of educational practice in order to receive different lists of questions to choose from.
The selected questions are printed on paper questionnaires and administered to the students. Faculty receive paper reports with their results compared to the results of the same questions of the whole university, and (if appropriate) with former evaluations. The possibility for electronic administration of the questionnaires will be offered after the initial test time.

Results and perspectives

The questionnaire tool is designed to be used on individual basis as well as integrated within a faculty development training. The questionnaire tool is currently in use in a training for beginning faculty. The tool will be filled out on an individual basis before the first collegial consulting session where the resulting questionnaires will be discussed. The second collegial consulting session shall be treating the results, the interpretation and planning for amelioration.
The individual use of the questionnaire tool seems to provoke reflective thinking and could as such be considered to be a powerful instrument to induce learning experiences. Preliminary findings of ongoing research suggest that users accept the framework of the subjective theory module. At the same time the feedback on subjective theory seems to induce reflection in that it opens perspectives to different views on education. The framework of the second module, the hierarchical network of concepts, seems to be difficult to understand and to work with. Maybe this framework does not relate strong enough to faculty's personal interpretation of their educational practice. Further research on the way faculty can describe their educational practice is needed. An exploration of the frameworks non-users utilise to describe their practice, in comparison to the one used in the tool is launched in order to resolve this shortcoming.

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Collaborative Support for the School of Education: a Joint Instructional Technology and Library Needs Assessment Program

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Abstract: DePaul's School of Education was the first implementation of a Needs Assessment designed jointly by the university's Instructional Technology Development (ITD) area and the University Libraries. The goals for the Needs Assessment were to identify areas in which an expanded, unified and comprehensive faculty development training and support package would both address faculty's perceived needs while also improving adoption of existing instructional technologies and/or services. The Library's education bibliographer and the ITD consultant for education interviewed faculty representing a cross section of departments and programs as well as technological expertise. The results were analyzed; issues were sorted according to faculty priority and by length of time and resources needed to address them.

Introduction

In the months following a reorganization, two units in the newly combined Office for Teaching and Learning Resources – the General Library and Instructional Technology Development (ITD) – examined ways in which to deliver course management software training for faculty. In the first year, the two support areas established a successful working relationship by collaborating on faculty training for Blackboard, the course management system adopted for use at DePaul. The introductory Blackboard training session – led by instructional librarians – combined both an introduction to Blackboard as well as an overview of web-accessible library resources such as online journals, databases, and electronic reserves. From these initial collaborative efforts the need to identify and deliver an expanded, unified and comprehensive support package to specific academic units became apparent. The School of Education was the first implementation of the resulting Needs Assessment process.

Goals and Process

In planning for the Needs Assessment, four goals were identified: first, to ascertain opportunities, unique to the School of Education, to enhance faculty skills in instructional technologies and in online library resources; secondly, to design a training plan for the School of Education, based on results of the needs assessment; and thirdly, to provide an opportunity for Education faculty to become aware of the

services and tools available to them through these two offices. Lastly, the process developed would become a model for training needs assessment that could be applied to other DePaul academic units in the future.

Twelve open-ended questions were designed to stimulate critical reflection on the possibilities of electronic resources and instructional applications. Some questions referred to specific features of existing applications (i.e., "Education faculty could use the assessment features – online surveys, tests, and gradebook -- in Blackboard to ____"). Other questions were more general in nature (i.e., "What have you seen others do that you'd like to do?"). Eight SOE faculty were selected to be interviewed; they represented a cross section of departments and programs as well as technological expertise. The Library's education bibliographer and the ITD consultant for education met with each faculty member in individual sessions lasting approximately one hour. The results were analyzed; issues were sorted according to faculty priority and also – on the part of the Libraries and ITD – by length of time and resources available to address them.

Process Issues and Suggestions

Suggestions for future Needs Assessments fall into four categories: when to perform a needs assessment, what questions are to be asked, who is to be interviewed, and who will perform the interviews. In terms of when, the DePaul Needs Assessment was performed soon after an accreditation report that suggested improving technology integration throughout the school. It was found that by timing such a venture to coordinate with the school's program review or accreditation cycle, faculty members were ready – and in some instances, eager - to comment on technology adoption issues. Questions referring to specific functions or applications may need to be altered for faculty who are not acquainted with that function. So a question such as: "If all Education courses had a Blackboard web site then___" might be altered to: "If all Education courses had an easy-to-access web site where students could access resource materials, assignments, and hold discussions then…." Adding a question that could elicit suggestions on how to operate most effectively within the School's unique culture might assist academic support areas in formulating successful training and support activities.

Faculty members in DePaul's School of Education vary widely in their adoption of technology. It was, therefore, important to include among the interviewees as wide a range of users as possible, also making certain to include representatives of the various departments within the school. This meant that several faculty who were interviewed were previously unknown to the Library and ITD interviewers. The combination of using, for interviewers, the Library bibliographer for the academic area and the ITD consultant for the school or college seems best suited for DePaul's unique academic support situation.

Conclusions

The process of meeting with key faculty members and hearing their input while introducing them to the work and services of these two support areas immediately strengthened the working relationships between the Libraries, ITD and the School of Education. The professional staff participating in the interviews became better acquainted with key faculty members. These faculty members, in turn, are more fully aware of the central services available to them from these two academic support units.

Short-term goals, which can significantly affect the current level of faculty understanding and application of currently available services –such as Carl UnCover – include simple-to-implement paper and e-mail communications specifically tailored for School of Education faculty. Workshops and Brown Bags on specific topics also provide immediate impact with minimal additional resources. It will be important to work closely with the School of Education in developing and advertising these sessions. In addition, success rates may increase if these sessions can be held either in or near School of Education offices.

In the long term, ITD and the Libraries can benefit from a continuing alliance with Education faculty on several issues and resources, including design of online versions of induction and continuing education courses, the curriculum materials center, redesign of computer classrooms, research and advocacy toward streaming video and audio, as well as applications to support streamlined administrative processes (e.g., Syllabi on line) and improved learning (e.g., database of case studies with video examples).

Making Technology Meaningful to Faculty: Two Approaches over One Semester

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Abstract: This paper provides two different examples of work during a single semester with two different faculty and two different PT3 team members. Example one shows how much technology learning can be accomplished over one semester with an open-minded and excited professor. Example two shows a different approach with a more technologically reticent professor. Each illustrates how different strategies must be enlisted for varying instructor needs and interests.

Introduction

Faculty contact is a chief component of the PT3 program because the knowledge the faculty members acquire through these services can t hen be delivered to the pre-service teachers. In this area, team members are assigned at least one professor to work with on integrating technology into their curriculum. In this paper, two different examples of work throughout one semester are discussed with the purpose of showing specific goals that can be accomplished in this amount of time.

Example 1

The first meeting with a new faculty is one of the most important meetings. In this, not only the importance of integration of technology into their curriculum is established, but the faculty is allowed to express their ideas and needs for the following semester. The technology fellow serves as both an assistant and a guide in the compbtion of the faculty's requests because he has access to hardware, training, and discipline-specific media that is easy to use (Groves & Zemel, 2000). In order for the approach to be successful, these three components are vital.

One of the strengths of this approach is that presenting technology in a way that is relevant to their individual needs can stimulate the instructor's engagement. In this example, the professor was a relative novice with little exposure to technology beyond basic word processing and email. She was intrigued by the possibilities of using technology in her curriculum, and her hesitancy was diminished by the one-on-one support of the technology fellow.

During the first meeting the discussion focused on what the professor wished to accomplish during the semester. In this instance, the faculty member's specialty was art education, and the display of graphics and images were central to her curriculum interests. PowerPoint was the most logical application to begin with, and it offered a convenient lead-in for the introduction of graphic file formats. Soon the instructor was requesting to learn about digital cameras and CD burners, as well as asking for server space. This instructor's enthusiasm continued, carrying her to learn Netscape Composer to begin to create web pages for her classes. As always, the technology fellow walked through the web process with the professor so that her comfort level was high and her understanding was guaranteed.

The whole process of working with faculty was extremely successful because it facilitated the transformation of an educator who gained important technology tools for teaching.

Example 2

The relationship between faculty member and Tech fellow is an integral part of the faculty experience within the fulfillment of the PT3 Grant. In this case, the faculty member was quite comfortable with his level of technology, but not particularly interested in new skills. Since the professor delivered a high number of presentations each year, PowerPoint was suggested as an alternative to his customary transparencies.

The initial meeting with the faculty member provides an opportunity for the assessment of needs. The professor's method and style of presentation and the technologies that are utilized are all concerns that should be addressed. As found by Vannatta and Beyerbach (2000), the relevancy of technology issues and applications are key points in engaging the faculty in using new technology. The faculty member was particularly fond of his outline process for using transparencies, and needed to be assured that the transition from using the overhead to PowerPoint was a logical one. To demonstrate this, the technology fellow created two different versions of one of the instructor's presentations. Upon seeing the prototypes, the faculty member was swayed by the flexibility and potential of digital presentations. He was quickly interested in learning to compose his own PowerPoint based on another set of transparencies for the next meeting. The tech fellow instructed the basics of the program informally by helping the professor convert another of his earlier presentations from transparencies to PowerPoint.

After the professor's initial success with PowerPoint basics, he became more interested in the special effects aspects of PowerPoint and wanted to learn more advanced features within the application. He was particularly interested in inserting JPEGs and links to related websites that might be of importance to his class. Soon, the professor had created a slide show that he felt was ready for presentation. He showed confidence with the program and expressed interest in acquiring a CPU and projector for his class. By this time, he was also becoming interested in other programs such as Win Zip, and made plans for further technology interests.

Time is often a major factor for many of the faculty contacts and this professor was attracted by the conservation of time that the program offered. What seemed to impress him even more was the versatility of a program that could be utilized every semester. The overall experience for the faculty member seemed to be an invigorating one in that he took great pride in his creations and his expanding knowledge base and the contribution to that by this grant was a motivational concern to all Technology Fellows. The coming year will hopefully encourage progress within the integration of more technology into his classroom and with time saved there may be an opportunity to include the usage of further applications.

Conclusion

The process of working with faculty through this grant was successful because the approach was individualized for each professor, and the resources such as training, hardware, and media were all available. The time and effort invested into this branch of the program has already paid for itself: professors are using technology in their education courses, and our pre-service teachers are understanding how the integration of technology can facilitate a lesson.

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Project Merlot: Bringing Peer Review to Web-based Educational Resources

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Abstract: The unprecedented growth of the Web has resulted in a profusion of educational resources. However, the challenge for faculty is finding these resources and integrating them into their instruction. Even after the resource is found, the instructor must assess the effectiveness of the resource. As the number of educational web sites mount into the millions, this task is becoming increasingly difficult.

To address the problems of finding instructional sites, evaluating their educational value, determining their accuracy and assisting professors to integrate the resource in a learning environment, the Multimedia Educational Repository for Learning and On-line Teaching (MERLOT) was established. The MERLOT virtual repository (www.merlot.org) of instructional materials is hosted by the California State University Center for Distribute Learning. The project also provides a peer review process to ensure the quality of the educational resource.

The exponential growth of the World Wide Web has resulted in a profusion of educational resources that are potentially useful in higher education. The challenge for faculty interested in using web-based resources as an important aspect of their instruction is finding these resources and integrating them into their instruction. Even after the resource is found, the instructor must assess the effectiveness of the resource. As the number of educational web sites mount into the millions, this task is becoming increasingly difficult.

The unparalleled growth of the Web is partly due to the fact is that just about anyone can develop a Web site. With the aid of inexpensive or free Web editors, creating a Web site is almost as easy as using a word processor. There are also a myriad of companies that will host your site for very little or no money. Since it is so cheap and easy to establish a web presence, the number of web sites, both good and bad, have proliferated. While using the traditional search engines can be useful in finding educational sites related to a specific topic, experienced Web users know how difficult it can be to find relevant information. Search engine may find a few million sites it deems relevant, but it does not separate the good from the bad. Educators have a particular responsibility to ensure that Web resources that they use in their courses are *authoritative*.

The concept of *authoritative* gets at the question, "Who says this material is accurate?" By knowing the background of the authoritative source of a work, one can judge how much one trusts it. For example, if you access the Microsoft® knowledge base (Technet, 2001) to look up information on installing a new NT driver, you would tend to trust what you read. Also, if you access a particular professor's course web site, you would know that the professor is the authority behind the information on the site. The professor's students would know that they need to believe what they read, at least for the rest of the semester. Since these pages are probably posted on a university's server, the reputation of the institution also gives it additional authority. However, until recently, there has not been any "objective" review of higher education Web resources available.

Even after finding the educational resource and determining its accuracy, the potential user must determine if the resource is effective in teaching or demonstrating the concept. A Web page could be both relevant to your topic and accurate, but may not be useful by the target audience you want to use it with. If it is pure text with no interactivity, has inappropriate vocabulary, or is simply ineffective instruction, you would probably not want to use it. To address the problems of finding instructional site, determining their accuracy, and determining how to integrate the resource in a learning environment, the Multimedia

Educational Repository for Learning and On-line Teaching (MERLOT) was established. The MERLOT virtual repository (www.merlot.org) of instructional materials is hosted by the California State University Center for Distribute Learning. As the project evolved, a peer review process initiated to "improve the effectiveness of teaching and learning by expanding the quantity and quality of peer-reviewed online learning materials" (University of Michigan, 2000). The balance of this paper discusses both MERLOT as a virtual repository of web based educational resources and as a source of peer reviewed resources.

MERLOT as a Virtual Repository of Education Resources

The MERLOT community has established and maintained a virtual collection of educational resources. Membership in the MERLOT community is open to any interested educator and there is no cost for membership. Once you have registered as a member on the MERLOT web site (www.merlot.org), you can contribute to the MERLOT community by posting links to web-based materials or by providing user comments to sites already posted. MERLOT members also receive periodic updates about MERLOT activities and projects.

Experienced Web users know that there are several ways to find information on the Web. When one is interested in searching for broad topics, a Web index like is useful. These indexes are useful for browsing, using hyperlinks to make it easy to navigate through a Web site. However, when you are looking for something more specific, a powerful search engine may be more useful. These search engines allow for complex searches using Boolean logic and sometimes even use artificial intelligence to find information. To accommodate both of these approaches, the educational resources, called *learning objects* in MERLOT terminology, can be accessed by either browsing through the materials by broad subject areas or using a powerful search engine.

Browsing the MERLOT Site

As shown on the MERLOT home page (see Figure 1: The MERLOT Home Page), the learning objects are categorized by both subject area (Arts, Business, Education, etc.) and academic discipline communities (Biology, Business, Chemistry, etc.).

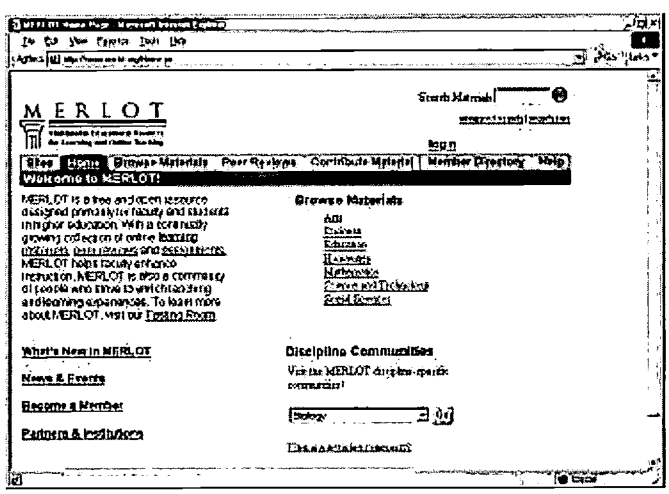

Figure 1: The MERLOT Home Page

Selecting a subject under the Browse Materials menu takes you to a screen showing the sub categories of the subject. For example, Figure 2: Science and Technology shows the categories produced by click on the main Science and Technology subject.

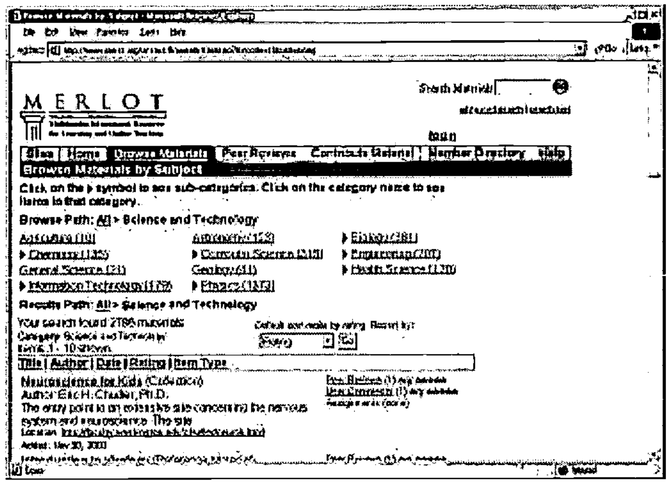

Figure 2: Science and Technology

The discipline community index works in a similar manner. For example, selecting the Information Technology discipline from the Discipline Community drop-down menu displays the sub-categories of the discipline (see Figure 3: Information Technology Discipline Community).

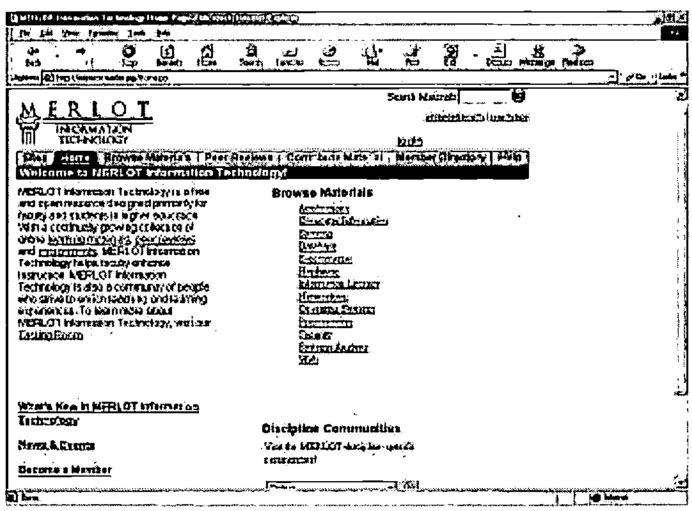

Figure 3: Information Technology Discipline Community

While having two indexes to the site may be a little redundant, they provide two easy ways to browsing the MERLOT site. They are both excellence ways to become familiar with the variety of learning resources available. However, as noted above, sometimes a powerful search engine is better suited for the task.

Searching the MERLOT Site

The MERLOT search engine provides for both simple string searches and advanced searches that allow you to specify the fields you want searched. The advanced search facility also allows the use of Boolean (AND/OR) operators to refine the search. As Web users know, sometimes your initial search is too broad and returns too many hits. To address this problem, the site recently added an advanced sub-search capability. This allows you to narrow the results of a search by adding additional conditions.

These searching and browsing capacities alone make MERLOT a valuable source for finding educational learning objects. However, as the project developed, it became obvious that MERLOT could perform an additional valuable service by providing some means of indicating the educational quality of the web sites. In 1999, a rigorous peer review process was initiated (MERLOT History Page, 2001). While only a small percent of the websites on MERLOT have currently been peer reviewed, the number is constantly being increased. This will make MERLOT an even more valuable resource in locating and using quality, authoritative learning objects.

Peer Review

Traditionally the quality of published educational materials has been ensured by the publisher. Publishers use processes including peer review, editorial assistance, and other procedures to ensure that published materials are authoritative and up to scholarly editorial standards. Because publishing on the Web has little or no expense, all of the expertise involved in the publishing process above the author is often eliminated. This means that the author, who sometimes isn't even identified, becomes the sole authority for the site. The MERLOT community decided to implement a peer review process for leaning objects to ensure that the sites are well designed and contain accurate information.

In order to develop a scholarly method for peer review, three models of peer review were considered: the peer review process used by journals, the process used in reviewing published materials, and the methods used for pre-publication reviews. All three of these methods select materials and review a bit differently.

Scholarly journals require the author to submit previously unpublished materials for review. In general, authors are expected to have knowledge of journal's standards and must submit the material in a specific format. It is incumbent upon the author to follow the journals style and subject area. The paper is generally sent out to several scholars in the field for review. The more scholarly journals perform a blind review to ensure fairness in their acceptance policy. The journal will then read the reviews and make a decision on the fate of the work. The editor may accept, reject, accept with revisions, or reject with recommendations.

Book companies use a pre-publication review to both determine if a manuscript is worthy of being published and how it can be improved. As such, it is more formative in nature. The reviewers are generally professionals in a field who are given a small honorarium for the review. The reviews are usually given to the author along with "suggestions" from the publisher.

After a work has been published, the editor of a professional journal may wish to have it reviewed. The editor selects both the reviewers and the book to be reviewed. Obviously, this type of review is for a different purpose. It is to evaluate the quality of an already published work rather than determining if something should be published.

Despite these differences, all of these models of scholarly peer review processes follow similar general processes to assure quality. For example, all of these publications establish evaluation standards and communicate these standards to their academic community. Reviewers then apply the evaluation standards to determine the worth of the material and write some sort of recommendation regarding the material. The model developed by MERLOT is a synthesis of thesc models.

The MERLOT Peer Review Process

In order to help higher education faculty to decide if online learning resources are appropriate for their courses, MERLOT provides a structured peer review process. To ensure the validity of the review, they are all performed by experts in the academic field of the topic being reviewed, not by instructional technology experts. (Unless, of course, if the academic topic is information technology.) All reviewers are professors that actually use Web based resources in teaching their academic discipline.

The reviews are all conducted by at least two higher education faculty members who use Web based resources in their courses. A composite review form based upon the individual reviews is posed to the MERLOT website. There are now twelve discipline-based communities conducting reviews.

The peer reviews evaluates learning resources along three dimensions: 1) quality of the content, 2) usefulness as a teaching tool, and 3) ease of use. Each review evaluates each dimension using a 5 point rating system. The ratings rate from 1 star (poor) to 5 stars (excellent). Only sites averaging 3 stars or higher are posted on the site (MERLOT Peer Review Page, 2001).

The MERLOT review process focuses on specific leaning modules (or learning objects) rather than entire Web sites. This allows professors to incorporate these modules into there own Web sites. Materials that have higher ratings come up first on MERLOT's search engine.

It should be noted that Merlot is not the only guide to academic Web sites. For example, see the World Lecture Hall at the University of Texas' World Lecture Hall (World Lecture Hall, 2001). Many scholarly associations and other groups have developed guides to course materials for their specific subjects, but these sites generally don't assign ratings to resources (Young, 2000).

Conclusion

Historically, college professors are rewarded for their scholarly activities. A professor that publishes a book with a respected publisher is able to use that scholarly accomplishment for promotion and tenure. Unfortunately, if one chooses to publish electronically, it may be difficult to get the proper "credit." The reason for this is partly due to the fact that the traditional scholarly processes used to validate a work have not been in place for the electronic media. MERLOT offers a solution to this problem. "If you spend a lot of time working on a module, then you should get some credit for it," says Cathy Owens Swift, a professor of marketing at Georgia Southern University who is one of Merlot's reviewers. "People spend a lot of time developing modules, but nobody else ever sees them except their students." Merlot's also plans to recognize professors who have developed excellent sites by mailing notices to their department heads (Young, 2000).

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Helping to Prepare Tomorrow's Teachers Using Technology: Faculty Development

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Prosperity in the global information society of the 21st Century is dependent upon the success of schools across the United States to increase students' knowledge and skills in all subject areas. As the demand for highly skilled workers increases in the workplace, the school system must network students and teachers to resources to help prepare them for jobs when they enter the workforce. Computing technologies are vital to support the educational needs of students and teachers to address these issues.

The rapid changes and pace of technology around the world, generates a requirement for the United States to have the necessary pedagogues to support the development of a knowledge-based economy and learning society, and to transfer the resulting knowledge into organizations, institutions of learning and companies for worldwide utilization. As a result, partnerships with businesses and the education community are necessary to address these important challenges of the 21st century.

The potential for increased access and reaching out to previously unmet education and training needs through learning technologies is a highly visible growth area. Funding for education is being reduced at a time when educational institutions need to maintain and increase a focus on the learning process. One way to address this challenge is to provide teachers with access to a central repository of state-of-the-art curricula using information technologies.

Current instructional system design and development techniques, evaluation methods, tools for lesson plan development and pedagogical issues in the design of effective instructional materials are being addressed by technology. The need for a unified curricula to enable collaboration via standardized curricula databases has surfaced. A technology-based learning approach could serve to tie together subject-specific educational learning needs with information technology learning technologies for personal growth and staff development to help teachers face the challenges that lie ahead.

With the introduction of these educational technologies, a radical disruption to the pedagogical foundations of the work of teachers has resulted. Computer technology and increasing access to educational resources through the Internet require teachers to rethink how they teach and how they assist students to prepare them for the digital workplace. The rapid change and pace of technology requires school districts, local schools, and school administration to consider facilitating teacher staff development through the use of computer-based educational technologies and tools.

The question is: how do we best prepare tomorrow's teachers to support their personal growth and development to help them maintain and stay ahead of technological advances?

A Solution?

A technology-based knowledge and skills development system to provide the opportunity to prepare tomorrow's teachers to use technology effectively, efficiency and in a cost-effective manner to address their learning needs and support the student learning process is the solution. A knowledge and skills development system, consisting of three main components: 1) a *Standards Proficiency* tool; 2) a *Learning Plan Deli*very tool; and 3) an *Authoring- and Publishing-to-the- Web* tool is the answer.

1. Standards Proficiency Tool

The *Standards Proficiency* management tool will allow administrators, teachers or students to check compliance to Federal, State or Local Standards; for example, this could include the ISTE National Educational Technology Standards for Teachers and/or Students, or the ISTE Technology Standards for Administrators (TSSA).

This standards proficiency-based tool will analyze a school district's core knowledge, skills and attitudes (KSAs) required for teachers to perform an established set of professional responsibilities. Using a

systematic assessment of staff development needs for the incorporation into teacher staff development curriculum will involve defining optimal performance, assessing actual practice, and identifying the gap between the two. Further, the standards proficiency tool can be used as an advanced organizer to maintain an up-to-date knowledge and skills base for standards' proficiency at all levels.

2. Learning Plan Delivery Tool

The *Learning Plan Delivery* tool will allow on-line chat sessions, on-line self-study sessions, synchronous "real time" instructor-led lectures and courses, web-delivered learning activities, instructor assignments; for example, reading a chapter in a book, writing an essay, as well as threaded discussions to increase teachers' knowledge and skill. This tool will provide the opportunity for teachers to select staff development activities to address their individual learning style in a just-in-time manner.

3. Author and Publish to the Web Tool

The *Author- and Publish-to-the-Web* tool will automate the content publishing process to allow teachers and staff development instructors to create on-line courses. The uniqueness of this tool is the authoring system is based upon sound instructional design principles. Further, the theoretical underpinnings are based on Bloom's Taxonomy of Learning Objectives and Gagne's Nine Events of Learning.

Instructional design is the iterative process of planning instruction. It is based on research findings on how learning takes place, and considers the conditions of learning of both external events of instruction, and previously learned capabilities which are stored in memory. The design phase is a detailed plan that defines, describes and prescribes methods and procedures for the development, implementation, and management of an instructional episode. Three points must be in agreement for the design. They are: the performance objectives, the instructional materials, and the evaluation instruments.

This authoring- and publishing-to-the-Web system will be aligned to relevant learning activities as prescribed learning interventions in the *Learning Plan Delivery* tool. This tool will help achieve the intended learning outcomes based on sound instructional design practices and principles. Further, this tool will allow for the automation of the instructional design process overall, and will facilitate automated collaboration between staff development content designers and subject matters experts (SMEs) to create on-line courses for teachers, administrators and students.

Summary

New staff development methodologies and technologies are being developed in response to the rapid technological changes within schools and the school community. To keep pace and ahead of these changes, staff development is required to support a flexible learning environment in order for teaching staff to respond and adapt quickly to these changes. Due to educational computing technology innovations, staff development no longer needs to be isolated from the school or the school community. Developments, like the *Standards Proficiency* tool, the *Learning Plan Delivery* tool, and the *Author- and Publish-to-the-Web* tool, now allow for distributed staff development to occur anytime, anyplace.

Faculty Development in Educational Technology

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Abstract: Many education faculty members do not feel qualified to integrate and model the use of technology in their own teaching. A faculty development program is one college's approach to expanding the confidence and abilities of education professors to use technology as a teaching tool. The college's Technology Committee conducted a needs assessment consisting of focus group discussions and a survey to discover and prioritize the technology interests and abilities of faculty. In response to the needs, the committee prioritized technology purchasing, developed an online technology FAQ, sponsored a technology open house, and held small Tech Friday focused learning sessions.

While faculty members in colleges of education generally agree that children in the information age need technology fluency, and therefore teachers need expertise in teaching with technology, the majority of faculty members do not feel qualified to integrate and model the use of technology in their own teaching. The faculty development program described in this paper is one college's approach to expanding the confidence and abilities of education professors to use technology as a teaching tool.

The National Council for the Accreditation of Teacher Education (NCATE) regularly evaluates the practices of teacher education programs, and technology has become an important part of the evaluation process. NCATE unit standards give technology an important role in teacher preparation: importance is placed on "the unit's commitment to the integration of technology to enhance candidate and student learning." In fact, the conceptual framework of a teacher education program is required to address its commitment to technology.

> The unit's conceptual framework(s) reflects the unit's commitment to preparing candidates who are able to use educational technology to help all students learn; it also provides a conceptual understanding of how knowledge, skills, and dispositions related to educational and information technology are integrated throughout the curriculum, instruction, field experiences, clinical practice, assessments, and evaluations. (NCATE, 2000)

The target of teacher education programs is developing candidates who "present the content to students in challenging, clear, and compelling ways and integrate technology appropriately." In order to meet these standards, teacher education professors must have the skills and interests to integrate technology into their teaching. NCATE states, "Teaching by the professional education faculty reflects the unit's conceptual framework(s), incorporates appropriate performance assessments, and integrates diversity and technology throughout coursework, field experiences, and clinical practices." In short, the success of a teacher education program depends in part on its ability to produce novice teachers who can effectively teach with technology. In addition to NCATE requirements, the state mandates that teacher education graduates document that they can teach using technology. None of this is likely to happen unless faculty model and integrate technology into teaching.

Over the last academic year, our college of education at a regional state university embarked on a mission to improve the technology integration among faculty. The college's technology committee led the mission. The process began with a needs assessment intended to discover and prioritize the technology interests and abilities of faculty. The technology committee began by hosting two hour-long technology focus group discussions, during which professors were invited to describe their views on technology in the college and to elaborate on their needs. The focus group sessions brought to light the main concerns of professors related to teaching with technology and helped to build consensus about the most urgent needs of the college.

Based on the issues presented during focus group sessions, the technology committee conducted a formal survey of faculty technology needs. In order to direct the college's technology resources in ways that best met their needs, faculty were requested to answer five questions. The questions concerned their current use of technology to support teaching, scholarship and service, and the forms of support that would best enable faculty to better use technology in their work. In an attempt to make the survey as user-friendly as possible, it was distributed on paper, and each question included a list of possible choices along with the option to write in a response. The majority of professors completed the survey.

The surveys showed that the faculty fall along a wide continuum of technology use and skill. A few professors used no technology at all, a few were expert users of advanced technology, and most had experience with

one or two technology applications that they use regularly. A small minority felt comfortable teaching with technology. Among the faculty at large, technology was used in several ways to support their activities. In their teaching, professors used technology for presentations to students, presentations by students, preparing print or electronic teaching materials, locating or providing online materials for students, and email. In research, technology was used in writing, data collection, data analysis, electronic searches, and reading the work of others. To support their service responsibilities, professors used technology for committee reports/agendas, gathering information for committee work, work with schools, and work with professional organizations.

When asked to indicate the technology topics about which they most needed training or seminars, faculty listed the following, listed in order of preference: Digital video, Web design, Electronic portfolios, Presentation design, Online course management (Blackboard, Lotus, Learning Space), Digital cameras, Palm/PDA, Databases, Online audio/video conferencing, Scanners. The vast majority of professors stated that they preferred small group sessions for learning technology integration, and several stated a preference for on-to-one personalized instruction. Very few preferred large group or online learning experiences. There was a strong desire among faculty to bring their own work to the technology sessions, so time would be used productively. Faculty also requested informal sessions that fostered two-way dialog with a facilitator who understands the education setting. One professor said, "Anything us better than what we have now." Faculty suggested Friday afternoons for workshop sessions, because that is a time with no competing demands on time such as teaching or meetings.

Based on the survey of the technology needs of college faculty, the college technology committee launched a plan to progress toward meeting faculty needs. The department chairs agreed to fund small grants for faculty who request assistance in integrating technology into their teaching. The technology committee prioritized their purchasing plan based on the needs expressed in the survey. A technology fair open house was scheduled to acquaint faculty with the technology resources and support available in the college educational technology center. A web-based technology FAQ was developed. A series of Tech Friday faculty development sessions was offered to teach the most-requested skills. The sessions featured small groups in a relaxed and interactive atmosphere led in project-oriented learning by a colleague. While groups on campus previously offered similar workshops, education faculty did not participate, saying that they preferred to learn new skills among colleagues in an education context. Learning from an "in-house" educator also made long-term follow-up with faculty more effective.

The Tech Friday sessions were seven half-day hands-on seminars led by a variety of faculty members who have had success using the technology and who wanted to share their experiences. A schedule of sessions was posted and emailed to faculty, who were invited to sign up for sessions. Faculty were requested to bring materials or ideas related to their goals or projects to enable the session leader to give more practical guidance. Workshop materials including printed guides and handouts were supplied. Tech Friday topics were digital camera basics, digital camera intermediate skills, scanners, web browsing and searching, presentation design basics, presentation design intermediate skills, creating CD-ROMs, digital video basics, digital video applications, electronic portfolios, Blackboard online course system overview, Blackboard applications, web design basics, and web design intermediate skills.

The anticipated results of these activities included faculty who recognize their technology integration support network, faculty who model effective uses of technology in their teaching, and students who are successful in integrating technology into their work and teaching. Professors have responded very positively to the new opportunities to learn technology skills. They have been enthusiastic participants in all activities. Immediately, professors began requesting technology equipment and using it in their courses. Several professors stated that prior to hearing about and participating in the Tech Friday sessions, they simply didn't know they had access to such technology for their teaching. Now the technology spends more time out of the closet than inside it. As our department chair says, "If the technology becomes obsolete before we wear it out, we're not using it enough!"

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How to Effectively Integrate Technology Into the Curriculum—Through Faculty Development

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Abstract: Many school and higher education faculty are being faced with a paradigm shift in the way they convey information to their students and communicate information to their peers. Many are fearful of technology; many more do not understand technology's function, and still others are not aware of technology's capabilities in their particular fields. My role as director of instructional technology at Robert Morris University is to help faculty to effectively integrate technology into their curricula. I will show the process I have used thus far to get the faculty involved in integrating technology.

Introduction

The following is a discussion of technology in education, how society can be encouraged to integrate technology and the ways in which I aid Robert Morris University faculty to integrate technology. Technological changes in the 20^{th} century have enabled us to access information quickly and make effective decisions that used to take considerable time. The American society has embraced computer technology and allowed it to reinvent the ways in which we create, find, exchange, and even think about information. The workplace and the operation of businesses have encountered rapid changes. So has the education arena. As we enter the 21^{st} century, educators must find answers and solutions to the concerns and issues surrounding the use of technology as an information tool.

Education is one of the areas where technology has had a direct impact on the way information/knowledge is delivered. Technology in education is no longer a novelty in instruction. It is a basic component of education like reading, writing, and arithmetic. When implemented effectively, technology can help support achievement by enabling learners to be independent, competent and creative thinkers, as well as effective communicators and problem-solvers (Edwards, May 21, 2000).

Technology in Education

Technology in education is a tool; a means to an end with endless specific implementation possibilities. Some of the numerous potential uses of technology in educational settings include support for individual learning activities through CD-ROM or Internet-accessed resource bases, support for group learning activities with E-mail supporting group communication or presentational software to allow groups to collaborate on presentation, support for instructional management through management of student portfolios, and support for development of individual student instructional plans, communications, and administrative functions through support for attendance and accountability.

The CEO Forum (June 2001) report argues that the 21^{st} century demands a new set of skills necessary to prepare students for life and work in the digital age. These skills include: digital literacy, inventive thinking, effective communication, teamwork, and the ability to create high quality products.

According to the CEO Forum, technology can help to develop 21^{st} century skills through improved basic skills, improved digital age literacy skills, improved inventive thinking skills, improved effective communication and interpersonal skills, and improved productivity (p. 6). The North Central Region Education Laboratory (NCREL) has developed the following list to help visualize 21^{st} century skills.

21^{st} Century Skills
Digital Age Literacy

1. Basic, Scientific, and Technological Literacy
2. Visual and Information Literacy

3. Cultural Literacy and Global Awareness

Inventive Thinking

4. Adaptability/Managing Complexity
5. Curiosity, Creativity, and Risk Taking
6. Higher Order Thinking and Sound Reasoning

Effective Communication

7. Teaming, Collaboration, and Interpersonal Skills
8. Personal and Social Responsibility
9. Interactive Communication

High Productivity

10. Prioritizing, Planning, and Managing for Results
11. Effective Use of Real-World Tools
12. Relevant, High Quality Products

Ehrmann (September/October 1999) discussed the Third Revolution in higher education for using technology to improve access and quality. The key technologies include silicon chips, a globe-spanning network of optical fibers and satellites, telephones, fax machines, video cameras, and the communications and data-storage agreements that undergrid the World Wide Web (p. 3).

Getting Faculty To Embrace Technology

With these in mind, the question becomes "How then do we get teachers to embrace technology?" That is a question I struggle with in my new role as director of instructional technology at Robert Morris University. RMU has invested thousands of dollars in state-of-the-art presentation classrooms. These rooms include an overhead projector, a computer, a document camera, cabling for a laptop, and a VCR. At RMU the problem is not equipment, but rather how to help faculty overcome their fears, prejudices, and uncertainties. My first step was to help faculty decide in what ways could technology be integrated into the curriculum to allow faculty to significantly enhance learning. Pierson (Summer 2001) states that unless a teacher views technology use as an integral part of the learning process, it will remain a peripheral ancillary to his or her teaching. True integration can only be understood as the intersection of multiple types of teacher knowledge and, therefore, is likely as rare as expertise." One of my goals as director of instructional technology, taken from CEO Forum (2001) is "to use technology to transform the learning environment so that it is student-centered, problem and project centered, collaborative, communicative, customized and productive (p. 5)."

In September, we began offering training sessions for the faculty that addressed issues such as operating the various types of presentation classrooms (deluxe, Smart cart, console), Group Wise (our E-mail system), grade submission, adult pedagogy, on-line education, and application software, such as PowerPoint and FrontPage. These sessions were designed to aid the faculty in their teaching and learning.

Some of the benefits our faculty can realize through education technology include:

1. Improved ability to meet student education outcomes
2. Improved professionalism
3. Improved instructional practices
4. Increased communication and collaboration
5. Improved efficiency and more constructive time spent on administrative tasks.

Kagima and Hausafus (2001) report that recent studies indicate that faculty are not supported with in-depth staff development or follow-up activities, which results in minor integration of new instructional technologies in their teaching.

According to Kagima and Hausafus (2001), educators are not easily disposed toward replacing familiar strategies, techniques, and methods of instruction learned over several years that have worked successfully (Hope, 1998). For educators to integrate technology into their teaching and learning environments, they need to believe that using technology is more efficient and effective than their familiar methodologies (Hope, 1998; Simonson & Thompson, 1997). Dagga and Huba (1997) notes that although implementation of technologies is growing, acceptance of new technologies does not occur readily. Several barriers have been identified that hinder educators' capacity to adopt computer-related technologies in their educational practices. Herring (1997) and Kelsey (1997) identified career concerns, lack of institutional support, fear of being replaced by the technology, and the lack of technological competence as

key barriers. Several educators identified time as one of the most critical barriers to integration of technology (Albright, 2000; Beaubodin, 1990; Dillon & Wright, 1993; Leggett & Persichitte, 1998). In relation to time needs, Leggett and Persichitte (1998, p. 33) notes that faculty require:

1. Time to plan, collaborate, prepare, and use technology in the classroom.
2. Uninterrupted time during the day to go online.
3. Time during and outside of the school day for technology training.
4. Time to personally explore, digest, and experiment with technology as well as maintain skills.

Teachers need to design/redesign the staff development process so it meets their needs—includes time to practice using the equipment, to watch teachers model lessons that infuse technology into the curriculum, and to mentor other teachers. Educators must have the time to work together, to explore, and to play with technological tools (Schrum, 2001).

Aiding Faculty to Integrate Technology

My role as director of instructional technology is to share with the faculty some literature and suggestions for incorporating technology into the classroom. Many of the faculty are very accustomed to using the technology, but they wanted some suggestions (with supporting documentation) of ways to effectively use technology in the everyday classroom.

The suggestions I shared with them are as follows:

1. Have clearly defined learning objectives. According to Eib (May/June 2001), "to know the best ways to use technology in teaching and learning, educators must know the learning objectives (p. 2)." For example, if the objective is to provide a map as one piece of information about a country or region, then any map will do. However, if the objective is to see where cities, national forests, and waterways are located and relate to a certain population, then another tool may have been more effective (Eib, May/June 2001).
2. Have some general ideas about the technology available to use. Lim and Clark (1998) offer a whole list of technology curriculum integration ideas for faculty to use. For example, there is multimedia software such as PowerPoint, Hyperstudio, or Web pages. Using this software to create lecture supplements, to present or assess information to create calendars of events or faculty/staff pages, or to conduct guided searches of the Internet aids learning.

Word processing software can be used to have students write stories, essays, or report research findings on various topics. It can be used to enable students to keep a journal.

Spreadsheet and database software can be used to compare information, such as literacy rate, per capita income, etc. Online databases can be used to find information quickly and efficiently.

Desktop publishing and graphic/paint/draw software can be used to have students create posters, maps, invitations, or newsletters (Technology Curriculum Integration Ideas!)

According to Caswell (Sept/Oct 2001), the Internet can be used as a way to conduct the threaded discussion forum. "Discussion forums are areas of the Internet that provide a common meeting place where participants can contribute to a dialogue and access information asynchronously (p. 1)."

3. View technology as a tool. According to Schrum (2001), if it's clear that technological tools will help them achieve their goal of having student's learn, educators will use those tools. In a technology-rich environment, students are active learners—producing knowledge and presenting that knowledge in a variety of formats. A tool is intended to aid in the learning process. For example, various software packages have specific intents.
4. Establish roundtables with other members of the school and department. Share ideas about what works and what doesn't over lunch, through a department meeting, or by visiting others' classrooms. Show demonstrations/ samples of projects. Coordinate strategies to move to a student-centered environment. Some faculty are comfortable with inviting their peers to sit in their classroom and observe the strategies and techniques used.
5. Observe others in the discipline to "see" technology use in action. Determine frameworks that will work for the classroom. Talk with others through "chat lines" to discuss ideas for

projects, etc. Either visit in person or on-line to see the actual technology being used. Find ways to make yourself comfortable with using technology.

These are some of the ideas I have shared with the faculty at Robert Morris. We have made some advances to get faculty to incorporate technology into the classroom, but the process is slow.

The technological changes in the 20th century have caused educators to change their viewpoints about the use of technology as an information tool. In this paper I have discussed the use of technology in education, how society is encouraged the integrate technology, and ways in which I aid the RMU faculty to integrate technology.

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Empowering Higher Education Faculty to Use Technology to Enhance Teaching and Learning: A Peer Mentoring Program

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ABSTRACT: This paper describes a peer mentor program to help college faculty integrate technology into their teaching and to use technology for personal learning and professional development. In order to help faculty become more comfortable with and use technology, a faculty mentoring program was created which centered on a faculty memberserving in the capacity of a faculty mentor. This paper reports from the mentor's perspective the technology-centered concerns that the faculty reported in an initial survey, the nature of the mentoring program and the current effort to make the mentoring program into an institutionally supported position.

Faculty Technology Survey

Faculty technology mentor conducted a survey to explore the nature of faculty concerns with respect to technology issues on campus. Survey results indicated several major areas of concern, including:

Faculty Concerns with Respect to Technology and Student Learning

- How to make this activity (**electronic discussion**) supportive of course objectives is an important question...if it just seen and experienced by the students as a gimmick, it will not be helpful. What is unique about the use of discussions that makes it worthwhile for student learning? I think I know but students don't always seem to be as motivated to get on the lists and participate.

Faculty Concerns with Respect to Technology and Time & Management

- Haven't had time or success with working with IT on these more instructional type issues.
- Workshops are slow and general. I want an intense session specific to my needs. I can't give 3 hours to many workshops, but 1/2 hr one-on-one is extremely helpful.

Faculty Concerns with Respect to Technology and Information They Needed About **Available Hardware & Software in Classrooms & Various Sites**

- ... am interested in transposing my overheads to Power Po int (or some other more technology-based media). I have run into several barriers: Equipment (I can't be assured of having a way to project the images in my classroom at Beach Park); Information about resources – such as, do we have a way of scanning images?

Faculty Concerns with Respect to Technology and Technical Support from the IT Department

- I will need the **ability to run Java applets** on the machines in the networked classrooms in fall 2001...The *issue was not resolved at that time* but I will need it (the capacity to run the applets from actual files developed by students) for a course in the fall.
- I increased by enrollment one semester in .... because I was promised support. However, the assistants were not able to help in ways anticipated, and they were not trained or interested. They seemed annoyed to even be asked.

Faculty Concerns with Respect to Integrating Technology into Their Own Teaching

- Need to know how to use technology in my teaching methods courses, other than word processing. Need the appropriate equipment: hardware & software; need to know what others in similar teaching areas are doing in this area

Faculty Concerns with Respect to Technology and Support in Handling Student Concerns

- ...need to know how to address student concerns, particularly their skills and available facilities/equipment at the college and home

Faculty Concerns with Respect to Technology and Institutional Support

- I don't feel we have the support at SJC (maybe until now!) to help make things work right for faculty and students...

Faculty Reported Some Integration of Technology into Teaching

- I don't like our email system (Electronically mediated discussion such as threaded discussion using our email system) for threaded discussions, and I have started to use Blackboard instead, which student appreciate!

Professional Development Activities

Faculty technology mentor provided professional development activities based on the needs expressed by faculty as indicated in the table below:

I am interested in Professional Development Options: (February, 2001)			
Personal	Informal	Workshop	

Contact	Discussion	Small Group	
7	5	10	Integrating the Internet into my courses
9	4	7	Support in developing a personal web page
4	3	5	Support in developing a department web page
7	3	14	Electronically mediated discussion such as threaded discussion using our email system
4	2	8	Creating PowerPoint presentations
1	3	3	How to evaluate software
1	5	4	How to evaluate World Wide Web sites
9	1	2	On-site (in the classroom) support when I try an innovation the first time
7	6	9	What's Janzabar and Why should I care?!
3	7	14	Discussion with faculty who are teaching online courses
3	5	12	Overview of teaching an online course
4	4	13	Overview of process of developing and online course
3	3	15	Managing and surviving an online course
3	4	14	Creating a learner-centered environment in an online course
7	2	7	Assistance in developing an online course
3	2	6	Using the SJC library from my home via the Internet
3	1		Accessing email & Public Folders off campus
	1	7	Developing a technology vision for SJC

In order to make my work meaningful to the faculty, I conducted a needs assessment survey. Survey results indicated six general areas of need as expressed by the faculty. During the course of the spring semester, I spent **57 hours in direct contact with faculty** either individually or in small groups focusing on the six areas of need. As indicated below, many projects have been completed. However, many have been started and work will continue in fall.

1. **Personal Web Pages**
   - Developed and posted 6 faculty personal web pages; 3 of these will require further development in the fall.
   - Started work with 6 other faculty members and will continue this fall in the development of their personal web pages.
2. **Department Web Page Development**
   - Continuing work with Religious Studies Department to develop web page.
3. **Electronically Mediated Discussion**
   - Shared research in support of the use of electronically mediated discussion.
   - Held one orientation meeting for faculty; 11 faculty members attended.
   - Mentored 3 faculty members in setting up and using public folders in conjunction with traditional instruction.
   - Anticipate working with these faculty members in the fall in terms of providing technical support the first time they try this with their classes.
4. **Online Course Development**
   - Shared research in the development and teaching of online courses.
   - Held one orientation meeting for faculty; 16 faculty members attended.
   - Mentored **4** faculty members in the development of CTDLC grants. Psychology Dept., Chemistry Dept., Biology Dept., and Counseling Dept. have developed and submitted CTDLC proposals for funding to online course development.
   - Continuing to work with English Dept., Nursing Dept., Nutrition Dept., Psychology Dept., and Counseling in the development of CTDLC proposals for the next round of grants.
5. **Conducting Research in the SJC Library**

- Shared with interested faculty the process for conducting electronic research.

6. **Accessing email & public folders from home**
   - Shared with interested faculty the process for accessing email & public folders off-site.

Institutional Support for Faculty Technology Mentor

The technology mentor position has been incorporated into the 5 year technology plan. Furthermore, it is specified that the person who will be a mentor is a member of the Faculty. The position taken is that such a program would be best staffed by a faculty member because of the specialized knowledge and closely related to the academic mission. There was much support for having a faculty member who understood how technology could be applied within the context of a pedagogic framework. This position has the full support of the Faculty and the college administration.

Faculty Development for Moving From Class Rooms to Learning Spaces.

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Abstract: The recent popularity of distance learning has brought increased pressure for change in institutions and for those who teach in them. Cheaper computers, greater capabilities, applications programs, inexpensive telecommunications, and more savvy groups of learners have built pressure for faculty and administrators to change for survival. One university has embraced a number of formal and informal methods to prepare, develop, support, and encourage faculty to adapt and change. These methods include faculty-driven efforts, administration sponsored peer-learning, monetary rewards, and availability of grant funds to encourage better use of technology in distance learning, and in taking that knowledge back into the traditional classroom.

Introduction

The process of facilitating learning, or providing "education" has remained basically unchanged for several millennia. Much of what happens in classrooms today—at primary, secondary, and post-secondary levels--is modeled after the Aristotelian approach of gathering students about the feet of the master. The teacher gathers students in a classroom, decides what is to be taught and proceeds to dispense information. Incremental changes in that model have been facilitated by technology beyond chalkboards and chalk, (opaque projectors, film-strips, films, overhead projectors, videos and television), though the model has remained relatively intact. The model has remained, however, largely teacher-centered, linear, and prescriptive in that the teacher sets the agenda, timing, and method of delivery.

Technology and Change

During the last decade, the application of relatively cheap, easy-to-use and fast-evolving technology has permitted and even required different ways of approaching learners and learning. Inexpensive and high-powered computers, affordable mass storage, generic and application-specific software, and telecommunications have come together to drive a revolution in education whether in the classrooms or on to the anytime-anywhere concepts, with many hybrids in between.

The application of technology to the teaching and learning process is not a panacea. Its potential is both broad and deep, it does not appear to answer every student or every learning need. There are some students for whom technology will be especially helpful, and some who might not find the benefits so great. There are some topics for which technology can provide a tremendous advantage, and others where application is more difficult to envision and apply.

Pressure for Change

This technology revolution has had a significant impact on colleges and universities. Traditional post-secondary educational organizations now face demands from customers (students, those who employ them, faculty, administrators, and other stakeholders) for greater flexibility and quality of course offerings. The need for flexibility is demonstrated by increased demand for learning from non-traditional learner groups, working adults, and for learning opportunities in technical and other fields that are not readily

available to large groups of people. The need for "anytime-anywhere" learning is becoming obvious.(Boettcher 2000)

For-profit organizations of various types are adding to the pressure for change by moving to the forefront of higher education and providing alternatives to those offerings long considered to be the exclusive province of traditional higher education institutions: not-for-profit universities, colleges and community colleges. In response, universities have begun to adapt and to adopt new practices, tools and technologies. The implementation of that change also requires retooling and developing faculty to effectively use the new opportunities.

Both academics and the marketplace have shown that distance learning in various forms can provide acceptable levels of learning. (Chernish and McNeil 2000; Industry Report 2001; Grayson 1999; Bond and Finney 2000). The one challenge is to develop faculty and institutional capabilities to deliver learning which is more effective and more efficient than the current model permits. (Olcutt 1999)

University of Houston

The University of Houston has offered continuing and some limited forms of "alternative education," "continuing education," for much of its history. As an urban institution serving a broad range of student needs in its four campuses, faculty members have been developing different and experimental learning delivery initiatives as a matter of course. Many of these efforts have been independent and only loosely coordinated or communicated among peers. Some might be described as "skunk works" efforts to push the envelope without the sanction or even the knowledge of central administrators.

The University has formally delivered coursework by distance for more than a decade, first using instructional television (ITV), and also using online tools. This outreach has brought about recognition that many of the traditional models, rubrics, and methods from the classroom require rethinking. Use of technology also surfaced the need for new and different skills for dealing with graphics, programming, application of telecommunications and related skills; skills which most faculty members do not have, and do not care to develop mastery.

The university has evolved a collaborative model for distance learning which brings together faculty members (subject matter experts, or SME's), instructional designers, technical support personnel, and administrators in a team. This team develops materials, content, and approaches to move learning from the classroom to cyberspace; and it also provided opportunities for improvement of traditional classroom activity as a valuable byproduct of distance learning efforts.

Faculty Development

Over the past decade, a number of informal and more formal approaches to preparing faculty for changes in educational and learning practices have evolved at the University. Among them are the following:

Moles. In 1994, several faculty began meeting informally to discuss technology issues in education. They chose the name "Moles" not because it represented any acronym, but rather that moles were furry creatures that burrowed underground without the benefit of sight. The Moles group grew to conduct monthly meetings and informal electronic communications to provide peer support and to share developments and challenges. Issues of technology (in distance settings, and in the classroom), sharing innovative efforts, and quiet encouragement had been, and continue to be Mole roles. Much of the leadership and innovation in the Moles came from the late John Butler, associate dean in the College of Natural Sciences and Mathematics who also maintained a Moles web page (http://www.uh.edu/~jbutler/professor/uhmoles.html).

COWS. The University Distance Learning office began more formalized development and support for system faculty several years ago when Sandra Frieden offered an off-site seminars that become known as COWS, Campus Online Workshops. These three-day gatherings for a broad range of system faculty from all University of Houston campuses combined peer-interaction, as well as staff and technical expertise. Peers are able to share experiences, successes, and impediments in a manner that has veracity and applicability to other faculty present. Staff is able to contribute information regarding current capabilities as well as anticipated changes and upgrades in technological capabilities. The workshops also provide an

opportunity for introduction of instructional design principles to teachers whose previous knowledge of teaching and learning has come from their own experience in classrooms as students or professors. Finally, the COWS process provides an ongoing opportunity for faculty collaboration, interaction, networking and research.

Technology Grants. The office of the university provost has offered tangible support to faculty involved in distance learning through an annual competition for Faculty Development Improvement Grants (FDIP). This program permits faculty to propose small projects for application of technology to distance learning and to receive funds to implement the projects. FDIP grant funds can be used for hardware, software, technical assistance, multimedia development, and even teaching assistant support to further technological applications. The current round of grants will award up to $6000 to successful proposals.

College staff Support. The information technology side of the University has also contributed to the development of faculty and technical skills for distance learning by creating a system of distributed support personnel in the various colleges. This technical support augments central staff technical expertise by placing knowledgeable and trained support personnel at the college level where they are able to develop working relationships with those involved in distance learning and application of other learning technologies.

WebCT. The University is currently using WebCT™ as the standard learning support system, for both distance and on-campus use. Many users have found the program to be very useful in a broad variety of areas, although the learning curve has been described as fairly steep. To aid new faculty users, and to upgrade those who have been using some of its functionality, the University has provided workshops, online materials, and technical assistance to users. As might also be expected and informal peer support system has evolved within and among colleges to use the program.

Compensation. Faculty who develop and deliver distance learning through the recognized University channels are eligible for, and receive, additional compensation. Current practice provided a fee for developing a course (paid only once, without respect to later revisions, whatever their nature), and a separate fee for delivering the course by distance. This compensation may provide the incentive for inexperienced faculty to address distance learning, and may encourage experienced faculty to develop new offerings, and to continue to participate in ongoing delivery of coursework.

Recognition. Additional incentive for faculty to attempt and to excel in distance learning initiative may lie in campus-wide recognition through naming of one faculty member as having made outstanding contributions to distance learning at the University. The award is of those few announced at annual commencement exercises and carries a handsome financial reward.

Other Issues.

On a less formal basis, many of those interested in distance delivery have worked outside of the formal University organization to team-teach innovative courses, participate in doctoral classes, serve as live case studies for graduate students, and to assist in the development of masters and doctoral research projects.

A number of these collaborative efforts have been used to begin to assemble a set of "best practices" for learning evolution in this new century. The experiences have produced results which range from different course structures, adjustments to the traditional "hours of class" requirements, portability of learning, greater convenience to students, and improved faculty skills.

Development of the collaborative approach has involved the use of several faculty and staff development tools at the University System, campus, college and departmental level. The efforts have involved three-day workshops, shorter and more focused seminars, an informal listserve discussion, and training in specific skills for teachers and technicians. All of these have provided significant development challenges for each of the team components: instructional staff, instructional designers, technical staff, and administrators.

Challenges. Challenges in the application of technology and implementation of distance learning abound. Issues such as economic feasibility, and quality of learning offered remain largely unaddressed. Distance learning is being offered by traditional educational institutions, by proprietary educational organization, and in many other forms and formats within and among industry. International opportunities exist and will present unique problems and challenges. Faculty, and institutions, is struggling with questions of intellectual property, ownership of materials, and residual rights to delivery of instruction that has been recorded for distance delivery.

Circularity. Development of faculty for participation in distance learning cannot be viewed as a stand-alone challenge. Distance learning is changing the very fabric of the higher educational process as it seeks to deliver more anytime-anyplace learning opportunities. At the same time, the lessons, techniques, and technology of distance learning must necessarily flow back into the traditional classroom.(Dollar 1999) More and more, classroom teachers are using technology in the actual classroom, or to support other related learning exercises. Classrooms are becoming paperless, learning resources are available from nontraditional sources (Armstrong 2000), the World Wide Web has become a primary source of information, and learners are becoming more able to utilize the multimedia learning resources and tools available online and otherwise. Those who design and facilitate the learning processes must do no less.

Perhaps the model evolving at the University can serve as a basis for development activities in other settings as well.

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Faculty of Education Staff Development—Support of Tomorrow's Teachers

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Abstract: Supported by teacher accreditation organizations promoting technology standards for teachers, and supported by teacher recruiters who are striving to hire new teachers with technology skills, education departments and faculty members are investigating professional development regarding technology. This paper describes an innovative study that collected data through personal interviews from one hundred members of a faculty of education to ascertain views of professional development and professional development needs. Faculty responses provided the field of professional development for educators a more coherent and comprehensive view and linkage with present theory and a foundation for a new model of professional development for faculty involved with educating pre-service and active teachers.

Introduction

Faculty members in departments of education are interested in the impact of technology on education. Faculty members interested in their own professional development regarding technologies to support preservice and inservice teachers are supported by organizations such as the International Society for Technology in Education (ISTE), the American National Council for Accreditation of Teacher Education (NCATE), Canadian provincial governments responsible for education such as Alberta Learning, and by teacher recruiters. ISTE is recommending and NCATE is adopting the inclusion of educational computing and technology standards in the American accreditation for teachers. The Department of Learning in Alberta is including the integration of technology in the provincial curriculum objectives (Alberta Learning), and one superintendent in Alberta is stating a preference to hire only teachers with a strong technology background (University of Alberta, 2001). With interest from faculty, and promotion of technology from accreditation and government bodies and teacher recruiters, this research study was established to better understand professional development for faculty with regard to technology to ultimately support pre-service and in-service teaching/learning.

Wilson and Berne (1998) completed research in the field of professional development for educators, and their work reinforces the need for this study. Wilson and Berne conclude that professional development for educators is only successful if educators drive the content and opportunities themselves. In order to create or enable professional development opportunities for faculty in departments of education in universities, this research study was initiated to investigate the professional development needs.

The Study

The research study used a convenience sample—all one-hundred and twenty faculty and administrative members within one Faculty of Education were invited to participate in the study by meeting personally with one of three experienced graduate student interviewers. Of the 120 invited for interviews, 100 participated. Confidentiality and security measures were implemented and communicated to participants. The interviews were taped and transcribed. The data was then carefully read and sorted and entered into an electronic database where data could be resorted, queried, and classified. Findings were condensed and presented back to the faculty at an open invitation meeting extended to all 120 invitees.

Findings

Responses from faculty member participants (faculty members) in the study provide practical information on what professional development means in their world of work, what they want to learn in the future and how they want to participate. Responses from faculty members also provide the field of professional development for educators a more coherent and comprehensive view and linkage with present theory and a foundation for a new model of professional development for faculty involved with educating pre-service and active teachers.

Perceived Technology Needs of Pre-service and Service Teachers

Faculty members in the study identify technology areas they perceive to be most important to pre-service and in-service teachers. Teachers need to be comfortable learning technology continuously from a variety of sources including their students because technologies are so rapidly changing and evolving. Teachers need to learn to use technology responsibly, to effectively integrate technology with the curriculum, seek creative ways to use the technology to enhance learning, and to use technology to their advantage in their administration. Teachers need to learn to think critically of technologies, to critique materials and equipment, ask what the technology can be used for, question sources of information, consider gaps in accessibility, and consider issues, impact of technology and ethics. To support these perceived technology needs of pre-service and in-service teachers, faculty members seek professional development opportunities. When asked about professional development involving technology, faculty members identified what they are interested in and how they would like to participate.

Faculty Member Participants Choose What to Learn

Participants in the study identify the major barrier to professional development as "lack of time," therefore, when determining what to learn, participants indicate a real need to be selective because there is so much available it is impossible to get to it all. "There is no way in hell you can read it all" (faculty member participant #42). "Need to look real hard for professional development opportunities that will nourish" (85). One participant was appreciative when the technology group selected and recommended training. "Moved to different email and professional development was setup to go with it—that was good" (65). Faculty members state that they are very busy within their own area of interest and want people involved in the technologies to keep them informed; they want people involved in the technologies to be their watchdogs for new and emerging technologies. Participants are also looking to people with experience using any of the technologies to share best practices. In addition to faculty searching for information about technologies, technology specialists and colleagues using technology can help faculty members overcome their lack of knowledge about what is available. "We don't even know what we don't know" (67). Faculty members want a smorgasbord of choices and they want to be sold on the technology. "Someone has to show me good examples and illustrations how technology might be used. A supermarket presented in a way accessible to me. I'd say, I could use that. I'd then need people to help me learn and develop the expertise. I have to see it to see how it would fit what I am doing (67). Faculty members want to learn about everything from "leading edge whatever" (40) to "pretty basic stuff" (28) and they want to

use technology "more effectively, more broadly" (27). For example, faculty members want to investigate how to better search and store, communicate, use bibliographic tools and research analysis programs, integrate technology with curriculum, and use technologies in their planning, teaching, research and management.

What Professional Development Means to Faculty Member Participants

Faculty members indicate their professional development is every day, it is self-directed and it is eclectic. Participants practice skills, investigate what is new and what the technology is capable of, what special requirements would be required, and the purpose. Faculty members self-learn and learn from sharing experiences and best practices. "Talk with people, watch what they are doing, figure out if we can do it that way" (22). Faculty members learn by belonging to professional organizations and by going to and giving presentations. Presentations are "invigorating and informative" (36). Participants also identified reading, reflecting and research as part of their professional development. "Teaching is professional development, writing and research is professional development" (19). Faculty members also learn from local events, documentation, help systems, and tools and services.

Faculty members indicate they want to learn and refine their skills using technology to communicate with student applicants, students, cooperating teachers, teachers, administrators, and colleagues worldwide. Faculty members also want to investigate how technology affects teaching/learning, the integration of technology with the curriculum, the relationship between technology and their area of interest, the impact of technology, gaps in access, ethics and issues regarding technology to support pre-service and in-service teachers.

Practical Professional Development Opportunities

From a practical view, participants identify logistics and characteristics of ideal training initiatives. Demonstrations to preview new software. Bring your own projects workshops, "bring your own data and have a website built in a day" (13), for example. Relevant content with immediate application if it is to be learned and retained. Interaction within courses or workshops with an instructor or students rather than a technology. Faculty members want delivery to be hands-on and interactive. Any demonstrations or courses need to be offered fast, one-half day courses for instance, and they need to be offered multi times so faculty members can choose times to fit their schedules. One-on-one is ideal, but small class sizes and homogenous groups. Objectives need to be included in the course description. The instructor should not assume students' skills, experience or levels of expertise. Instructor needs to break away from computer jargon and speak in plain language. An overhead needs to be used to display computer screens and the instructor needs to physically navigate throughout the room to help everyone keep up. Faculty members want instructors to have better facilitation skills to keep themselves and the class on track and to handle questions that typically hold up the class or divert the class from the objectives.

Faculty members are also suggesting that workshops and courses, no matter how good, need follow-up. "The follow-up must be very specific" (98). "Tutors available after the workshop" (76). Follow up by documentation, help, tools and services, or a community of learners to draw help from. "How do I know about the guy in biological sciences working with similar graphics when I want to do something in graphics" (16). Participants also recommend people in the department become champions of processes to turn around and teach or help others in the department. Participants also suggest the need to find training and support from software companies. Help can be from formal sessions, from informal sessions or online. It was suggested that it is not productive to learn without help. "Learning without help is not an effective use of my time" (86).

All colleagues use hallway help by asking their neighbors for quick verbal help at the time they need help, by having a colleague drop by for a few minutes to provide direction, by informal chats to pick up on tricks and tips, and by faculty working and learning together. Participants described extensive use of and appreciation of hallway help, but draw our attention to their feelings of taking up too much of colleagues valued time, thus they are recommending a formal registry of faculty who can help, a help desk, and house call help. Participants want help available when they need help on whatever topic or program they might be stuck on. Help is requested for horizontal or generic programs such as word processing,

spreadsheets, databases, presentation packages and website development, and help is requested for vertical or specialized training programs such as the research analysis tools. Help desk help can be a formalized help phone line or email, but it can also include a registry of people with expertise who are willing to share or teach others at a specific time or place. An immediate response is preferred but faculty members recognize replies might be delayed depending on the complexity of the question. In addition to wanting a help desk, participants also request house calls. Participants can see the value of house calls to increase their productivity—for a person to come in and help with a specific application or project, to come in and watch to improve efficiency, or to come in and make technical adjustments. One participant makes us aware that some people do not want to read to learn, they want a personal visit. "No, I don't want a list of steps, I want face-to-face, hand-to-hand, I want to have my private tutor" (22). Others, however, are redefining a personal house help call to include an electronic connection. "Want someone to come into my office by linking by speaker phone to walk me through it - like yesterday C&S [Computing and Network Services] walked me through a complete change, it took about 40 minutes" (23).

Faculty members identify tools and services that could be provided to help them with their use of technology. Tools such as grade management programs, centralized databases, telephone answering equipment, virus protect programs. Templates or forms that are user friendy, and advertised and made accessible to faculty members. Services for one-time or once-a-year projects such as a poster or for one-time long-time tasks such as scanning. Faculty members identify the need to have equipment/software and training available and accessible, and constant technical and application support.

Professional Development Model Emerges

Based on input from faculty members, a model for professional development involving technologies emerges. Participants need a system or infrastructure in place to support training and development and an ongoing follow-up system, professional development activities rooted in constructivism, and delivery in line with andragogical principles.

Just as Moore & Kearsley (1997) raise awareness of the need for systems theory when working with technologies, faculty members identify the need for an infrastructure to be in place. The infrastructure is needed to support access to technologies, technical support, professional development training activities, ongoing follow-up support, and a community of users and specialists to draw on. Drawing a comparison, the faculty members' infrastructure equates with Moore & Kearsley's need for systems theory or an interrelated and interdependent system in place to support the use of technology.

When professional development activities are designed, faculty members are demanding principles of constructivism to learn technology in context with their work and with their prior knowledge (Crawford, 1998). Supporting constructivism and the faculty members' recommendations, Wilson and Berne (1998) conclude that professional development for educators is only successful if driven by the educators themselves.

Faculty member participants demand a learner-centered approach in the design and delivery of professional development activities, an approach Boettcher (1999) claims is relevant to both constructivism and andragogy. The learner centered approach to include relative objectives and concepts, interaction with instructor and students rather than the technology, design and delivery tailored to specific learning styles, in plain language, delivered individually or to small numbers of participants, in homogenous groups, by a facilitator trained to keep the class on task, in short courses offered at multi times. The learner centered professional development activities need to be project based, fixed achievement, variable time (10). Boettcher's (1999) conclusions promote relevance of content, participation of learners in the design and implementation stages of the course, self-directedness, facilitated learning and linking of resources to learners, reflection on experience and knowledge, and collaboration or interaction between instructors and learners and among peers to support problem solving and critical thinking. One participant summarizes with the need for adult education. "Need the basic principles of adult education, they need to know how adults learn and apply that to their education designs" (10).

Contribution to Tomorrow's Teachers and the Profession

Although this study is limited to faculty members, other faculties of education may be able to identify with what faculty members in this study want to learn and how they want to participate in professional development. The underlying goal being to discover and disseminate knowledge about the impact of technology, and the integration of technology with teaching and learning to tomorrow's teachers and to fellow colleagues.

Faculty members in departments of education are recognizing the need for both pre-service and active teachers to learn to continuously incorporate technology and become comfortable and innovative in their approach to technology throughout their teaching career. Pre-service teachers need to learn to use the technology to meet accreditation standards. As researchers, faculty members are also interested in what the effects and affects are of technology on learning, and they are interested in issues regarding the present and future use of technology. In their own professional development, faculty members are interested in how technology is or can be implicated within their area of expertise, their teaching, and in their research. Faculty members recognize the need to participate in professional development opportunities to extend their learning and to model attitudes and approaches to technology to tomorrow's pre-service and in-service teachers.

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Engaging Teachers in Building Curriculum Webs
A Promising Strategy for Re-Energizing Professionals

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For the past five years, my colleagues and I have been training teachers to build curriculum webs in the Web Institute for Teachers, an intensive summer professional development experience at the University of Chicago. We have also conducted a professional curriculum development project called Chicago WebDocent that utilizes teachers as curriculum writers in the creation of web-based curriculum materials based on the resources of Chicago-area cultural institutions. Out of these experiences, I have come to believe that the outcomes of teacher growth and engagement are at least as important as web development skills or subject matter knowledge in these efforts.[i]

A curriculum web is is a web page or pages designed to support a curriculum. Building an effective curriculum web is excellent preparation for teaching an effective curriculum unit. Teacher involvement in curriculum development and web design fosters improvements in teaching and in teachers. This is the only way teachers can improve, but it is one way, and it is one that is timely and increasingly available to teachers in schools and in colleges of education.

Curriculum webs are easy to make, given a basic understanding of curriculum development and mastery of the basics of web page creation. Once a teacher or other curriculum developer has produced a few simple curriculum webs, he or she will be ready to incorporate increasingly sophisticated technical and pedagogical techniques. Curriculum webs provide a natural pathway for teacher growth and development, while helping the teacher to keep up with technological and curricular changes.

The availability of information on the Internet and World Wide Web leads to a new role for teachers. In the classroom, teachers who develop their own curriculum webs can become facilitators of learning experiences specifically designed for their students, based on a careful assessment of the students' needs. By engaging in the process of curriculum planning, teachers grow as teachers and as learners, modeling the process for the students as they grow.

Building a web site for learning is itself a process of learning in which meaning is created. Meaning consists of associative relations among concepts or experiences. As people learn, these relations, or meanings, intertwine in complex webs that are built in the medium of ongoing experience. Designing a web site is like creating a mental web of meaning in a set of experiences.[ii] In order to design the site, the teacher who creates a meaningful curriculum web becomes at the same time a more knowledgeable and effective teacher, with a more sophisticated mental map of the subject.

The International Society for Technology in Education's National Educational Technology Standards for Teachers (NETS-T) set forth what teachers should be able to do at three levels: before starting their student teaching; after their student teaching and internship, when they are ready to take over their own classroom; and at the end of the first year of teaching. Among the important things that teachers must learn is to:

- "engage in planning of lesson sequences that effectively integrate technology resources and are consistent with current best practices," and
- "plan and implement technology learning activities that promote student engagement in analysis, synthesis, interpretation, and creation of original products."[iii]

These skills are precisely the ones that can be furthered by having teachers in training develop their own curriculum webs. Additional skills fostered by this process include: critical thinking; data collection; ethical behavior; assessing and selecting resources; planning effective learning activities aligned to standards; creating assessment activities to generate information that can help to improve instructional planning, management, and implementation of learning strategies; and using technology tools to collect, analyze, interpret, represent and communicate data for the purposes of instructional planning and school improvement.

My paper will explore some of the theoretical and practical justifications for promoting the role of teachers as curriculum makers,[iv] and will describe some of the practical issues discovered in our work in

the Web Institute for Teachers and in Chicago WebDocent. This is suitable for either a paper session or a roundtable.

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[i] For more information on the Web Institute for Teachers, see "The Web Institute for Teachers: Engaging Teachers in Developing Web-Based Curriculum," with Ellen Diaryko and Frada Boxer. In D. A. Willis, J. D. Price, & J. Willis (Eds.), Society for Information Technology and Teacher Education Proceedings 2000. Charlottesville, VA: Association for the Advancement of Computing in Education. Also available at http://cuip.uchicago.edu/wit/talks/SITE2000.htm. See also http://webinstituteforteachers.org.

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Database *for Classroom Plans*

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The purpose of this poster/demonstration is to clarify the issues that must be addressed in developing a database for teacher-developed activity plans, lesson plans, and unit plans.

Today, classroom teachers are exposed to an abundance of information about instruction much of which is not relevant to their needs. The Internet is an effective means of providing instructional resources to classroom teachers, but the quality of these resources depends on the professional knowledge and skill of the Web site designer. In a collaborative effort among nationally recognized foreign language educators and technology innovators we have designed a Database for Classroom Plans designed to be an effective teacher resource for pre-service and in-service teachers. We will focus on the design process for this database in this poster/demonstration.

We designed this database to help classroom teachers with the planning process. This database is designed to be very flexible. It will allow classroom teachers to view activities, lessons, and units designed specifically for the content area they teach, and, in addition, this database will allow teachers to connect to a variety of content areas, thus, enhancing interdisciplinary planning. The majority of the examples currently on the database are designed for the content areas of foreign languages and technology. Leaders in foreign language education are encouraging classroom teachers to integrate technology into the foreign language curriculum as suggested by the national student standards for foreign language education. More importantly, foreign language educators need resources that will enable them to increase the integration of technology into their curriculum.

After much thought and discussion about what categories of information are essential in planning and communicating the essence of the plan to others, the following were agreed upon and are included as categories in the database:

- Content area (foreign language, mathematics, science, etc.)
- Subject area (Spanish, multiplication, etc.)
- Title
- Grade level (Pre-K – 16+)
- Performance level (beginning, intermediate, advanced)
- Objectives
- Procedures
- Assessment
- Reflection (author[s]'s reflections on the activity in use)
- Author(s)' name(s)
- Author(s)' school, city, state, email and type of author (whether the primary or secondary author)
- References
- Resources
- National standards (currently available only for Foreign Languages and Technology)

The demonstration and discussion of this Database for Classroom Plans will enable the creators to clarify key issues that relate to on-line resources and to receive feedback on this database and to inform educators about a database that can be effectively used for classroom planning by any content area.

Case Studies of Professional Development

John Fischer, Trinka Messenheimer, Sarah Bombich, Kelly Madger

This presentation is a self-reflective case study of the authors' involvement in a faculty professional development program. This case study of our professional development teases out what might be learned from an innovative program that teams a faculty member involved in teacher education one on one with a "knowledgeable" graduate student. Our experiences over the first year have led us to believe that this form of professional development provides contextual learning in a job embedded manner, such that faculty members leave the experience better prepared to infuse the use of technology into their work with preservice teacher candidates.

For years, the university has struggled to infuse technology in its teacher education programs due to lack of resources and equipment, lack of faculty expertise in technology integration, and lack of programmatic alignment with the ISTE Recommended Foundations in Technology for All Teachers. Recently, the barrier of inadequate equipment and resources has been addressed at the university as well as area K-12 schools. However, program restructuring, curriculum revision, and faculty training are imperative for effective technology infusion in teacher education. The overall goal of the project is to enable preservice teachers to fully utilize modern technology for improved learning and achievement in their future classrooms.

T o describe and support the notions of professional development for technology these cases are framed around the topics of: partnering, structuring the work, characteristics of learners, evolving roles, and impact. The case studies are based on the experiences of two professors and their graduate student mentors for technology training. These case studies represent different learning styles in the professional development process. The similarities and differences will be addressed. Clear indications present us with the need for individually driven / motivated effective professional development.

Standards are only somewhat threatening in the abstract. However, in real practice, especially practice that is reflective, our own work, skills, knowledge can cause us to back away from the enormity of what NET-T means for faculty involved in teacher education. We are not experts. One of us describes herself as having played with a lot of hardware and software at a surface level, but is overwhelmed by the potential for classroom use. The other claims that he plays with the various technology tools, even though they don't work all the time. Sometimes he feels like they don't work at all. And yet as professionals we have been acting to push ourselves and our institution to look at, investigate and struggle with meeting the ISTE standards in one of the largest teacher education programs in the United States. We are seeking to do this by involving ourselves in a PT3 funded program.

Faculty Development Using a Problem-Based Learning Methodology

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Abstract: This paper is based on the premise that university faculty will utilize technology when it solves problems they routinely encounter in their profession. It theorizes that the construction of hypermedia case studies by faculty can encourage the extension of basic skills in technology proficiency into high-end production tools. Faculty view both the product and process as beneficial not only to their students' needs but to their own professional requirements as well. A problem-based learning approach is used that both stimulates dialogue across teams representing universities and k-12 schools and allows for individual team enterprise, direction and creativity.

Introduction

Teacher educators voice many concerns regarding technology integration in their courses. These concerns focus on 1) time and resources for learning the technology and considering how it may be integrated into courses; 2) on-going support while in process on a technology enhanced project; 3) an overwhelming frustration at the speed of technology innovation; and 4) valuation of this work in conjunction with promotion and tenure needs. For teacher educators to value, support and model the integration of curriculum and technology with preservice educators, these concerns must be addressed within a framework that allows faculty to consider how technology might address issues routinely faced by teacher educators. Norton (2000) suggests six areas in which technology can assist in solving teacher educators' problems. These include 1) helping students prepare for class, 2) supporting students' grasp of concepts through collaborative meaning-making, 3) publishing and sharing insight, 4) promoting resource-based problem-solving, 5) modeling how theory translates into practice, and 6) communicating with students to meet diversified learning needs. This author suggests the addition of a seventh: facilitating faculty tenure, promotion and merit needs.

Consideration of these seven areas by faculty informs the basis for the University of Wisconsin Oshkosh, College of Education and Human Services (COEHS) *Faculty Developed Hypermedia Case Studies* project. This professional development opportunity is rooted in problem-based learning, traditional case study methodology, and hypermedia learning theory. While the ultimate outcome of the project will be hypermedia case study products to assist preservice students in the observation of, and reflection on, the complexity of the teaching and learning interactions, the process by which those materials are developed is really the focus of the project.

The project fits into a five-year plan for technology integration in the College of Education and Human Services at UW Oshkosh. Over the past two years faculty have availed themselves of numerous opportunities for development of technology skills and the integration and demonstration of those skills with curriculum in their courses. The third year affords teams of university faculty, k-12 faculty and undergraduate students the opportunity to engage in a collaborative inquiry into pedagogy, case study methodology, and hypermedia technologies.

Rationale

As COEHS faculty consider themselves to be students of how technology can be integrated with curriculum, a problem-based approach was an ideal vehicle for delivering this project. Problem-based learning

proposes that situated learning (Brown, Collin, & Duguid, 1991) in an authentic context (Stepien & Gallagher, 1993) will simultaneously engage students' curiosity, stimulate cognitive mapping, and promote problem-solving and content learning. In the context of the *Faculty Developed Hypermedia Case Studies* project, this approach followed these steps: 1) use of an ill-defined problem that provided the opportunity for dialogue, investigation, collaboration and problem solving; 2) faculty meta-analysis of the big problem leading to identification of specific problem for investigation; 3) infusion of resources - text, mentor, and equipment - to illuminate the processes and theories of case study methodology and hypermedia development; 4) time to collaboratively investigate and collect artifacts; and 5) technical assistance leading to hypermedia case study materials for teacher educators' use with their students.

A problem-based approach was also selected to allow faculty members to again experience the difference between the conventional approach to education and that used both by what Lave (1988) refers to *just plain folks* (JPFs) and experts in fields. Brown (1991) explored the common reasoning processes of these two groups by examining the practices of JPFs and then comparing these observations to those made of highly competent physicists by Roshcelle and Green in 1987. Brown found surprising similarities in the reasoning process of the two groups. Both experts and JPFs have a belief system that treats learning as a sense-making pursuit that grapples with ill-defined problems. Both are heavily situated. Both try to produce reasonable, causal stories about their world. Both negotiate with the situations. Both take as much advantage as possible of their embedded position to help them make inventive and insightful assumptions and approximations.

This is very different from the sort of cognitive activity that Resnick (1987) has shown as being championed in our current educational system. It also differs greatly from past models of problem solving which evolved from the imposition of the discourse method of scientific methodology. While there appears to be a continuum between the JPF and the expert, there is clear discontinuity between the student and the expert (Figure 1).

	JPF's (Just Plain Folks)	**Students**	**Expert Practice**
Reasoning with:	Causal stories	Laws	Causal models
Acting on:	Situations	Symbols	Conceptual situations
Resolving:	Emergent dilemmas	Well-defined problems	Ill-defined problems
Producing:	Negotiable meaning, socially constructed	Fixed meanings, immutable understanding	Negotiated meaning, socially constructed, concept understanding

Figure 1: Learning activity: JPF's, Students, and Experts

Traditional courses for teacher education students often deal with theories that act upon abstract concepts dealing with problems that fall neatly within the parameters of the theory under discussion. In the real field of the classroom, problems teachers encounter can rarely be linked to individual theory much less solved by strict application of any theoretical constructs. Therein lies the conundrum faced by first year teachers. Having been nurtured by years by an educational system that champions learning as an individual process in which opaque and disconnected symbols are manipulated with little connection to the real world, it is little wonder that teachers often express aloud that they learned little in their undergraduate coursework that was of use when they actually started teaching and that the best learning occurred on the job.

Case-based instruction may serve as a means for addressing this problem. Merseth (1999) sets forth four categories in which case study instruction is of benefit to teacher education students. She states that cases and case-based instruction help students to develop skills of critical analysis and problem-solving, encourage the development of higher order cognitive thinking and the generation of multiple pedagogical techniques, foster reflection, and help present a realistic picture of the complexities of teaching.

A hypermedia approach to case study was selected because of the potential for learning afforded faculty members and for its benefit to students as well. Hypermedia is a common methodology today for constructivist learning environments. Its features can support learning as well as learning strategies. It can support learning through enhanced motivation, encoding and retention of the knowledge, and the use of the knowledge. This support is facilitated through the use of good organization and sequence of the hypermedia program. Hoffman (1997) recommends the application of elaboration theory in hypermedia design thus beginning with the big picture and then sequentially adding the depth of details and artifacts. While hypermedia

programs may not incorporate actual interactions within their scope, it is important to provide features that support learning strategies. These strategies do not occur solely on-line; rather, they acknowledge the need for a facilitator outside the program to guide students in interactions, reflections and activities that extend the information presented within the hypermedia program.

Project Design

In spring of 2001, the Hypermedia Case Study project was announced at the annual Collegiate Classrooms for the New Millennium symposium. Over the next two weeks, nine faculty members indicated interest in the project. Those university faculty members were asked to team up with a k-12 faculty member of their choice. During the summer of 2001, teams could request funding to begin to consider what direction their individual case studies might take. It was suggested to each team that it was appropriate to think beyond the usual case study subjects and extend their investigations into those areas that are notoriously difficult for teacher education students to grasp, critical to their first year of teaching, and typically not covered in the usual course work

In September 2001, the teams – both university and k-12 faculty – came together at a one-day retreat. Dr. Selma Wassermann, professor emeritus of Simon Frasier University, was scheduled to be the guest facilitator. Unfortunately, the events of September 11 prevented her from flying to Wisconsin. We were able to continue the retreat through the use of on-line video conferencing and phone conferencing with Dr. Wassermann. Each team presented their area of focus. These ranged from student discipline issues in a middle school social studies class, the formation of a charter school within a school at two local elementary schools, ESL techniques with elementary school children, serving special needs students in the regular classroom, technology infusion in curriculum, to a holistic view of an elementary classroom from multiple perspectives of analysis.

Dr. Wassermann led teams through an analysis of a case study that then led to consideration of the critical elements for any case study. Next, teams were introduced to the concept of storyboarding and were asked to consider how the case study they worked on with Dr. Wassermann might have been storyboarded and how it might have been enriched with supporting artifacts. Next, examples of hypermedia case studies were presented and discussion of those examples centered on the format selected and the artifacts needed to bring the case study to life. Teams were given a selection of books for background information. These included *Multimedia for Learning* (Alessi and Trollip, 2001), *Who Learns What from Cases and How* (Lundeberg, et al, 1999, *Getting Down to Cases: Learning to Teach with Case Studies* (Wassermann) and *Introduction to Case Method Teaching: A Guide to the Galaxy* (Wassermann, 1994).

Each team received both a digital video camera and a digital still camera. Brief instructions were given in the use of the equipment with each team signing up for a subsequent longer session with a staff member of the UW Oshkosh Instructional Development and Authoring (IDEA) lab. Faculty were asked to begin to collect artifacts – still photos, videotapes, student work, lesson plans, etc. – for inclusion in a team database of materials available for hypermedia formatting at a later date.

Individual teams also made appointments to meet via phone with Dr. Wassermann to discuss their project's goals and objectives. As was expected, Dr. Wassermann indicated that each group was in a different place on the continuum of the project scope. Some were just beginning to focus on an area, others were on their way with well-defined plans of action and two teams were still seeking k-12 faculty partners. During the following two weeks, the two teams requiring k-12 faculty partners made their connections and conferenced with Dr. Wassermann. She remains available for feedback and support to each group; to date, one group has met with her extensively via phone conferencing.

In January, teams will meet with our instructional designers to discuss alternative software packages available for publication of their hypermedia case studies. The available alternatives have been selected to cover a range of difficulty and include PowerPoint, SuperCard, Flash, Director and Authorware. Teams will be encouraged to push their limits; settling for PowerPoint because it is familiar and safe was not what the grant intended. After the presentations, teams will meet to consider their needs and learning styles. Based on the software selected, they will be matched to an individual IDEA lab staff member for mentoring in both learning the software and preparation of the materials.

During the spring 2002 semester, additional workshops will be held on the use of digital video editing software, photograph manipulation software, and the hypermedia software selected. An additional workshop with Dr. Wassermann is planned in late April of 2002. Undergraduate students will join the teams in the spring

as well. They will preview the materials and make suggestions from a user's viewpoint. Some teams may opt to have the undergraduate students ask questions of the k-12 faculty for inclusion in the hypermedia case study. In the summer of 2002, university and k-12 faculty will work with IDEA lab partner to complete their video case studies. Pending availability of funding, additional case study projects will be funded in the 2002-2003 academic year.

Conclusion

The Hypermedia Case Study project has been well received by the faculty in the College of Education and Human Services at the University of Wisconsin Oshkosh because it fulfills Norton's criteria as well as that proposed by the author. The final product – the hypermedia case study – will assist teacher education students to be better prepared for their student teaching experience, will support students' grasp of concepts through collaborative meaning-making and shared insight, promote resource-based problem-solving, and modeling how theory translates into practice. Case study methodology presented in a hypermedia format does meet diversified learning needs. Finally, faculty are pleased to be able to use technology to produce a product that will facilitate their tenure, promotion and merit needs.

Again, the finished product was not the goal of the grant that funded this initiative. Rather, this project was about the process of developing that product. The collegiality and study with fellow faculty members at both the university level and the k-12 level and with those at a distance were fundamental to the process. The experience of participation in a problem-based learning situation, the willingness to grapple with the discomfort of self-selected project scope and sequence, and the assumption of risk in learning new technologies – digital cameras, video editing software, photo manipulation software and hypermedia production software – have proven to faculty that they can be at the cutting edge of technology innovation and utilize those skills in their teaching and scholarship.

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Operationalizing a Technology Standard with Proficiency Skill Sets

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Abstract: This paper begins with an overview of the existing program which operationalizes the California technology standard for K-12 teachers with the California Technology Assistance Program (CTAP) Region 8 technology proficiencies. It is supplemented by a link to a PowerPoint presentation and demonstrations of the following web sites: 1) the CTAP Region 8 site (http://www.ctap.org/ctc/) includes a rubric for three levels of certification and digitized video examples of exhibits at Levels 1 and 2; 2) the California technology standard (http://www.csub.edu/~dgeorgi/contents/techstand.htm); 3) the PT3 grant that helped coordinate these efforts (www.projecttnt.com). Next, a description of the process involved in coordinating this certification process with K-12 districts and teacher credential programs. To date, over 500 teachers have been certified including growing a cadre of Level 3 leader/mentors. An interactive discussion on implications for those present will conclude the session.

Introduction

In 1997, the California legislature passed a law mandating the development of a technology standard for K-12 teachers that would be used in the credentialing of new teachers and in the review of teacher credential programs. The Technology Education Advisory Committee (TEAC) was selected from among diverse constituencies to research the topic and develop recommendations for the Commission on Teacher Credentialing (CTC). The TEAC met many times over the next year and engaged the services of the State Librarian to research the efficacy of technology on the teaching and learning process (Umbach Report). A preliminary set of recommendations was sent to all pertinent institutions and individuals for field review. Taking the feedback from the field, the TEAC proceeded to develop language for a technology standard with a number of "factors to consider" that would be used to accredit teacher preparation programs (http://www.csub.edu/~dgeorgi/contents/techstand.htm). The recommendations were presented to the CTC in December, 1998 and were accepted. At first, the new standard was to be made effective in January, 2000, but a number of institutions requested more time and currently the standard will be effective in January 2002. All teacher preparation programs in California have been requested to submit plans for implementation of the standard and a number of methods have been proposed and were accepted. In September, 2001 California adopted a whole new set of teacher credential standards. The Technology Standard was slightly reworded and included as Standard 9 The technology plans written to Standard 20.5 are still in effect under the new standards.

Meanwhile, the California Technology Assistance Program (CTAP), a consortium of regional offices coordinated by the California Office of Education, was working on developing its own technology standards for teachers. Region 8, consisting of four central California counties, decided to build on the work of the CEAP by taking the technology standard's factors to consider and using them as skill sets for technology proficiencies. The CTAP Region 8 Advisory Committee met several times and developed a rubric for assessing technology skills (http://www.ctap.org/ctc/). The rubric has been used by K-12 districts to organize professional development activities and by teacher preparation programs at CSU Bakersfield. A federal PT3 project included a task force on Technology Proficiencies and helped coordinate the effort (www.projecttnt.com).

The CTC technology standard divided its levels of proficiency to articulate with the system for obtaining a teacher credential in California, which is a two level system. Meeting level 1 is a requirement for a candidate must be recommended for a preliminary credential. Meeting level 2 is required for recommendation for a professional clear credential. Level 1 is primarily personal computer skills with some application to teaching responsibilities; level 2 involves the integration of computer skills into teaching responsibilities.

CTAP Region 8 proficiencies have been organized into a rubric based on the two tiers described above and added a level 3 for advanced certification. All certification is done on the basis of portfolios assembled by the teachers. Teachers can be certified at level 3 as either mentors, whose main responsibility is training other teachers, and leaders, who serve as tech coordinators or administrators. Level 3 teachers can certify level 1 and 2 teachers.

Results

As a result of implementing a coherent approach to certifying teachers at various proficiency levels, a number of positive results have occurred.

First, technology skill training is directed toward meeting the levels of certification. This ensures that teachers attending training sessions are at an appropriate skill level and for specified skill development; avoiding some teachers being lost and others bored. This also allows all training at K-12 schools and university teacher credential programs to be articulated on the factors underlying the technology standard.

Second, teachers are encouraged to attain certification at all levels. Some schools offer a bonus for attaining level 2. Level 3 teachers often receive stipends for the training and administrative tasks they perform.

Third, by having level 3 teachers certify levels 1 and 2, the presence of expertise has been greatly expanded. Most local schools have at least one level 3 teacher and many schools are including the attainment of specified percentages of faculty attaining each level by specified deadlines. A strong cadre of level 3 teachers is being developed and will soon be adequate to provide technical support for local schools.

Fourth, by having a common certification system, unprecedented collaboration is occurring among schools and university teacher credential programs. Level 3 teachers are participating in the writing and implementation of a variety of grants and projects involving technology. One example is the Preparing Tomorrow's Teachers to Use Technology Implementation federal grant, which includes a Technology Proficiencies Task Force. CTAP Region 8, local teachers and university professors have collaborated in developing a web site that includes the technology proficiencies rubric, application for certification, and examples exhibits that meet most proficiencies. In addition, a list of certified teachers is maintained at the CTAP Region 8 office and is posted on its web site. This is a further incentive for teachers to attain certification as it indicates that all teachers are expected to have demonstrated technology skills.

In addition to the positive results of this system, a number of problems have emerged.

First, articulation between CTAP Region 8 and instructors in the university teacher credential programs has had difficulties. University professors have been slow to get certified to level 3. CTAP Region 8 has offered to provide such professors with level 3 teachers so students in university classes can have their portfolios certified officially.

Second, it is difficult to ensure that all candidates will have access to certification. The university credential programs have submitted a plan to the CTC stating that by June, 2001, all credential candidates will be required to attain levels 1 and 2 in order to be recommended for the preliminary and then the professional clear credential. Because of the large number of credential candidates, an independent study course in Technology Portfolio Certification is being developed to meet the needs of out of state teachers and others who fall through the cracks. In addition, the state of California has contracted with National Evaluation Systems to develop a test our procedure for level 1, primarily for out of state teachers.

Third, some universities in the region refuse to participate in the system, citing turf issues. They will be required by the state to meet the technology standard in their own ways.

Fourth, other regions and the state level CTAP are developing their own systems, which may have a future impact on the Region 8 system. Similarly, the ISTE standards are seen by some as a model on which to base training. In response, a correlation chart has been developed, which indicates where specific skills are located in each system.

Conclusion

The implementation of a technology proficiency skill sets certification system based on a state technology standard has had dramatic positive effects on the development of technology skills in local schools. The certification of hundreds of teachers at levels 1 and 2 has encouraged many teachers, including those with life credentials, to develop technology skills that enhance the teaching-learning process. The increasing presence of level 3 teachers is providing that most commonly missing element in technology professional development: adequate and accessible technical support. As an added benefit, the awareness of the importance of technology in schools among level 3 teachers has produced that second most commonly missing element: equipment and training as a result of grant writing activities. As the new technology standard goes into effect, the system described in this paper can be expected to continue to promote the development of technology fluent teachers in local schools.

References

You can access all the documents for this presentation at
http://www.csub.edu/~dgeorgi/pres_refs/SITE2002.doc

California Technology Standard 20.5
http://www.csub.edu/~dgeorgi/pres_refs/technology_pamphlet.pdf

California's New Teacher Credentialing Standard 9 for Technology
http://www.csub.edu/~dgeorgi/pres_refs/standard9

CTAP Region 8 web site http://www.ctap.org/ctc/

An overview of the certification process is at http://www.ctap.org/ctc/TechCert.html

Download the Application, Checklist and Portfolio Suggestions from
http://www.ctap.org/ctc/download.htm
This page also has links to lists of Level 3 certified Mentors and Leaders

Online training of attaining the proficiencies, including video based instruction, is at
http://www.ctap.org/ctc/training.htm

All credential-granting institutions are required to plan to meet the Technology Standard
http://www.ctc.ca.gov/codcor.doc/999916/999916.html

Correlation chart of ISTE and California Standards
http://www.csub.edu/~dgeorgi/pres_refs/NETS-CEAPclr.pdf

Digital High School Project Formative Assessment Report on Highland High School describes exemplary skill development among faculty and students as a result of having the resources and the proficiency framework to organize the skill development.
http://www.csub.edu/~dgeorgi/pres_refs/DHSEvalRepDr.doc

Teaching with New Technologies, a federal PT3 project www.projecttnt.com

Technology Leadership Community - Students as Teachers

Scotty Govaars, Department of Defense Dependents Schools -Europe, US
Pat Ridge, Department of Defense Dependents Schools - Europe, US

This poster session will focus on case studies of students and teachers from several of the Department of Defense Dependents Schools throughout Europe who are currently offering a new course, entitled "Technology Leadership Community" or "TLC".

TLC Course Description

The course is about teaching, learning, and learning to teach. The domain of information is technology and technology skills.

Technology Leadership Community (TLC)

Grade Level: 7-12

Length Of Course: 18-36 Weeks

Recommendations:

Experience with PCs, strong working knowledge of applications used in school and capacity to learn newest technologies, interest in education and teaching. Students must be self-motivated and have a high level of personal responsibility.

Major Concepts/Content:

The TLC class merges learning the newest computer technologies with learning how to effectively teach others those technologies. Students collaboratively study and learn new software packages and computer skills while learning how to become effective trainers and educators. In addition to raising the technological knowledge of the school community, TLC students examine their own roles as teachers and learners, increasing their learning abilities in all other classes.

Major Instructional Activities:

This course is designed to train students to become effective teachers and learners by complementing the technology support in their school community.

Technology study includes Internet navigation and searching, web page creation, server management, desktop publishing and graphics applications, GIS, CAD, and other specialized software. Pedagogical study includes methodology of teaching, materials preparation, presentation strategies, evaluation techniques, and formalized self-reflection activities such as log-keeping and using videotape to observe, analyze, and improve their own teaching efforts.

Teaching activities include weekly one-on-one mentoring sessions with faculty, staff, students or community members; teaching in larger group situations (such as another classroom learning a single application); and preparing manuals and other instructional materials for their "clients." Other activities include regularly assessing the school's technology learning needs and developing strategies to effectively meet those needs.

Major Evaluative Techniques:

Students will create their own assessment rubrics and goals. Doing so enables them to set learning objectives and have a clear understanding of what is expected of them. They do this individually with the teacher. The students will also be graded on completion of tasks and participation and there will be several take-home essays that reflect what the student has learned at different points in the semester.

Assessment Will Be Based On:

How well they learned to identify, analyze, and improve their teaching abilities through their video and writing work. This will be based on survey and writing assignments, comparison of pre/post surveys, and essay writing.

How well their mentees learned the technology material. Teachers and other mentees are asked in survey form to assess their experiences with the TLC students. The TLC student assesses himself and a combination of this data describes how the student performed.

The degree in which a student's technological knowledge improved. The TLC teacher, along with the student, will examine the pre/post surveys and determine how much of the technological knowledge the student learned. Students are expected to attain a high level of competence in one or two applications, rather than learning only a little about as many applications as possible.

Essential Objectives:

Upon completion of the course, students should be able to

Demonstrate how teaching others enhance one's own learning abilities and styles, in any subject.

Demonstrate technological competency on at least one application. Competency is defined as thorough knowledge of the program, fluency with operation, and ability to explore with the tool.

Design a teaching unit or activity, including an assessment piece about a specific software or technological application.

Demonstrate growth in communicative, developmental and social areas. For example, students learn how to become articulate, develop confidence to communicate clearly with adults and youngsters, become methodical in their learning styles, attain a very high degree of responsibility.

Help the school use the complex technologies already in place, working with and complementing the training tasks of the Education Technologist, and also develop new training programs to meet changing demands.

Demonstrate that work of this nature is directly tied to real-world workplace skills.

This is a course that engages the student in the learning process. The content and activities serve to get students to think of themselves as learners, identify their own learning patterns and styles, and improve as learners. They do this by studying how to teach, by teaching others, and by reflecting upon themselves as teachers and learners.

The topic they teach is technology. This is not a technology learning class per se; it is not a computer education, application, or programming course. Those topics may be included, but it is primarily about learning how to teach technological information to others.

This is also not a "students-as-techies" course or program. While students in the TLC may learn how to service an LCD projector or a printer, their job is not to visit a classroom and change a printer cartridge, but rather demonstrate to the faculty in one-session maintenance procedures on a range of common technological equipment. TLC students are the leaders of the school, and presumably the leaders of tomorrow; therefore it wouldn't make sense to exploit their knowledge by having them tasked to fix problems everywhere.

The TLC course contains rigorous academic activities as well as demanding technological experiences.

Expanding Teachers' Literacy in Science and Mathematics: Basing Technology Professional Development on Histories of Classroom Practice and Beliefs

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Abstract: One hundred four middle school mathematics and science teachers committed to participating in a professional development summer institute with approximately 90 hours of instruction in the use of educational CD-ROMs, calculator-based laboratory, and microcomputer-based laboratory. Prior to the institute we were able to make classroom observations of teachers and collect various types of data in order to construct a rich description of the teachers. This paper will describe the types and frequencies of activities in the classroom.

Introduction

As pressure is exerted upon educational systems to implement instructional technologies, teachers' abilities to accept change and adopt innovations become key factors for success. Finding successful methods for educating teachers to use new technologies and working with them to adopt new pedagogical approaches is a widespread concern.

Evaluation of summer professional development institutes often takes the form of collecting data at the beginning of the institute, in the form of tests or surveys, and collecting data again at the end of the institute (Fenstermacher & Berliner, 1985; Lock & Dunkerton, 1989). Recently, more studies have been designed to follow the teachers during the school year after the institute (Barrow & Sawanakunanont, 1994; MacArthur et al., 1995; Shroyer & Borchers, 1996). The impact on teachers participating in summer professional development institutes has often been reported without definitive knowledge of the teachers' performance prior to the institute. Using a constructivist framework, evaluators would recognize that teachers do not begin the institutes as "blank slates," rather they begin with a history of classroom practice and beliefs that become part of the institute.

This study is based on work with a group of rural middle school teachers assigned to teach mathematics and science in eastern North Carolina. The intensive, 3-year, high support program began with a summer workshop with 90 hours of instruction in the use of CD-ROMs, CBL, MBL, and inquiry techniques. These technologies were not previously widely available in our state's middle school classrooms, particularly in rural areas. The teachers entered the EMPOWER program in math-science teams from 41 schools. Teaming teachers was important for potential interdisciplinary cooperation, social environment necessary for diffusion of innovation, and support structure for adopting math and science reforms (George, Stevenson, Thomason, & Beane, 1992; Rogers, 1995; Sparks, 1997).

Design of the Study

The study's focus was the generation of a rich description of the entering characteristics of rural middle school mathematics and science teachers prior to entering a long-term inservice program. Data collection procedures involved observation of participants, document analysis, an open-ended essay questionnaire, a personality type instrument, and a questionnaire investigating the type and frequency of activities in teachers' classrooms during the spring before the initiation of the inservice program. This paper will highlight the type and frequency of classroom activities.

Sample

EMPOWER was an inservice program for middle school mathematics and science teachers sponsored in part by the National Science Foundation (NSF). One hundred and four practicing teachers participated in the workshop instruction. The participants represented a wide range of backgrounds, years of teaching experience, and teaching assignments. The teachers were primarily from rural middle schools in eastern North Carolina. Some participants had used computers and calculators in the classroom before, but many had never used MBL, CBL, or graphing calculators.

Types of classroom activities

A self-report questionnaire was used to measure the activities of instruction for an 8 week period of the spring semester. The instructional activities listed in the questionnaire were based on the *Local Systemic Change through Teacher Enhancement: 1997 Teacher Questionnaire, K-8 Science* (Horizon Research, 1996) and the *1997 Local Systemic Change Classroom Observation Protocol* (Horizon Research, 1997). The teachers were instructed to use their lesson plan books or planning calendars to categorize activities and count frequencies with a 1*(daily)* to 6*(never)* scale. The teachers were asked to do the counts on the first math or science class taught each day. A wide range of possible classroom activities were included along with open-ended items.

Data analysis and results

Although participants had used computers and calculators in the classroom before, many had never used graphing calculators and none had used MBL or CBL to collect data. The 10.87% of the teachers who had never used calculators in teaching were all assigned to teach science. Graphing calculators were used by over half of the teachers for computation. Computers were used by the largest percentage of teachers for word processing, drill and practice and spreadsheets.

Conclusion

Middle school mathematics and science teachers may need more experience with the many uses of graphing calculators and computers. In particular, using them as tools for data collection should be addressed. Providing experience and practice in many facets of calculator and computer use should be considered in designing professional development programs. Teachers need time to develop a comfort level with the technology and time to consider and develop teaching strategies to accompany the technology. The many possible uses of graphing calculators and computers for data collection and problem solving should be introduced to teachers, particularly when large numbers are teaching out of field. Their methods courses as preservice teachers would not necessarily touch upon these subjects. The instruction in these technologies could be used as an anchor for introducing subject matter content.

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Effective schools, Effective learning, Effective tools

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The interest in technology has been altered substantially. It is now seen as a critical application of effective teaching and learning strategies. It is a facilitative experience in using and acquiring knowledge and information. This represents a study and examination of a school committed to renewal and improvement. It has carefully initiated teacher leadership activities and practices. It has sought ways of incorporating meaningful change within the classroom context of teaching and learning. Technology and its wise and appropriate use are critical to this enterprise. This session will consider the application, analysis, interpretation, and summary of technological strategies to promote student learning, increasing the effectiveness of the teacher and the teaching process. Specifically it will consider the use of the IPAQ computer in a middle school talented and gifted program. Data and information will be shared that exemplify best practices for teachers, students, prospective teachers, and administrators. As a part of the report, the impact that technology and this specific program will be examined as these relate to preservice and inservice dimensions of professional growth.

Using Video Ethnographies for Professional Development of Educators

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Peter Chan, Brigham Young University, US
Ping Zeng, Brigham Young University, US
Carol Greene, Virginia Tech, US
Susan Magliaro, Virginia Tech, US

Purpose

This panel will provide an extensive examination of an emerging approach to profession development--video ethnography from four different perspectives: pedagogical foundations, demonstration, national and international applications, and current research studies.

1) "Pedagogical Foundations of Video Ethnography" by Carl Harris

The pedagogy for video ethnography is based in specific principles of constructivist learning. According to learning scholars there are at least four critical elements of learning that must exist if learners are to be fully engaged in the learning process and develop deep, reflective thinking patterns that will transfer to other contexts. First, learners must be confronted with problems and frame questions that genuinely mirror the world beyond the classroom. Second, the problems and questions must come to have personal meaning to the learners. Third, the process of teaching learners how to frame questions and inquire after solutions must model active inquiry pedagogy (i.e., practice in inquiring about and finding their own answers). Fourth, the display of learning must be to real audiences, for example, those who can benefit from and who have a vital interest in the problems and questions, in addition to teachers and peers. In developing the pedagogy for the use of video ethnography and in the development of video ethnographies, Harris has attended carefully to the inclusion of opportunities for students to engage in learning tasks that address these four critical elements of learning. While scholars might log on to the video ethnography web site and use the case to illustrate points in their lectures, the deep learning that can accompany this work emerges only as one embraces not only use of video ethnographic cases but the pedagogy of video ethnography as well.

2) "Demonstrations of Video Ethnography" by Peter Chan

This part of the presentation will focus on demonstrating the actual CD-ROM interface. The Video Ethnography CD-ROM consists of three main parts: (1) Exploration, (2) Creation, and (3) Supporting Functions.

Part 1: Exploration

This part of the CD-ROM includes several study buttons. Each button launches six to nine "probe" buttons, which represent the study of the case teacher from a general educational principle. Each "probe" button brings a video clip showing classroom activities that illustrate a particular aspect of the principle. A video slider is located at the bottom of the video screen so that users can slide to any part of the video when they choose to repeat part of it. At the bottom of the display are the perspectives (commentaries) on what happened in the video clip. The perspectives may come from the case teacher, another teacher, a student, a teacher educator, a school administrator, and professional literature depending on the nature of the case. Each of the perspectives is in both audio and text formats.

Part 2: Creation

The second part of the CD-ROM allows users to create their own video ethnographies by manipulating the provided video clips into any desired order and commenting on what they perceive to happen in these clips. This part of the CD-ROM may be used for recording personal reflections, comments, elaborations, and new insights related to what they have studied in the Exploration part. It may also be used as an instructional, researching, and demonstrating tool.

Part 3: Support Functions

The CD-ROM has supporting functions such as text transcriptions, Internet connection, tutorial, and general help.

3) "National and International Applications of Video Ethnography" by Carl Harris, Peter Chan, & Ping Zeng
This part of the presentation will show various applications of video ethnographies from elementary to higher education and from Utah to Beijing and Xian, China. It will be broken down further into three shorter sections

(a) *"Julene Kendall Case Study: A Video Ethnography of Teaching in an Elementary English as a Second Language (ESL) Classroom"* by Carl Harris
The Julene Kendell Case Study allows teachers to explore strategies and principles of teaching ESL students. Furthermore, the case study engages learners in building and documenting their own interpretation of the Kendell case from various perspectives. Students share and seek feedback from peers as well as the course instructor. The cases, while interesting in and of themselves, are most interesting because they allow students to see the theory in practice and the practice of theory. This duality is made visible for and accessible to students through the pedagogy of video ethnography.

In the Julene Kendell Case Study the strands of focus articulated by the case author are 1) Building Community in the Classroom; 2) Visual Cues; 3) Hands-on Activities; 4) Guarded Vocabulary; and 5) Classroom Management. Each of these strands is represented by a study button that links to seven probes: 1) Use of Names; 2) Chance to Share; 3) Comfort Zone; 4) Social Skills; 5) Use of Space; 6) Friendly Environment; and 7) Cooperative Learning.

(b) *"Experiences from using video ethnographies with teachers from Beijing and other parts of China"* by Peter Chan
Besides the applications in the United States, video ethnography CD-ROMs were also developed in Chinese for professional development of Chinese teachers. The first two Chinese CDs focused on developing thinking skills of elementary and secondary students. Ten teachers in Beijing were asked to extensively evaluate these CDs over a four-day period. Multiple methods were used in the evaluation. The CDs were also used as the parts of the key instructional materials in two consecutive Chinese conferences on teacher education and received positive responses from the participants. An American video ethnography on persuasive writing was translated into Chinese earlier this year for intercultural studies, which will also be demonstrated at the conference.

(c) *"Content Design of A Video Ethnography of the Pre-service Student teaching in A Foreign Setting"* by Ping Zeng
Normally, pre-service students have little idea about the countries where they would have their teaching experience. What they would prepare as the possible teaching plans, instructional and assessment tools may not fit the target cultural settings. Similarly, the host schools in the countries other than America need to know about how, on the one hand, to utilize the resources of the student teachers and their teaching methods to benefit the local students, and, on the other hand, to make the environment more favorable for the career development of the pre-service students. Without some background training, these students will have to face some possible cultural barriers and difficulties in their teaching and their social life in the unfamiliar cultures.

This paper aims at introducing a combination of a new technological tool, a video ethnography and some constructive principles of content design to serve the purpose of solving the problems listed above. The template, developed by Dr. Carl Harris and David Baker, is chosen to be the instructional tool and its content format is designed to contain the substantial data about the real teaching experiences of the BYU students in Xi'an, China. The final product can be used to acquaint the future pre-service students in advance in the aspects of educational system, prevailing pedagogies, problem-solving skills, cultural traditions, and customs. It should be able to help not only these students adapt to new cultures quicker and easier, but also benefit the host school administrators, providing them with information of the educational performances in North

America, and of how much and in what aspects such performances are constructive to the local curriculum development. Consequently, the co-teaching and the cooperation between the student teachers and the local teachers can be more successfully executed. Moreover, teacher educators may also use it for academic studies, particularly in the areas of comparisons of educational systems and the teacher education in foreign settings.

4) "A Technology-Enhanced Field Experience" by Susan G. Magliaro and H. Carol Greene
This part of the presentation will show a research study using video ethnography.

This project added an experimental field experience component to an existing educational psychology foundations course for pre-service teachers that is offered at Virginia Tech. This was done through the use of video-based case studies. The focus was on the solving of authentic video-based cases that highlighted the psychological, emotional, cultural, and social dimensions of teaching and learning.

The specific objectives of this discussion are to focus on:

1. the learning outcomes related to principles of educational psychology,
2. the learning outcomes related to teaching practices, and
3. the enhancement of participants' learning about and appreciation for diverse educational settings

While a full report of the findings will be shared at the presentation, a sample of the results is highlighted here. Preservice teachers noted several advantages of having the electronic field experiences. Among those mentioned were: opportunities to see classrooms and teachers from diverse communities; opportunities to see outstanding teachers from their respective fields; and opportunities for them to critically analyze a lesson. One student even mentioned the "bird's eye view" the camera offered, allowing them to see the classroom and students from various angles and perspectives, rather than simply the view from the back of the room. Comments about the case studies increasing their understanding of educational psychology concepts occurred frequently. The students cited the videos as helping them to make concrete the concepts that seemed very abstract when read from the textbook alone. They als o stated that seeing teachers perform the methods and strategies talked about in class served as a good modeling agent. This was enhanced by the fact that the "field experience," because it was electronically offered, was both immediate and coordinated with the classroom discourse. The case studies immediately followed a topic or concept that was under discussion in the course.

Changing the Role of the Teacher: Promoting Meaningful Learning Through Collaboration between Teachers, Students, Technology and Professional Development.

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Introduction

The problem of inappropriate integration of technology into the classroom is not the fault of the teacher, rather it is the current model of teacher training. Regardless of fault, the problem must be addressed. While education resorts to improving teacher use of technology through training, it is necessary that the current model of teacher training with technology be abandoned. A series of one-day seminars, or periodic after-school instructional sessions will not keep teachers at the pace of current school reforms (RAND, 1995). While the scope and scheduling of training must change, the content and approach to teacher training with technology must also be addressed. This paper will discuss the current model of teacher training with technology, technology and meaningful learning, and guidelines for teacher training with technology.

Current Model of Teacher Training with Technology.

Current teacher training involves the development of skills associated with various software. For example, at one rural school, each teacher was given a laptop computer. Prior to receiving the computer, each teacher had to attend a workshop on "How to Use PowerPoint". While presentation software can be helpful in creating meaningful learning experiences, it was obvious that the focus of the workshop was to improve teacher presentations. There was no mention of methods to apply the computer to assist in student learning. Also, some software that would have more potential in creating meaningful learning environments are database programs, spreadsheet programs, concept mapping software, hypermedia construction software, and microworld environments software (Jonassen, 1996). While many of these could obviously not have been discussed in two or three after-school sessions (the length of the PowerPoint workshop), possibilities for their use in the classroom and the relevance of technology in education could have been introduced, discussed, and modeled. It is the modeling and implementing of relevant learning environments, in order to promote meaningful learning, using technology that must move to the forefront of training teachers with technology.

Technology and Meaningful Learning

"Students do not learn from teachers, they learn from thinking." (Jonassen, et al, 2000). Activities that facilitate "thinking" can provide meaningful learning experiences for the learner. These activities should be active, constructive, intentional, authentic, and cooperative. (Jonassen, 1996) Active learning involves tasks in which the learners manipulate objects in the learning environment and observe the consequences of their actions. Constructive learning involves learners reflecting upon their learning experience, and articulating those reflections. Learners construct their own "mental models" to explain their experiences. Intentional learning occurs when learners are attempting to achieve a learning goal of their own. Authentic learning activities occur when learning tasks are modeled after real-world problems or situations. Cooperative learning occurs when individuals work with others in formulating "mental models" and communicate their findings to others (Jonassen, 1999). Each of these must be addressed as teachers are developing meaningful learning activities and environments for students.

There are a number of learning environments that promote the partnership between students and technology (Jonassen, 1999). One of these learning environments involves Internet Learning Activities. These include students creating home pages (student, class, or school), role playing on the web, cybermentoring (communicating through the Internet), and supporting scientific experimentation through the Internet. Video Learning Activities can also promote meaningful learning. These include activities such as video press conferencing, producing student talk shows, creating video documentaries, and developing video theater. Multimedia Environments, including multimedia environment software (*Exploring the Nardoo*) and constructing hypermedia, can also be used to foster meaningful learning with technology. Other examples include constructing databases, semantic networks, and expert systems. The purposes of all of these activities is to promote active, constructive, intentional, authentic, and cooperative learning environments

Guidelines for Teacher Training with Technology

In order to change teacher training with technology, a number of guidelines should be implemented. The following is a list of guidelines for teacher training with technology. Teacher training should focus on:

1. the development of meaningful learning for the student.
2. the changing role of the teacher in a technological age.
3. methods of promoting student production.
4. implementing technology as a partner in the learning process.
5. methods in which teachers put students in the appropriate learning roles.
6. the implementation of technology.
7. fostering teacher-teacher and teacher-student collaboration, not just the student-student collaboration.

Conclusion

In this paper, numerous deficiencies in teacher training, with regards to the integration of technology into the classroom, have been addressed. Guidelines for general changes in in the model of teacher training have been discussed. These guidelines cover the follo wing topics:

- **The types of activities currently occurring in Teacher Training with Technology.**
- **The new roles of the teacher and student when technology is integrated into the learning environment.**
- **The implementation of technology into the classroom.**
- **Collaboration between teachers and students, with respect to implementing technology.**

In order for these guidelines to be implemented, the current model of teacher training must be abandoned. Activities that promote meaningful learning must be modeled for teachers. These activities must be modeled in a way that the teacher assumes the role of the student. This not only aids in modeling the types of activities that promote meaningful learning and provide teachers with a relevance for the implementation of technology in the classroom, but also models the actual implementation of the technology into the classroom. Collaborative activities are essential for meaningful learning. In order to promote and model collaborative activities, teacher training sessions need to promote collaborative environments. Collaboration between the instructor (trainer) and the students (of the training session) must be modeled and discussed. For teacher training to be successful, the scope and duration of workshops must be addressed. Technology training takes time, and the current model of teacher training with technology does not appropriately address the time issue necessary to appropriately implementation of technology into the classroom to promote meaningful learning environments.

While there are many issues related to the training of teachers with the use of technology, this paper addressed some issues that need to be addressed. By discussing the shortcomings of the current models of teacher training, it is hopeful that teacher training and technology become a much more potent partner in creating collaborative, meaningful learning environments, in the future.

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Weekly IT Teacher Training: A Model for Success

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Abstract: Lausanne Collegiate School in Memphis, Tennessee (USA) has created and implemented a weekly, after school IT training program for faculty and staff called Tech Tuesdays. Since the fall of 1999, this program has met the needs and schedules of teachers at a school where hardware and software availability and usage was rapidly evolving. This paper documents the rationale behind the Tech Tuesday model, its origins, topic selection, process, and successes as evaluated by increased teacher skills and administrator feedback. Of particular note is the impact the school's recent move towards laptops in grades 7-12 has had on the training needs and interest levels of teachers and staff. Tech Tuesdays is an easy-to-replicate faculty development program with a proven track record and the flexibility to adapt to the changing training and platform needs of K-12 teachers and staff.

K-12 schools are constantly faced with the need to train and retool their faculty and staff, as technology changes and the need for technology integration in the classroom grows. While administration and technology personnel recognize this need, time and resource constraints often impede effective training from taking place. A short, on-site, after school training model called Tech Tuesdays has proven a successful solution to the challenge of ongoing staff development for one school struggling with this issue. In this paper, the history of Tech Tuesday, presentation format, topic selection, and successes will be discussed, as will the impact of the new laptop program on Tech Tuesday. Finally, challenges and opportunities for future growth will be offered.

Lausanne Collegiate School (LCS) is a diverse, co-educational, private college-preparatory school for students in grades pre-school through 12. Like many schools, LCS wanted to increase the technology skills of its staff so that the teachers and staff would in turn integrate technology, but found that existing technology training models were too long and not tailored to individual needs. Therefore, in the fall of 1999, Tech Tuesday was created as a way to provide very short and specific serving the faculty's varying ability levels and interests.

Each week, an e-mail is sent to all faculty and staff announcing this Tuesday's topic. Five minutes before each Tech Tuesday begins, an announcement is made over the public address system. Teachers and staff meet in the Lower School computer lab immediately following carpool and school dismissal. The Lower School technology integration specialist then begins a fifteen-slide PowerPoint presentation on the week's topic. The PowerPoint explains why a topic is important and outlines very basic steps to achieving the skill or task. Each participant practices the skill on a lab computer or on a school-owned laptop while observing the presentation on the Smart Board. The presenter takes attendance and e-mails that attendance to each of the division heads (the administrators in charge of Lower, Middle, and Upper Schools). The PowerPoint presentation is then attached to an e-mail sent to all attendees and other staff who could not attend but who asked for materials. Finally, the presentation is uploaded to the school's web site for later reference.

Topics vary widely. The topics for fall 2001 included: viruses, computer maintenance, web quests, finding lost files, hardware and software basics, adding pictures and hyperlinks on teacher web pages, and creating address books in the school's e-mail program, among others. Administrators, teachers, and technology staff request topics to be covered. Because the specialist who teaches Tech Tuesday is also responsible for one-on-one training of teachers on a daily basis, she has a good understanding of staff skills and interests.

How successful have Tech Tuesdays been? Given that the sessions are "off-the-clock" and completely voluntary, attendance has been high, with over a third of all faculty and staff (includes librarians, development, and administrators) coming to at least one Tech Tuesday. Of these attendees, one-quarter has attended over half the fall 2001 sessions. Average attendance at Tech Tuesdays was ten, with weekly numbers varying from six to nineteen attendees.

Yet these numbers only tell half of the story. In a recent survey of faculty, staff, and administration, administrators report increased competency and confidence from their staff. Teachers cited "computer confidence" and e-mail proficiency as the two greatest improvements made by attending Tech Tuesdays. Increasing their knowledge and topics that were relevant were the two primary reasons for attending the sessions. The faculty responded that having the training on-site, keeping training short, having a dynamic and helpful instructor, and focusing on only one topic at a time made Tech Tuesdays convenient for them.

Beginning in the fall of 2001, all seventh and eighth graders purchased IBM Thinkpads to be used in classes. A campus-wide wireless network figuratively broke down the walls of the traditional classroom, while middle school teachers revamped their curricular and activities to take full advantage of the flexibility and freedom the laptop provides. With this new opportunity, however, came a need for retraining. Non-math teachers needed Excel training to use spreadsheets creatively. Teachers with limited computer skills faced a classroom of eager and competent students with the world at their fingertips.

LCS refocused its Tech Tuesday topics to help faculty meet the needs created by the laptop program. For example, Upper School faculty are preparing to teach next year's entering freshmen who will have had a year of laptops in the classroom already. Yet, many of these teachers have limited computer skills themselves. The four technology department employees gave each one of the upper school faculty a hands-on practical assessment in six areas of technology: operating system (PC), First Class (LCS' e-mail program), Internet Explorer, Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Teachers attempted to complete tasks in each portion of the assessment, and staff evaluated their ability or inability to do so.

Administration required faculty whose skills in a given area were average or below to attend a Tech Tuesday held on that given software or hardware topic. Once again, the presentation was limited to a 15-minute format with a PowerPoint presentation and handouts that gave concrete examples on how to use Excel, Word, etc. in a variety of content areas. Technology staff re-evaluated the faculty within weeks of a given session to see if skills had improved.

Replication of the Tech Tuesday model at other schools would be simple. Given the brevity of the training, sessions can be taught before or after school or during lunch or other free time as needed. Technology staff need not teach sessions if none are available. Keeping sessions short and targeted to the teachers' needs, with step-by-step presentations and electronic texts (or paper handouts) for later use are the most important components.

At LCS, the ongoing challenge will be to keep pace with the advancing skills and needs of our laptop faculty while still offering basic instruction for new teachers or those with only basic skills. Recently, the school began requiring three technology professional development (TPD) hours this year, and five TPD hours in the following years. This new expectation will undoubtedly increase the numbers of teachers attending the sessions, but will they be motivated to learn or simply be present to fulfill a requirement? LCS tech staff must therefore double their efforts to ascertain and address the needs of the new "reluctant" attendee. Plans are also being made to open up sessions to other independent schools in the area. Finally, as teachers become experts, they too can begin leading Tech Tuesdays, providing technology success stories and inspiration for their peers.

Tech Tuesdays have met one school's needs for short, on-site, relevant IT training for K-12 faculty and staff. With only a minimum of time and effort, this success can be duplicated elsewhere to provide effective staff development in a variety of educational settings.

Motivational Processes in the Integration of Technology into Teacher Education

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For the past three years, the College of Education at Northern Illinois University has required all new faculty members to take a course - Integrating Technology in the Curriculum. This course is designed to assist faculty to more fully develop skills with respect to the meaningful integration of technology in the curriculum so as to serve as models for the use of technology in classrooms for teacher education students. This study examines the influence of the mandatory nature of this course on the motivation of the faculty to integrate technology into their teacher education courses. Self-determination theory provides the basis for understanding the process of internalization from externally regulated reasons for faculty taking the course to increasing degrees of internally regulated motives for these same faculty using technology in meaningful and effective ways in their courses.

Theoretical Perspectives: Self-determination theory suggests that intrinsically motivated behavior occurs when one acts autonomously - under their own volition (Deci & Ryan, 1985). Therefore, we would not expect someone who is *required* to take a technology course as a condition of their employment to be intrinsically motivated to do so. Likewise, we would not expect a technologically *incompetent* faculty member to be motivated to integrate technology into their coursework. Thus, the goal becomes one of creating a learning environment that promotes perceptions of competence and autonomy.

A person feels most autonomous when his behavior is internally regulated; that is, when the behavior is intrinsically motivated, or engaged in for the pure enjoyment of the task (Ryan & Connell, 1989), however, experience and logic tell us that it is not practical to assume all activities will be intrinsically motivating. Therefore, we need to consider the process of internalization as progressing on a continuum from external to internal regulation (Deci, Vallerand, Pelletier, & Ryan, 1991). Internalization "refers to the process by which an individual initially acquires beliefs, attitudes, or behavioral regulations from external sources and progressively transforms these external regulations into personal attributes, values, or regulatory styles" (Ryan, Connell, & Grolnick, 1992, p.171). The greater the internalization, the more it is perceived as being "caused" or endorsed by the self (Ryan et al., 1992).

Deci, Ryan, and others (see Deci & Ryan, 1985; Deci et al., 1991) have identified four types of extrinsic motivation: external regulation, introjected regulation, identification, and integration. The least autonomous behavior would be controlled via external regulations, such as following a rule merely to avoid punishment or to achieve a reward – "I will take this course and use technology so that I can get and keep my job." The primary "cause" of the behavior is external to the individual. Behavior that involves acting to avoid disapproval from self and others is referred to as introjected regulation – "I like my department chair, so I'll take this course and do what I can to integrate technology into my courses so I can please him." There is no inherent value to, or interest in, the activity or behavior itself, but neither is it controlled by external contingencies. More internally regulated, and therefore more autonomously engaged in behavior would be labeled as either identified or integrated regulation. An identified regulatory style involves acting because the goal itself is valued or personally important – "I might learn something valuable from this course, so I think I'll get the most out of it." The most advanced form of extrinsic motivation is integrated regulation – "As a teacher, it is important for me to use technology in meaningful ways to be more effective; therefore I believe taking this course is a valuable opportunity." "When regulatory processes are integrated, behavior is an expression of who the individual is -of what is valued by and important to the individual" (Deci et al., 1991). Each type of regulation involves a greater degree of internalization. The more internalized the reasons for acting, the more autonomously regulated, or self-determined the behavior.

Purpose: The goal of this study becomes one of understanding the relative influence of a mandated technology course for all new faculty in the College of Education on the integration of technology into teacher education courses. It begins with the question: To what extent and for what reasons have new faculty become engaged, behaviorally, affectively, and cognitively in the integration of technology into their courses? It ends with understanding the characteristics of this course that promote the internalization of reasons for technology integration in teacher education courses.

Participants: Nine of the course participants, three from each of the past three years, will be selected at random from the pool of new faculty in the College of Education (N = 41) who took the course each year. Only faculty currently teaching teacher education students at NIU will be eligible to participate in the study.

Data Collection: Structured interviews will assess each faculty participants' use of technology in their courses, their attitudes and feelings about technology, and the degree and depth of their reflection on their integration of technology. The interviews will take a developmental focus beginning with the thoughts, feelings, and actions of the participants prior to taking the course, during the delivery of the course, and since completing the course. The participants will be asked to reflect on how the course may have influenced their behavior, attitudes, and thoughts. The initial cohort will have taken the course two years ago, so some longitudinal data will be available.

Observations of class sessions and review of course syllabi will provide information regarding each participant's integration of technology in their courses.

Value of Study: In an ever increasing technological society, it becomes imperative that current prospective P-12 teachers acquire the knowledge and skills to effectively and meaningfully integrate technology into their instruction. To better prepare teachers for this task, teacher educators need to model and value the meaningful integration of technology in their courses, yet college faculty are often unprepared for this task themselves. This study seeks to explain how one mandated course on the integration of technology in the curriculum provides a catalyst for motivating new college faculty to use technology in their teacher education courses.

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'Surviving' Web Based Professional Development (or, How Not to Get Kicked Off the Island): Lessons Learned from the Learning to Teach with Technology Studio

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Introduction

Organizations and institutions are increasingly offering online professional development opportunities to educators (Mather, 2000). This is especially true for teachers must keep up with new teaching strategies, the latest professional standards, and constantly changing technologies. Coincidentally, new technologies promise to facilitate access to learning at times and places chosen by the learner (Albion and Gibson,1998). These web-based environments have the potential to transform teacher professional development through the use of new models of teaching and learning. They also have the potential to facilitate a sustained culture of sharing, collaboration, mentoring, and support for K-12 teachers.

In the design of these web-based environments, there are not only technical challenges, but perhaps, more importantly, there are social and cultural challenges and norms which must be addressed in order for these new models to succeed. While initial attraction and interest may be high, establishing long term, high quality learning opportunities is a much more difficult goal to reach. This is the story of one such environment.

The Learning to Teach with Technology Studio (LTTS) is a web based professional development system to integrate technology into their classroom. The goal is to provide short focused mini courses or modules that teach teachers to develop a technology-based classroom project for use in their own classrooms. The LTTS is a five-year project funded through the Department of Education/FIPSE. It is currently in year three of development at Indiana University and with partner organizations (University of Georgia, PBS Adult Learning Services, and IMS).

Challenges

As with many online systems, there are challenges with designing and scaling the LTTS system. These include:

- Technical issues with designing an online learning anytime, anywhere environment
- Instructional design issues with developing high quality problem based learning modules that are designed not only for teachers but by teachers
- Supporting teacher developers of modules who have content expertise but little or no skills in instructional design or experience with adult learners
- Scaling and sustaining such a system past the grant funding.

Technical Issues

First, the technical issues of designing an online learning anytime, anywhere environment are numerous.

We need to understand the strengths and limitations of the online environment and learn how to operate within these.

Instructional Design Challenges

In designing LTTS, the developers chose to use inquiry based learning framework as it best matches the goals of the type of instruction we wish to model. Since there are few models of online inquiry based learning, LTTS designers face the challenge of first developing a new instructional model for Web-based PBL. The goal was to take the best of PBL learning and develop a new instructional model that would work within a Web-based learning anytime, anywhere environment. Designing an interface and instructional model that not only used inquiry but modeled it was key. This choice impacted not only the instruction but the technical challenges the strengths and constraints of web-based instruction, learner characteristics, and the purpose of the LTTS, which is professional development.

We also have to understand what aspects of PBL will work in these environments. Since most commercial course delivery systems did not support inquiry, LTTS developed and implemented its own inquiry based interface and learning environment that models the type of teaching that was being promoted. This included making an interface that modeled the inquiry process with a problem posed, a collection of

resources, activities to scaffold the learning, and assessment guidelines that are provided as part of the module package. Designing all of this to work in a learning anytime anywhere environment has proved to be challenging because there is no instructor present. This is one of the trade offs of designing professional development in the context of learning anytime anywhere.

Supporting Non Instructional Designers

Perhaps the most difficult challenge of LTTS is to support teacher developers of modules. These teachers often have excellent content expertise but little or no skills in instructional design or experience with adult learners. LTTS has designed a support system with guidance, mentors, and resources to support teachers through the process of module development. However, there are still many challenges faced with helping teachers understand how to translate their content knowledge into high quality modules for other teachers. Since teachers are most often designing for preK-12 students and material for a specific content, LTTS has to provide scaffolding that will help teachers become designers of online instruction for other teachers focusing on teaching strategies and not necessarily content.

Through research completed with LTTS teacher developers, we have found they have particular challenges with learning to design modules for LTTS. These include: translating the projects or units they complete in their classroom into an instructional package that will help teachers go through a design process of developing such a project for their own classroom; finding high quality resources online that will support their module; and obtaining appropriate mentoring from instructional designers who often have little classroom teaching experience.

Scaling and Sustaining the System

Scaling and sustaining such a system past the grant funding is critical if these projects are to survive. LTTS is designed with an e-commerce model. In the future, royalties and usage agreements with schools will help keep the LTTS sustained and in use by preK-12 schools and preservice teachers. LTTS also plans to design an added component to support school- or district-wide professional development efforts in technology integration. Challenges include knowing the market for such a system with few examples to learn from and designing one system that can meet the needs of both preservice and inservice teachers.

Conclusion

In the design of these web-based environments, the technical, social and cultural challenges as well as the challenges of providing high quality learning opportunities is not easily done. Designers of such systems must have a critical understanding of the online learning environment and how to design inquiry based learning environments. Perhaps the most critical understanding is that of one's audience and how to involve them in this ongoing design and development process. As professional development increasingly goes online, designers of such online learning environments will be challenged to build environments that are enticing, high quality, and ongoing.

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Faculty Development by Design

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Across the academy, preparing faculty members to teach is a pressing need. A doctoral degree in a discipline does not necessarily prepare a faculty member to effectively teach that discipline (Soder, 1996). While we agree that faculty members are sometimes unprepared for teaching, we also note that they often have even less experience with areas related to teaching, such as the design of curriculum or the development of instructional materials. But recently, new problems have arisen with the introduction and integration of technology in the teaching and learning process. Faculty members now have a new set of skills to acquire, but no more incentive or time to do so.

The axiom that "people tend to teach the way they were taught" may not always be the case, but the U. S. Department of Education has recognized the need for changing the ways that new teachers are trained to integrate technology into the classrooms around the country. And one of the areas identified as critical by the Preparing Tomorrow's Teachers to Use Technology Program (PT3) has been the development of skills and modeling capabilities of the faculty who teach these prospective teachers. But if traditional faculty development approaches are used, it is likely that the same problems will persist. With the luxury of extensive resources and personnel provided through a PT3 grant, we have been able to establish a model for faculty development that is organized around the metaphor of design studios, employing principles of "learning by design" as a means of helping faculty integrate technology into their teaching, and effectively modeling technology integration strategies for their students.

Learning by Design and the Design Studio

Design is a human activity that has been described by some as the solution of unstructured, or "wicked" problems (Rittel, 1984) through the specification of artifacts or systems meant to achieve emergent goals that are continually generated and refined throughout the design process (Lawson, 1990; Malhotra et al., 1980; Mayer, 1989; Newell & Simon, 1972). Others view design as an experiential learning process where an individual constructively shapes the problem and solution through cycles of situated action and reflection (Schon, 1991; Suchman, 1987). But when viewed as a social process, design involves both shared and distributed cognition (Lanzara, 1983), with the design team developing through conversation and representations a shared understanding of the problem, and through individual and collaborative efforts, a solution to the problem (Hutchins, 1991; Walz, Elam, & Curtis, 1993).

Design is increasingly seen as an activity that can be used to facilitate learning in a variety of content areas and contexts. Perkins (1986) has proposed a description of learning based on the notion that design is a fundamental characteristic of human thinking that arise naturally from human social and cognitive activities. From students learning through the design and production of multimedia (Kahn & Taber Ullah, 1998), to students learning science by constructing and testing solutions to problems (e. g. Harel & Papert, 1991), project-based and problem-based learning that incorporate design tasks have become effective models for teaching and learning. Proponents agree that the effectiveness of learning by design comes from a variety of necessary elements, including context, collaboration, reflection, and inquiry.

To organize and manage learning by design activities, educators have adopted the model of design studios common in the practices of the visual arts, architecture, and other fields that emphasize design. Studios provide an open learning environment where the students use design tools and processes to complete various projects (often self-selected, or at least open to selection within some set of parameters), and the teacher offers assistance and critique when asked, or at various pre-determined points in the process. This collaborative atmosphere lends itself well to the self-organized and self-paced learning that occurs in studio design activities. While design studios are common in other fields, the application of the model to education is just beginning to emerge (Orey, Rieber, King, & Matzko, 2000; Rieber, 2000). Since this model supports many of the principles of adult learning recognized by various theorists (e. g., Knowles, 1989), as well as the theories of learning and instruction discussed earlier, we felt that it could be easily adapted to our faculty professional development efforts.

The Faculty Technology Design Studio

To assure that our faculty members develop the skills necessary to effectively model technology integration strategies to their students, the design studio model is being employed within the School of Education at Southern Illinois University Edwardsville as part of our PT3 program efforts. The design studio fits particularly well with the unique teacher education partnerships that have been developed recently. University faculty members work in a two-year, field-based program with the teacher education students and K-12 students, supervising teacher education students

and providing effective models of best practice, as well as delivering weekly content seminars where students are given opportunities to discuss various theories and methods. "Courses" are non-existent. Instead, various content areas are completely integrated across the two-year program. Students prepare portfolios to demonstrate their growth and competence in standards set by state and national certification and accreditation agencies.

There are several other reasons that we felt the design studio model was particularly appropriate for our faculty development goals. First, the faculty participants possess varying levels of skill development with respect to technology utilization and integration. Second, the faculty participants are already organized as teams to deliver the teacher education program at partnership schools, and therefore have developed a high degree of camaraderie and are used to collaborating. Third, a small core of faculty members who are highly skilled and experienced with various learning technologies were available to act as facilitators, or "lead designers" for each team. Finally, resources from the grant have allowed us to expand an already well-developed technology infrastructure and support system for development of various types of applications and resources. In other words, if the faculty technology design teams can dream it, we will be able to make it happen for our teacher education students.

The Faculty Technology Design Studio process began early in the fall of 2001. Faculty from the School of Education and the College of Arts and Sciences were invited to attend a kickoff meeting where the studio concept and plans were shared, along with information related to the new Illinois teacher certification standards for technology integration and utilization. Eight design facilitators and three project staff members facilitated the design studio activities as "lead designers", challenging the thirty seven faculty participants to identify opportunities for technology integration in their teaching activities, especially activities that might model appropriate practices or help teacher education students meet some of the new state certification standards. After much collaboration and discussion, more than 15 design projects were identified and described in written "design briefs".

Following the kickoff meeting, design facilitators continued meeting with the faculty participants to refine and elaborate the designs, and to identify available technologies or elaborate on specifications for technologies to be developed. Support personnel hired with grant resources are currently working to develop and assemble the custom-designed technologies to meet the design goals specified by the faculty participants. Faculty participants will then implement the technology applications and strategies with their students during the rest of the academic year, culminating in a "showcase" event where K-12 students, teacher education students, mentor teachers, and university faculty will come together to demonstrate and share with their communities the results of the year's activities.

Two examples taken from the 15 design projects being completed as part of the grant activities may help the reader to better understand the design studio effort and the expected results. It should be noted that by the time of the conference, several of these design projects will have been implemented, and the preliminary results will be shared with colleagues attending the conference session. For example, one group of faculty members is working with teacher education students to design and publish a research journal focused on teaching activities at the partnership school. Each student will be required to submit at least three manuscripts for the journal, with mentor teachers and university faculty will serve as editors for the journal, along with some of the students. An online article submission system is being developed, along with facilities for editors to communicate with students regarding revisions to the manuscripts. In addition, an artist will be working with the editorial staff to create graphics for the journal, which will be published as a traditional paper product, as well as in an electronic version.

A second group of faculty is developing a video-case library of teaching examples that illustrate various issues related to educational psychology and educational foundations. Students will be able to access the video cases through the web, participating in asynchronous discussions about the cases, as well as submitting their own analyses of the cases. Faculty members are preparing content that elaborates on the principles being illustrated by the video cases. In addition, teachers shown in the video as well as university faculty will be participants in the discussions, allowing students to ask questions about the video cases, and presumably, identifying issues for further learning and discussion.

These are two examples of the many design projects currently being completed. Faculty are participating not merely as designers, but as developers wherever possible, thereby increasing their technology skills while working on something of utility for their teaching and their students learning. Again, an assessment of the growth of faculty knowledge and skills related to the various technologies and tools being employed in the Design Studios is currently being undertaken, and will be available and discussed as part of the presentation at the conference. Informal observations and comments to date indicate that the Design Studios are successful in promoting the kinds of faculty development we had envisioned.

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"Views of an Online Course From the Participants at Morehead State University"

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Abstract:

Online courses are becoming common for university offering. Some argue that the online courses are not well suited for the average student. Those same faculty would tend to agree that one needs to be at a perceived proficient level before under taking an online venture. In this case, 60% of respondents believed that EDUC 599 is best suited to someone with a perceived apprentice level of technology.

Critics might again argue that grading standards are not rigorous enough in online courses. Respondents in this study stated differently. The graph below shows the college identification compared to the perceived difficulty level of the course. Grading in the course was conducted by the individual instructors. The instructor responded to e-mail reflections and gave students scores of 0-7 points. The final project web page, was valued at 15 points. 100% of the respondents stated that they felt feedback from the instructor was individualized.

Introduction and Background

Morehead State University (MSU) is known for ground-breaking in the field of technology facilitated classes. The institution was one of the first subscribers to industry leader Blackboard, and Internet Classroom Assistant, and has again shattered the limits with technology assistance in offering from Teacher Education Institute (TEI) an Internet-based course, "Teachers Discovering Computers."

The Internet-based course (hereafter referred to as EDUC 599 or "the course") is the result of a partnership with TEI in the Preparing Tomorrow's Teachers to Use Technology (PT3) grant awarded to MSU in July 2000. As with many institutions, several faculty were pioneering the use of technology while others waited for the trend to end. The purpose of the course within our grant was to deliver more opportunities for undergraduates to use technology in the teaching environment. MSU's PT3 grant focuses on undergraduate, preservice teachers. To offer this course to others, individuals must be directly involved with training preservice teachers. EDUC 599 is offered to MSU faculty, MSU teacher education students, K-12 cooperating teachers with student teachers, and K-12 administrators and technology coordinators in a five-county partnering region. The course is given with a tuition-waiver and students in the course receive a free textbook. Students eligible for graduate credit may elect to receive graduate credit, waiver-free. Faculty were given an additional incentive of $500 for completion of the course. Later, awards of $1,500 per person were made available for MSU faculty to apply their newfound knowledge. This award could provide release time to restructure courses, purchase equipment, support travel to conferences, etc. Students were given the option of applying the course toward program requirements for undergraduate or graduate degrees.

The class was initially offered in Fall 2000; a special section was started for K-12 administrators and technology coordinators in November, 2000. Students were given information for enrollment through classroom solicitation and word-of-mouth. Registration occurred only through the PT3 secretary. Pre-registration for Spring semester was conducted both through the PT3 secretary and MSU's registrar. During Fall semester, EDUC 599 sought to prepare students to actively incorporate Internet and its resources, common educational software, and basic skills in web editing. Undergraduate students and K-12 personnel were asked to construct lesson plans complete with scoring guides. Students were allowed to visit Web sites in many different discipline areas to explore the potential for their classrooms.

Statistical Information from surveys

Despite many obstacles to enrollment for Fall semester, MSU Registrar records indicate 148 students were enrolled. Of these 113 completed the course with either an incomplete or final grade recorded. 107 persons from the completion group were sent an online survey in March 2000 (see http://people.morehead-st.edu/fs/j.lewis/educ599_survey.html). The 107 persons are broken into the following categories: 30 undergraduates, 13 student teachers, 11 K-12 cooperating teachers, 11 K-12 administrators or district technology coordinators, and 42 MSU faculty, staff, and administrators. A 20% return was seen on the survey with 21 people responding; 20 surveys were usable. At least one person from each category responded to the survey. It is important to note some reasons that the return was so low. Foremost, the email requesting participation was sent at an inopportune time. Although the request was sent from an America Online account, the MSU mail server was malfunctioning for many of its mailboxes. Mail was undeliverable , mail was eliminated, and mail was sometimes not returned properly from an MSU origination. The MSU server email accounted for a large portion of our potential responses. Students who were student teachers during Fall semester likely graduated and would not have had access to their MSU accounts. Finally, the specially created class from November, 2000 had not had grades posted to the Registrar at the time of this survey. It is possible that anyone receiving an incomplete or not having completed the course chose not to answer the survey. Only students having withdrawn were omitted from the survey.

This survey was designed to test the null hypothesis, "students will not demonstrate perceived increases in technology use or improvement in performance as a result of having taken EDUC 599." This paper focuses on key components related to the null. For a lengthier discussion of the survey results, please see http://people.morehead-st.edu/fs/l.lennex/jump.htm

Before displaying some relevant results, it is important to note the following. The survey consisted of 5 males and 25 females. 100% liked to use computers ; 95% reported access to a home computer; 95% were satisfied with the course and had their expectations met with the course; 90% had more than one e-mail account; and 41% accessed the Internet five or more times per day. The table represents a distribution of respondents by academic area.

academic area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	business	3	13.6	15.0	15.0
	ed and behavioral science	13	59.1	65.0	80.0
	humanities	1	4.5	5.0	85.0
	science and tech	3	13.6	15.0	100.0
	Total	20	90.9	100.0	
Missing	System	2	9.1		
Total		22	100.0		

This survey used definitions for skill level from the Kentucky Department of Education. The levels were novice, apprentice, proficient, and distinguished. The definitions are as follows: novice-demonstrates minimal and/or incorrect knowledge, apprentice- demonstrates basic knowledge, proficient-demonstrates broad knowledge, and distinguished- demonstrates extensive knowledge of the content area. The tables below show the results of a one-way t-test comparing the perception of skill level before and after taking the course. The perceived skill level increased from a mean of 2.2 to 3.0, or from apprentice to proficient level, after taking the class.

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
where would you place your skills	11.804	19	.000	2.2000	1.8099	2.5901
where do you place your skill after the class	26.723	19	.000	3.0500	2.8111	3.2889

USD's Web Group: Its Contribution to Faculty/Staff Development

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Abstract. This paper is a companion to the paper we presented at AACE M/SET 2000 entitled *USD's Web Group: A Service Learning Experience in Computer Science*. It focuses on the web group's contribution to faculty/staff development. The web group is a friendly and accessible computing resource for faculty and staff across campus which complements the services provided by the Academic Computing whose main concern is the infrastructure of the campus computing. The web group does not limit itself to web-related problems. It promotes computer literacy by advising users, solving problems for them and wherever possible, training them to solve problems for themselves. The USD web group could be easily duplicated on other campuses and therefore this paper should be of interest to many.

This paper is a companion to the paper we presented at AACE M/SET 2000 entitled *USD's Web Group: A Service Learning Experience in Computer Science.* Interested readers can find out how the web group contributes to the USD community in many ways from the afore-mentioned paper. This paper focuses only on its contribution to faculty/staff development.

The web group was founded in the spring of 1999 to help the USD community with their computer-related problems. It consists of Computer Sciences students working under our supervision. We meet regularly for seminars on technical issues. Three years after its inception, the USD web group has become a respected institution on campus. The members of the web group are helping a variety of people and groups on campus and in the process educating themselves. The first author was honored with the *USD Innovation in Experiential Education award* in 2000 and *Davies award for teaching excellence* in 2001, both related to his web group activities. The USD web group could be easily duplicated on other campuses and therefore this paper should be of interest to many.

The web group is a friendly and accessible computing resource for faculty and staff across campus which complements the services provided by the Academic Computing whose main concern is the infrastructure of the campus computing. The web group helps users solve problems ranging from the most basic such as how to construct a web site, or how to convert a data set, e.g., an address book, from one format to another, to very challenging problems such as how to build an enterprise class web site.

To help faculty/staff develop their own web sites, we give 40-minute web site construction classes with web group students on hand to help the participating faculty and staff. We use a utility program to create a rudimentary web site for the participants instantaneously. We then use the Netscape editor to beautify their sites and make sure that they know how to publish on their own.

For more involved web projects, web group students are assigned to faculty and staff to design and construct the sites and train the users. This is particularly successful when we use systems that are amenable to collaboration such as Zope Web application server[1]. As an example, we are creating a web site for the Dean's office of the School of Arts and Sciences. This site will have many sub-sites that will be managed by different people who need not have any web sophistication other than some brief training. These managers can in turn train sub-managers to work under their supervision. To fix the idea, you are invited to visit a Taiwanese Forum/News

[1] http://www.zope.org

site[2] that we put together for a SDSU Psychology professor Dr. Raymond Lee. Even though Dr. Lee did not have any prior web construction experience, he is able to manage the site after a 30-minute training. We are only needed occasionally to provide technical assistance. He trains other people to manage sub-sites.

The web group does not limit itself to web-related problems. It promotes computer literacy by advising users, solving problems for them and wherever possible, training them to solve problems for themselves. In the following, rather than giving a laundry list of all the things that the web group has involved in, we give some example cases to show that it will help wherever help is needed:

- Helping re-organize user data stored in spreadsheet files or even word processing files into a database using free and open source DBMSs such as MySQL[3] and Postgresql[4]. We have found that users are so strongly influenced by their spreadsheet programs and word processing software that they will use such tools even when they are not the right tools to use. Even after they migrate from spreadsheets to databases, they continue to think in terms of spreadsheets. This can cause them to use one huge universal table or to have difficulty designing their databases efficiently. With our help, they are able to come up with better designs and understand the importance of normalization.
- Advising users on
    - the merits of different operating systems such as Linux, MacOS and Windows
    - different Linux distributions and their licensing
    - hardware upgrading and the merits and demerits of double boots
    - different languages such as Java, Perl, Python and Tcl/Tk. Different technologies such as applets and servlets, ASP, PHP, JSP and application servers.
    - different web site construction software such as Dreamweaver and FrontPage
    - content and presentation as two different concerns in web site construction
- Writing programs to help users with tasks such as data formatting, conversion or look-up. Even if the users cannot fully participate in the programming projects, they can be educated. As an example, a user tried to construct a 500 plus member mailing list in the Pine mailer by typing one address after another. However, the data file already existed, although in a not readily usable form. We wrote an *Expect*[5] program that automated the creation of the mailing list. The program took minutes to write and seconds to execute.
- Customizing and gluing existing software to meet the users' needs for online calendars, threaded discussion forums, mailing lists and Wiki[6]-style collaboration.

This spirit of *help wherever help is needed* has led the web group to expand beyond USD campus. Some of the beneficiaries now include elementary and secondary school classes and faculty members from SDSU.

[2] http://holycow.sandiego.edu:8080/isota The site was put together by using the Squishdot product with minor customization. You need a browser that can display Chinese in order to see the site displayed correctly.
[3] http://www.mysql.com
[4] http://www.postgreql.org
[5] http://expect.nist.gov
[6] http://www.wiki.org

Technology and Careers: A Period of Transition

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Abstract: Technology continues to grow in today's society and its influence on individuals is staggering. Research appears to have focused primarily on the use of technology to enhance education and productivity. Little research has focused on how technology is changing other aspects of the environment for individuals. As the educational and work environment change that pre-requisite skills and knowledge required for vocations changes. This article reviews current career theories, the changing nature of work and what can be done in the educational environment to deal with these changes.

Technology continues to grow in today's society and its influence on individuals is staggering. Research in this area appears to have focused primarily on the use of technology to enhance education and productivity in the workplace. Little research has focused on how technology is changing other aspects of the environment for individuals. As the educational and work environments adopt technology the question is, How has the technology changed the nature of the work and the pre-requisite knowledge and skills required for successful completion of a occupation?

Technology is responsible for the birth of many brand new careers each year, most of which are related to the rapidly evolving and expanding capabilities of computers in many areas. In addition, however, technology is rapidly changing the faces of many established careers. Careers that recently required no knowledge of computers at all now depend heavily on computer proficiency. In addition to the direct effects of computers on the specific tasks of a vocation, technology is changing many careers drastically through its promotion of globalization. Organizational structure is changing faster than ever, and many workers are finding their jobs to be much less predictable and secure than they are accustomed to. Although it appears that the educational environment is doing an adequate job of integrating technology into learning, it appears to be doing less than an adequate job of relating technological skills and knowledge to the work place

These changes are having a drastic effect on the world of work and the skills and knowledge that one needs to be competitive in the new work place. The question now appears to be, How does the educational environment address this issue to facilitate the school-to-work transition and provide students with the technology, knowledge, and skills to be competitive? Additionally, how does this change in the world of work and education influence the career

development and decision-making of students?

John Holland (1997) developed a theory of vocational behavior based on the idea that people express their interests through their work choices and experiences. Holland assumed that people's impressions and generalizations about work, which he referred to as stereotypes, are generally accurate. However, with the recent advances in technology many of the stereotypes and knowledge that individuals have about the work environment may not be accurate. Without accurate stereotypes of the world of work, individuals may have difficulty expressing their interests in a choice of an occupation. Through utilization of these stereotypes, people and work environments are assigned to six different typologies. Within each of these typologies researchers have described sets of behaviors and knowledge that individuals typically possess. Additionally, researchers have examined the work environments and described the skills and knowledge required to be competitive in that environment. To make an adequate career choice an individual can examine the fit of his or her individual interests, skills, and knowledge with that required by various environments. Research on this approach to career counseling has shown that indeed a close fit between an individual and their work environment leads to many positive outcomes. However, with the changing world of work and the technological changes in education, are individuals getting an accurate picture of their unique skills and at the same time getting the information from educators about the changing skills and job requirements? Without accurate knowledge about themselves and the work world career decisions become more difficult and lead to more mismatches between individuals and their occupation.

Surprisingly few writers have tackled the daunting issue of the changing nature of the vast majority of careers that have for many years been thought of as consistent and immutable. Additionally, few if any researchers have examined how the changing educational environment with its incorporation of technology into almost all aspects is affecting the individual and how this change in educational practices may be influencing the career decisions of individuals. Clearly, research needs to focus on all areas of the changing educational and work environment and how these are affecting the career decision of individuals.

Despite the current lack of knowledge, based on theory there are many things that can be done in the educational realm to help individuals with career decisions. First, educators need to not only use technology to help students learn and master material, but they must demonstrate the link between learning technology itself with requirements of occupations. For example, an educator may be using a computer program to enhance math skills. While using the computer the instructor can remind children that they are not only learning math skills, but are also learning computer skills that may be important for future career endeavors. At the same time the instructor may point out a few occupations that use or require computer skills. This process would not only allow students to learn the math material, but also to start to make links between technology skills and the world of work. Along these lines, educators can develop plans to help students learn technological knowledge and skills specifically. It appears that in the educational realm, technology is being used to help students learn and master other material and not being directly taught to students. With the reliance on technology in the world of work, it behooves educators to not only use technology, but to teach students how to use technology. If students can learn technology skills and develop knowledge in this area, it may open many career doors for them.

On the other side of this issue is for researchers to begin to explore the changing world of work and provide information about how the requirements and skills that are associated with occupations have changed due to technology. Without this information educators will have no idea what technology skills are related to what particular occupational field. As researcher conduct these job analyses and delineate the skills and requirements for the various occupations this information can be relayed to educators who can in turn relay the information to students.

These are just a few of the many strategies that educators can employ to help students with the career development and decision process that they will face as they complete their education and enter the workforce. Technology is not only changing the educational and work worlds, but is having an impact on how the two interact. Without a clear understanding of the interaction and how the two complement each other we may be doing an injustice to our students and future workers as they struggle with careers and occupations.

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Evolving with Technology in the Preparation of Teachers (Lost in Cyberspace: A Trek in Technology)

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Abstract: Most teacher educators advocate and value the use of technology. Too often teacher preparation programs are negligent in modeling the implementation of technological applications. This paper highlights the implementation of technology into graduate level education courses and a field-based undergraduate course. The teacher educator (once lost in cyberspace) and students report gains in confidence and competence. Discussion follows the struggles and successes of implementing the use of hypergroups in these courses.

Researchers agree that understanding teacher knowledge and teacher thinking is critical to understanding teaching and learning how to teach (Fenstermacher, 1994; Grossman, 1995; Leinhardt, Putnam, Stein & Baxter, 1991). White (1996) advocates the use of technology to facilitate understanding and problem solving and critical thinking skills for preservice teachers. Advances in constructing teacher knowledge are needed. The importance of technology is emphasized in all areas of education. Most teacher educators advocate its value and use in the classroom for all content areas. Keeping pace with the technological advances can be overwhelming. Too often teacher preparation programs and graduate programs are negligent in modeling the implementation of technological applications. This paper highlights the implementation of technology in preservice teachers' methods courses in a field-based context, and in graduate courses in education. "Falling through the cracks" refers to those that have not had the opportunities to experience and/or master basic concepts in education. Discussion follows the evolution of the technological trek from traditional instructional strategies to approaches that successfully incorporate more technology. For those that are confident and competent in their technological explorations, there is merit in this story. Merit in the fact that not all have successfully made the passage and would benefit from patience and shared expertise.

The Context and Inquiry

One objective of this teacher preparation program is to provide professional development for faculty to implement components of technology into courses. Initial learning experiences and a support system in technology were provided. However, it is imperative that relevant, real-world application be experienced to facilitate learning (Brooks & Brooks, 1993). Merely attending in-service training does not provide the needed "real-world" context, as did this inquiry. The hypergroup was chosen to support the weekly learning environment for both the preservice field-based course and the graduate level courses. This allowed an ongoing dialogue and communication regarding course information while sharing experiences and creating a support system. Participants were 27 graduate students and 18 undergraduate students. Technology tasks included emails, posting reading reflections, and Internet website research (creating an annotated bibliography of websites). The abilities and experiences with technology, and in particular the use of a hypergroup ranged from expert to novice. The teacher educator had never used the hypergroup. Expertise was shared and much was learned by trial and error through the semester.

Data collection spanned a semester. A case study was chosen for this context-specific inquiry (Lincoln & Guba, 1985). The use of multiple data sources and methods triangulated information. Context-rich materials provided background meaning to support data analysis and interpretations. Norms of qualitative methodology were observed and facilitated the discovery and extent of knowledge construction in the use of the hypergroup. The teacher educator kept a reflexive journal. Small interactive discussion and information sessions were informally conducted throughout the semester during classtime along with anecdotal records. Those that were more savvy with the hypergroup shared information as a means of promoting knowledge construction. Time in the computer lab was available during all class periods. For evaluation, all students responded to the following: Describe your "technology trek" through the semester. Address these points: Things I already knew; Things I learned; Things I would like to know; Advantages and Disadvantages; Improvement; and, Overall comments on using the hypergroup. (The undergraduate class also responded to this: Overall comments on creating the professional resource file in electronic format.)

These excerpts are indicative of the many positive responses that were reported in the data.

I do plan to make use of this type of curriculum planning in some form or fashion. ... Other technology in use within my future classroom will hopefully be a class web site, e-mail for use with administration, other faculty, and parents, and a spreadsheet for grading purposes.

... I found this project useful both in incorporating technology into the classroom and planning effective lesson plans or curriculum. Thanks for coming up with such a forward-thinking plan about which all pre-service teachers need to learn.

I was very comfortable with the technology used in this class. I work in a very technology-rich environment where almost everything is e-enabled. I am on the Internet and use email on a daily basis. My team even has its own website. However, this was my first exposure to a hypergroup and I liked it. The biggest advantage was the ability to read the writings of the other students. This helped me to learn more about them as people and to learn about the real challenges facing teachers today. ...One side benefit was that the hypergroup became an easily accessible archive of all the work I had done during the course.

Wow, what a trek this course has been, and still is for that matter! ... I am not very comfortable with using the Internet and the only emailing I had used before this class was inter-district email at school. ... At the first of the semester I was not sure why we had to post our reflections to the hypergroup, why not just turn them in like last semester. It would be so much easier for me. ...I guess I should not be ashamed for falling behind in the game of technology, and not be afraid of asking questions. But the time it takes to become familiar with all that technology can offer is very consuming. ...I enjoyed reading the reflections and even discussed various points with other classmates. So in the very end it was worth the effort. So now that I am reflecting on my journey through technology land, I can say that I have leaned so much. I am feeling more comfortable with using both the web and email. ...it has been a great learning opportunity and being able to read the thoughts and views of my classmates has made the class that much richer. Thank you for pushing me to grow in an area in which I was not willing to go.

Summary

Reports indicate that the hypergroup learning experience was valuable. As the teacher educator, I believe the advantages of the hypergroup out weigh the struggle at the onset. The hypergroup is now a permanent component of all my courses. I am more comfortable with its use and its frustrations. The confidence achieved opens venues for implementing more technology. Being technological literate should be a goal for all education programs. The importance of this reflective inquiry helps in structuring appropriate experiences and encourages those that have fallen through the technological cracks. To those feeling Lost in Cyberspace and struggling along the technology trek, it can be accomplished, keep on trekking. It is possible to attain a level of competency and successfully implement technology components into teacher preparation programs. To those leading the way, be patient and diligent in your efforts to share knowledge and forge the way for those of us on your coattails. It is worth all of our efforts.

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A Beginner's Guide to Publishing in Technology Journals

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Abstract: This paper is intended to furnish advice for beginning professors who work in "publish or perish" environments. Publishing can be highly rewarding and enjoyable, but is an odious task for many beginners. The paper provides ten tips for establishing a productive scholarly agenda. The paper begins with advice about the importance of maintaining a positive attitude about publishing, and covers topics such as how to choose a topic, how to prepare a manuscript, and how to cope with and respond to rejection.

Introduction

Academic publishing is a condition of employment in most U.S. colleges and universities, and decisions related to promotion, tenure, and merit pay are heavily influenced by the quality and quantity of published articles. Many beginning professors fear that they may not be successful in the typical "publish or perish" environment, and regard publishing as a necessary evil and a major hurdle on the way to professional success. Such attitudes are unfortunate, since some of us find writing and publishing to be one of the great joys of academe, and look forward to the entire process of writing, submitting, revising, and eventually publishing our ideas and our research results.

There are probably various reasons why so many neophytes fear and dread the need to publish. One important reason, however, is that their doctoral programs and doctoral advisors did not provide the guidance and the practice needed to clarify what may appear to be a difficult and mysterious process. Therefore, this article will present a number of guidelines aimed at providing some of the basic information and advice beginners need. It is hoped that this advice will be of use to beginning professors, both in helping them to become successful writers, and, just as importantly, to enjoy the entire process.

Maintain a Positive Attitude Toward Publishing

One of the most important pieces of advice for beginning professors is to strive to maintain a positive attitude toward scholarship and publishing. Every department in every college in every university in the land has a number of cynical, perennial complainers who consume incredible amounts of time, energy, and enthusiasm telling (and retelling) whoever will listen about the unfairness of the requirement that they publish. A favorite refrain of these chronic complainers is that "the rules have changed" since they were hired, when, they maintain, publishing was not important.

There are many reasons for not paying attention to these pessimists. In the first place, their arguments, even if they were true, are completely beside the point. The fact is that most of us *are* required to publish, and no amount of whining or protesting will change that fact. Therefore, continuing to assert the unfairness of this requirement is simply an outrageous waste of time. In fact, if most of these individuals devoted even half the time, energy, and enthusiasm to their research and writing agendas that they currently spend complaining about the need to publish, many could become successful writers with nothing about which to complain.

Another reason to avoid the trap of becoming a chronic complainer about publishing is that it is self-defeating. Not only does it take time that could be far better spent on publishing-related tasks, but it becomes discouraging and debilitating, since it is difficult to become accomplished at anything about which one is negative and pessimistic. Thus, the complainers find themselves participants in a vicious circle in which their

hostile attitude mitigates against scholarly productivity, which makes them more negative and hostile and less likely to even attempt to succeed.

Then too, the argument that "the rules have changed" is not itself reasonable. In the first place, the publishing requirement has been in place in American universities for many years. Even if the rules did change, however, is this grounds for a complaint? Where is it written that those in any job have the right to expect that job requirements will never change?

Be Alert to Publishing Opportunities

I am frequently asked for advice on how to select the subject of scholarly writing efforts. There is no one best answer to this question, but there are some strategies that many successful writers find to be useful. I always carry a small, pocket-size notebook in which I jot down ideas for future articles, which often come to me in odd moments. In my office, I keep a file folder where I compile such ideas. As this article is being written, the file contains about a dozen different ideas. I periodically review this list, prioritize the topics, and add any details I have thought of that might help further define the article.

Where do these ideas come from? They come from many diverse sources. One piece of advice to help find research ideas is to make it a practice to spend several hours a week reading the research reports of others in the field. As I read such reports, I often think of ways a study could be improved, or get an idea for a new, but related research strand. My classes provide another source of ideas for articles. Anything my students find especially controversial, difficult, or interesting may make a publishable "how to" article or a good position paper. Position papers of professional organizations also sometimes provide a topic for an article. As I read such papers, I am alert for statements or ideas about which I agree or disagree strongly. Observations made in public school classrooms are another source of potential ideas. Sometimes I write about something I have seen and admired, while other times I am inspired to write about something I have seen about which I disagree strongly.

I have never found it difficult to find a topic to write about. On the contrary, I usually have more topics than time, and find that I can only write about a fraction of the things that interest me.

Consider Writing A Literature Review

Beginning authors should consider writing articles that are literature reviews. Good literature reviews are extremely valuable, but are rarely submitted. Every editor I know says they are constantly on the lookout for good literature reviews, seldom receive one, and would move a good one to the top of the list of articles waiting for publication. A good literature review summarizes the literature in a given area, identifies what is known or suspected, criticizes what has been done with an eye to common errors, and concludes with a description of needed future research.

Write for A Specific Journal

Once I decide on a topic, the next step is to decide where I will submit the article. The best way to do this is to inspect a few recent back issues of the journal under consideration. As research editor for Computers in the Schools (CIS), I find that many assistant professors make the mistake of sending articles to me that are clearly not appropriate for CIS, a fact they would have easily surmised if they had spent a few minutes looking through a few previous issues of the journal. Sometimes these articles are much too lengthy, or do not contain enough statistical detail. I even receive a few articles each year that have no relation to the use of computers in schools. Very often articles are not written in the proper style (American Psychological Association).

There are a number of commercially available books written for aspiring authors. These books summarize the requirements of many different academic journals. Such volumes can be helpful, but they are not good substitutes for examining recent back issues as they quickly become outdated and many are full of errors.

If there is any doubt about the appropriateness of a manuscript for a given journal, authors should feel free to telephone or email the journal editor. Most editors enjoy talking with potential authors, and can often provide valuable information not found in the formal journal author guidelines printed in back issues. More

importantly, such a call may prevent an author from wasting several months by submitting an article to an editor who will eventually reject the article as inconsistent with the mission of the journal. If the editor indicates that such is the case, authors should feel free to ask for a recommendation of some other journal that might find the article to be appropriate.

Use Writing Strategies That Work For You

Only trial and error can determine which writing strategies will work for a given individual. Some writers like to formally outline the article before beginning, some make a few notes in narrative style, and others jump in "cold," begin writing, and let the article go where it will.

I find that for me, it is best not to begin writing immediately after I decide on a topic and select a journal. Instead, I do better if I defer doing any actual writing for a couple of days and let the article idea "percolate" in the back of my mind. I don't know why this works, but I think perhaps my subconscious mind works on the idea, because I find that after a few days, I often have a good idea about the structure of the article, and a fairly clear notion of what the beginning, middle, and end of the article will look like. I have no idea if this will work for anyone else, but I have been told by others that they also find this a useful strategy.

Prepare the Manuscript

Manuscript preparation is extremely important. Authors should find, and rigorously adhere to the specific target journal's guidelines for authors. These guidelines can be found in recent back issues or, increasingly, on the World Wide Web.

There are two separate, but equally important aspects of manuscript preparation that require very careful author attention. The first is the publication style specified by the journal. CIS, for example, requires that manuscripts be prepared according to APA (American Psychological Association) guidelines. However, very rarely do we receive manuscripts that even come close to rigorous conformity to these guidelines. Sometimes, manuscripts employ a totally different style, or, more often, a curious mix of several different styles combined with completely idiosyncratic elements of style. Failure to accurately employ the proper style is a grave error, because it conveys the covert message that the author is careless and lacks concern for precision and accuracy.

The other critical aspect is that of correct grammar, spelling, and other mechanical elements. I am constantly amazed at how many manuscripts I receive in which the first sentence makes no sense because a word or phrase has been omitted. Very careful proofreading and subsequent revision is essential. Improper spelling, bad grammar, or inadequate proofreading prejudices editors against a manuscript before its content has been evaluated.

A related problem involves the reference list and textual citations. APA style calls for textual citations that include only the authors' last names and date of publication. The reference list at the end of the article contains full details about the article. A very commo n problem occurs when the reference list does not include all articles cited in text, or vice versa. Such problems routinely delay publication of articles and are a major source of frustration for editors. A word processor provides an easy way to ensure that the reference list agrees with the articles cited. As soon as the author completes the manuscript, a copy of the reference list should be printed. Then, the author performs a global search, first for "19," then for "20." These searches will find all the citations in text, and each can be marked off the reference list as they are found. Any omissions will then be apparent and can be corrected.

Submit the Manuscript

The manuscript should then be submitted according to journal guidelines. Some journals will require multiple hard (paper) copies, some require files submitted on diskette, and some require both. Any diskettes submitted should be carefully labeled with the authors' names, the article name, and the format (such as Word for Windows). Some journals require a stamped, self-addressed envelope if the author wants the manuscripts

returned in the event of rejection. An increasing number of journals are charging a publication fee. Authors unwilling to pay such a fee should not send manuscripts to these journals. Most journals require that submissions be exclusive, and simultaneous submission to multiple journals is regarded as unethical.

Checking the Status of a Manuscript

Authors wishing to check on the status of a manuscript should use email or the U.S. mail, but should not telephone the editor. Editors often enjoy discussing a potential article with an author, but few, if any, welcome telephone calls to check on an article. Editors are busy people, and most are volunteers who receive no remuneration for their efforts. Checking the status of an article is a time-consuming, routine, record-keeping function, often requiring laborious file searches, and authors should refrain from interrupting editors with such inquiries. By using the mail or email, editors can assign the task to an assistant or perform it at their leisure.

Coping With Rejection

Every author experiences rejections. It is vital that authors strive to avoid the error of taking rejection personally. Most manuscript rejections occur because the submission was not appropriate for the chosen journal, not because the article was faulty or uninteresting. I have published somewhere in the neighborhood of 200 articles and 15 books, and I have been rejected on numerous occasions.

Unfortunately, higher education is full of professors who have been so devastated by a rejection or two that they have never recovered from the humiliation. Many of these individuals subsequently abandoned or greatly restricted their publishing attempts, and their careers have suffered greatly from this reaction.

The best attitude to have about rejection is that it is completely natural and unavoidable, and the best practice is never to give up on a rejected article. Be willing to edit, revise, or completely rewrite, but resolve that every article will eventually be published.

It is also important to be aware that there is more than one type of rejection. By far the most common rejection contains a statement that if listed deficiencies are addressed and corrected, the article should be resubmitted. Upon receiving such a rejection, authors are best advised to carefully read through the criticisms and set the letter aside for a day or two. It is unwise to use the heat of the moment to decide what to do about a rejection. After a few days, the rejection should be read again. If resubmission seems the best course, then authors should decide which of the criticisms are legitimate, and which, if any, are the result of poor reviewing or misinterpretation by reviewers.

The article should then be revised in response to each of the criticisms provided. Once the revision is complete, the article can be resubmitted along with a detailed letter to the editor. Authors should maintain a polite tone in this letter, and list each criticism and how that criticism has been responded to in the rewrite. Each point should refer to a specfic page number and paragraph in the rewrite. If the author feels any of the criticisms are not legitimate, the letter should unemotionally state this fact and provide a complete justification for retaining the original, criticized sections. Finally, a photocopy of the original manuscript, plainly marked "original" should be provided, as well as a photocopy of the original rejection letter. These photocopies will make it easy for the editor to see what changes have been made in the rewrite.

A word needs to be said about the unlikely possibility that the original rejection letter is abusive, rude, or otherwise unprofessional. Authors should bear in mind that reviewers are volunteers who are almost never paid for their refereeing services, and that tenure, promotion, and merit committees typically give little, or any, credit for refereeing. Therefore, good reviewers are difficult to recruit and retain, and arrogant or abusive reviews sometime slip past an editor and find their way into the hands of a potential author. This is unprofessional and unfortunate, but probably unavoidable. If this occurs, authors should resist the impulse to shoot off a reply in kind. Some editors have long memories, and it never pays to alienate a colleague. The best course of action is simply to shrug off such a rejection as undeserving of comment, write off that journal for the present, and send the article someplace else.

Be Generous with Co-Authorships

It pays to collaborate. Not only does it bring added expertise to an article, but also often paves the way for future publishing opportunities. Beginners should choose experienced authors with whom to collaborate, and should carefully provide second or third authorships to anyone who had anything whatsoever to do with the article. I am always surprised at how many publishing and consulting opportunities have come my way because I was careful to include as an author someone who helped a little with an earlier article. While everyone needs a few articles with sole authorship, especially at the beginning of an academic career, most committees and potential employers regard multiple authorships as an indication of willingness to collaborate and an sign that a professor lacks a selfish, or overly competitive approach to scholarship.

Conclusions

Writing can be one of the great joys of academic life. Writing confers a little chunk of immortality that most of us find immensely rewarding. There is something comforting in the knowledge that many years after we are gone, some scholar, in some library, may stumble across something we have written that will prove to be exactly what was needed to inspire a new idea or begin an entirely new line of inquiry. Those of us who are privileged to work in universities need to remind ourselves that we stand on the shoulders of our predecessors, and that we owe a debt of scholarship to our successors. It is hoped that the advice in this article may prove useful to some new professors who are availing themselves of this unique privilege and striving to fulfill this important debt.

Lessons Learned from Project ImPACT: Graduate Student Perspectives on Implementing a Student-Faculty Mentoring Initiative

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Abstract: Project ImPACT, a new PT3 awardee, contains several elements that are designed to systemically address the goal of producing technology-proficient teachers who can appropriately infuse technology into curriculum and instruction. Achieving this goal requires a collection of interwoven strategies within the preservice teacher education program. One such strategy, faculty modeling, is crucial for producing preservice teachers who possess adequate knowledge of educational technology applications, current educational technology standards, and effective practice. Project ImPACT includes a student-faculty mentoring component that provides one-on-one training and support to participating teacher education faculty (Thompson, Hanson, & Reinhart 1996) for the purpose of facilitating institutional change at the university level by promoting the infusion of technology into the preservice teacher education curriculum.

Professional development opportunities may not be widespread or individualized enough to meet the ongoing and specific needs of teacher education faculty (Bentley & Mumma 1999). Typically, universities' professional development strategies consist of offering faculty a variety of generic technology-related workshops; this model of professional development is not effective. First, faculty must see the relevance of the content as it applies to their area. Generic workshops often include participants from a range of subject areas and levels of expertise, and as a result, the content is targeted to meet broad needs of a general audience. Secondly, in order for faculty to take advantage of newly acquired technology skills, adequate follow-up support is critical. This support must be timely, convenient, and presented in supportive ways so faculty members are encouraged to continue taking risks. This kind of support is often lacking in a generic workshop format.

Project ImPACT 's mentoring component is built upon a foundation of collaborative learning and best practices in mentoring. It utilizes a team of mentors, comprised of graduate students from the department of Instructional Technology, Curriculum, and Evaluation, who possess expertise and experience in educational technology applications. Each mentor works one-on-one with three to four members of the University's teacher education faculty. The faculty members represent a cross-section of content areas and mentor-faculty pairings are made with consideration to the knowledge and skills of the mentor and the specific needs of each faculty member. The primary purpose of this mentoring process is to facilitate the infusion of technology into teacher education courses. This work focuses on enhancing each faculty member's ability to integrate relevant technology applications (Thompson, Hanson, & Reinhart 1996). The approach addresses two shortcomings associated with generic workshops by focusing on faculty needs that are relevant to their course curriculum (Zachariades & Roberts 1995) and providing continuous support (Levin & Buell 1999).

During the fall semester, each ImPACT Mentor and his assigned faculty members develop individual professional development plans. Each plan serves as a road map for developing and/or selecting professional development opportunities that are aligned with the needs of the faculty member. These opportunities are diverse in scope, ranging from individualized one-on-one sessions to small group training sessions focusing on specific technology applications.

Session content and format varies with the need of each faculty member. Some faculty members require short sessions of direct instruction on specific technology applications that integrate with course content to meet specific objectives. Examples of these include:

- Digital imaging
- Presentation software
- Small scale digital video production
- Web publishing
- Productivity software

Other faculty members require series of sessions over time that focus on a variety of applications needed to achieve larger, long-term objectives. Examples of these include:

- Web-based and web-enhanced course development
- Larger scale digital video production
- Assistive technology course development

The mentoring component of Project ImPACT has produced a wealth of information that can be utilized in future systemic planning initiatives within the College of Education. Much of this information is documented within session logs that are maintained by the mentors. These logs serve as mechanisms for reflection and strategizing during biweekly meetings. Insights gained from these reflections can be categorized as follows:

- Perceived relevancy of technology applications
- Faculty commitment and prioritization
- Scheduling issues
- University support
- Issues related to mentoring roles and knowledge-base

While each mentoring relationship is unique and presents its own set of challenges, these areas provide a focal point for review of the mentoring process. In subsequent years, proactive strategies grounded in reflection will lead to continual improvement of Project ImPACT's student-faculty mentoring program.

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Coaches and Players Perspectives on Faculty Development In Technology: It's a Whole New Ballgame

Leroy Metze, Pam Petty, Steven Wininger and Charmaine Mosby

Western Kentucky University

Western Kentucky University's College of Education and Behavioral Sciences has received an Innovation Challenge Grant from the United States Department of Education. The project, called e-train express, is designed to implement programs and strategies that increase the number and quality of new teachers who are highly effective in using technology to facilitate, assess and communicate learning for all students.

Since only 20% of current teachers feel comfortable using technology in their classrooms and over two million new technology proficient teachers will be needed in the next decade, Western Kentucky University (WKU), along with partner schools [schools in the 28 districts of the Green River Regional Educational Cooperative (GRREC)], the Compass Learning Corporation and NetTango are implementing programs and practices designed:

- To ensure that all teachers who graduate from our teacher education program can use technology to increase student achievement;
- To ensure that all graduates can use technology to assess student learning;
- To ensure that all university faculty from both teacher education and the arts and sciences departments can model effective technology-assisted instruction for prospective teachers;
- To ensure that electronic portfolios are used as the primary means of gathering data used in the evaluation of teacher performance;
- To use technology to show K-12 students that teaching is a good career option; and
- To set up an electronic clearinghouse that will give teachers and teacher educators throughout the country access to exemplary technology-assisted lesson plans and assessments.

Western Kentucky University believes that technology has the potential to make teaching and learning far more efficient than in the past. Technology not only gives people access to new information, it gives them more opportunities to work together. The e-train express will enable WKU to integrate technology in teacher preparation courses and use technology to spread the best practices that develop from them.

During the first year, e-train has focused on faculty development. Faculty development began when thirty faculty members, called technology advocates, attended a day long institute. The plan was to excite, educate and obtain a commitment from the advocates who came from teacher education and the arts and sciences. During the institute, the advocates learned about the NETS standards from one of the co-authors and explored examples of the integration of technology into instruction. After a long day of work each

advocate was surprised when they received a PDA. Each PDA was labeled as belonging to an e-train technology advocate. This has had the intended effect of identifying them as a member of a 'special' group and increasing interest in faculty who are not yet involved. Finally, each advocate made a commitment to advocate the use of instructional technology, help their peers use technology in their instruction, model the use of instructional technology and participate in groups that investigate instructional uses of technologies. These groups focus on topics including:

- Personal Digital Assistants
- Web Design
- Presentation Software
- Digital Cameras
- Scanners
- Electronic Portfolios
- Web Quests
- Video Production
- Electronic Classrooms
- Online Classes
- Online surveys
- Ethical use of technology

The primary objectives relative to faculty professional development in technology centered on breaking the traditional mold of staff development characterized by one-shot, one-size-fits-all, trainer-driven presentations that lack follow-through. Studies show that most educators do not learn to use technology from taking courses, attending seminars or workshops, or through traditional professional development programs. Our training plan works on the premise that a team effort toward technology training can promote effective technology learning. The model of technology training we developed utilized the Project Director and the University Coordinator for the grant to act as coaches and facilitators, serving more to guide understanding than to follow pre-defined agendas. Instead, the people who attended the sessions defined the training agendas based on their needs and were active participants rather than passive listeners receiving knowledge from an "expert."

The training sessions were social in nature, yet very goal oriented. We limited the sessions to one hour and scheduled them frequently, either weekly or bi-weekly, with attendees deciding when the next session would occur. The sessions were inquiry-based as attendees set goals for the content of each session based on a "need to know" scenario. Trainees moved quickly from information synthesis, to application of the new technology skills as personal production tools, to integration of the new skills into coursework.

After the first six months, it was determined that the advocates were still excited about their roll and most had gained significant knowledge and enthusiasm. Individually or as a member of a group, all advocates have been asked to make a presentation at an e-train conference using instructional technology. The purpose of this activity is to transition

the advocates from learners to mentors and/or teachers, to build their confidence and to recruit new advocates.

Panel members include the Project Director, the University Coordinator, a faculty member from the Arts and Sciences, a faculty member from Teacher Education, a 'new' faculty member and a 'seasoned' faculty member. These members will present their perspective on the activities described above from varied points of vies.

For more information about e-train express, please see www.etrainexpress.com.

With a Little Help from Your Students: A New Model for Faculty Development and Online Course Design

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Abstract: We describe an approach to faculty development that brings together senior education faculty and graduate students to design online learning environments. This approach forces course designers to confront beliefs about what constitutes good teaching, in conjunction with the roles of technology in effective pedagogy. Our experiences, supported by observation and interview data, show that faculty have explicitly considered pedagogical, technical, and practical aspects of course development; learned new technologies and their application to good education; considered the perspective of graduate students in ways they often do not in traditional courses; and to reconciled their views of education in traditional classrooms with what they would be doing online. Likewise, graduate student co-designers learned new technologies; gained insights into how faculty design courses; and considered how pedagogical ideals get translated into specific features of the course.

Introduction

In order to prepare university faculty to meet the demands of teaching and learning in an online environment, institutions of higher education must find ways to develop the expertise needed to teach in the online world, while meeting several very real constraints (e.g., limited faculty time, limited college budgets, fear of technology, etc.). Faculty members who are to teach these courses are key to the successful implementation of these online courses. However, faculty development is often a difficult task particularly when it comes to technology. Research in the area of faculty development indicates that attitudinal issues, such as how people perceive and react to technologies are far more important than structural and technical obstacles in influencing the use of technology in higher education (Dillon & Walsh, 1992; Clark 1993). As one of the faculty members who was to develop an online course said:

> "I don't know a lot about the technical stuff of the computer. I don't feel like I want to know that, or need to know that.... other people can do that. That's not what I want to do. I don't know how the telephone works either. Nor do I care."

Other obstacles include extensive investments of time for course preparation and development something most faculty find burdensome (Harris & DiPaolo, 1999; Loeding & Winn, 1999).

The standard approach to confronting these problems is to separate roles i.e. enlist the help of technical experts (e.g., web-programmers and designers) for the technical aspects of online course development, while leaving the development of course content to the faculty. The technology experts develop suites of tools, templates for course layouts, and then apply them to the content they receive from the instructors.

We see a variety of problems with this separation of roles approach. Most importantly faculty members do not have any ownership over the design of the course and the technology being used particularly if they are not intrinsically interested in learning technical stuff. This is in direct contrast with every day faculty experience with face-to-face courses where they have far greater ownership and control over the design of the course materials. In addition, the faculty members' lack of knowledge about the technology and its possibilities limit their ideas to those offered to them by the technology experts. Since form and function are intimately related, leaving these design decisions to technical experts can have a significant impact on pedagogy. Faculty members need to be the ones making these decisions rather than leave it to the technical experts, who may not have any background or expertise in instructional design and education. Ironically, the fact that faculty do not need to learn any technology is often touted as being the main value of this separation of roles approach.

Another consequence of this strategy is that it often leads to uniformity and an one-size-fits-all approach towards course development. In other words most online courses begin to look like clones of each other. Institutional practices get stabilized as producers present incoming faculty members with existing online

course designs and since the faculty do not know better, they continue to replicate what they have been told "worked before." This, once again, is in sharp contrast to the immense diversity we see in regular face-to-face courses. Courses taught face-to-face often differ drastically from each other when taught by different faculty members and even when taught by the same faculty member at different times. Instructors bring their personality, their individuality to the course, its presentation and its execution. However, in online instruction, the individual faculty member is often missing from the presentation of the course, or at the best delegated to a corner of the web site (the corner that contains the mandatory instructor's picture and bio).

Finally, the separation of roles approach treats faculty development as being the last stage in the process, i.e., faculty use the technology only when they get to teach it. First time is real-time, and this denies faculty members an opportunity to reflect on the process of online instruction prior to teaching it.

Our Design-based Approach

There are many different strategies that have been used for faculty development in higher education. Menges (1994) lists the different approaches that have been found to be successful. These are (a) workshops and seminars; (b) individual consultation; (c) grants for instructional improvements; (c) resource materials, such as books and newsletters; and (d) colleagues helping colleagues. Rather than use any single of these approaches our strategy of learning by design, incorporates all of the above and more. The design approach attempts to avoid the problems we listed above by developing the technical and pedagogical skills needed by the faculty members within the context of designing the online course. Instead of handing web-programmers a set of materials that worked in the face-to-face classroom, we advocate that expert teachers take a hand in the design of the technology to support the learning. We rely on the process of design to develop the necessary skills and relationships for understanding the nuances of integrating technology and pedagogy. Our emphasis on design has been informed by long-standing research on the use of design for learning complex and interrelated ideas (Dewey, 1910; Perkins, 1989; Blumenfeld et. al. 1991; Harel & Papert; 1990; Kafai, 1996; Mishra, Zhao, & Tan, 1999; Vyas & Mishra, in press). Design-based activities not only provide a rich context for learning, they also lend themselves to sustained inquiry and revision that we hope will help designers to come away with the deep understanding needed to apply knowledge in the complex domains of real world practice (Mishra & Koehler, in press).

At Michigan State University, this design approach is represented in an educational technology Master's level course taught by the authors. In this course, master's students design technology to help solve a problem of educational practice. That is, participants learn education technology in the context of real world problems. To accomplish our goals for developing skills in faculty members responsible for the development of online courses, we extended the course in design to include faculty members. During the Spring 2001 offering of the course, six tenured faculty were enrolled as "students" in the design course. Teams consisting of one faculty member and three or four master's students worked on designing an online course that would be taught by the faculty member in the following year.

There were various motivations for faculty and student participation. The faculty received a laptop computer and $1000 for developing the course. Graduate students were attracted to the opportunity to work with faculty members on an authentic project, as well as to learn about educational technology, specifically as it applied to online learning and teaching. For us, the faculty members teaching this course it was an opportunity to build on our research agenda on learning through design. It allowed us to take our ideas about technology proficiency and what teachers need to know and actually apply it (Mishra & Koehler, in press; Mishra, Zhao & Tan, 1999). This was also an important service that we offered to our college and university.

The major activities of the course consisted of readings, explorations with technology, prototyping of the online course, online and in-class discussions, and peer review and feedback. A typical class period had a whole class component that was used to discuss readings and issues that applied to all groups, and a working group component in which the design teams worked on their projects.

Data Sources

For this study we collected a range of data. We interviewed the faculty members about their experience. The average length of the interviews was around one hour. We also collected the final papers written by the students. In this paper students were asked to describe their learning and experience in this course. We also conducted a student email survey (after the grades were handed out). We combined this with our observations in class, postings made by faculty and students to the discussion groups as well as the artifacts created by the groups during the design process.

Outcomes for Faculty Members

Each of the six groups successfully designed an online course. Five of the courses have already been taught, and one will be taught during the Spring 2002 semester. More importantly, we believe that faculty members have learned a lot about designing online courses that they would not have using the traditional approach. First, faculty took control of over design decisions about when, why, and how to use technology. No longer were decisions about technology made by programmers who did not realized the pedagogical impact of those decisions. Also, faculty development happened *before* they taught the course – instructors thought about and used the technology before the class went live. Finally, the faculty leamed about technology and developed skills that they would not have had they simply left the details to the technology experts.

Through an analysis of the interviews conducted after the course was over, postings to the online threaded discussion, statements in the class, and the courses developed by the design teams, we found that the faculty developed in a number of ways. First, because faculty had to talk out loud to their design team, faculty had to explicitly confront pedagogical issues in ways they have not had to in traditional courses.

> "One of the most challenging and confrontive (sic) groups I ever worked with and that's been very healthy and refreshing. I've confronted them about the way I want to do things and they've confronted me like 'you can't do it that way,' or 'it doesn't make sense to do it that way,' so that's been very refreshing. It hasn't been personal at all, ... not challenging in a negative way but it's been stimulating the group process"

Designing courses for a face-to-face environment was something that all faculty members had a lot of experience with. However, like most experts, firmly established work activities were characterized by automatic routines and tacit knowledge and practices. However, the introduction of a new context for course design, where the rules of face to face teaching do not necessarily apply, presented new challenges to established practices. It required the development of new procedures, new tools, and new artifacts to represent and teach content in new contexts. The faculty participants quickly realized this and sought new forms of support and collaboration required to support their solutions to these new problems. For example, a major concern of all faculty members was how to engage students with the text online. Faculty used their student group members to test out their ideas and make revisions as needed. One faculty noted:

> "I was shocked because I had given everybody a sample chapter. I boxed it, bolded it, the things that I wanted to be salient. They still didn't see it. So that told me it was only when we sat face to face and I said okay, here is a little pretest I'm thinking about, answer that one question and they couldn't. And they didn't even know they'd read it and they didn't even know where it was. That was a very poignant test for me, it said, we have to think much more carefully about how we're going to signal the students relative to what is really salient here."

However, the struggle was not without merit – the instructors were able, through their experiences in the class, to successfully reconcile these differences between their past teaching experiences and the challenges posed by the new online environments.

Faculty also developed a broader understanding of technology. Teaching online courses equires a level of familiarity and comfort with technology that many faculty members lacked. Although faculty members were the "content experts" they typically were not the technology experts. Consequently, developing an online course required collaboration with individuals who are experts in technology (the course instructors and knowledgeable graduate students). Accordingly they not only became more knowledgeable about various technologies, their understanding of technology became realistic, and was more likely to inform the relationship between technical decisions and the impact on pedagogy. For example, one faculty member mentioned how the class discussions increased her knowledge of what is possible with technology: "I think there were applications I hadn't seen before. I'd seen streaming video but I'd seen how it could be linked... used in a course so I kinda thought about them concretely for the first time. We spent some time almost every week talking about something technical and those were very interesting to me."

Finally, the faculty members benefited from their interaction with the graduate students. The graduate students proved to be a valuable source of ideas. For example, one faculty member found:

> "I think It's... going to be simpler and clearer (for students) than I thought at the beginning and one thing that a couple [of] people (in my group) recommended to me is for those discussions, don't leave them open ended. Connect them to a text chapter and have some very

> focused items or, or questions or focus points for each web talk conversation.... In the past I would have tended to be more loose and students kind of pick up indirectly and maybe that's been one of the things that hasn't worked real well for me so that's an example of being very explicit in terms of today, based on this content, we're having this discussion."

Furthermore, by bringing to bear their own experiences as students, and by imaging themselves in the online class they were developing, the graduate students were able to give faculty members feedback about the likely effect the design would have on prospective students. For example, all faculty members commented on the value of the collaborative process of course design with students. One noted, "I think that was one of the most interesting things is that what was actually produced was largely their (students) work. I mean, they, they actually did the design, the graphics and all that stuff was all their work."

Outcomes for Graduate Students

In many ways, this design course was a typical graduate class experience for the students – they read articles, discussed ideas, and were responsible for meeting course deadlines. However, there were some important differences. Like faculty members, students learned a lot about technology – they were exposed to several technologies, they assessed their usefulness, and potentially used them in the design of the online class. In more traditional technology courses, students explicitly learn target technologies as part of the course (e.g. web design, digital video, etc). In contrast, the design approach made learning about technology implicit – students learned about technologies as they needed to in order to fulfill some desired feature of the course they were designing. However despite this "implicit approach" students were exposed to a range of different technologies and managed to focus their attention on particular technologies that were most appropriate for the task at hand. For instance, one student wrote, "This course was a wonderful experience for me, and I gained a lot of new knowledge and information that I found very useful for. The best thing that I learned from this course was about FTP and Digitizing Videos."

The task of designing an online course was a unique opportunity for most students. Most of their experience in graduate education has been as students in graduate courses. For those who had some experience teaching a graduate course, their experience was mainly limited to being a teaching assistant, or enacting someone else's ideas. None of the students had previously had the opportunity to design a graduate course from scratch. Opening up the process of graduate teaching for students gave them the chance to apply their knowledge of educational theory to a real context, and to further their own development as future lecturers, instructors, and professors. As one student said, "This class has been one that I will never forget. From how much work building, maintaining, and revising an on line course is to learning how to work in a group again, this experience has been one that has reshaped many things that I have held to or thought about teaching."

Also, the chance to work with tenured faculty provided novel experiences for most of the students. Too often, graduate students' experiences with their professors seem opaque – they only get to see final products of their thought processes (e.g., research papers, courses they take, etc.). By working with expert educators, they got to interact with ideas in ways that they are seldom allowed – they worked over a whole semester with these ideas, got to influence the experts' ideas, and apply them to a real problem. As one student said, "Working with a faculty member, as a team to create an online class had been a wonderful experience to me especially in thinking about a particular course structure, it's syllabus, schedule, grading systems, forms, the layout of the web, video presentation about the course." Another said, "It was fascinating to see how the faculty thought about curricular design, teaching strategies, and student learning. As I was concurrently enrolled in HALE (Higher, Adult, and Lifelong Education) core course focused on teaching, learning, and curriculum, I learned a tremendous amount through listening to the faculty discuss their ideas and concerns." Most students reported that this course was one of the best courses they had ever had in their graduate program. Working on an authentic design problem, within a group led by a faculty member made the experience a unique one—one very different from most courses the students had been in before.

Conclusion

The design approach to faculty development has proved to be a fruitful lens for considering the many avenues of professional growth required to enter the world of online teaching and learning. Instead of turning over the development of their courses to web-programmers, the designers of these courses experienced something quite different. They worked together to design the courses themselves. Along the way, they not only

learned new technology skills, they also thoughtfully considered how the technology could be leveraged to accomplish higher-order learning goals for their potential students.

Did faculty develop? Consider the following quote we had offered at the beginning of the paper.

> "I don't know a lot about the technical stuff of the computer. I don't feel like I want to know that, or need to know that.... other people can do that. That's not what I want to do. I don't know how the telephone works either. Nor do I care."

And a quote from a web programmer helping the same faculty member as she implemented the course having gone through the course:

> [She] has been changing with that stuff all semester and it's great, it's been nice to watch when she first started she just changed text, now she puts in links, she adds papers up to the server and then links to them, she changes different html things. One of the things that she does is she records her weekly feedback to the students and then converts that to a real audio and puts it on the server. She doesn't have to bother about sending it to me and then worrying whether I did it right or not and she can also do it while she's on vacation or what ever.

Clearly, this faculty member had changed her stance about her own learning about technology and indicates what is possible in the design approach. As the same faculty member summarized her experience with this course "My goal was to really give myself, force myself the luxury of thinking critically about teaching in, in this format and in any other format. That was really a luxury of the course and that's what I wanted and that's what I got. I made that happen for myself."

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"Surviving" Web-based Professional Development (or, How Not to Get Kicked off the Island): Lessons Learned from the Inquiry Learning Forum

Julie Moore, Indiana University, US

Background

Organizations and institutions are increasingly offering online professional development opportunities to educators [Mather, 2000 #56]. This is especially true for teachers who must keep up with new teaching strategies, the latest professional standards, and constantly changing technologies. Coincidentally, new technologies promise to facilitate access to learning at times and places chosen by the learner. These web-based environments have the potential to transform teacher professional development through the use of new models of teaching and learning. They also have the potential to facilitate a culture of sharing, collaboration, mentoring, and support for K-12 teachers.

In the design of these web-based environments, there are not only technical challenges but, perhaps more importantly social and cultural challenges and norms which must be addressed in order for these new models to succeed. While initial attraction and interest may be high, establishing long-term, high-quality learning opportunities is a much more difficult goal to reach.

The Inquiry Learning Forum

The Inquiry Learning Forum (ILF) is a NSF funded research and development project that seeks to support a community of K-12 math and science teachers interested in inquiry-based teaching. The original research aspect of the project seeks to understand how to build and sustain an online community of practice. From a service perspective, we are trying to support teachers, pre-service teachers, administrators, and teacher educators come together in a resource and context rich web-based environment to explore, challenge, and expand their notions of inquiry-based teaching.

This paper and presentation will focus on the first two and a half years of the Inquiry Learning Forum project. Specifically, this presentation will address key design features based on a community of practice model, challenges consequent from both our original conception of the project and it's design, and how the project and the design of the website has evolved to meet these challenges.

The concept of "community of practice" has come out of sociology literature [Lave, 1991 #43], [Wenger, 1998 #40]. Barab, MaKinster, and Scheckler [Barab, in press #46]. define community of Practice as "a persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on a common practice and/or mutual enterprise." The ILF was originally conceptualized as an attempt to create such a community through an online environment. When we approached teachers and asked them what they would most like to do for their own professional development, the answer we received overwhelmingly "I'd like to go see how that person teaches." With that in mind, attention focused on creating online "classrooms" - video-based examples of actual inquiry-based lessons that acted as anchors to discussions, teacher reflections, resources, connections to standards, lesson plans, and student work. The original thinking was that these resource-rich videos provided teachers with a mechanism for sharing their history and experiences, would provide a common practice upon which to discuss and challenge each others notions' about inquiry-based teaching and learning. The site launched in March of 2000 and seemed to be well received whenever shown or demonstrated.

The Journey

As time went by, however, the ILF project team realized that the type of interactions that were occurring were very superficial and not very sustaining. Groups using the system for workshops would be excited to use it, but not return and continue in any long-term conversations. Additionally, teachers who were featured in the videotaped classrooms were disappointed with the lack of critical dialogue around their classes that they had hoped would provide them ideas and avenues for improvement.

So why wasn't this working? As we examined the project at the end of year one we began to reach several conclusions. In many ways, we realized that we were battling more than the normal diffusion issues. We were battling long-held cultural conditions, a realization that the building of community requires

more scaffolding than we originally wanted to give, and the inability for the project in it's current form to reach the person to person aspect that was needed.

First, while we sought to meet teachers needs by providing the type professional development they said they wanted, we were still fighting an uphill battle with regard to the culture of schools. To fully engage in a discussion around a classroom required a large chunk of time -- time their day didn't allow for. Also, while the web offers the promise of "anytime, anywhere" the reality of a teacher's day and the continuing lack of pervasive technology in teacher's classrooms makes this promise an illusion. Another cultural issue had to do with the way in which teachers traditionally interact with one another. Teachers traditionally work in extremely isolated situations, rarely get to see other teachers teach, and hardly ever engage in critical dialogue about one another's teaching. If they don't do this in their current situations, it was perhaps naive of us to expect them to do it in an online environment, where their words were captured for all to see -- forever!

Second, in our exuberance to have "community" evolve and blossom, we designed a space without much scaffolding for engaging in the space or in the dialogue. Discussions were distributed throughout multiple classrooms and general discussion areas. In our hopes for the notion of "inquiry" to bubble up out of the community, members were left to wonder, "what is inquiry, anyway?" Additionally, we did not provide any real mechanism for structuring people's experience with the ILF. They came to the website and were left to their own devices as to where to go and what to do. An aspect of the project that was overwhelming for many. Lastly, many users felt that the only way they could really contribute to the community was to contribute a video lesson - a daunting task for almost all. We did not have any low-cost ways of engaging in and contributing to the community.

Third, while we designed well for usability, we did little to design "sociability" into the ILF. It was difficult for people to "find" others with common interests. In our concern in protecting anonymity, we dehumanized many aspects of the site. In our attempt to build an online community, we failed to realize the importance of face-to-face, human interaction.

Changing our Course

We have attempted to meet all of these obstacles in a variety of ways. First, we have shifted our focus from "building online community" to "supporting community online." As such, we have developed group work spaces that allow pre-established, school-based, subject-based, or course-based groups to work together, build and share documents, and have their own private discussions. To address the issue of scaffolding, we have developed printable "guides" for the ILF as well as activities that utilize the features of the ILF to help teachers answer their own questions about inquiry-based learning. We have refocused the project and, quite literally, the site on inquiry-based teaching, putting our own stake in the sand as to what inquiry-based teaching is and how it can benefit students. We have tried to make entry into the community more accessible by providing lower cost ways of contributing and gaining from participation. The library, formerly a list of relevant links, is now a place where teachers can contribute and download lesson plans, the currency of the classroom. To reduce the overwhelming nature of the project, we have created a personal portal where members can store bookmarks to their favorite classrooms, lesson plans, discussion groups, and group spaces. To help encourage connections, we have developed personal profiles that are accessible from discussion forums, a members' list, and contributed resources. Members can now see, send email to, and leave guestbook comments to other members with common interests. Lastly, we have developed a model for bringing groups together to support one another in their common interests that focuses on both face-to-face meetings as well as online support.

Conclusion

While we can't say with complete assurance that we have "survived" the world of online professional development, we have certainly learned, and continue to learn a great deal. Breaking the mold with new professional development models is a very enticing challenge, but one that must be taken only with the proper respect for current culture and constraints.

Technology Committee Function: Holly Jolly Technology Folly

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Lois Christensen, University Of Alabama At Birmingham, US
Jiang Lan, University Of Alabama At Birmingham, US
Karen Dahle, Unversity Of Alabama At Birmingham, US

This session will be an interactive session in which panel presenters will discuss their functions on a technology committee and present the ways that they incite technology infusion and training with university faculty. Digital photos of two technology extravaganzas and the varied technological themes involved in both events will be featured in a PowerPoint presentation and accompanied by a description outlining committee endeavors. Conferees will interact and share some of the ways in which they enthusiastically provide technological professional development for university teacher education faculty.

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A Collaborative Faculty Technology Development Initiative

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Abstract: The Technology Advisory Committee and the Faculty Development Committee of the college of education at Appalachian State University began a Faculty Technology Development initiative that involved faculty from across departments. This initiative had the following goals: (a) to have ongoing, sustained conversations on identified instructional technology issues within the college; (b) to create, promote and share a faculty vision on the role of technology in teaching and learning; (c) to collaboratively inquire into continuous improvement and sharing of what faculty were doing with instructional technology; and (d) to promote and share models of effective technology enhanced teaching and research. Funding for this effort is provided by the Appalachian Rural Teacher Technology Alliance, a PT3 grant from the U.S. Department of Education. This paper will include a discussion of the processes used by the Faculty Technology Development group to promote and support educating college of education faculty in appropriate technology integration into curriculum and will share lessons learned as well as the products produced to date.

Introduction

Recent national reports and research (CEO Forum Report, 2000; Uttendorfer, 2001; Carbonaro, Snart & Goodale, 2001) note that while computer technology is in place in higher education settings, the integration of technology into teaching lags behind. In K-12 teacher training programs, state boards of education have adopted technology standards for their teachers. North Carolina's State Board of Education

(http://www.ncpublicschools.org/tap/techcomp.htm) mandated a set of basic and advanced technology competencies for pre-service and experienced teachers. As a result, faculties of education need to develop and strengthen their technology skills in order to model and facilitate these skills for pre-service teachers. Much research has been presented on the use of technologies in post-secondary learning environments in an effort to bridge the gap between available technologies and the integration of those strategies (Bohannon, 2001; Glennan & Melmed, 2000). Yet, little research exists on formative ways of training faculty to use this technology appropriately (Dutt-Doner, Larson, & Broyles, 2001). The focus of this paper is to present the work and lessons learned from a college of education Faculty Technology Development initiative.

This initiative began with six faculty members from across departments within the college of education in the fall of 2000, selected by the College's Technology Advisory Council and the Faculty Professional Development committee. The group, the first of the Faculty Technology Development (FTD), had the following goals: (a) to have ongoing, sustained conversations on identified instructional technology issues within the college; (b) to create, promote and share a faculty vision on the role of technology in teaching and learning; (c) to collaboratively inquire into continuous improvement and sharing of what faculty were doing with instructional technology; and (d) to promote and share models of effective technology enhanced teaching and research.

Activities and Products

The faculty team initially used attendance at a national professional conference as a catalyst for meeting the FTD goals. The team met to select a conference to attend as a group, and to assess the current state of affairs within the college on instructional technology issues. Points, concerns and issues raised during these initial meetings became woven throughout the pre, during, and post-conference meetings. Pre-conference meetings included identifying key questions to be researched during the selected conference, establishing team and individual roles and goals, setting an overall team agenda for the conference, establishing travel arrangements, setting meeting times during the conference, and brainstorming post-conference dissemination activities to be implemented within the college. The team met during the conference to share experiences from different sessions attended, review goals and revise plans for future sessions, and raise new questions. Participant meetings during the conference were designed to connect the conference experiences to the college's instructional technology issues. During post-conference sessions, the participating faculty discussed lessons learned, determined and planned additional dissemination activities, and planned for the next team.

Principles Guiding the Implementation of Instructional Technology (below) written by the participants on the first team has become an initial working document for the group as well as a statement for the college.

1. Above all we value effective teaching. We believe that technology can enhance effective teaching. Technology is fulfilling when it helps make us more effective teachers.
2. The learning curve and dynamic environment of technology don't alienate or separate technology from teaching and learning or curriculum & instruction. All principles of pedagogy and learning apply to technology-based instruction as well.
3. The rate of change in the information age is immediate and the impact is dramatic. Long-term plans must be flexible. We must stay focused on our learning goals so that we don't lose our way when new technology becomes available.
4. We believe that computer/telecommunications technology can improve the culture of the college. We must emphasize the importance of computer networks and what they offer. Interdependency via computers increases the importance of viewing ourselves as a learning community. Social-constructivist theory supports the use of technology to increase the levels of collaboration and innovation in our teaching. Computer networks are extensions of human networks. We must strive to include all our colleagues as well as our students in technological innovation.
5. We need to keep a clear understanding of the role of technology in activity construction; we also need a better understanding of when ***not*** to use technology in our instruction (Just because we can do something with a computer, doesn't mean that we should. We must ask ourselves why we are using the technologies we are and how it will benefit our students.).

Often, we will need to resist technological innovation that is imposed from the outside (distance learning, for example) when the pedagogy may be compromised. Conversely, we must not blame the technology for bad pedagogy.

6. Integrating technological tools in instruction is tricky business. We must learn how to separate out real improvement in learning from temporary or illusionary learning. Instruction utilizing technology may make an activity fun, but may not actually accomplish learning goals. Technology innovation in instruction should take the following into account:

   The student may find the activity to *be fun* – but is learning taking place?

   The students may enjoy the *novelty and excitement* of the activity – but is it just because it's something new or are students really learning something?

   The students may be *engaged* in the activity – but is the engagement because of learning or because of the excitement of the technology tool?

7. There are dual objectives in selecting technology tools in our teacher education programs:

   a. Using technology to enhance concept and content acquisition in the teacher education curriculum.
   b. Helping students learn and acquire skills in the use of technology as an effective part of the teaching act or other professional role for which they are preparing.

In addition, a second document, *Actions needed to Sustain the Growth of the Effective Use of Technology* (below) has been used to assist the planning process for creating new forms of learning environments.

1. Faculty members in Reich College of Education are already doing great things with technology. We must develop an awareness of the quality, types and levels of technology in instruction. We must be more conscious about the way we collaborate.
2. We should conduct research on our practice. We must think of new ways to capture what we are doing. Case studies, ethnographies, experimental design studies, and other research techniques can be applied. The current literature on researching technological innovation supports creative multiple approaches. We cannot know our deficits if we don't know what we have.
3. We must acknowledge that we learn through our interactions with all people. While there are mismatches between people and developmental differences to take into account, it is crucial to recognize the worth and potential contributions of all of our colleagues.
4. We need to seek ways to sustain research, conversations, sharing, and explorations related to the use of technology in learning settings. How we reward effective work with technology and encourage the continued effort to explore and share the results of using technology will be critical to our efforts to prepare our graduates for the roles they will take on after completing our programs.

The first team of the FTD returned from their first conference experience and invited new members to participate in team activities. The new members joined some members from the first team to attend a second conference. This second team began by discussing the two documents above before attending a conference and then, at the conference, used their experience to expand upon the discussions and actions initiated at the first conference. Thus, the faculty team currently consists of new as well as previous faculty members.

A key recommendation of the team attending the second conference was to hold a retreat for the entire FTD group. This activity was held before the beginning of the fall 2001 semester. From the retreat several key activities emerged. Colloquia have been held to provide faculty opportunities to share their uses of technology with each other. Plans are being made to provide faculty with opportunities to visit K-12 schools in which technology is being used effectively. And plans to develop resources to support case studies of technology use in the college are being formed.

The FTD will be expanded further this year with additional participants who will attend other professional technology/education conferences this spring to continue the foundational work started previously.

Lessons Learned

Retreats and conferences allowed faculty members to take time to learn about and discuss current issues and goals for this project. Out of this planned discourse came the realization that collegiality is an important factor for participation in this initiative. This coupled well with the concept of social constructivism that is the focus of our conceptual framework within the college.

The first team to participate in this effort quickly realized that a number of faculty members within the college of education were currently implementing state of the art technology in their teaching. After arriving home from the first conference, plans were discussed about how to more effectively share methods of instructional technology between colleagues.

Forming teams to participate in this project created a sense of ownership. From this sense came renewed feelings of belonging and commitments to attendance and further contributions toward common goals. Leadership also emerged in the form of school-based issues, policies, and politics on the use of effective technology in public schools.

Conclusions and Future Directions

Clearly, educating the professorate to understand the issues, tools, processes and products needed for a technology-based society is difficult at best. Transforming the faculty in our colleges of education who prepare our future teachers has proven just as challenging. This project has explored a model of professional development designed to provide faculty of a college of education strategies for investigating various technology-based learning environments. Experiences to date in developing and implementing this model support several conclusions:

1. Cross-discipline teams of faculties of education are very interested in learning about appropriate technology integration strategies for their programs.
2. Creating a college-wide vision of teaching and learning in technology-based learning environments is paramount in order to guide our future efforts.
3. Engaging faculty teams in asking appropriate questions concerning new technology-based learning environments is critical.
4. Opportunities to measure specific progress in our own college against that demonstrated within the national community are very useful in furthering faculty dialogue.
5. Planning specific small and large group pre- and post- activities is a necessary to insure continuity of purpose and dialogue.

As we continue to explore the implementation of this model, several future trends and directions are discernable within the faculty-teams.

1. Identifying and visiting exemplary technology-based instructional sites will serve as models for further discussions.
2. Collaborative cross-discipline research projects will be designed and implemented.
3. Additional faculty within the college will continue to be invited to participate in this program.

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Technology Integration in Teacher Education: Changing the Way Learners Think About and Do Their Work

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The Linking the Future to the Present PT3 grant at Kent State University is now in it's third year of implementation. With a keen, questioning eye on our progress and insightful feedback from our evaluators, we are learning a lot about technology integration in our teacher education program. With this insight, we might simply say that in Year I we learned what didn't work, in Year II we learned what did, and now in year III we're learning why.

Linking the Future to the Present supports faculty development of technology integration models by providing student assistants, consultants, materials and supplies, field visits to technology-rich learning sites, and stipends only in restricted instances; university conditions prevent our support through release time, which is the most frequently requested faculty incentive at our institution. During Year I, our incentives were apparently not attractive enough to generate the degree of faculty participation we originally expected. Also during Year I, faculty participation was limited to a triad structure, involving education faculty collaboration with liberal arts and sciences faculty; the idea of collaboration was not a barrier, but timing of courses and workload was. PK-12 collaborations were already in place for faculty in education *and* arts and sciences so that was never a challenge.

In Year II we expanded faculty opportunities to include individual and program-level projects. This successfully increased faculty participation so that by the middle of Year II we were on track with originally targeted numbers. We also found faculty could now better articulate how their technology integration was changing their students' learning, and more importantly, their own. Concurrently, the evaluation feedback helped the project implementation team consciously recognize and attend to the role informal networks were playing in our complex process of innovation. Now that we have begun Year III, we are intentionally exploring, nurturing, and examining these networks; we believe a new model of faculty development is emerging. We too are changing the way we think about and do our work!

To effectively Link the Future to the Present, we situate our technology integration in the context of highly intellectual and compelling inquiry work for learners. We have chosen the research of Newmann, Secada, and Wehlage (1995, also www.consortium-chicago.org/acrobat/Intellectual%20Report.pdf) to frame this type of work for learners.

In this paper, we invite you to visit our virtual gallery of faculty technology integration models, listen to their commentary on how this integration is changing their own and their student's thinking and learning, and hear our preservice teachers' firsthand comments about the same.

The gallery includes work such as explorations of digital photography and language development in early childhood, critical examination of new literacies in middle childhood language arts, sophisticated imaging techniques in middle childhood biological sciences, case study in WebQuest format in early childhood intervention, authentic application of mathematical processes through inquiry into Rock and Roll Hall of Fame data, and examination of urban sprawl using real data in geography. These projects involve education faculty, liberal arts and sciences faculty, student assistants, and consortium partners.

Coaching Faculty for Technology Integration

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Abstract: This paper examines various staff development strategies used to integrate technology. This university received part of the statewide technology challenge grant referred to as LOFTI. Using this grant, both technology integration and change has been addressed through strategies such as intensive training sessions and coaching. This paper focuses on the bridge from intensive group training to a coaching mentality for technology staff development. The paper will also examine the potential effectiveness of coaching as a strategy.

Introduction

Faculty development is an important step in technology integration in higher education. Trying to keep faculty members updated in new technology developments and encouraging them to use technology in their teaching is a never-ending job. While staff development opportunities abound, there hasn't been an effort to make the opportunities relevant to individual faculty members. Thus, it may now be time to move into a "coaching" relationship with faculty members to encourage them to stretch their technology integration ideas.

Because South Dakota is currently in year four of a technology challenge grant, development opportunities have been numerous. The grant called Learning Organizations for Technology Integration (LOFTI) focuses on using technology as a change agent for the educational systems in the state through increased skills, knowledge and technology integration (Parry et al., 1997). As a representative of a local LOFTI group, the challenge has been to provide opportunities to faculty members without spreading myself and our other technology staff too thin as a resource. This session focuses on the opportunities provided and the realization that coaching may be an effective strategy for continuing the learning of university faculty members.

Past Faculty Development Opportunities

LOFTI has provided the funding for the College of Education and Counseling faculty members to learn about technology and determine how best they could integrate it into their curriculum. The goal of LOFTI for higher education has been to improve preservice curriculum to provide "in-depth, contextual learning opportunities for integration of content, pedagogy, and educational technology which incorporate engaged learner and process portfolio strategies" (Parry et al., 1997, p. 15). In order to do meet this goal of the grant, faculty members needed tot model technology use in their teaching. Locally, it meant that faculty members needed to learn how to integrating technology effectively. The issues came with time and know-how amongst faculty.

In order to get faculty members to feel comfortable, a needs assessment was conducted the first year of the grant. In this assessment, faculty members indicated that they needed skills in everything from file management to web page design. In accordance with the expressed need, a weeklong intensive faculty development academy was designed providing opportunities to learn various programs applications and to grow comfortable with the computers in their building. This academy went a long way toward meeting the needs of faculty members who had little or no expertise in a variety of programs.

The second year was spent on reviewing some of the skills and taking more time with the integration tools available to our faculty members. Sessions during this weeklong intensive faculty training centered on distance learning using both interactive videoconferencing and internet, courseware products,

and brainstorming opportunities for integration of these tools. This session went well and built a community of faculty members committed to at least trying to integrate new technology. As the school year progressed, however, time and technology failures discouraged some of these faculty members.

The third year has been spent building a community atmosphere rather than focus on the various technology skills. Individual faculty members were granted monies to develop curriculum for interactive video conferencing delivery and technology integration within courses. However, this was a loyal core developing the materials so another avenue had to be tried.

Potential for Faculty Coaching

As the third year progressed, the LOFTI coordinator had the opportunity to work with an individual faculty member to enhance her technology skills. Using some coaching strategies, the coordinator noticed a real gain in that individual's abilities and confidence level. The stretch came from incorporating technology in a meaningful way not skill building for skills sake – this was an important discovery to the coordinator.

At about the same time, the coordinator began conducting coaching training sessions for business in the community as an independent project from the grant. Through the training sessions developed, the coordinator realized that coaching could be one strategy that may possibly be effective in working with faculty members. The concepts in coaching that would be useful include gathering information about the needs of individual faculty using surveys, and informal conversations. A second concept in coaching that is useful is dialogue with individual faculty members to determine what type of technology skills and integration projects can be useful to the department and the students they teach (Vella, 1997). Goal setting than could occur on an individual basis as faculty and their coach could set up some projects that move them to the goal of technology integrated curriculum. In this stage, the coach can help the faculty member to think and act differently as technology integration can require some redesigning of teaching practices. The last step is in following up with the coachee to assist them in reaching their goals by providing resources and helping them around barriers (Hargrove, 1995).

Realizing that this might become a possible model for faculty development, the coordinator has started formulating a plan to try using a coaching approach as faculty indicate a difference in needs. The plan consists of holding conversations with faculty to find out what they truly want in terms of technology integration and their curriculum.

Conclusion

The ultimate goal is to create opportunities for various faculty members to coach others that have the need for someone to help them stretch their technology goals. This can be completed through teaching other faculty coaching skills as well as encouraging continued growth in technology integration skills. The fourth and fifth years of the local LOFTI grant will be dedicated to this philosophy of staff development.

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GRANT WRITING INFORMATION AND THE INTERNET: EFFICACY OF STATE EDUCATION WEB PAGES

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Abstract: The Internet can provide a valuable resource for teachers and others seeking information about grants and funding resources. Ideally, state department of education homepages should provide information to assist teachers and administrators who are interested in writing grants and finding education funding sources. This paper offers several state education homepages that provide easy-to-locate information on grant writing or unique features for those seeking information about grants. Chief state school officers should assist in making such valuable information easily accessible.

State education agency web sites are important tools for disseminating relevant information to educators and to the public residing within their respective states. A review of department homepages reveals many similarities. Generally, they contain some form of welcome or introduction from the chief state school officer, information about offices within the department, special initiatives or reforms; links for students, parents and administrators; recent news releases; and special links for those seeking employment or desiring information on state certification. Many sites use pull-down menus to help classify sub-categories of information, and most, but not all, have site search capabilities to help users locate specific topics or information that may be difficult to classify or otherwise uncover intuitively.

Ideally, state education web pages can, and indeed should, be powerful resources for educators and others interested in finding relevant information about education grants. In addition to providing information about public in-state grants, such sites should offer links to private and federal grants and offer tips and resources on the grant writing process specially designed for teachers who are novice grant writers. Grant information should be well maintained and up-to-date. Links should be available to such sites as the Foundation Center (www.foundationcenter.org) and the U.S. Department of Education at www.ed.gov ("Grants and Contracts").

Problems with locating state education grant information fall into several categories:

1) Grant information is easily located but is outdated *(Once Upon a Time)*
2) Information is found within various offices (*Find Me If You Can*)
3) No information exists (*The Nil Factor*)

All fifty state education departments and state jurisdictions now have active web pages; however, there is little consistency on the type and amount of grant information found within the sites. If the topic of "grants" does not have its own button on the homepage, under what category should information about this topic be placed? Unfortunately, information about grants is generally not easy to locate on most state education sites and is often buried under such headings as *Programs and Services*, *Initiatives,* or *For Educators*. Site search availability also varies considerably.

All state education department/agency sites are readily available at the Council of Chief State School Officers (CCSSO) site via a point and click map (www.CCSSO.org); however, few sites contain information that is easy to

locate, up-to-date, and useful to both the novice and experienced grant writer. A review of state education homepages reveals some state sites that could serve as models for those wanting to provide grant information that effectively reaches its intended audience. Examples of sites with useful information include:

Texas

The Texas Education Agency (TEA) homepage has a link to "Available Grants and Contracts" that is listed under the School Finance and Grants heading. Grants are accessed using a drop-down box on a page administered through the TEA Division of Grants Administration. The downloadable documents may be completed on the computer, another valuable tool. In addition to the grants and contracts, there are a number of other useful links: "A Grantseeker's Resource Guide to Obtaining Federal, Corporate, and Foundation Grants," "The Grantee Handbook" (a procedures manual for TEA grant recipients), "TEA Grant Process," "Information Links" (federal and state links, including the Texas Register) and other TEA Grant Programs. The Resource Guide has a separate chapter on foundations, including information on starting a school foundation that would enable a public school to seek funding through a nonprofit foundation. Another positive aspect to this site is the "Join the Grant Announcements" listserv. Subscribers to this free service receive automatic notification of newly available grants and contracts. This means Texas educators who sign up for this service are getting notification of grant announcements delivered to their mailboxes regularly!

Pennsylvania

Unique to the Pennsylvania Department of Education grants page is the Peer Review Team Nomination Form, asking for parent, community member and educator volunteers to serve on grant review panels.

New Jersey

The New Jersey Department of Education Office of Grants Management and Development maintains an up-to-date web page with several unique elements. The site offers links to approximately 100 foundation-sponsored grants, which in turn provide direct links to detailed information about proposal submission for each foundation. In addition, there is a link to current federal discretionary grants. A unique element on the New Jersey site is an online survey for educators, asking for feedback on usefulness of information on the site.

Alaska

Listed under the obvious heading of *Forms and Grants*, the Alaska Department of Education provides a link to over forty topics of interest to teachers and administrators. Those using the site are encouraged to download the forms and fill out and return the forms electronically. Grants and special recognition programs are available from this site.

Summary: The Council of Chief State School Officers is a nationwide, nonprofit organization composed of the public officials who head departments of elementary and secondary education in the states and other jurisdictions. In 2000, the CCSSO announced six objectives, among which was to strengthen leadership at the district and school levels within each state. State school officers must realize that one way to strengthen leadership is to provide adequate and up-to-date resources using the Internet. States interested in encouraging a pro-active approach to grant writing should review and revamp their sites to make them user friendly to those interested in launching activities through grant writing. Billions of dollars in grants are available annually from thousands of funding agencies, but only a few select sites actually assist educators in uncovering information about them.

The Barat Program for Learning With Technology: Real Teachers, Real Students, Real Learning

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Despite the investment of time and money, it is not true that technology has reached its fullest potential as a tool for learning. To fulfill the promise of technology as a learning partner, three crucial issues must be addressed:

1. Teachers must be adequately prepared to use technology to assist student learning. This preparation includes appropriate content knowledge, understanding of and comfort with technology, and insight into student cognition.
2. Classrooms must be adequately supported. This support includes not only monetary support, but also support by knowledgeable people to assist teachers as they design, deliver, and evaluate instruction.
3. Curriculum materials must reflect the best understandings of content, cognition, and technology.

In order to address these issues, the Barat Program for Learning with Technology (BPLT) was established to provide a comprehensive approach to technology use for learning in classrooms. The goal of the BPLT is to improve student achievement in content areas, using appropriate state and federal standards for technology. In order to accomplish this goal, the BPLT will increase the readiness of teachers to use technology in the classroom by providing training and support, and create appropriate curriculum materials, including software, to aid student learning.

Increasing teacher readiness requires different approaches for pre-service and in-service teachers. Work is underway to change pre-service teachers' technology experiences. First, we are working with education and content area faculty to help them appropriately integrate technology into courses, thereby putting technology into a curriculum context. This is important because teachers teach as they have been taught. Second, a new lab has been constructed to help students experience appropriate uses of technology. In doing this, we are balancing between the current realities of technologies in schools and helping students realize what some of the possibilities are for technology use. A required course, EDU 212, has been repurposed to expose pre-service teachers to a variety of software typically found in K-12 schools.

With in-service teachers, our goal is to create learning communities that continue to evolve past the BPLT's involvement. We began with an assessment of needs and teacher abilities. We then, with the participating teachers and administrators, decided on appropriate emphases for our involvement, and began an initial design of our participation. Our efforts involve helping teachers develop action research projects so that they can assess the effectiveness of technology in their own classrooms. Our support for teachers includes graduate courses and other professional development opportunities, technology support, software development, and a lending library of software and hardware. Some examples of support include reduced-tuition graduate courses offered at local schools, technical support for teachers in classrooms, and loaner computers for teachers to work with at their homes. Special sections of EDU 525 and EDU 592 give in-service teachers both graduate credit and greater experience in integrating technology into their teaching.

So far, the program is involved with several different schools and school districts in northeastern Illinois, on projects ranging from early childhood language arts through middle school social studies to high school math and science. Both public and private schools are involved in this project. In all cases, we have found it important for curriculum needs to be generated by the teachers, and then work toward finding solutions, using technology where appropriate. All efforts are evaluated for effectiveness and to help guide future projects.

This presentation will present examples of our efforts, along with preliminary findings from some of the projects along with some of the early software development and online professional development offerings.

Implementing and Sustaining a Successful Faculty Development Initiative in a College of Education

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Abstract. This presentation outlines a three-level model of faculty development: workshops, support mechanisms, and consultations, and dissemination.

Beginning in the fall of 2000, the College of Education at the University of Florida recognized the importance of promoting technology integration throughout the college. Committed to doing more than simply paying lip service to the idea, the college hired an Assistant Director of Technology to develop and implement a faculty development program throughout the college. The first year began slowly, most of the faculty members had little or no motivation to attend these workshops, and consequently our faculty development initiative did not have a wide audience. However, the audience we had during this first year provided diffusion to the wider audience in the college and in this second year the program has expanded considerably. We believe that successful faculty development must include a variety of components such as workshops, continued support (physical and virtual), and individual consultations. We approach faculty development as a three tiered model (figure 1).

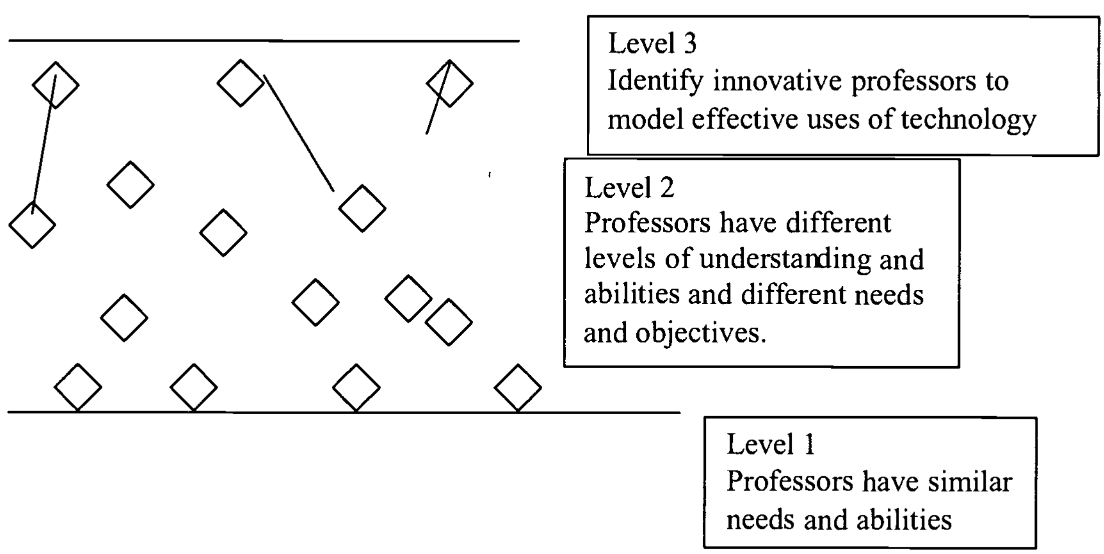

Figure 1: three levels of faculty development

Workshops

Workshops (Level 1) are broken into individual modules rather then as a step-by-step cookbook-type approach to technology training. Workshops begin with a brief brainstorming session where participants are questioned about their particular objectives for the workshop. This approach makes each workshop context specific for the group of faculty in attendance, and consequently everyone leaves the

workshop feeling like they "got their monies worth." In addition, at the end of the workshop we probe further to determine which concepts should be expanded into online support elements. Each workshop is high energy where each person is both a participant and a contributor.

Support

In addition to these workshops we have an online support center which includes the workshop handouts as PDF downloads, tutorials that serve as prompts for concepts that might be forgotten after the workshop has ended, and frequently asked questions. We have learned that handouts, online tidbits, and downloadable documents contribute to the self-sustaining element of faculty development in the college.

Consultations

Once the faculty has gotten the basics from the introductory workshops, they may request additional time with a consultant (level 2). This element of our faculty development initiative has been very successful. When the consultants work with faculty the following issues are considered:

Context - All consultations occur in the professor's office using their computer and software.

Student teaching Teacher - Student consultants must remember that in this environment they are the experts and as such must understand how to effectively use their expertise to instruct their professors, through probing, modeling, patience, and practice.

Learner's goals - Prior to beginning a consultation the consultant discusses the professor's short-term and long-term goals. In addition, the consultant questions the professor to ascertain their current level of understanding.

As the consultants spend time with faculty a bond quickly develops between student technology consultant and faculty. This bond is dependent upon mutual trust and respect, and once developed, student and professor work together on many projects over time.

Faculty Modeling

The third level of our faculty development program is faculty modeling effective use of technology. We have found that once they learn how to use the technology, faculty are extremely innovative ideas for technology integration. Through college and university wide poster sessions we hope to share our faculties innovative uses of technology within the college of education community as well as the university community. It is our belief that faculty sharing ideas, strategies and techniques with other faculty motivate other faculty members to integrate technology in their teaching and research.

Facilitating Technology Integration In Teacher Education

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Penny Garcia, University of Wisconsin Oshkosh, US
Lenore Wineberg, University of Wisconsin Oshkosh, US

This paper session will present a description and analysis of an ongoing project that has facilitated faculty, students, and their cooperating teachers coming together to participate in a variety of projects that help them integrate technology into their teaching within a constructivist framework to promote powerful teaching and learning. Keys to this process are meeting the needs of post-secondary faculty to become proficient with the integration of technology into instruction in the teacher education curriculum at the University of Wisconsin Oshkosh, and having an effect on preservice teachers' use of technology at field placements. The four part project: address faculty and academic staff skill levels with technology, have faculty develop technology-rich instructional projects, identify technology rich field experience placements, and collect information and data about faculty perceptions of instruction that utilizes technology to help promote powerful teaching and learning in the teacher education curriculum.

Faculty and academic staff technology integration workshops are offered to assist faculty to become skillful with, and model, a variety of electronic tools that can be added to their instructional repertoire to a) help students prepare for class, b) support students' understanding of concepts through collaborative meaning making, c) promote resource-based problem solving, and d) model how theory translates into practice. Workshops also serve as a forum where faculty can reflect on shared concerns and collaborate in modeling the development of technology-rich instructional practices. Workshops are led by core team members, as well as other university professionals with technology expertise. Core team members also are available on an ongoing basis to provide one-to-one assistance to faculty members.

Electronic teaching portfolios are being developed to model authentic assessment strategies and to create linkages between the College of Education and NCATE standards, to contribute to preservice teachers' professional development and lifelong learning, and to develop faculty and student technological skills.

Faculty instructional projects are the outcomes of the workshops on technology integration. Projects are examples of instructional innovations that employ a variety of technologies to promote greater student understanding of course material and to integrate technology via faculty modeling. Projects are developed by individual faculty for their courses and by teams of faculty associated with secondary learning communities.

Student teachers are placed with cooperating teachers who can facilitate the integration of technology into instruction at the PK-12 grade levels. Student teachers are to develop and teach technology-rich lessons collaboratively with their cooperating teachers. All student teachers submitt at least one lesson plan featuring technology-rich instruction. Selected examples of technological instruction are collected and disseminated via CD-Rom to all cooperating teachers and preservice student teachers.

A College of Education symposium "Collegiate Classrooms in the New Millennium", was held for faculty, invited student teachers and cooperative teachers so these related but diverse groups in terms of needs and experience could share and reflect on their instructional rich technology projects. Faculty/student teacher/cooperating teacher teams came together in table sessions to engage in substantive conversations about the instructional effects of their projects and changes they would make in the future. Student teachers demonstrated their lessons and faculty members discussed their technology-related projects.

Evaluation of the project involves collecting data and information about faculty who are in the process of changing their teaching to incorporate technology, gathered through both qualitative and quantitative methods. Faculty interviews were conducted about different elements related to integrating technology into their teaching.
The research sought to understand the following propositions:

1. How are faculty using technology and how is it impacting their teaching?

2. Has the integration of technology in teaching resulted in students demonstrating an improved understanding of course subject matter, deliberation skills, and/or pedagogy?

3. Has the integration of technology change the way faculty teach?

4. Has the integration of technology facilitated preservice teacher's deeper understanding of pedagogical knowledge?

5. How have faculty's increased skill and use of technology impacted their personal view as self as teacher?

6. What are faculty perceptions of the climate in the college of education toward the use of technology in instruction?

Faculty teaching projects also are evaluated to determine the range and sophistication of uses of technology.

Quantitative data collection concerning faculty change over time in attitudes toward teaching methodology and acceptance of technology involve pre and post – assessments that utilize the following instruments: Stages of Concern Questionnaire, University of Texas; Computer Anxiety Scale, Sears; Computer Thoughts Survey, Weil; and Teaching Styles Survey, Norton. Data retrieved from these instruments will help determine the quality, effectiveness and appropriateness of integration of technology into their teaching.

This presentation will discuss what the information and data indicate are the effective components of facilitating technology integration in to teacher education and those areas in need of further modification.

Staff Development: A Tale of Two Programs

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Abstract: Over the last decade or more, large amounts of money have been invested in establishing school based computer labs, classrooms with Internet connections, and at least on Internet ready computer per classroom. Research indicates that staff development is the key to whether these investments are successful. This paper presents two staff development programs from on large urban school district with different outcomes. As school districts continue to spend scarce resources on technology innovations, learning how to predict sustainable change is important.

INTRODUCTION

In the last decade extensive amounts of money have been invested in establishing school based computer labs, classrooms with Internet connections and at least one Internet ready computer for every classroom. Conferences are dedicated to discussing the impact and importance of computers in education (e.g., SITE, Ed-Media). The proceedings from these conferences offer tips on how to integrate technology into teacher education programs, staff development tips, specific topics related to teaching math and science, and comparisons of technology implementations between countries. There are journals dedicated to technology in education, again with examples of implementation programs, uses of the Internet, and more. The key to effective impact of technology in classrooms, however, lies in whether the teacher knows how to use the computer, Internet, and/or software in pedagogically appropriate ways for her students.

Current technology training for teachers is insufficient. While the U.S. Department of Education recommends spending 30% of school technology money on training, the reality is that only 12-18% is used for training (Giordano, 2001). The fact that many teachers do not use technology in ways other than for games for reinforcement is not shocking. Most public school teachers were not taught by teachers who used technology, so they have no model from which to work. Rogers (1995) theory of "diffusion of innovation" explains that only when the innovation is seen as better than current practice, among other characteristics, will it be embraced. The ACOT studies (Fisher, Dwyer, and Yocam, 1996) demonstrated that teachers need time to reach the point where the technology is truly one more tool in the toolbox. And, while there are numerous studies that indicate positive outcomes from technology infused teaching and learning, technology is one more intrusion into classroom activities, often seen by teachers as something to take up time. This paper compares two teacher development projects designed to help teachers learn how to appropriately use technology to improve literacy, and attempts to predict which will more likely provide sustained change.

BACKGROUND

As part of a Technology Literacy Challenge Fund (TLCF) Grant received by a large urban school district (e.g., over 200,000 students district wide), several projects were developed to help teachers learn how to use technology to impact reading and writing abilities of children in grades PreK-8. One of those projects was designed to teach 4th through 8th grade teachers how to use technology as part of project centered learning (PCL). Another project created a mentoring process coupled with both face-to-face and online training to teach Kindergarten through 3rd grade teachers how to use technology in their classrooms more effectively. These two projects had the same overall goal using two different approaches.

The school district contracted this author to assess of the implementation of the grant. My objective was to assess how each project was implemented and the impact on teachers in classrooms. This paper presents a comparison between two of the staff development approaches to help teachers use technology to improve literacy. A sample of teachers who participated in the two projects were interviewed and observed in their classrooms after completion of the training programs, or participated in focus group discussions of their experiences. This qualitative data was used to compare teacher response to the two programs and to provide guidance for future program development.

PROJECTS

The developers of the first project adapted an established teacher development course in PCL for infusion of technology into PCL. The course lasted 15 weeks, and teachers received a Mac computer for their classroom upon successful completion of the course. The course taught the basic principals of PCL and how to design a cross-curriculum project. In addition, the course taught the participants how to effectively use specific software, and how to use the Internet. The course was delivered through community technology centers to selected teachers selected. The trainers were oriented to the course two weeks prior to the first implementation to ensure to ensure comparability of delivery across trainers. The PCL project director did not participate in delivery of the course. Approximately 500 teachers started the course, and 450 completed it.

The second project involved identifying teachers who were successfully integrating technology into classroom activities (mentors), and teachers who wanted to learn how to integrate technology into their classrooms effectively (mentees). This project was initially developed through another grant, and the director both developed the program and taught most of the face-to-face classes.

The mentees initially attended 3 face-to-face classes where they learned how to use a laptop computer, to use specific software, and to use the Internet. They were introduced to an online discussion forum, where they would have five online modules for the program, assignments and a journaling area. These teachers were loaned a laptop computer throughout the program to do the online assignments either at home or at school. After the face-to-face sessions, the mentees were paired with a mentor, whose classroom they visited over two days. During this time, the mentors modeled infusion of technology. The mentee was to "soak up" as much information as possible and return to his classroom to implement technology into literacy activities. There was follow-up over the next three months by the mentor and a district technology person. One hundred and sixty eight teachers completed the mentoring program.

DISCUSSION

These two projects were very different, even though they had the same goal. The first had a project director who helped write the curriculum, helped train the trainers, and then went on to new projects. The second project had a director who was intimately involved with curriculum development and out in the field with the teachers in the classrooms. The first project depended on many sites and instructors to implement to course, while the second brought all the participants to a central location for training with a small consistent group of instructors that included the project director. The teachers in the first project only had access at the training centers to the new software they were learning and received a classroom computer upon successful course completion. The second project provided laptop computers for the teachers throughout the training and then replaced the laptop with a Mac computer for the classroom. Training received in the PCL course depended on the trainer, while formal training in the mentoring program was centralized and scripted. The only variant for the mentees was to which mentor they were assigned. The first project had no follow-up activities or support, while the mentoring program had 3 months follow-up technical support and ongoing support through the project website.

The full impact of these two projects cannot be assessed in a short time, no matter what teachers say upon interview. According to the ACOT studies, significant change in teaching with technology takes years to accomplish, not weeks or months. Obviously, this paper cannot report which project achieved definitive change. However, using the literature on diffusion of innovations and on implementation of innovative educational programs as a guide, there are elements in the two project descriptions that can be used to predict sustained change. Rogers (1995) suggests five sequential stages in the process of adopting an innovation: knowledge of the innovation, forming an attitude toward the innovation, decision to adopt or reject, implementation, and confirmation of decision. The ACOT (Dwyer, Ringstaff & Sandholtz, 1990) studies also suggest teachers go through five phases toward technology integration: entry, adoption, adaptation, appropriation and invention. Fullan & Pomfret (1977), in their review of research on curriculum and instruction implementation, posit five dimensions of implementation in practice - changes in materials, structure, role/behavior, knowledge and understanding, and value internalization.

One of the most comprehensive studies of educational innovation was the RAND Change Agent study of implementation of the ESEA Title III, Bilingual Education, Right-to-Read, and Vocational Education programs of the late 1960's through the mid-1970's. They reported that well-implemented reforms had a strong training component, practical workshops and locally available technical assistance. Effective follow-up support must address teacher's specific problems in implementing the strategy in their classrooms: "Classroom changes were most apparent where the projects provided teachers with some form of classroom support, which complemented the training and/or materials development phases of the project" (Berman & McLaughlin, 1975, p. 45).

Using this literature as a lens on the two projects, one could argue that the participants made it through the technology integration entry phase and were working through the adoption phase. They had received training in, what was for them, innovative ways to use technology to affect literacy. Both projects provide knowledge of the innovation, an opportunity to form an attitude and to adopt or reject, and to implement new skills in the classroom. Participants were provided materials, examples of different classroom structure and teacher/student roles, and opportunity to develop knowledge and understanding of infusing technology into teaching literacy. However, only one of the two projects provided the follow-up support back into the classroom. Previous assessment of success of educational programs for change indicates that one predictor of success is ongoing support after teacher training programs. The mentoring project described has ongoing support for the participants, initially through classroom visits, and then through the online discussion at the website. The PCL project offered training and technology with no follow-up. One can predict that as these teachers are re-interviewed in the new academic year that teachers who took the PCL training may continue to implement the principals of PCL using technology, but that the teachers who took part in the mentoring project will more likely continue to use both the technical skills and resources acquired.

CONCLUSIONS

School districts are obligated to provide teacher development programs of all kinds. Some training has greater impact than others. Overall, behavioral change is difficult to accomplish. In the case of the two technology-related projects described, support beyond the training program may be the key to sustained change. This paper presents only the first year of looking at the implementation of two programs intended to change teaching behavior, however, long term impact may be predicted. As school districts continue to spend scarce resources on technology innovations, learning how to predict sustainable change is important.

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Professional Development of Teacher Educators: The eChange Project Example

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Abstract: The paper describes a professional development project which has the aim of promoting and supporting pedagogically sound use of Information and Communication Technologies (ICT) in a faculty of education in a university. The professional development project, called the eChange Project, focuses on pedagogy first and technology second and supports the academic staff of the faculty in their development of appropriate strategies for use of ICT in their subjects. The paper focuses on the experiences and issues concerning the use of ICT which arose in the teacher education part of the faculty. It explores the layers of support that are required in the use of ICT in teacher education and analyses some of the issues concerning professional development projects with teacher educators. An evaluation of the success of some of the strategies used and a discussion of future directions for the project are presented.

Introduction

Recent literature on the use of Information and Communication Technologies (ICT) in education indicate that most education faculties are not using the technologies to their full potential and that academics in these faculties often exhibit a lack of confidence about ways of implementing such technologies in appropriate and authentic ways. Many teacher educators are uncomfortable with the use of ICT in their subjects, either because they do not see any value in using ICT with their students, or because they, themselves, lack skills in the area (Cuban 1998). Further, it appears that beginning teachers and student teachers often do not see themselves as computer literate and, because of their belief that computers will remove opportunities for highly valued face-to-face interactions, they are not motivated to use computers themselves in their teaching (Foley & Schuck 1998).

It therefore becomes apparent that there are two areas in which support for appropriate use of ICT is needed in teacher education institutions: firstly to encourage teacher educators to start using ICT in ways that both enhance their teaching and promote their students' development of the required skills for using ICT effectively and secondly, to show prospective teachers how to use ICT appropriately in their future teaching. A two-layered approach is therefore necessary in any professional development of teacher educators.

Further, if the transformational potential of using ICT is to be recognised then more must be done in professional development projects than merely teaching a few skills. New conceptualisations of ways of using ICT in teaching and learning need to be considered (Carroll 2000). New content can be covered in ways that could not be done previously. Therefore the "what" of learning can change as we have access to simulations, tools and techniques for understanding content differently (Cuban 1993, Pea 1998). However, Pea (1998) goes further in this discussion and adds that the technologies will not be the panaceas on their own. All such tools are mediated by human goals, beliefs and activities. Consequently, professional development in this area must consider the learning context and beliefs of the teacher educators and has to take these into account. The literature on professional development in general suggests that professional development must be sustained, ongoing and intensive and supported by collective problem solving around specific problems of practice (CERI 1998). It must be experiential, and able to provide opportunities for teachers to engage in teaching, reflection and discussion that contributes to the process of learning and teaching (CERI 1998). These understandings of professional development and the use of ICT in teacher education led to the creation of the eChange Project.

The eChange Project

The eChange project is an ongoing professional development project based in the Faculty of Education at the University of Technology, Sydney (UTS) located in the state of New South Wales (NSW) in Australia. The Faculty of Education at UTS has responsibility for two major areas: adult education and teacher education. The eChange Project is a professional development project, coordinated by the author, for faculty staff to develop and support their use of information and communication technologies in appropriate ways in their teaching. The project started in 1999 and is ongoing. This paper will focus on the particular challenges and context of the Project in the teacher education area.

At the start of the project academics in teacher education in the Faculty of Education, UTS, appeared to fall into two major groups: the first was a group of academics who had been early adopters of new technologies and who frequently experienced frustrations in their attempts to either incorporate these new technologies into their teaching or to transform their teaching through the new technologies. Administrative structures, policies and practicalities often posed barriers to the developments initiated by this group.

The second group were academics who in general, had little knowledge of how to incorporate new technologies into their teaching in effective ways and who lacked confidence to explore possibilities with ICT. Their major use of ICT was for their own email and internet usage. This group did not see value in the use of new technologies for their teaching or were quite unfamiliar with them. As the faculty was undergoing a large amount of change with respect to its staffing, resistance to new and seemingly untested uses of technology, and to the accompanying time demands was high.

A contextual factor which highlights the importance of professional development for teacher educators in the appropriate use of ICT is that the major employer of graduates of the teacher education programs, the NSW Department of Education and Training, requires certain competencies in ICT from graduates that they employ. Further it is assumed that these competencies will be embedded in the subjects in which they are appropriate. This requirement points to an urgent need for teacher educators to be able to use ICT appropriately in their teaching, and importantly, to teach their students how to incorporate ICT into their teaching.

The eChange project consequently offers two major areas of support:

- firstly, to assist early adopters of new technologies to have a forum in which to reflect on thoughtful use of the technologies and to remove barriers limiting their progress,
- secondly, to encourage, support and facilitate appropriate use of ICT by faculty members who are not doing so.

The first challenge for the project was to convince teacher educators from the second group that using ICT might enhance their teaching. There are four major professional development options that tend to be used for this sort of purpose. These are central support, faculty mentoring, technical support in the faculty and the use of external consultants. While our university does offer excellent centralised support, most people in the faculty were not availing themselves of it, possibly because they felt that as educators they could learn little from people outside the faculty, and possibly because the encouragement to use that support was not targeted specifically at the faculty. Technical support in the faculty, another option, was not used because many of the faculty staff were unfamiliar with the jargon often used by those familiar with new technologies and staff also needed to be convinced of the pedagogical value of the use of ICT before being interested in learning the skills. Having an external consultant who might be technically expert but would not have a good understanding of the context of the faculty was also rejected. In developing the idea for the project, the Dean of the faculty became convinced that the best way to get staff to embrace ideas of change in their teaching was to have two teacher educators in the role of coordinators of the eChange Project. The two coordinators were selected from the academic staff. We were teacher educators who were interested in exploring the new technologies and had used them in various ways in our subjects. We were not technical experts but rather academics with a keen interest in enhancing our practice.

Towards the end of 1999, we were appointed in the role of eChange Coordinators. We were given time release from part of our usual workload from January 2001. The project has been running since then and is ongoing. My colleague who had worked on the project with me from 1999 retired in July 2001. In 2002 two other colleagues will have roles in the project to support the work that I do. In our first year of the project we developed a number of strategies to get the project running. These continued in 2001 with a few additional activities and strategies. A discussion of these follows.

Strategies for the eChange Project

Working with the Early Adopters

Due to the different requirements of the two groups of academics described above, it was necessary to have a two-pronged strategy to launch the project. We needed a way of encouraging the early adopters as we saw them as a valuable resource for the faculty in leading the way in transforming teaching and learning. We therefore wanted to identify the problems they were having and also to investigate their ideas for transformational practice. Our way of achieving these two goals was to form a committee of early adopters. Membership of this committee was by invitation. We invited those academics who were engaged in interesting and innovative ideas for using ICT in their teaching, the faculty technical support person, and a member of the faculty management committee and we coordinated the running of the committee as part of the eChange Project. The mix of people on the committee was helpful in that it allowed the sharing of ideas. The technical support person could advise us of the potential of the available software for the new ideas that were proposed, the management committee person would take suggestions back to that committee for resourcing and would also suggest ways forward that fitted with the strategic initiatives of the faculty, and the remaining members of the committee would brainstorm ideas that they had for innovative implementation.

In that committee we resolved to have a faculty web development server for experimental and developmental purposes and this was set up for all faculty members to use as required, but with the main intention of supporting the developments of the early adopters. We also supported a plan for two members of the committee to develop a CD-ROM for teaching purposes and investigated ways of encouraging other staff to develop their thinking in the area. The committee has had a few changes of membership since its inception but remains an active and dynamic source of ideas for ICT usage development in the faculty.

It is our intention in the coming year to have members of the early adopter committee work with their close colleagues and act as mentors for their colleagues in small groups. This strategy should help us develop a critical mass of users of ICT who are interested and committed to enhancing their practice. The increase in innovative use of ICT will encourage those who are not participating to join in the developments.

Encouraging New Users

Our strategies emphasise collegiality, pedagogy, warmth and acceptance. We discuss the pedagogy first and then suggest ways of using ICT to implement those pedagogical strategies. The project focuses on how the technology would enhance teaching and learning rather than on what the technology could or could not do. Technological jargon was not used at all, and the coordinators and the academics shared a common language.

One of the first initiatives we implemented was to hold a forum in which teaching and learning ideas could be discussed as a way of preparing the ground for developing new approaches using ICT. We discussed new ideas for teaching and learning and illustrated with a few suggested models. We then had a group session in which people could talk about the major program in teacher education in the Faculty, the Bachelor of Education which prepares elementary teachers. One of the benefits of this session was that people were able to share their ideas and plans across disciplines, and get an idea of what others were doing in the program.

Following this forum, we offered individual support to staff members to use a Virtual Learning Environment (VLE) which is supported centrally in our university. We worked with staff members on ways of setting up the environment so that it would enhance their teaching and we were on hand if they needed support with their use of the VLE.

After a lengthy period of working in this way with different staff members, we had a two day preparation session, in which we suggested that staff members come with particular subjects in mind and work on leaving at the end of the two days with a product that they could use the following semester. Ideas on "blue skies" development were shared, subjects were planned with use of the VLE incorporated, and discussions on teaching practice were held.

A succesful strategy has been to team teach with others in various subjects and to incorporate use of ICT in rich ways into these subjects, thus supporting the other team members' development of knowledge in the area and providing them with contextual evidence of the value of such incorporation.

This year another initiative we have offered has been a reading group. In the reading group, those interested are sent relevant papers dealing with the issues arising in education concerning ICT. We meet and discuss these issues about a week after the participants have received the papers. These meetings are held monthly and a group of about six to eight academics and support staff attend them. These discussions allow

staff members to reflect on and raise issues about the use of ICT in their teaching and to discuss these in an intellectual manner, supporting arguments from a research basis.

Successful Examples and Remaining Challenges

The major factor contributing to the success of the project has been that the coordinators have been academic staff and not technicists. Those who do not feel confident about their use of the new technologies have appreciated the fact that I am not a technical expert and am prone to making errors and learning on the job. This alleviates any reluctance to expose their ignorance which some staff might have felt in working with a technical expert. Also I have a good understanding of the context as I am a teacher educator and this allows appropriate suggestions and support to be offered. Staff who had little knowledge of the technologies but were very informed about good pedagogy appreciated the emphasis and direction that I gave the professional development.

A project that was piloted this year and hopefully will be developed further next year occurred with one of the academics who had not previously done any online work with his students. The academic was aware that his students needed to work with schools to get clearer ideas of how to develop a teaching program. Beginning teachers often would tell us that the area they struggled most with when starting their teaching careers was this one. However, because of the very contextual nature of programming in schools, it was difficult for staff to give the students the experiences they needed. So an online assignment for the students was developed which used a partnership with school teachers. Students were put into working groups headed by teachers and would discuss their programs online with the teachers and each other. In this way, they could obtain practical advice from their teachers to merge with the theory. The students were enthusiastic about this project in their evaluations but a limitation was the number of teachers who actively engaged in the project. When the project is repeated when the subject is next offered, the lecturer intends to give more support to teachers so that they find participation easier.

Another project with the teacher education students had the aim of challenging their beliefs about mathematics. Students were placed in pairs and given a statement to debate with another pair. Mathematics educators from around the world were invited to respond to these statements. Their responses were placed in the communication site and students would use these responses and recommended readings from the library and from websites to compose their position. The intervention was useful in challenging the beliefs about mathematics teaching and learning that the students had held (Schuck & Foley 1999).

A mentoring project in which beginning teachers and experienced teachers interact online is ongoing. Beginning teachers find that they get valuable support from the mentoring network and the experienced teachers learn about the experiences of beginning teachers that they might otherwise have not heard about.

Other projects done in teacher education included an email project where first year teacher education students interacted with teacher education students in New Zealand and shared experiences of learning in their respective teacher education programs; and using a question and answer forum in a discussion board to develop student teachers' understandings of mathematics and of science. So we have a number of areas in which teacher educators are using new technologies in authentic and appropriate ways to develop learning. However, there are still many staff who are either reluctant or have not yet had the opportunity to rethink their subjects in terms of what they might now be able to do with new technologies that they could not do formerly.

The challenges therefore that lie ahead are many. It is apparent that having forums, whether regular or irregular, is not sufficient for getting staff to develop new ideas and use ICT consistently. There is an increase in expectations of employers of teacher education graduates with regard to their ability to not only use ICT skillfully but also to use it effectively in their classes. Teacher educators can no longer afford to choose not to use ICT in their teaching nor can they limit their use to presentation uses. They need to be aware of how students can incorporate ICT into their teaching and into their future students' learning. So a challenge is to encourage all staff members to embrace the need for professional development in this area. An allied challenge to this one is one concerning time factors. Staff are already overburdened with the intensification of academics' work and it takes great commitment to be prepared to devote more time to subject development. This extra time is undoubtedly necessary as in any reconceptualisation of subjects, contrary to the rhetoric which suggests time is saved by working with ICT.

Another aspect of professional development that needs to be considered is student access to computers. Students are all given access to computers on campus and can work in one of the many computer labs where necessary. However, those who have computers at home and have internet access are advantaged by having ready access to such facilities. Implementing projects at schools during students' field experiences

would enhance their learning as they would be using ICT in context. Unfortunately, often students are not given the opportunities to implement such projects due to practical constraints at the schools.

The major obstacle to be overcome is that of the beliefs of many of the teacher educators and student teachers. If they can be shown that use of ICT is enhancing their practice they will be far more committed to its use. Therefore projects such as the eChange Project need to work in context and suggest ways that practice can be enhanced. This is a major strategy of the eChange Project.

Conclusions

The eChange Project has had a number of successes in supporting authentic and appropriate use of ICT in teacher education. More staff are now online and have incorporated ICT into their teaching in useful and effective ways. Others are making inquiries and starting to think about how they can use new technologies in their teaching. However, sustained and targeted support is necessary to continue the process. One of the important aspects of my role in supporting staff is to develop open relationships with them in which they feel free to ask for help in any aspect of their work.

One of the great opportunities for the eChange Project is to act as a catalyst in promoting reflection and reconceptualisation of practices, and encourage the sharing of ideas from which all teacher educators would benefit. Thinking about new ways of teaching and learning for whatever purpose is always a useful exercise which prevents stagnation of ideas. Having forums to share ideas which are centred around practice with ICT encourages the sharing of other ideas simultaneously and provides the opportunity to debate teaching and learning issues about which little discussion has occurred. Consequently, the professional development opportunity allows for greater thinking about teaching than might occur otherwise.

Our future directions involve looking at developing a whole program project such as an electronic portfolio which will have aspects of each subject contributing to it. Students will then have a product to take with them when they seek jobs and different aspects of the portfolio could be developed in different subjects, thus encouraging staff to incorporate appropriate ICT into their areas.

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The Rocky Road to Faculty Development

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A panel of three Instructional Technologists, a Media Services Librarian, and a member of the faculty will present the history, trials and tribulations, disasters and successes of faculty development at this small liberal arts college in suburban Pennsylvania. Topics covered in this panel discussion will be the history of faculty development, the development of an Instructional Technology team, the move from technical workshops to project-based faculty development, the collaboration between Media Services and Instructional Technology, and a brief presentation of a project developed during project-based faculty development.

The history of faculty development began with desk-top applications workshops designed for faculty and staff where the basics of the application were taught by computing services staff. The workshops were taught out of context with no relationship to their application to teaching; faculty and staff received the same training.

The development of an Instructional Technology team led to changes in the focus of faculty development. Faculty still looked at workshops as being "techie-oriented" and it has been an ongoing struggle to change their perceptions.

The addition of the Media Services Librarian (with faculty status) to the IT team led to the collaborations between the library and the Instructional Technologists. The Librarian's familiarity with the faculty provided insight into the attitudes that were affecting the success/failure of faculty development. We needed faculty allies!

After a year of providing workshops with few attendees we developed a new plan. With the help of "early adopters" of technology we presented a panel, "Exploring the Possibilities of Teaching with Technology". Four faculty members served on a panel and briefly described their successful incorporation of technology. They answered questions by the faculty concerning the time involved in learning the technology and the development of course materials, the benefits to the students of technology incorporation, the assistance available through the IT team. At the end of the panel we advertised our new approach to faculty development, project-based faculty development opportunities, and asked for proposed projects from individual faculty members.

Shortly after the end of the Spring semester we held our first Technology Exploration. Ten professors with specific ideas for technology integration into their courses attended our three-day hands-on Exploration. Multiple workshops were designed specifically to meet the needs of the individual faculty projects. Time was given for work on individual projects with one-on-one assistance from the instructional technologists as well. The Technology Exploration ended with each professor presenting his technology project.

One of these professors will give a brief presentation of the multimedia, web-based project he developed and is using with his classes. Included in his presentation will be his impressions of the new approach to faculty development.

Time will be given throughout the panel to questions from the audience.

Evidence for Campus Transformation Through Instructional Technology Faculty Development

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Southeast Missouri State University is a public regional comprehensive Master's granting institution enrolling 8000 students. Founded as a Teacher's College, the University still provides a quality teacher education program and graduates a large class of K-12 teachers every year. At the dawn of the Internet revolution in the mid-1990s, the University found itself at the trailing edge of instructional technology adoption. Faculty interest in computer-based instructional technology was limited, technology investment was poorly funded, and technology infrastructure was inaccessible to large segments of the campus. Recognition of our weakness in instructional technology coincided with a growing awareness of the need to enhance access to education in our service area, and increasing concerns that online instruction offered by universities outside of our service region were beginning to compete for the undergraduate students that have traditionally been Southeast's clientele.

The University responded to the IT implementation gap with a comprehensive and inclusive strategic planning process. A University-wide Information Technology Committee (ITC), representative of all constituencies in the institution, developed a coordinated campus-wide technology plan that included a strong faculty development program. Teaching, Learning and Technology roundtables for faculty identified academic goals and priorities for integrating information technology with learning. Technology Associates, consisting of a faculty member from each college and school of the University, were charged with developing and implementing a Technology Serving Learning (TSL) program (the TSL Institutes) to develop faculty expertise needed to integrate IT with learning. All of these actions were supported by the University's 1995 Strategic Plan, which recognized the need to significantly upgrade technology for student learning by devoting one of the Plan's six Priorities to the problem. Two of the Priority's six Goals stated that the Priority would be met by extending "access to information technologies to faculty ...by providing training opportunities and support", and extending "distance learning opportunities via technology."

Strategic planning resulted in creation of a comprehensive support structure for faculty seeking to effectively integrate technology into instruction. Permanent funding was procured, and the Office of Instructional Technology (OIT) was established within the Center for Scholarship in Teaching and Learning (CSTL) to support faculty. Faculty instructional technology training was delivered informally through the CSTL/OIT, and formally through the TSL Institutes. Those involved in planning and implementation opted not to act defensively, seeking merely to develop expertise in a few Southeast faculty sufficient to give the University an Internet presence. Rather, the planners sought a campus-wide transformation of IT use

through the TSL Institutes, believing that many faculty – even those with little previous computer experience – could benefit from mastery of basic IT skills. By achieving a "critical mass" of faculty interest and expertise, Southeast might become a leader in IT application and innovation: the Internet was a new frontier to all educators, and therefore, offered opportunities even to IT newcomers. Through use of the Internet to **improve** instruction, Southeast might well blaze trails that other institutions could follow in an emerging field that had few established leaders.

The TSL Institutes were launched in 1997, and since that time, 279 of the 380 full-time faculty on campus (73%) have attended at least one Institute session. The Institutes were organized through collaboration of the CSTL, the OIT, and the Technology Associates. Inclusion of the Technology Associates in the collaboration gave the Institutes a distinctly faculty-driven aspect. Adoption of a continuous-improvement approach allowed both problems and new opportunities to be quickly identified and addressed in ways that befitted rapidly evolving technology, growing student familiarity with computers, and changing faculty attitudes. As a result, the Institutes moved in 1999 from a short course format to single-day sessions. The change better leveraged previous faculty experience, and improved access by faculty who had time conflicts that made commitment to a five-eight day Institute impractical. To improve the balance between technology and pedagogy, the single-day sessions became part of a two-tier model, in which a mandatory pedagogy session was followed by choice of twelve or more applications sessions over several weeks. To serve a wide range of faculty, from early adopters to those harboring deep fears of computers, Institute offerings were reorganized and expanded into a five-track program, featuring multiple sessions on Basic Computer Skills, Instructional Design, Basic Web Design, Advanced Web Design, and Teaching on the Web. Further improvements included online sessions, such as "Teaching in the Online Environment", and Web page development with our Online Instructor Suite (OIS) course management software. Follow-up support in the informal, comfortable work environment of the CSTL continued beyond the Institute sessions, with hardware, software and human resources all available to faculty.

Many at Southeast Missouri State University have claimed that Southeast has moved from the trailing edge of IT adoption to the leading edge of development and implementation. Further, the change has amounted to a transformation of the campus culture. To give credence to these claims, we have sought evidence in a variety of forms. This presentation will focus on how 20 items of evidence were used to evaluate the state of instructional technology at Southeast, with suggestions for adapting the list for use at other institutions. The 20 items are:

1. Evolution of Institute
2. TSL Institute attendance numbers
3. Declining recruitment budget for the TSL Institutes
4. Evaluation instrument completed by Institute participants
5. Number of Institute participants who later became Institute Facilitators
6. Number of online courses offered
7. Enrollment in online courses
8. Number of faculty IT server accounts
9. Number of course sections supported by Websites

10. Support for locally-authored course management software (OIS)
11. Quality and sophistication of course Websites
12. Changes in strategic plans around the University
13. Increases in faculty attendance and presentations at IT-related conferences
14. Increased faculty participation in IT committees and discussions on campus
15. Increased IT-related purchases and infrastructure formation (labs, servers, staff)
16. Student and faculty surveys
17. IDEA results
18. Faculty visits, phone calls, and e-mails to CSTL
19. Interest in the place that IT-related work has in Promotion and Tenure decisions
20. Promulgation of standards for instructional Web pages on campus.

The evidence supports the claim that Southeast has indeed undergone an IT transformation. The ability to support such claims can have important implications for planning by teaching and learning centers, and funding of technology-related programs on many campuses.

Adjunct faculty: Prepared to integrate technology into their curriculum?

David Stokes, Westminster College, US
Betsy Price, Westminster College, US

The Campus Computing Project has conducted the largest continuing national study of the role of instructional technology in higher education since 1990. The Project's 2000 national survey reveals that 59.3 percent of college courses now utilize electronic mail and 42.7 percent use Web resources (Green 2000). These numbers are consistent with what we see on our campus and what we have learned from peer institutions. These observations indicate that faculty have made strides in the use of technology, but those strides have been primarily in the areas where technology supports traditional teaching methods. Educators must now capitalize on those features of technology that allow them to change what they are able to do in the classroom, not just how they do it.

This phenomenon in colleges appears to be similar to what is happening in the pre-college classes. Recently T.H.E. Journal (May 2001) presented a summary of their State of the States survey on technology funding and use in the public schools. While funding across the country for technology and technology innovations in the classroom continues to rise, particularly in the area of professional development, the growth in teacher proficiency remains a challenge. According to survey results from the 20 states reporting 60% of all elementary school teachers, 75% of all middle school teachers, and 80% of all high school teachers have demonstrated average proficiency in integrating computers into the curriculum (p.50). This may appear encouraging yet hese findings suggest that many educators have yet to become fluent with technology or to use technology fluently to the learning advantage of students.

The inability of numbers of teachers to engage technology critically for learning may not alone lie at the door of school districts, state funding, or teacher education programs. While it has been determined that the success of integrating technology into curriculum depends upon the computer skills of teachers (Gallo & Horton, 1994), many preservice teachers remain unprepared to teach with computers. While federal funds infused through PT3 grants are beginning to change the way higher education views the need for technology integration into curriculum, perhaps even inducing the paradigm shift in investment from hardware to brainware Farenga and Joyce (2001) call for, recent changes in this funding pattern may well set back technology for teaching initiatives.

Instructional technologies engage students in more active learning while accommodating diverse learning styles (Smith & Kolosick, 1996). Yet resource based learning, inquiry, and other powerful teaching strategies are largely dependent on faculty's ability to effectively utilize new technologies (Taylor & Laurillard, 1995; Brace & Roberts, 1996). The presence of technology is not sufficient to create change. Faculty need time and support to incorporate new technologies into teaching and learning. Assisting faculty in the meaningful integration of instructional technologies into curricula is one of the greatest challenges facing higher education today. Faculty at institutions of higher education may still struggle in advancing technology integration into the curriculum (Isaak & Ward, 2000). Though technology has made changes in faculty thinking about teaching, it has not changed how faculty teach.

In many instances computers are still being used in higher education for little more than communication and administration (Green, 2000). This may be particularly so for adjunct faculty who may not have the access to technology or means to learn how to integrate technology into their curriculum. This comes at a time where many colleges are increasing their dependence upon adjuncts to fill key teaching roles nationwide. The ability of this group of educators to teach to learning with technology has never been more necessary. Many adjunct faculty teach in content areas central to obtaining teaching licenses. If adjuncts do not have access to knowledge and training in how to incorporate technology into their curriculum it is difficult for them to model technology teaching practices for future teachers. The trickle down effect of this upon future teachers ability to "see" the need for such integration must cause problems for teacher education programs and the potential of technology proficiency of future teachers.

Westminster College in Salt Lake City has been successful in obtaining two Preparing Tomorrow's Teachers to use Technology grants. These grants have greatly impacted teacher education faculty who now regularly integrate technology into their curriculum. This said the grants have had little impact upon faculty who help prepare teachers in content areas not taught by School of Education faculty and even less impact upon adjunct faculty across campus. With the advent of a Teagle grant on campus in 2000 efforts have been made to provide adjunct faculty access to technology

workshops with an objective for them to gain knowledge and experience in integrating technology into their teaching and curriculum. Specifically this paper reports upon the results of a survey of these adjunct faculty who teach in the School of Arts and Sciences, Nursing, Education and Business with suggestions as to how to improve their teaching with technology skills and knowledge.

Method

Surveys were sent to all 139 adjunct instructors on campus seeking their input upon their various uses of computer based technologies, 77 responded. Issues reported upon include:

- percentage of class time spent with different teaching methods
- percent of class time spent with different teaching methods by rank
- teaching methods used in the different schools on campus
- percentage of class time adjuncts use material supports (chalk, PowerPoint, overheads, pictures, stories, Internet etc.
- number of workshops adjunct faculty have taken
- use of home email
- use of campus email

Results are analyzed and compared to Green's (2000) assessment of the use of computing in colleges. From this data comparisons are drawn between the effectiveness of faculty training and adjunct training with technology applications. Suggestions of further means to improve adjunct training are provided.

Discussion

Adjunct faculty at Westminster College begin their tasks with a campus wide orientation that in part provides a "how to" for use of the campus computer network. Adjuncts are provided with a network computer account, an office often shared with other adjuncts, a brief working knowledge of their teaching environment, and sometimes a regular faculty mentor to help overcome the hurdles of "settling in". With access to the computer network comes extensive data storage capacity on a server, a full array of word processing, statistical, and graphic software, a website, and email. Adjuncts were also informed that they could contact the IT Department to meet them in their classroom to learn how to use the presentation equipment. Finally, for those who may not have computers or compatible software at home, adjuncts could checkout laptop computers from the library computer lab.

To assist adjunct faculty to better understand the possibilities of teaching with technology, a regular once a semester workshop was created and adjuncts encouraged to attend. For the past 2 years, as the college created a Faculty Technology Center (FTC), adjunct faculty were increasingly directed to the center for one-on-one instruction. More recently hired adjuncts are immediately brought to the FTC where qualified instructional technology staff provides individual assistance at a level of comfort compatible with the adjunct faculty members' skills. Additionally, beginning computer workshops are offered two or three evenings or weekends a semester. The content of the workshops focuses upon the perceived needs of those who attend. Technologies taught are in the main, PowerPoint, email applications, webpage creation, and a sprinkling of WebCT applications. Discussions on the general or specific role of technology for teaching and/or learning were conducted at a novice level. Adjunct faculty's pedagogical understandings of technologies for teaching and learning at their time of hiring, their technology knowledge and skills, were never recorded if in fact they were asked for. Thus the survey as a data source.

In contrast to the above, full time faculty in the School of Education not only have access to all that available to adjunct faculty, but have been 3 year participants in a Preparing Tomorrow's Teachers to use Technology (PT3) grant shaped to provide intense levels of professional development in the pedagogy and practice of teaching and learning with technology. Included in the broad goals of the grant are a goal to improve the quality of instruction in science math, language arts, reading, social science and creative arts methods courses through technology enriched curriculum on campus and in field placements.

At the beginning of the PT3 project faculty had a dawning understanding of the power computer based technologies provide for achieving instructional gains but perhaps not learning gains. Faculty came with a growing recognition that computer based technologies, particularly multimedia, bring to their teaching real-life examples that provide a context central to learning (Brown, Collins, & Duguid, 1989). Though it was understood by faculty that access was available to many forms of technology aids, videos, audio, statistical data and lesson plans, they felt considerably underexposed as to how best to use these technologies in their own instruction to benefit preservice teachers' cognitive and practical skill development. The notion of anchored instruction (The Cognition and Technology Group at Vanderbilt, 1990) that is the capability to demonstrate real world applicability of knowledge was less prevalent than hoped. Research findings that

suggest computer-based learning environments reduce learning time significantly with higher achievement levels (Kulik & Kulik, 1991) were not known or ignored. Although all content method faculty at Westminster College are in philosophical agreement with Piaget (1969) that students learn better when they can invent knowledge through inquiry and experimentation rather than through acquiring facts presented by teachers, they did not understand the role computer based technology and particularly multimedia, web applications and online learning can have upon instruction and learning practices. In short faculty had not yet came to understand that "Technology-is not a collection of machines and devices, but a way of action" (Muffoletto, 1994).

Over the course of the last three years School of Education faculty (12) have each experienced extensive one-on-one training by competent instructional technology staff funded by the PT3 grant. These staff regularly visit faculty, while faculty teach, making careful suggestions of technologies capable of extending instruction and learning. Workshops are held for several hours each month to provide group training on new technologies of interest to faculty e.g. video editing. Additionally, several hours are effected each month for forum discussions on the general and specific efficacy of teaching and learning with technology. Faculty share their successes and failures, read articles exploring pertinent issues, and discuss the ramifications of technology upon the School of Education program and preservice student' learning. Issues developed in these forums become subject matter for School of Education faculty meetings often resulting in programmatic changes.

To date faculty have received training to a measure of competency in:

- PowerPoint
- Dreamweaver
- Smartboard
- Mimio
- Digital cameras
- Software applications
- WebCT
- Eboards
- Streaming video
- Various online research databases

Outcomes of this training and educational project include: ready support of faculty for the creation of an education teaching with technology lab/classroom; numerous examples of curriculum revision, program changes that provide a richer immersion into technology- rich learning environments for preservice students; and "more effective instruction" (Van Ert, 2001).

Competition for technology resources is now the issue of discussion by regular faculty.

Survey outcomes

Despite the discrepancy between training offered to regular faculty in the School of education and adjunct faculty the results from the adjunct faculty survey are encouraging. Seventy six percent of respondents report taking at least one technology workshop. These respondents tend to be newer adjuncts more likely to have taken a workshop and to engage with technology in the classroom. The newness of the adjunct reflects how we orientate and work with our new adjuncts. During their orientation they are introduced to the instructional support services and asked to report to the FTC for a one-on-one session with staff. This activity parallels the colleges' recent efforts to provide better workshops and support for adjuncts. In this the college feels some success. Unfortunately, the emphasis on new adjuncts has resulted in the college not successfully inducing veteran adjuncts to attend the FTC or to integrate technology, with the exception of email, into their curriculum.

Email use by adjuncts has risen dramatically with much use being generated from their homes. This may indicate a need of adjunct faculty to generate lessons and pedagogy at times convenient to them, times not necessarily convenient to access to on-campus facilities. In contrast regular faculty use more diverse means of communication including eboards, and most particularly threaded discussions on a routine basis.

	Fall 2000	**Fall 2001**	
	Campus email	Campus email	Home email
Use Email	51%	68%	89%
Seldom use or never use	48%	32%	11%

Further survey results suggest that email is the dominant form of out of the classroom communication between adjunct faculty and their students. This suggests an increasing awareness of the advantages computer based communication technologies have over more traditional means. This result was not expected. Regular faculty (11 of 12) as expected, use email almost exclusively for out of classroom communication.

How Adjuncts Connect with Students

	Email	Phone	Set office hours	Appointment	Casual meeting on campus
% of time	29%	27%	21%	12%	6%

Other survey results suggest that the provision of technology workshops was a popular choice for adjuncts. As the level of sophistication of the workshop increased so did the number of attendees. This suggests that adjunct faculty are very interested in learning basic computer skills leading to much deeper understandings as to why use technology in the classroom as well as to best time such use. They understand the need to be current in their field and this includes technological innovations.

As the FTC became more fully equipped and staffed and thus better able to serve adjuncts the survey revealed large numbers of them seeking one-on-one assistance in developing their curriculum. This has resulted in increasing numbers of adjuncts seeking multimedia classrooms in which to teach. Regular faculty report regular use of the FTC along with in-house support and training on issues of interest or concern.

Number of workshops adjuncts attended

Year	None	One to Two	Three to Four	Five to Six
2000	38%	41%	14%	7%
2001	9%	61%	15%	15%

A further surprise is the manner of use of technology in the classroom. More adjuncts report regular use than anticipated. This is tempered by indications that the technology use may be in the form of simply replacing another teaching medium than any measure of substantive change to Muffoletto's "way of action" (1994).

Use of computers in the classroom.

	Use computers in class		Specific Software	PowerPoint	Internet
Sometimes to everyday	54%	% of class-room time	28%	26%	21%
Hardly ever to never	46%				

Prior to the grant, the college ran large group, one-size-fits-all workshops. Each workshop featured specific software. All the attendees went step by step with the IT instructor. We wanted faculty to use discipline specific software and to use it into the classroom. To accomplish this we followed the suggestions of Green and other researchers who indicated that a new way of teaching was needed.

FTC attendance	WebCT	FTC	Workshops
2000	1	13	29
2001 (Fall only)	7	70	0 (not offered)

However our survey also indicated that lecture continues to be the dominant teaching activity.

Types of teaching styles adjuncts use.

Activity	Lecture	Small Group	Problem Base	Questions	Large Group	Special Projects	Hands-On	Interactive	Demos
% of time	35.2	14.6	14.6	12.1	17.1	11.8	29.4	17	11.7

This said it is interesting to note that when use of lecture method is assessed by school, education adjuncts appear more likely to use diverse teaching methodologies. This is both pleasing, perhaps not surprising, yet still difficult to explain. Only one adjunct faculty in the school of education regularly took part in the PT3 promoted project described previously, thus the overall effect of that technology program had little influence upon the practices of the majority of School of Education adjuncts. These adjuncts shared no benefit in training with technology over those in other schools across campus. Most importantly this finding is in line with regular faculty uses of lecture for teaching. The difference is that regular faculty are much more likely to use manipulatives and multimedia in concert with lecture.

Percent of Time Lecture is used by School

	Business	Nursing	Education	Arts and Sciences
Lecture	49%	35%	12.4%	35.2%

Overall adjuncts report a more varied use of technology in the classroom and a deeper use of email as a communication medium than expected. This said email was rarely used as a device to move along pedagogy. Adjuncts continue to use lecture as the primary source of instructional medium and to use technology as a replacement tool for now outmoded technologies rather than to fundamentally restructure their modes of teaching.

Conclusion

The suggestion that Green and other researchers had made that teachers need a different type of instruction than large computer classes, worked at Westminster. Although we are still a year away from the end of the Teagle grant and our results are not conclusive, we believe that we are making strides at bringing technology into the classroom as a pedagogical tool. This is being accomplished through our efforts to individualize computer instruction with an emphasis on discipline specific software and uses.

While our survey results are promising there is a need to reflect upon the outcomes and to build upon the successes of the adjunct training programs now in place. Adjuncts seem to be more technologically literate than expected but lack knowledge and skills that would allow them to reinvent their teaching using technology aimed at improving student learning gains instead of as an instructional medium. Overall adjunct teaching with technology as instructional aids is not much different to regular faculty use across campus. This said their teaching to learning gains, perhaps best exemplified by bringing the world to the classroom through computer based technologies is far behind that of faculty in the School of Education. To close this gap the following are under consideration:

- Extend the hours that adjunct faculty have access to support in the FTC
- Introduce adjuncts into the FTC prior to their teaching so that they have the opportunity and encouragement to use technology for teaching
- Treat the FTC as adjuncts' personal and professional development expecting that they will build skills and expertise the longer they are at Westminster
- Reconsider the role of workshops to focus more upon technology education than technology training. That is educate adjuncts on the means to explore technology as an instructional and learning tool rather than a communication medium or a replacement tool for older instructional technologies like chalk or overheads
- Provide short sharply focused workshops for small numbers of adjuncts to learn specific pedagogical applications of technology or develop technology skills in collaboration
- Provide access to adjuncts to classrooms that model exceptional teaching and learning with technology practices
- Help adjuncts to understand the need for careful time management as they further engage in integrating technology into their courses
- Provide key technical help, at short notice, in setting up and perhaps operating various technologies as adjuncts explore the medium
- Need to find the means to help veteran adjuncts to want to consider integrating technology into their courses given their history of long service for mediocre pay and spotty curricular support.
- Finally, though our survey provided much needed information on adjunct actions, there is a need for greater knowledge of specific technology and teaching skills adjunct faculty bring with them as they enter service, and how the college community could help them fulfill their crucial but often voiceless roles.

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Assessing the Integration of Technology Within a Context of Change: A Center-based Approach

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Abstract: Recognizing technology as an essential tool for teaching and learning in the 21st Century, the University of Missouri-St. Louis established a technology and learning center within the College of Education to fulfill its vision for technology integration. While the center is a physical facility, it is also the springboard for a variety of faculty development activities. Among other change management programs, a study was undertaken to assess the integration of technology by faculty college-wide. The collection and analysis of faculty survey data and the corresponding results are presented.

Introduction

Beginning in 1996, a process of renewal and change began at the College of Education (COE) at the University of Missouri-St. Louis, under the leadership of a new dean. This "futures" planning process established four pillars of the college's shared vision: 1) more field-based student work, 2) technology as an essential learning tool, 3) life-long learning for all educators, and 4) community collaboration. Attaining the goals set forth in this visionary process required change, both at the individual and the institutional level. Recognizing technology as an essential tool for teaching and learning in the 21^{st} Century, the COE's E. Desmond Lee Technology and Learning Center (TLC) was established to fulfill the "futures" process vision for technology.

While the TLC is a physical facility, it is also the springboard for a variety of faculty development activities. One of these change management programs is the PT3 project. The goal of PT3 is to have faculty model technology integration in their courses. This is accomplished through one-on-one and group meetings, providing opportunities for planning and reflection. By its nature, the PT3 program supported the implementation within the TLC of several data collection initiatives to assess its impact and guide future work. PT3 evaluation, including student portfolios, case studies and self-assessments is a data collection and analysis task set.

In addition to PT3, the TLC is collecting data regarding the overall numbers of users served by the facility and its staff and equipment. During the first year of operation, from May 2000 to September 2001, there were 47,000 visits recorded (each time an individual comes to the center, one visit is recorded). There were 28,613 visits by students, approximately 56% were undergraduate students and 44% graduate students, 1200 visits by

guests, and 1098 visits by faculty. In addition, 27 individual faculty members have held classes in which technology was integrated into the learning process and 60 faculty members have received instruction at the TLC. These numbers demonstrate a promising degree of use of our facility and services but we are working to extend the research conducted by the TLC regarding the *benefits* derived from its service offerings.

The third area of data collection is aimed at assessing the integration of technology by faculty college-wide. Toward this end, a study was undertaken to determine faculty technology competencies. This study used a self-assessment competency-based survey to gather information regarding faculty's knowledge and use of a variety of computer technologies. With the recently approved National Standards in Education, came specifications for the inclusion of technology education in pre-service teacher preparation programs. Three sources were referenced in the development of the technology skills survey items, the International Society for Technology in Education (ISTE) Standards, National Education Standards, and the Missouri Show-Me Standards. The survey questions ranged from skill-based questions, such as opening, saving and deleting files, to application questions, such as developing online courseware. In general, the survey questions addressed the use of hardware and general software applications available within the TLC.

This survey assumes faculty members are able to fairly and adequately assess their own level of skill in the use of various computer technologies and tools. Skill tests were not conducted to verify the responses given. Faculty were not required to disclose their identity, however they were given that option so the researchers may potentially conduct follow-up interviews and further skills investigation with willing survey participants.

The scope of this project is two-fold: (1) to reduce the number of factors in the survey instrument used and (2) the investigation of the underlying data structures that permit the grouping of faculty based on personal and professional descriptors and self-determined computer technology skills. The intent is to develop characteristics that describe faculty who are well versed in the use of technology tools and their application in academic instruction as compared with those who are lagging behind. If these attributes are identified, the education technology faculty can develop a plan to involve more faculty members in technology preparedness programs.

Method

The data set used in this study was collected at the University of Missouri- St. Louis and contains survey responses from 20% of the estimated College of Education faculty population, or 33 faculty participants. These faculty members were full-time or adjunct instructors. They were asked to participate in the online survey via an e-mail memo from the Dean of the College of Education to the entire college faculty population. The survey was available to faculty online through Internet access to Flashlightonline, an academic survey instrument available through the Center for Teaching, Learning and Technology at Washington State University – Pullman, Washington.

The survey results were anonymous, unless the respondent chose to complete an optional section including name and/or additional comments. Upon review of the data, it was noted that 18 of the 33 faculty members who responded completed the optional sections. All 33 participants responded to the 16 survey items that reflect demographic data (items 1-6) and provide a measure of technology use and tool-based skills (items 7-16). Each skill-based question was a simple check box on the survey form, with a check indicating an affirmation that the respondent possesses the skill and a blank box indicating a negative response. The first six questions determine the respondent's position, years in that position, academic area of emphasis, gender and age. Since the purpose of this study is to investigate relationships among faculty descriptors and familiarity with computer technology tools and resources, the demographic information was selected based on criteria for describing and discriminating between different faculty members. These 33 subjects' responses were used for the data analysis conducted.

The data report generated by Flashlightonline was downloadable to MS Excel as a spreadsheet. The analysis of this data was conducted using SPSS software (® SPSS, Inc.). The raw data was modified such that each technology skill sub-item on the survey (each check-box) was a nonmetric categorical variable with a value of "1" or "0", with "1" representing a checked box and "0" an empty box. The demographic data points are either

nonmetric categorical (such as gender) or nonmetric ordinal variables (for example, respondent's age). A review of the data indicated four invalid technology questions. Every respondent answered these four items affirmatively. Thus, these data points were removed from the data set. The frequency plots for the technology questions are a good indicator of the "easy-to-do" (general and introductory) performance tasks and the "hard-to-do", or more advanced skills. The correlation matrix indicates some collinearity among the technology item variables. For factor analysis, this is desirable.

Although it is recommended the researcher use a sample size of at least 50 observations with the factor analysis technique, this study was conducted with the data collected. The factor analysis resulted in identification of 15 component factors for the complete data set. The 15 component factors are described as:

Description of Component Factors Derived from Factor Analysis		
Factor No.	Description	No. of Original Survey Questions
Factor 1	General computing skills	10
Factor 2	Spreadsheet, word processing, database intro skills	6
Factor 3	Instructional technology/online courses	8
Factor 4	Word processing features/tools	5
Factor 5	Classroom technology	6
Factor 6	Database, word processing, Web advanced skills	5
Factor 7	File access	2
Factor 8	TLC equipment use	2
Factor 9	Technology evaluation	2
Factor 10	TLC equipment loan	3
Factor 11	E-mail attachments	2
Factor 12	File management	3
Factor 13	E-mail reply	1
Factor 14	E-mail addresses	1
Factor 15	Advanced TLC	1

Table 1: A Description of Component Factors

According to the Total Variance Explained table generated, these 15 component factors account for 88.2% of the total variance.

After reducing the data set from 57 variables to the 15 component variables derived in the factor analysis, a cluster analysis was performed to identify distinguishing characteristics for grouping respondents. The demographic items were introduced in the cluster analysis. The Proximity Matrix for these 33 observations indicates all data points are distinct and are separated by at least 4 units in Euclidean distance. The smallest squared Euclidean distance value is 16.162 and it relates to the similarity of observations number 27 and 30.

The results of the cluster analysis on the data set indicated the significant differences in the demographic data overshadowed any differences in the technology skill levels of the participants. Thus, the demographic data was removed from the data set and a second cluster analysis was conducted using only the 15-factors for the 33 data points. A review of the Agglomeration Schedule for the cluster analysis indicated an increase in the difference in the percent change values at the transition from four to three clusters. Therefore, the four-, three-, and two-cluster solutions were investigated. Next, a one-way ANOVA was conducted on the 15 factors using the Ward's method variables resulting from the cluster analysis as factors (for two-, three- and four-cluster solutions).

For the three-cluster solution, the ANOVA results indicated the significance level of the F-test is < 0.05 for the latent variables identified as: Factor 1 (Significance = 0.014319), Factor 7 (Significance = 0.00000114), Factor 11 (Significance = 0.000000146), and Factor 13 (Significance = 0.014046). This indicates group differences on the skill areas of general computing skills, file access, e-mail attachments, and e-mail reply.

The final step was the K-cluster analysis. The results for the two-cluster, three-cluster and four-cluster trials were reviewed. Based on the analysis of the observation groupings and the ANOVA results for the three

alternatives, the three-cluster solution was determined to be an appropriate grouping of observations. This cluster solution provides groupings with significant differences on four factors without isolating any single observation as its own group. The remaining task was the interpretation of the clusters.

To develop cluster profiles, an interpretation of the three clusters was attempted using the raw data responses. By comparing the observations using both their technology skill data and their demographic data it was possible to develop the following attribute information:

Cluster Membership							
Cluster	Observations in Cluster	Characteristics of Cluster					
Cluster 1	1, 3, 7, 9, 12, 14, 17, 18, 19, 10, 13, 14, 17, 18, 30, 31	56.3% male	37.5% <51 yrs old	19.0% Prof & Endowed Prof 56.3% Assoc & Asst Prof	62.5% <4 yrs in position	<50% yes for Factors 8, 9, 10 (14.6%) & 15 (6.3%)	Very high % yes for Factors 1 (94.4%), 7 (90.6%), 11 (100%) & 13 (93.8%)
Cluster 2	5, 11, 15, 21, 25, 32	83.3% female	50% <51 yrs old	0% Prof & Endowed Prof 66.7% Assoc & Asst Prof	83.3% <4 yrs in position	<50% yes for Factors 2, 3, 6, 8, 10 (16.7%) & 15 (0%)	Moderate to high % yes for Factors 1 (66.7%), 7 (100%), 11 (83.3%) & 13 (100%)
Cluster 3	2, 4, 6, 8, 10, 13, 16, 22, 26, 29, 33	54.5% male	45.5% <51 yrs old	27.3% Prof & Endowed Prof 45.5% Assoc & Asst Prof	54.5% <4 yrs in position	<50% yes for Factors 10 (36.4%) & 15 (45.5%)	High & very high % yes for Factors 1 (80%), 7 (90.9%), 11 (100%) & 13 (100%)

Table 2: Cluster Definition for Three-Cluster Solution

The research indicates there are significant differences among the faculty members with regard to computer technology skills and classroom application. The three groups that have been identified are distinct in their use of the TLC resources, experience with online courses and spreadsheet, database and e-mail skills. In addition, those with more advanced computer technology skills (clusters one and three) tend to be newer to their current university positions, predominantly male and in the fields of Educational Technology, Educational Psychology and Teacher Education (the areas occurring most frequently in clusters one and three). However, there is a split in this group that is related primarily to their reported general computing skills levels and their use of the TLC resources. The faculty members with lower average scores in the skill areas of spreadsheet, database, and advanced Web skills tend to be young, predominantly female and in fields such as Educational Administration (the area occurring most frequently in cluster two). This group reported lower skill levels than the other two in the factors described as general computing skills, classroom technology and dealing with e-mail attachments.

Discussion

In addition to information provided by this study regarding the current technology integration status, it provides a baseline for future studies. Thus, the goals of the faculty data collection are to assess both status and change in technology integration in COE courses.

The survey data collected was analyzed using two statistical methods, factor analysis and cluster analysis. The primary purpose of the factor analysis was to reduce the data set to a smaller number of parameters. The fifteen components identified by the factor analysis were used in the cluster analysis. The resulting groups of participants were differentiated by their level of technical skills, academic specialization, and the number of years in their current position at the university. Part of the analysis was conducted to enable changes to the survey instrument itself. Thus, the reduced survey will be used to conduct future investigations of technology integration in faculty courses. Further research will assist in the verification of current results and will begin to capture the change perspective among faculty participants with regard to technology integration.

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Higher Education and Technology Integration into the Learning Environment: Results of a Survey of Teacher Preparation Faculty

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Abstract: Standards delineated by the Council for Exceptional Children (CEC) include competencies in technology that promote teacher development of a supportive technological learning environment for students with disabilities. Personnel preparation programs must demonstrate in courses and field experiences that technology use is incorporated in the learning environment. This study presents preliminary analysis results of a survey to determine faculty technology use in educator preparation courses. The data presented are part of a larger study of technology learning environments in a teacher preparation program. Results indicate that faculty do not model all types of technology use within the learning environment of educator preparation courses.

Introduction

The National Council for the Accreditation of Teacher Education (NCATE) adopted technology competencies as a required component for training all teachers. Standards delineated by the Council for Exceptional Children (CEC) include competencies in technology that promote teacher development of a supportive technological learning environment for students with disabilities. Personnel preparation programs must demonstrate in courses and field experiences that technology use is incorporated in the learning environment. Gillingham and Topper (1999) discussed four possible delivery approaches to preparing teachers for technology use in classrooms: single course, technology infusion, student performance, and case based. Ludlow (2001), in a review of the literature and discussion of technology and teacher education, notes that research indicates a need for better training. This need is based on research and reports that indicate (a) preservice program faculty do not model the use of technology, (b) faculty do not facilitate its implementation in activities and coursework, (c) future special educators are more likely to use technology competently if it has been embedded throughout their coursework and field experiences, (c) technology competencies are often "add ons" rather than integrated into coursework, (d) few faculty members have the expertise to develop complex technology mediated instruction, (e) faculty lack the skills for troubleshooting technical problems during instructional interactions, (f) research in the area of making informed programming decisions related to technology is lacking, and (g) systematic training procedures to assist faculty and students in using new technologies have yet to be developed.

Edyburn (2001) delineated 197 articles that have contributed to an emerging knowledge base on special education technology research and practice. Content analysis identified several themes but most relevant to this study were the areas of implementation issues, preservice teacher education, and technology integration. In a review and discussion of instructional technology and personnel preparation for early childhood special education, major issues were identified within the context of higher education. Illustrations for faculty to examine their own instructional strategies within technology use were presented. Self-examination areas included online materials, electronic reserve, electronic mail, listservs/reflectors, online forums, electronic presentations and face-to-face instruction (Hains, et al, 2000).

Method

Using a survey of education personnel preparation faculty, the investigators addressed the question: Do faculty model technology use in the courses they teach? Faculty were invited to complete the survey at the end of a program area meeting. A script describing the study was read by one of the investigators requesting that surveys be completed after the meeting and returned anonymously.

Participants

A total of 26 faculty members at an upper division university in the Southeast region of the United States constituted the sample for this survey. Response was 100 % of faculty attending program area meetings. Participants were all full time faculty members in an education personnel preparation program.

Measures

This study used the Technology Integration Survey for Faculty (High Plains Regional Technology in Education Consortium, 2001). For the purposes of this study, only the first 16 items were analyzed. These 16 items are designed to gather information on the degree of technology integration the faculty is incorporating into their teaching and are directly related to the question of whether faculty model the use of technology in their courses. Responses are evaluated on a 4-point Likert-type scale with the following labels: (1) strongly disagree, (2) somewhat disagree, (3) somewhat agree, and (4) strongly agree. The following is taken from the directions on the survey:

> **Directions**: This survey is designed to gather information on the degree of technology integration you are currently incorporating in your teaching. The statements address what you are actually *doing*, rather than what you *can* do.
>
> Use the following scale to gauge the degree to which each statement is true of you:
>
> **1 Strongly disagree** (You have never tried this, either because you are not comfortable with the technology or because you believe it is not appropriate in your teaching situation or because you don't have access to the necessary technology.)
>
> **2 Somewhat disagree** (You've tried this once or twice but it has not become a consistent part of your instruction.)
>
> **3 Somewhat agree** (You do this consistently to some degree but it is not an integral part of your instruction.)
>
> **4 Strongly agree** (This is a consistent, integral part of your instruction.)
> (High Plains Regional Technology in Education Consortium, 2001, paragraphs 1 & 2)

Results

The results of the study are similar to those identified in the literature: faculty (a) are incorporating software packages into the teaching of their subject areas; (b) are using assistive technology (e.g., scanner, digital cameras, video cameras, voice recognition) to develop and deliver instructional units in their

teaching areas; (c) are using technology (e.g., video conferencing) to teach students; (d) are using the internet to gather resources (e.g., lesson plans) for teaching in their subject areas. However, faculty are not using projection devices with a computer to develop and deliver instructional materials in their teaching areas. The following table summarizes the results of the study.

Table 1: Samples of Faculty Responses by Technology Use

Technology Use	Response	Frequency	Percent
Use of spreadsheet applications	Strongly disagree	8	30.8
	Somewhat disagree	6	23.1
	Somewhat agree	5	19.2
	Strongly agree	7	26.9
Use of scanner, video/digital cameras	Strongly disagree	20	76.9
	Somewhat disagree	4	15.4
	Somewhat agree	1	3.8
	Strongly agree	1	3.8
Use of multimedia and/or Internet	Strongly disagree	12	46.2
	Somewhat disagree	9	34.6
	Somewhat agree	0	0
	Strongly agree	5	19.2

When the participants answered whether they use a variety of software packages to teach in their subject area, 38.5% of the participants stated that they do not use software packages. Similarly, 53.8% of the surveyed faculty stated that they do not use spreadsheet application when teaching. When asked about their use of a scanner to develop and deliver instruction, 76% of the participants answered as not doing so. Of those surveyed, 84.6% stated that they do not use digital cameras to enhance their teaching. Similarly, 92.3% of the participants indicated not using video cameras to develop and deliver their teaching. In relation to the use of assistive technology to promote learning for students with special needs, 88.5% of the participants indicated that they do not use such technology. Of those surveyed, 80% indicated that they do not use technology for distance education and 92.3% stated that they do not use video conferencing to teach in their subject areas. When asked about their use of projection devices, word processing, and use of multimedia, 53.8%, 88.5%, and 69.2% of the participants, respectively, agreed to incorporating them into their teaching. Similarly, 88.4% of the participants agreed to using the Internet in an informed manner and 69.3% agreed that they used lesson plans and other resources published on the web in their teaching.

Convenience sample, sample size, and the use of self-report data limit the findings of this study. However, results are consistent with research findings that preservice program faculty do not model the use of technology and that faculty therefore do not facilitate its implementation in activities and coursework. This lack of technology use is contrary to recommendations that future special educators are more likely to use technology competently if it has been embedded throughout their coursework and field experiences.

Discussion

Technology integration to provide a supportive classroom learning environment has been discussed as an evaluation tool of an educator's ability to address the individualized needs of students (Crawford & Martin, 2001) as well as a critical component in the success of learners with disabilities (Seevers, Crawford, & Martin, 2001). University faculty teaching personnel preparation courses should be modeling the integration of technology for their university students. Research has indicated that effective technology integration may be critical to producing educators who use technology competently to meet the needs of their students through a supportive classroom environment. Additionally, implications related NCATE recommendations and CEC standards for providing a supportive learning environment for students remain an area of concern.

This study used a survey questionnaire to determine whether faculty model the use of technology in educator preparation courses. It measured faculty use of technology not faculty knowledge of technology. It is possible that there is a discrepancy between knowledge and use of technology. Faculty may know more technology than they incorporate into their education personnel preparation courses. Results of this study indicate that some faculty (a) are not incorporating software packages into the teaching of their subject areas; (b) are not using assistive technology (e.g., scanner, digital cameras, video cameras, voice recognition) to develop and deliver their instructional units in their teaching areas; (c) are not using technology (e.g., video conferencing) to teach to their students; (d) are not using the internet to gather resources (e.g., lesson plans) for teaching in their subject areas; and that some faculty (e) are not using projection devices with a computer to develop and deliver instructional materials in their teaching areas. Additionally, the use of the survey questionnaire may have resulted in faculty self-assessing their use of technology in educator preparation course.

Conclusion

In light of faculty responses to the survey, further consideration pertaining to faculty professional development opportunities and curricular integration is imperative. After all, "Computerized electronic technology makes possible not only the wide and rapid distribution of information, but its manipulation, analysis, synthesis, and recombination as well. Through these operations, new knowledge is created that helps us understand ourselves and our world in new ways" (Gibbon, 1987, p. 2). Technology provides the opportunity to expand the realm of the curriculum, but only with faculty time and effort, as well as support of the institution, will appropriate and successful integration occur.

Perhaps consideration should be allocated toward the philosophical framework through which the faculty view their own pedagogical behaviors. A traditional mode of interaction within a classroom environment is one that is supportive. However, a supportive environment that celebrates the successes of the faculty may be described as one in which innovative approaches to teaching are perceived as inventive and appropriately rewarded. "A combination of essential conditions is required for teachers to create learning environments conducive to powerful uses of technology. The most effective learning environments meld traditional approaches and new approaches to facilitate learning of relevant content while addressing individual needs: (International Society for Technology in Education, 2001, paragraph 1).

As university faculty shift toward an integration of technology within their university courses, the modeling of technology use for university students will contribute to the production of education personnel who are competent technology users. This shift may provide the supportive learning environment necessary for education personnel to understand the importance of not only having pedagogical expertise but also of modeling its use through technology (Crawford & Martin, 2001).

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Adding "Flash" to Your Faculty Development Program

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Abstract: A number of factors have been shown to influence the acceptance of new technologies in education. Research indicates that training and support are critical factors in the adoption of instructional technology by higher education faculty. This paper is a report on one solution that has shown potential in solving a problem of providing faculty development in instructional technology on multiple campuses with a small development staff at the Center for Teaching and Learning with Technology.

Introduction

With ever-increasing pressure from college administrators, faculty members are being encouraged to embrace technology as a way to increase the number of students served, improve the quality of their instruction, better prepare students for the workplace and reach students not previously served by traditional classroom instruction (Green, 2001). The initial review of the research examined factors reported in the literature as causes of college faculty reluctance to use technology as well as factors that help promote its increased use.

As indicated in Okpala & Okpala (1997) and Spotts & Bowman (1995), while the use of technology is rapidly increasing in the business world, the use of technology in academia is still not widely accepted. Additional evidence in Green (2001) shows that only 14.7% of colleges and universities in his study used course management tools for their online courses and only 30.7% used web pages for class materials. With the need to expand the use of technology increasing, it is important for colleges and universities to recognize the critical issues that impede growth in the use of technology by instructors and address them if their goals are to be met. Identifying incentives and motivational factors that will help expand the use of technology by college faculty will be beneficial to institutions of higher education (Chizar & Williams, 2001). Understanding the need for support systems will assist colleges and universities in planning for the infusion of technology in teaching. Providing adequate user support and assisting faculty with integration of technology in instruction were reported by Green (2001) as two of the most critical issues in on-campus computing for the next two to three years.

The literature review established a foundation for planning and implementing faculty development programs at the New York Institute of Technology's Center for Teaching and Learning with Technology (CTLT) in the use of technology as a tool for instruction. Understanding how faculty use technology, their concerns about technology and factors that help produce positive acceptance by faculty members are keys to successful instructional technology implementation and expansion projects.

The Role of Training

Faculty training is a critical component to successful integration of technology in higher education. The Center for Teaching and Learning with Technology at the New York Institute of Technology (NYIT) was formed with the expressed purpose of providing technology training to the college's faculty.

In recent surveys, Milliron and Leach (1997) and Green (2001) reported that the training structures for developing the technology skills of faculty members are still not in place and yet training is viewed as an essential ingredient in keeping their faculty current. Chizar & Williams (2001) also reported similar findings in their faculty survey.

For a staff development program to meet the needs of the faculty, it is critical that the trainers understand the specific types of technology being used by the faculty and which new technologies may also be useful for them. Gandolfo (1998) and Inman & Mayes (1999) suggest that training programs must be designed

to allow for multiple training experiences. They found that as faculty become more familiar with technology, their need for additional training in other technologies is likely to increase.

Inman & Mayes (1999) also suggested that there should be a distinct separation of general computer literacy education and basic hardware training from advanced training in more sophisticated technologies. Dusick & Yildirim (2000) also found the need for separation of users and nonusers in training. Experienced users were focused on improving their existing skills through specific training. Nonusers preferred short personal training sessions or small group training sessions (Carey & Dorn 1998). Wilson (2001) also reported that faculty preferred one-on-one or small group training to traditional classroom training settings.

Dusick & Yildirim (2000) and Wilson (2001) found that computer competency and prior computer instruction were significant predictors of the use of computers for instructional purposes by faculty. It is evident from the study that training is an important positive factor in expanding faculty use of computer technology.

Candiotti & Clarke (1998) and Dusick & Yildirim (2000) also found that on-going technical support for faculty while they are learning new technology is critical. Both studies suggested that a modest investment in support staff yields far higher returns in increased faculty use.

Using Technology to Teach Technology

Ongoing training and support for faculty also plays a critical role in the expansion of technology use. Trainers must be aware of the types of technology that are available and in use in order to create training programs that will be useful to faculty (Inman & Mayes, 1999; Dusick & Yildirim, 2000).

Green (2001) reported that the single most important information technology support issue for institutions of higher education over the next three years will be assisting faculty to integrate technology into instruction.

Recently, NYIT adopted a new course management system for delivery of the college's online courses. It was selected because of its ease-of-use and intuitive interface. However, the organization of lesson materials in the new system required training for each faculty member using the online delivery system. Over 100 faculty members needed to be trained in a very short amount of time.

Many of the research articles cited the time factor as a deterrent to faculty adoption of technology. Train ing can only be effective if faculty take advantage of it. It became part of the training plan at CTLT to produce online versions of the training programs for the course management system, online web editors and general best practices for online teaching and learning.

Providing training that is available to faculty online has great potential for increasing faculty participation. Faculty members do not have to manage already tight schedules to attend sessions. They can take the training courses at any time of the day or night when time permits. The ability to work independently also has the potential to alleviate some of the reluctance to attend large group training sessions where their lack of certain technology skills may become more apparent to others.

Online faculty training appears to be a solution with a great deal of potential to provide much needed training while avoiding many of the disadvantages of traditional classroom style training sessions. Although group training sessions are still be offered by the Center, this additional delivery option has provided a way to reach many more faculty members in more different locations.

Tools that Facilitated Online Training

Rapid development of online training with a small faculty development staff required tools that were easy to learn, provided flexibility in formats and supported the types of training needed at the Center for Teaching and Learning with Technology. The writer investigated a number of tools designed for online content development and selected a set of web tools from Macromedia (http://www.macromedia.com). They proved to be quite powerful, worked well together and yet were very intuitive and relatively inexpensive.

The primary tool used was Macromedia Flash 5. The writer was able to create a few simple templates that facilitated the technical training required for a variety of faculty needs. The files created in Flash were remarkably small and required no special plug-in to be viewed on the web. Action scripts built into the software allowed the designer to easy add interactivity that allowed the learner to control the pace and sequence of the instruction. It was possible to import screen captures from programs that the faculty wanted to learn, such as Blackboard or Dreamweaver, and provide step-by-step instructions and guided animations using the actual

displays from the program. Being able to see the screens and read or hear the instructions at the same time proved to be a useful strategy based on initial feedback from the faculty.

Another part of the Macromedia "Web Design Studio" package was another product called Fireworks 4. This graphic manipulation tool allowed the writer to compress the screen captures to reduce the download time without substantially reducing the quality of the images.

Macromedia's Dreamweaver 4 was used to develop and maintain the Center's web site where these tutorials were made available for use by faculty (http://iris.nyit.edu/~ctlt). Dreamweaver's built-in file transfer protocal (FTP) feature made file transfer and updating a relatively easy process.

Initial Results of Faculty Satisfaction

Although the results are quite preliminary at this writing, the initial data, gathered using an online survey instrument, indicate a high level of satisfaction with the use of online technology to assist faculty in learning technology. One of the major factors mentioned by numerous faculty members who used the programs was the convenience of being able to using the training programs anytime and anywhere. This convenience factor may encourage more faculty members to participate in technology-based educational enhancements to their traditional instruction when regularly scheduled training sessions offered by the Center for Teaching and Learning with Technology do not fit their busy teaching schedules.

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Multimedia cases and the professional development of teacher educators

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The integration of ICT in teacher education is one of the priorities of Dutch educational policy. Much money is already invested in computer hardware, and although less, in specific software for teacher education. However, the investments in professional development activities for teacher educators in order to integrate this software in their programs lay far behind.

This proposal is about an arrangement for professional development of teacher educators in elementary science. This arrangement aimed at familiarizing teacher educators with multimedia cases. Working with multimedia cases implies a double innovation. The first innovation is about the change in pedagogy of teacher education. Case-based learning in teacher education means a more profound place for classroom practice in the programs. The second innovation refers to the use of ICT for student learning purposes. Both intertwined innovations have implications for the knowledge base of teacher educators, and hence for their professional development. This proposal describes an explorative study on teacher educators learning about multimedia cases. In the next sections an outline is presented of the context of this study followed by brief a description of the methodology and a summary of the main findings.

The MUST-project

The study described in this proposal in part of the MUST project. The acronym MUST stands for Multimedia in Science and Technology. This project is a joint venture on behalf of three Teacher Education Colleges, the National Institute for Curriculum Development and the University of Twente in the Netherlands. The project aims at developing multimedia cases and investigating their impact. At the core of every MUST case is an interactive video-clip of elementary science classrooms. Hyperlinked to this video all kinds of information are added on a CD-ROM, such as comments on the video, facts about the school and the class etc.

Teacher education programs are frequently charged with being irrelevant, overly theoretical and out of touch with the realities of teaching 'on the front lines'. However, situating teacher learning in classroom practice may have as drawback that the kinds of teaching advocated in reform proposals are non-existent in real settings. Case–based learning is perceived as a means to overcome this theory-practice divide and cherish the innovative aspirations of curriculum change. When combined with computer technology, the educational potential of case-based learning may even be enhanced. Multimedia applications add the power of computer technology to approaches of case-based instruction, because these applications can stimulate more than one sense at a time and in doing so, may get and hold more attention (Jonassen & Reeves, 1993, p. 703; Cennamo, Abell, George & Chung, 1996)

"Case methods are expected to be more engaging, more demanding, more intellectually exciting and stimulating, more likely to bridge the chasms between principle and practice, and more likely to help neophytes to learn "to think like a teacher" (Shulman, 1992, p. 1).

Although the advantages of case-based learning is well-documented in literature, empirical studies on their use by teacher educators is scarce. This study tries to make a contribution to fill this gap.

Methodology

The research reported about in this paper was guided by the following two questions:

- Which images do teacher educators associate with the implementation of MUST cases by teacher educators?
- How do teacher educators evaluate their competencies of the different knowledge domains necessary to integrate MUST cases in their curriculum?

Fourteen teacher educators (3 women and 11 men) participated in this study. They all followed a short trajectory of professional development in order to get familiar with the MUST philosophy and products. This trajectory consisted of a one-day workshop, activities with MUST cases at their teacher education college and a finalizing workshop of 5 hours.

The following data have been collected:

After the first workshop the teacher educator wrote down their impressions of the MUST cases. Their responses were stimulated by expressions such as "What is on your mind when thinking about using MUST cases?

Subsequently, the responses are collected per expression and grouped in the following categories:

Implications MUST cases from a curriculum perspective;

MUST cases and future teachers;

MUST cases and teacher educators;

Technical implications of MUST cases.

After the last workshop the teacher educators were asked to evaluate aspects of their knowledge and skills on a 14-item list. They could rate themselves from 1 to10. (In Table 1 the results are summarized.)

Results and conclusion

Images

Most remarks were related to MUST cases and the curriculu m at the teacher education college (37%). The teacher educators saw good opportunities to integrate the multimedia cases in the existing curriculum at their college. They did not perceive the cases as a springboard for curriculum reform. This is not surprising, because all participants had redesigned their curriculum profoundly in the recent past. The participants express as a major point of concern the lack of time within the curriculum. Multimedia cases capitalize on in-depth information processing. So, from a perspective of content coverage cases are rather in efficient. Teacher educators were afraid that other important topics would get less attention when much time was devoted to the topics in the cases.

About 25 % of the remarks were about the anticipated reactions of students on the cases. The teacher educators expected that working with the cases would a motivating experience for their students, especially because of the video-clips of elementary classrooms.

Remarks (20%) were on the technical implication of working with multimedia cases (installation on the computer network and so on.)

18% of the remarks were about the role of the teacher educator, especially how to guide student learning while working with a multimedia case.

Competencies

At the end of the second workshop the teacher educators filled out a self-evaluation form.

Table 1: Knowledge domains in relation to MUST cases

Installation/ navigation MUST	(4 items)	7,7
Insight in ICT knowledge students	(3 items)	6,1
Science in teacher education	(3items)	7,9
ICT in elementary science	(2 items)	6,1
Teaching with multimedia cases	(2 items)	5,1

N=14

Not unexpectedly, the teacher educators rated themselves highest on their "core business" (science in teacher education). Remarkable is the high rating of the technical competencies to work with multimedia cases, because after the first workshop the participants expressed concerns on this point. Informal conversations with the teacher educators indicated that the first in-college experiences with the cases did not cause any major technical problems.

The teacher educators do not have much insight in the ICT competencies of their students or in the role of ICT in elementary science. This implies that they cannot take a leading role in innovation in elementary science in which ICT plays a significant role. The participants do not feel very comfortable as far as teaching with multimedia cases is concerned. Teacher educators particularly perceive the use of multimedia in interdisciplinary courses as beyond their reach.

In conclusion:

The workshops and in-college activities with MUST cases have raised enthusiasm amongst the participants. But the i mplementation of multimedia cases in an innovative way requires more long-term support and collaboration. Especially the rational behind case-based learning needs more thorough attention, otherwise multimedia cases may be viewed as an interesting and motivating "extra" in a already heavy loaded curriculum.

Back to Basics: Non-Technical Tips for Improving Technology-Based Presentation Skills

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From a simple PowerPoint™ presentation to a complete online course, technology now allows educators unprecedented freedom to create, modify, and disseminate their own instruction; however, this same freedom also offers unprecedented opportunities to create and disseminate ineffective or poorly designed instruction. Ineffective technology-based instruction often stems from neglect of the basic principles of effective instruction. This paper describes four non-technical tips educators can use to enhance the quality and effectiveness of technology-enriched instruction. They include (a) identifying instructional objectives, (b) understanding the target audience, (c) organizing the content, and (d) preparing for instructional delivery.

Introduction

It is no longer surprising to see P-12 teachers and college or university faculty with the technical ability to create multimedia-rich PowerPoint™ presentations, develop and maintain their own course Web sites, or, with no technical assistance, setup and operate a wide variety of computer-based equipment. As educators, we are rapidly becoming more technologically savvy. Fortunately, many of us are learning to embrace this change and are enjoying the unprecedented freedom technology offers us in our ability to create, modify, and disseminate instruction, however, this same freedom also offers us ample opportunity to produce ineffective or poorly designed instruction. In allowing us to personalize and package the instructional messages we convey to our students, technology also gives us much latitude to miss the mark, and that is precisely the issue raised in this article. Perhaps we need to be reminded that, as we run to jump on the technology bandwagon, we must not forget to bring the basics of good instruction along with us.

Most of us have endured PowerPoint™ presentations with font sizes so small that we could not possibly read the information being presented or lectures by professional educators who stood with their backs to the audience as they read paragraph after paragraph from the information projected on the screen. In these and many other situations, technology, in all its capacity to enhance instruction, only served to impede the dissemination and reception of the intended message. It is with this in mind that we offer a few reminders on how, as professional educators, we can reduce the chances of getting blindly caught up in technology's enticement and instead, capitalize on its potential to support effective teaching.

Identifying Instructional Objectives

In simple terms, objectives are specific descriptions of what we want the learner to know or be able to do as a result of instruction. Whether we are using PowerPoint™ in the classroom or delivering our instruction online, it is critical that we make the effort to identify specific instructional objectives, even if it requires a considerable amount of time. Surprisingly, many of us spend more time selecting background colors and clip art, digitizing video clips, creating endless lists of hyperlinks to online resources, or toying with any number of technology's fun and often

frivolous features than we do identifying and incorporating objectives into our technology-based instruction. While technology's bells and whistles or its ability to expedite our productivity should not be neglected, our first priority should be to identify and incorporate instructional objectives in the design and development of our instruction.

Determining and writing good objectives is not always, if ever, a quick and easy process. Taking the time to determine instructional objectives, refining them, and then developing content and evaluation methods around them can be a very detailed and time-consuming process. This stands in direct contrast to the expectations we may have of technology and its ability to assist us in rapidly creating a finished product. While convenience and expediency are enticing attributes, as educators, surely we are not willing to trade them for quality and effectiveness.

Understanding the Target Audience

In a traditional setting, when teachers walk into a classroom to teach a lesson or deliver a lecture, they are in direct, face-to-face contact with their audience and can react, make accommodations, and modify the information they are presenting and the way in which they present it based on audience reaction and response. Trained educators know this ability can greatly improve the effectiveness of instruction. Unfortunately, technology, if we allow it to, can easily separate us from the learner.

As many of us have already discovered, our efforts to understand and accommodate our audience often tend to lead us away from the rigid and inflexible presentations that can be so instructionally ineffective and instead, toward the development of presentations that simply support the information we wish to convey. For example, rather than creating a presentation that contains slide after slide of the exact content being presented, forcing the instructor to follow the pre-developed content precisely, we instead find ourselves more often creating presentations that merely contain supporting electronic artifacts such as charts, graphs, maps, photographs, video clips, or a few talking points. By simply augmenting a lecture or presentation with technology instead of letting technology dominate it, we help create an instructional environment that is much more responsive to our audience.

Organizing the Content

The appropriate organization of content is crucial when conveying information or providing instruction. The clear articulation of the content order reduces the chance of misinterpretation or confusion by the learner while assisting him or her in establishing important and necessary associations between the elements that make up the content and between prior knowledge and current information. Fortunately, content organization is often made simple by the content itself. For example, the order in which a step-by-step task such as creating a new slide in PowerPoint is presented is very sequential and straightforward. On the other hand, some content is more open ended and much more complicated to organize. Imagine having to organize the content for a presentation on how to deliver a persuasive oral speech. This type of content could be effectively organized in a wide variety of ways.

It is in the delivery of this open-ended type of material that it becomes crucial for educators to give careful attention to the appropriate organization of content. Unfortunately, as we now find ourselves with the technology-enhanced ability to create our own instruction, we must often assume the responsibility of organizing our instruction ourselves. To do so effectively, we must have a strong understanding of the content itself, of our target audience's existing skills and knowledge, and of the desired learning outcome we wish to achieve. Based on these, we can begin to organize our instruction or information in clear and appropriate ways.

Preparing for Instructional Delivery

This is perhaps the simplest but most overlooked aspect of delivering effective technology-based instruction. Simply put, make sure everything works before getting up in front of your audience. Audiences or students are no longer tolerant of our lack of preparation and consideration when we don't know how to operate equipment. In addition to being familiar with the operation of the equipment, we must also be familiar with our presentation and its content. Were not suggesting that hours of rehearsal and practice are required in order to deliver a polished and professional presentation, however, adequate steps must be taken to ensure that, as the presenter or teacher, we are familiar with what we are presenting and with the equipment used to present it. Anything less runs the risk of seriously jeopardizing the instructional effectiveness of our presentation. This is a big price to pay for failing to take a few extra minutes to make certain we are prepared.

New Instructional Technology and Faculty Development: Negotiating the Titanic Through the North Atlantic

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Introduction: What does the Titanic have to do with new instructional technology and faculty development? As we are well aware, the Titanic was an extremely large ship that had to negotiate dangerous icebergs in the North Atlantic. The Titanic was promoted as an unsinkable new ship, guaranteed to deliver its passengers safely and for them to have a most enjoyable trip while moving from one shore to another.

For faculty, technology is that new ship. Like the Titanic, it is not unsinkable. Icebergs can wreck any project. There just has to be good navigation through the icebergs that will inevitably appear in the North Atlantic or in projects that execute change. A point for the navigator to remember is that icebergs are moving objects and hard to chart so what seems like smooth sailing may have some surprises along the way.

Methodology: To execute our plan, three phases were instituted. *Phase 1*: Recruit interested faculty on PCC campus, provide training in the Blackboard software and offer time, technical guidance and funding for on-line and web enhanced course development during the summer. *Phase 2*: Seek grant funding to provide released time or technical support to allow faculty time to devote to learning new technology. Offer training to PCC faculty first but invite regional community colleges to participate in the training, as well. Provide guidance and support for faculty interested in going "beyond PowerPoint." *Phase 3:* Seek additional grants to develop an E-Mentoring program to have faculty assisting faculty.

These phases were based on faculty needs assessment and again, like the builders of the Titanic, available innovations and demand.

Original Project Objectives:

- Assist faculty in transition to more technology use
- Provide learning in a non-threatening environment
- 'Incent' faculty to try new technology
- Increase internet and web enhanced classes across the curricula, to feeder institutions, to other institutions and to the global market

Faculty Involvement: Some faculty are adventurers – ready to try anything new and different; some see the move to incorporate more technology in the classroom and on-line courses as an imposition on their academic freedom, their personal time and their teaching competency; some feel that the adventurers can try it first, get the kinks out, then they "just might" get on board if someone helps them. The course of action is to

ind the incentive for each type of faculty member and use that to ensure their participation. Some types of incentives which can be used are recognition, released time, new equipment, opportunity to be first and "know more," travel and presentation options, leadership opportunities, and the ever popular, cash.

Funding Sources: Businesses build incentive programs into marketing and training plans. In most cases, educational institutions, especially ones funded by tax dollars, have little or no ability to start or market new programs without taking funds from some other internal source. As with Pitt Community College, grants and gifts are usually the major outside funding sources but there are other internal sources available, as well. For example (1) lapsed salary funds which must be spent on faculty salaries or be returned to the state can be used for extra contracts for faculty technology skill and course development, (2) Grants with a technology "twist", (3) partnerships with industry or universities (4) faculty initiative.

Navigating Faculty Using E-Mentoring for Creating Online Courses and Marketing Materials

Welcome to E-Mentoring: A major concept for navigating the Titanic was through team work, with everyone having a major part to play for the success of the trip. Navigation for faculty was through a new technique called "E-mentoring," also referred to as telementoring or online mentoring. The role of the e-mentor is one of an esteemed educator who has already been down the path of learning technology and gained experience and knowledge to share upon a worthy e-mentee (one who is learning). An E-mentor is compared to the captain of the ship, one who been trained and understands the dangers of currents and plots the course for a successful trip.

With the year 2000, the Internet and technology has improved the way of doing business with the working world. The traditional role of mentoring has expanded and evolved as well. Technology has allowed up to alter the traditional method of mentoring, allowing the workforce and education to tap the career advice of a mentor from virtually anywhere in the world.

Goal:
With the use of E-Mentoring, the goal of this project was to provide a means for creative and interactive learning that involved significant and continuous participation among faculty as a team to develop online courses or marketing materials.

Objectives:

1. To use new tools and technologies to extend educational access to faculty for communication and online development.
2. To implement technology to improve the quality of teaching in face-to-face classrooms, web-enhanced courses, and online courses.

3. To change the nature of the teaching-learning interaction to involve learners more direction, support, and guidance in creating effective learning environments through the use of technology.
4. To develop marketing materials for CDs and/or web applications.

What is E-Mentoring? E-mentoring is an interactive relationship between a mentor and a mentee through the use of the Internet, e-mail, information highway, discussion groups, chat rooms, etc. For our training, e-mentors are the pioneers who have already designed, developed, implemented, and evaluated online courses. The e-mentors possess a wealth of knowledge and experience in technology and course design. They have the knowledge of "what works" and "what doesn't work."

E-Mentoring is a Team Effort: Developing online courses is a team effort and everyone brings a certain about of expertise to the team. In this project, the following roles and responsibilities were as follows:

- **Faculty mentors:** The faculty member of instructor assumes the role of the instructional or content expert. He or She is responsible for planning, implementing, and evaluating instructional materials. The Faculty Mentor also assists in locating resources and course materials appropriate for course content. He or She assists in helping Faculty Mentees solve problems related to organizational structure and policies.
- **Technology mentors:** A Technology Mentor assumes the role of assisting with instructional and graphic design and the logistics of structural design. This person is responsible for assisting the instructor in selecting software and hardware appropriate for specific course results. This person assists in designing specialized graphics; visuals and print materials; web-based materials; and audio, video, and digital requests. The Technology Mentor is also responsible for equipment setup, network connections, testing, and troubleshooting course design applications. This is a critical role in that the Technology Mentor advises the instructor how to develop course content and learning strategies to blend with software and hardware capabilities. Technology Mentors may be on your campus or at a distance. FTP (File Transfer Protocol) can be used for Technology Mentors off your campus.
- **Faculty Mentees:** The Faculty Mentee assumes the role of the learner by researching and working closely with a Faculty Mentor and Technology Mentor in course development. Faculty Mentees tasks include
    - communicating frequently with Faculty and Technology Mentors
    - preparing and following a timeline
    - developing course content and learning strategies
    - obtaining copyright approvals
    - developing contingency plans
    - taking care of program logistics
    - preparing course resources ahead of time
    - providing feedback to learners

About the E-Mentoring Project.

This e-mentoring project is funded by the NorthCarolina Community College system's grant. The grant is available from September 2001 to May 2002. This project is also unique because the e-mentoring took place between two community colleges. Martin Community College is located in Williamston, North Carolina, and Pitt Community College is in Greenville, North Carolina. Pitt Community College provided the Technology Mentors for Martin Community College.

The mentoring project included synchronous and asynchronous communication and learning.

- Synchronous communication is then mentors/mentee are online at the same time. This includes brainstorming, role playing, and discussing course content in real time.
- Asynchronous interaction is communication that takes place outside of real time. Mentors and mentees participate at times that are convenient for them. This delayed interaction allows mentors/mentees time to reflect and pace themselves and to check resources and references before contributing to online discussion.

Summary:

A series of training and application were conducted throughout 2001-2002. Approximately 123 faculty from 13 other community colleges participated in the training. Technology funds provided training and travel opportunities for faculty during a period when there were severe budgetary constraints with the community colleges. Funding provided release time for faculty, technical personnel to assist in software and hardware needs, and specific training and resources for course design. A web page was maintained for convenience for participants for information and updates.

Upon completion of this project, faculty will showcase marketing CDs (Commercial Refrigeration and Welding) and online course development. Materials developed are available for other colleges to share and use as resources.

Evolution of Faculty Web Page and Video Skills: A P^3T^3 Case Study

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Abstract A primary mission of staff working with the Purdue Program to Prepare Tomorrow's Teachers to Use Technology Project (P^3T^3) is to train faculty members in the School of Education to use technology and serve as mentors during the learning process. This study was initiated to investigate how select faculty members evolved as they integrated technology into their work, how they perceived technology integration, and how effective and efficient their strategies were to use technology in their teaching In addition, existing problems in faculty training, and inefficient processes in technology integration were investigated. The authors provide tentative solutions to these problems and suggestions for possible early intervention in an effort to prevent similar problems in the future.

Introduction

Among other goals, the Purdue Program to Prepare Tomorrow's Teachers to Use Technology (P^3T^3) is designed to prepare pre-service teachers to demonstrate fundamental technology competencies, and prepare teacher education faculty to teach pre-service teachers in technology-rich environments by modeling approaches that future teachers should use themselves. In order to achieve this goal, P^3T^3 incorporates a comprehensive faculty development and mentoring program, which is the focus of this paper. P^3T^3 combines workshops, training sessions, and one-on-one mentoring. Workshops, which are conducted at the beginning of each semester and during summer breaks, consist of a two-day "start-up" session followed by three or more days of focused skills development. In the first two days participating faculty members engage in problem-based learning activities involving technology integration. This is followed by previews of technology skills development workshops and consideration of models of technology integration in education. At the conclusion of the "start-up" sessions, faculty members develop and share personal technology integration plans. Based upon the technology integration plan, a graduate student – skilled in the appropriate software/hardware to meet the goals of the faculty member – is assigned to provide optimal mentoring throughout the integration of technology into teaching during the following academic year. Subsequent sessions include workshops on WebCT, PowerPoint, FrontPage, and Dreamweaver, and "how to" sessions focusing on the use of digital video, digital photography, HTML programming language, and Purdue's career account system (supporting centrally managed storage for files and web pages).

Through workshop and personal mentor training provided by the P^3T^3 graduate assistants, some faculty made great strides in the development of technology skills. Others attended the same workshops but encountered major struggles and challenges as they attempted to incorporate technology into their courses. A few faculty members chose to continue their curriculum in the same manner as it always was – without the addition of new technology. What are the reasons for this broad spectrum of use? Why did some faculty members perform exceptionally well? Why did some find the challenges so overwhelming? And why are there still faculty members who choose not to use technology?

Theoretical Framework

Considering the rapid pace of development in educational technologies, coupled with innovations in teaching and learning, utilizing technology is high on the lst of priorities of educational managers, administrators and operatives. Sandholtz et al. (1997) noted the use of technology is recognized as a valuable tool – making technology more common while developing it to enhance teaching and learning. However, Brand (1998) found that despite increased access to computers and related technology, educators are experiencing difficulty in combining technology into classroom teaching practice. Training and mentoring provide two major incentives in aiding faculty to successfully integrate technology in teaching (Dusick, 1998; Dusick & Yildirim, 2000).

Methodology

This research relied on case studies conducted by two of the authors. Both of us are proficient technology users and work as graduate assistants in the P^3T^3 program. We serve as mentors for the faculty members and have been involved with the project since it's inception in the summer of 2000.

Through an interview process, we videotaped or tape recorded responses from three faculty members and a teaching assistant. Two additional faculty members included in this paper were not interviewed, but information was recorded from interviews with the P^3T^3 assistant assigned as their mentor. Completed faculty projects were also used as a source of information for the subjects – websites and edited video projects provide evidence of faculty involvement with technology. Subjects were selected to include those who successfully learned and integrated technology and those who chose not to make changes. The faculty members have been teaching from 10 to 37 years in K-12 and higher education. One faculty member was proficient with technology, but the others were at various developmental stages of computer skills. For the purposes of this study, they were categorized into two groups: those who used web design software to develop websites, and those who attempted to incorporate video into their curriculum or course presentations. We conducted the interviews to explore faculty member attitudes toward technology integration, the strategies they used to learn the technology and integrate it into their teaching, and to determine the challenges they faced as they incorporated the new skills.

Website Integration

Three faculty members were interviewed about website integration. Two had no prior experience with website development but the third was familiar with website design, as she maintains her own website.

Successes

Dr. F. has been a professor in the School of Education for more than 10 years. After attending the faculty workshops, with the help of her P^3T^3 mentor she created her own web pages and a separate website related to her research interests. Professor F. stated, "There are several people I work with that use web pages... It's very convenient for me to get information. Web pages look like the information source. The assistance I get from P^3T^3...definitely impacted me to have my own web page. I don't have the technical skills to do

it, but after I went to the Dreamweaver workshop, I know what I can do." Dr. A. had been an administrator in the K-12 school setting for more than 30 years. He has been a Professor in the School of Education for three years. Like Dr. F., he created his web pages with the help of his P^3T^3 mentor after attending the faculty workshops. Dr. A. stated, "I use the web a lot in my work area...this university is a highly-technology involved university. Both of these are motivations for me to create a website for myself." Dr. E. has more than 5 years of experience as a professor in the School of Education. Recognizing the value of the web as a communication tool for her students, her associates at other universities, and the outside world even before the P^3T^3 project began, she employed a graduate assistant to create her own website. After attending the P^3T^3 workshops, he was excited about converting her designs from FrontPage on a PC operating system to Dreamweaver on the Macintosh platform. With positive reinforcement from her P^3T^3 mentor and technical help when she needs it, she has plans underway to transfer the pages to the new format rather than recreating the pages in a new website.

Challenges

Some challenges were more easily solved than others. Dr. A. was faced with the introduction of web-editing software that was different from the one he had originally learned. He stated, "The changing of the software forced me to learn the new technology. However, it'll be a long process for me to learn and update the new software." Dr. F. stated, "Faculty's time is very tight." Dr. E. agreed and also stated that she is a Mac user; however some web design software, like FrontPage, is just for the PC. Her need for P^3T^3 assistance occurred when she found a need to update her current site. She approached a P^3T^3 assistant and together they experienced a great deal of difficulty making edits, even when working on the platform used to create the pages. Because the grad student who made the original site was no longer available for advice about specific programming, editing was neither efficient nor easy. After unsuccessful attempts to edit the pages in a manner the faculty member could understand and duplicate, the P^3T^3 mentor recognized the faculty member's confusion and frustration. The mentor chose to work on the site alone, read the HTML coding, identify the problems associated with the programming, and save new documents. When the mentor and Dr. E. met again, Dr. E. successfully updated the new documents. The mentor's decision to work on the project alone prevented Dr. E. from becoming frustrated to a point of choosing not to make future changes. If she had faced the problems alone, they may have been overwhelming. By finding the problems and creating documents that could be more easily edited, the mentor helped the faculty member gain experience and confidence. Currently she needs little more than occasional help for her updates.

Impact of P^3T^3

Professor F. stated, "Without the assistance of P^3T^3, I don't know if I would have created [a site] or not. I got hands-on experience, and specific handouts in the workshop; I get back and use it. After the workshop, I got individualized help from P^3T^3. P^3T^3 provided me encouragement, support, a sense of 'can-do' confidence." Professor A. stated, "The P^3T^3 assistant has been indispensable for me to put that [site] on. [She] helped me a lot. It would not be on so quickly, in such a quality without [her] help. I really appreciate [the] help." In contrast, Professor E. stated, "I went to a couple of FrontPage workshops, but they didn't get to the level and skills I needed. They just start teaching how to create a new page, how to insert graphics." P3T3 one-on-one mentoring provided the required help.

As P^3T^3 mentors work with faculty, we must strive to help them determine the correct software before their projects begin. When projects are already underway, we must recognize when faculty members become frustrated and find ways to minimize the frustration and provide alternatives to motivate the faculty to continue making personal technical advancements. We must also meet the needs of faculty who already have some expertise but desire to learn skills beyond those taught in beginning workshops.

Video Editing

Several faculty members showed interest in adding video to their coursework after viewing a demonstration using iMovie on a Macintosh to make a video clip from a digital camera. Four faculty members subsequently purchased digital video cameras with a stipend provided from the P^3T^3 project. Others

decided to use one of 14 cameras already available in the department. A variety of results occurred from the purchase of these cameras and the incorporation of digital videos. One faculty member and one teaching assistant were interviewed for this case study, as well as two P^3T^3 assistants working as a faculty mentors.

Successes

Teaching Assistant Mrs. L taped an interview with a Master Teacher in a K-12 classroom and desired to edit the tape prior to introducing the teacher to her students. She was immediately provided with personnel resources and training to complete the work within her timeline. The result was a teaching assistant with a new skill, and a polished final product that succeeded in meeting her objectives. Dr. E. first became involved with video through a 3-year project she headed in the Educational Technology Department – a few years before the P^3T^3 project began. Although she had extensive experience with video, she took a more personal interest in adding it to her curriculum when she saw the ease of digital video editing as presented in the P^3T^3 workshops. As a direct result, she purchased a digital camera and began working with it herself without the aid of her mentor. Soon she was editing the videos and she currently has plans to incorporate video in her classroom in the future.

Challenges

Even though Mrs. L. is a new teaching assistant in the School of Education, she set her project into motion with a set of clearly defined goals. However, she didn't realize the amount of video-editing time required to meet her goals. With her new responsibilities and minimal free time she was overwhelmed with the task she needed to accomplish. Professor G, a 17-year faculty member at Purdue, wanted to use video to document his research, but he became disinterested when he found that he could not use his video camera to download still photos to his Macintosh due to platform issues. Professor C, a Visiting Professor in the School, attended a P^3T^3 faculty workshop session designed to build computer skills through the use of hands-on training but experienced difficulty during the sessions. She commented that she did not learn skills when she was guided through each "point and click." Even though she wasn't comfortable with her own use of the technology, she realized its importance to the students so she added a video assignment to her undergraduate course curriculum. While this project had great potential, neither she nor her course instructors had the skills to support the activity. When it became clear that P^3T^3 staff would be unable to provide support for more than 400 students since the P^3T^3 project concentrates on faculty development, Dr. C. changed the assignment and made it clear to P^3T^3 staff that her teachers were too busy teaching course content – that "they don't have the time to teach technology."

Impact Of P^3T^3

Each instructor had different reasons to use video – personal research, interviewing guests, curriculum enhancement, and challenging students. Professors G and C do not have plans to continue using video at this time. Some of their setback lies in their lack of research and quick decision-making. Dr. G purchased a camcorder before realizing it did not fit his needs, and Dr. C assigned a student project before verifying resources for support. Ms. L. was overwhelmed by the amount of work necessary to edit the tape, and didn't plan enough time to do it by herself, but she communicated her needs effectively and P^3T^3 was able to obtain help so she could meet her goals. Each of these instructors had limited experience with technology. On the other hand, "Dr. E." is technology proficient and realized she needed to take time with a camera and learn to use it prior to adding the component to her classroom, choosing a slower path without the need to discuss it with her P^3T^3 mentor.

It is easy to become motivated to learn a new skill when opportunities arise, and experienced P^3T^3 assistants make the technology appear simple. However, learning a new skill takes time; two of the faculty members lost motivation when they learned that their goals had a price that was too high (in time and/or the requirement to learn and teach a new skill). In the future, as P^3T^3 introduces new technology, we can learn from the two faculty members who were successful. We need to recognize signs that instructors are

planning unattainable goals and try to more effectively communicate the time and resources necessary to integrate new technologies so that the instructors have a better chance of success in developing realistic goals in the future.

Outcomes

The study shares successes for some faculty, but more importantly it identifies problems for faculty that include frustration during "point and click" hands-on workshops, platform-dependent issues, lack of awareness of the scope of some technology-integration issues, and a need for better pre-planning. Workshop instructors and mentors must analyze their audience/mentees and strive to meet their needs rather than assume all learners need basic skills. For example, let the participants bring questions and specific needs or challenges to the workshops. Help them understand what they can achieve at the end of their training. When tasks appear to be as simple as a "point and click" P^3T^3 staff must be capable of explaining the learning curve necessary to become proficient with the software and hardware. Most of the workshops are conducted on PC computers, and skills may not translate easily to Macs. Although many software programs are seamless today, there are issues when older versions of software are used, and these issues should be addressed. Mentors have an obligation to give faculty confidence in themselves by helping them determine realistic tasks using reasonable time and effort while using the appropriate equipment to meet their goals. Faculty must to be able to practice and use their new skills in their own time on their own computers so they are motivated to continue to increase their skills and become independent users of the technology who no longer need assistance. With the new skills, they will develop their curriculum to include technology designed for teachers of the future, and those of us involved with the P^3T^3 project will have met our goals.

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