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Technology-Rich Faculty Development for Teacher Educators: The Evolution of a Program

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Abstract

Many teacher educators lack the skills necessary to model effective technology use in their university courses. An effective faculty development program is critical in addressing this concern. This project focused on the development and implementation of a professional development program to assist faculty members in the integration of technology into courses taken by teacher education students. The article describes the evolution of this program over a 3-year period. During the first year, seven ways were identified to enhance the professional development experience including depth, hands-on practice, project-based approach, modeling, examples, ongoing assessment, and timesavers. These ideas were implemented in the second and third years. The workshop format was found to be an effective professional development tool. However, some faculty members required support beyond the workshops. The third year placed emphasis on addressing the individual needs of faculty members and providing expanded professional development opportunities such as mentoring and professional sharing. As a result of the professional development program, faculty members designed course syllabi that demonstrated technology use, integrated technology into their courses, and became better prepared to meet the challenge of integrating technology to enhance student learning.

From preschools to universities, technology has become an integral tool in the teaching and learning process. Over the past decade, teacher education programs have sought ways to prepare preservice teachers to integrate technology effectively into the classroom (National Council for Accreditation of Teacher Education [NCATE], 2003). Teacher educators campuswide must model technology use in order to prepare prospective teachers to integrate technology into their own instruction (Carlson & Gooden, 1999; Cooper& Bull, 1997; Kinslow, Newcombe, & Goss, 2002; Moursund & Bielefeldt, 1999).

successful in today's world, there is evidence that many K-12 and university teachers still do not use technology at all in their teaching (Bolick, Berson, Coutts & Heinecke, 2003; *Education Week*, 1998). According to a national survey (DeMedio & Teclehaimanot, 2001), 90% of schools in 10 states have Internet access in their classrooms. A report from the CEO Forum on Education and Technology (2000) found that 80% of schools in the United States have access to technology, but few teachers are ready to use the power of technology in their classroom activities. A Department of Education Survey learned that only about 33% of teachers believe they could use technology in their classrooms (National Center for Education Statistics, 2000). A national survey by Becker (1999) supported the finding that as many as 70% of teachers are not using the technologies available to them.

Faculty Development in Technology Integration

A number of factors are critical to the success of a professional development program for university faculty. In order for faculty members to integrate technology across the curriculum, there must be institutional support that rewards faculty members with release time, development grants, or other incentives (Maduakolam & Bell, 2003; Maney, 1999). Furthermore, there must be a support infrastructure available to help faculty members troubleshoot and solve technology related problems without delay and interruption of classroom activities (Bell & Hofer, 2003). According to Maney (1999), it is not the technology that makes the difference, but rather how teachers adapt and apply technology.

Faculty adoption of technology into the curriculum is key in transforming the teaching and learning process. Rogers (1995) stated that adoption is "a decision to make full use of an innovation as the best course of action" (p. 36). A positive attitude toward any innovation increases the likelihood of the adoption of the innovation. Faculty member attitudes toward technology, fear factors and complexity issues, lack of time and support, limited access, inadequate faculty development opportunities, and lack of organizational support have all been identified as major barriers to the infusion of technology into teacher preparation programs (Butler & Sellbom, 2002).

Time is a primary concern of faculty members and often provided as a reason for not using technology in the classroom (Strudler, McKinney, & Jones, 1995). Educators must be allowed adequate time to learn new technologies and experiment with new teaching strategies.

The purpose of this paper is to examine the design and implementation of a faculty development program focusing on the integration of technology into courses taken by teacher education students. Funded as a 3-year Preparing Tomorrow's Teachers to Use Technology (PT3) implementation grant, our project entitled "Teachers Info-Port to Technology" (TIPT) provided a series of workshops and guidance for faculty members to assist them in modeling effective uses of technology. This article focuses on the evolution of this professional development program over 3 years.

Teachers Info-Port to Technology (PT3) Workshops: Year 1

The University of Toledo submitted a grant proposal to the U.S. Department of Education PT3 implementation grant to fund the following goals and objectives: (a) to revise all College of Education undergraduate curriculum to include technology-rich teaching methods that meets, Ohio, NCATE and International Society for Technology in Education (ISTE) standards; (b) to develop resources and activities that ensure graduates use

technology in their classroom; (c) to develop resources and activities to assure that the faculty members at the University of Toledo Colleges of Education and Arts and Sciences use technology in the classroom as both a model for students and a method of instruction. A TIPT/PT3 advisory board was established to facilitate effective communication among all members of the collaboration. This group consisted of three faculty members from the College of Education, College of Arts and Sciences, and University College, plus five Toledo Public Schools classroom teachers.

During the fall semester of the first year of the project, surveys were distributed to all faculty members in the College of Education (COE) and College of Arts and Sciences (AS). The survey was designed to collect data about how faculty members integrated technology in their courses. Specifically, information was gathered about the types of technology used by faculty members, to what extent faculty members required students to use technology in the classroom, and how often and whether faculty members were interested in participating in workshops to enhance their technology use and integration skills. The faculty member response was overwhelmingly positive. Due to the high demand by faculty members to attend the faculty development workshops, 31 faculty members were randomly selected for participation in the first year. Sixteen were chosen from COE and 15 from AS. Over the 3 years, a total of 90 faculty members participated in the program.

Faculty members received their choice of an incentive of $3,000 or a one course-load reduction. Upon completion of the workshop series, faculty members were committed to integrating technology into some aspect of their course. In addition, each participant designed course syllabi with goals and objectives that included technology to enhance student learning and course content. The educators represented a wide range of backgrounds and experiences. While some had significant experience with teaching distance education and the use of technology, others had limited computer skills. Faculty members from the following disciplines were represented the first year: early childhood education, special education, educational psychology, educational technology, educational foundations, curriculum instruction, mathematics education, science education, physical education, geography, history, political science, English, mathematics, and foreign languages.

During the spring semester of the first year of the grant, the University of Toledo offered the first round of faculty development workshops. The workshop approach was twofold. First, faculty members were given the opportunity to explore a specific technology such as video production. Second, ideas were provided about how to integrate technology into the classroom. For example, faculty members were shown how video could be used in various assessment situations. Faculty members were then encouraged to brainstorm ways these tools could be applied to their own content area teaching.

Faculty Development Workshops

The director of the TIPT/PT3 project coordinated the workshops. Ten instructors who had significant experience with instructional technology and distance learning were also employed as facilitators. Individuals with special expertise provided sessions on a variety of topics. The workshops were organized into two groups based on to the computer platform preference of faculty members. As the result, most COE faculty members preferred to use the Macintosh platform, while the AS faculty members preferred Windows systems. All faculty development workshop sessions were conducted on 11 Friday mornings for the COE faculty and 11 Friday afternoons for the AS faculty members at the Carver Teacher Education Center at the University of Toledo. A hands-on approach gave faculty members time to explore, practice, and experiment with technology using a variety of examples across subject areas.

The workshops focused on the use of technology as a tool for teaching and learning. Emphasis was placed on ways to integrate technology into university classroom instruction to enhance student learning. In addition, the workshops provided models of effective use of technology in teaching and learning at all levels. Table 1 (located at the end of this paper) provides an overview of the technologies, approaches, and examples used for each workshop session.

Faculty Member Evaluation of Faculty Workshop Series

The first workshop series conducted during the first year included 31 faculty members (16 from COE and 15 from AS). At the conclusion of the workshop series, a participant evaluative survey was administered to collect formative data as to the perceived value of the workshops overall and specific workshop units of instruction. In addition, an open-ended item asked faculty members to provide examples of how they planned to integrate technology into their courses. This item provided some product-oriented evaluation. Integration plans were then compared with the TIPT goal of modeling the use of technology to students so that they, in turn, might learn how to integrate it into their teaching practices upon graduation.

Based on the participant evaluations, the Faculty Development Workshop Series was an overwhelming success. All of the workshop sessions and presenters were rated highly by participants, with the exception of the instructional design workshop.

Of the 31 Year 1 participants, 19 (61%) completed the participant evaluation survey. For a program of this size and one that has the opportunity for close interaction with participants, this return rate was low. Participants were permitted to take the evaluation forms with them with the promise that they would be returned. This did not occur. All subsequent participant surveys were administered as part of a session in order to secure a higher response rate.

Results

Participants were asked about the usefulness of each workshop. Sixty-eight percent (13) of respondents responded that the workshop was very useful overall. No one responded that the workshop was not useful.

Participants were asked if the workshop content was appropriate. Of the 19 respondents, 53% said the content overall was “very appropriate,” 26% said it was “appropriate,” and 16% said it was “somewhat appropriate.” One respondent said that the content overall was not appropriate at all. Open-ended items in the survey indicated that this respondent felt the delivery level of several of the sessions was geared more toward what K-12 teachers might expect to incorporate into their classrooms.

Participants were asked if the amount of information provided was suited to the time and abilities of the faculty members. Results show that 53% of the respondents felt the amount of information was “just enough,” and 26% felt it was actually “more than enough,” suggesting that perhaps too much information was covered during the course of the workshop series.

Participants (N = 18) were asked to rate the usefulness of the specific topics covered in the TIPT workshop. Results are compiled in Table 2.

Table 2
Perceived Usefulness of Faculty Workshop Topics

Session	Did not Attend	Not Useful	Somewhat Useful	Useful	Very Useful	% Finding Topic Useful
Imaging devices	0	0	1	5	12	89%
Web browsers	0	0	3	5	11	84%
Spreadsheets	2	3	3	5	4	47%
PowerPoint	0	0	0	5	14	100%
Web-CT	1	0	0	2	13	79%
Instructional Design	2	10	1	4	2	32%
Inspiration	2	0	3	3	11	74%
Plagiarism & the Internet	1	1	4	10	3	68%
E-Portfolios	1	1	1	7	8	79%

The percent useful was calculated using the final two responses—"useful" and "very useful." Respondents were asked to provide more information on those topics they ranked as either "not useful" or "somewhat useful." Six of the nine topics received a usefulness rating of 74% or better. Specifically, respondents were asked how these sessions might be improved. A summary of responses follows. Unfortunately, respondents who indicated a topic as "not useful" did not provide suggestions or reasons.

The instructional design (ID) workshop was not a topic the faculty members found useful. Specifically, they resented the amount of time spent listening to a lecture. Unless the development of a Web-based course was the end product, the usefulness of ID as a part of the TIPT goals did not appear relevant to participants.

The faculty members found the Web-based course development and Web page design sessions particularly useful. They also indicated an interest in additional topics, including chat rooms, email lists, HyperStudio, assessment tools, and video editing. Several reported the need for additional time to work on projects with the availability of immediate help. Many indicated that they would like follow-up sessions or more time with some topics.

Faculty Member Technology Integration

The workshop evaluation survey asked faculty members to provide two examples of ways in which they planned to integrate the technology tools and skills attained during the workshop series. Of the 19 respondents, only one did not plan to integrate technology into some aspect of a university course. The reason for not doing so hinged upon the

unavailability of technical hardware, software, and support. Six of the remaining 18 planned to use technology to enhance planning and recordkeeping of their courses. There was no evidence that the use of technology would trickle into the classroom itself except as a PowerPoint presentation. The rest of the faculty members (12) provided examples of the integration of technology into the classroom that involved both faculty members and student use of technology.

Overall, the workshop evaluations indicated that the professional development series was a success. However, the true test was identifying evidence of effective integration of technology by these faculty members. Prior to the workshops, course syllabi reflected little technology use. Faculty members were asked to submit syllabi for the semester following the professional development activities to determine if any evidence of technology integration was demonstrated.

Of the 30 faculty participants, 20 have returned syllabi to date and 5 indicated that they were either not currently teaching the courses they had adapted or they were away on sabbatical. Syllabi from the remaining 5 participants are still being solicited. These 20 syllabi were examined to determine whether they reflected integration of technology. Syllabi were rated in two general areas: (a) the faculty member used and modeled technology and, (b) students themselves were required to use it. The use of word processing was not scored. The study found that all faculty members incorporated at least a minimal level of technology. In addition, 12 (60%) of the respondents incorporated the use of technology into their course instruction at an adequate level. It is expected that continued professional development, along with the sharing of ideas and strategies among faculty members will increase this number. The tools most commonly used by faculty members were email (17) and the Internet for research purposes (11). Student use paralleled faculty use with 16 courses requiring students to use email and 10 requiring students to research on the Web. While the most common uses were still the more traditional tools (email and Web), many participants reported using technology in creative ways to enhance the teaching/learning experience.

Lessons From Year 1

Based on the results of the faculty evaluation form, course syllabi examination, and informal faculty discussions, the first year of the professional development program was judged as being successful. Rather than repeating the first year workshops, the evaluation data, faculty member comments, and advisory committee suggestions were combined to identify seven ways to enhance the professional development experience. These seven areas, including depth, hands-on practice, project-based approach, modeling, examples, ongoing assessment, and timesavers, were used to revise the workshop materials for years 2 and 3 of the program.

Depth. Some faculty members expressed an interest in spending more time on fewer technologies. As a result, some of the less popular topics were omitted in favor of spending additional time in those areas where a majority of faculty members identified interest. In addition, rather than moving from topic to topic, the revised program built on skills throughout the workshop series. For example, imaging was introduced early and then later applied in both desktop presentation and Web development sessions. The topic of electronic portfolios was moved to the end and used as part of a culminating experience drawing on all the technologies.

Hands-on practice. Workshop participants expressed an interest in having more time to practice. Chamberlin and Scot (2002) recommended that a hands-on approach focus on participants spending at least 50% of their workshop time applying their ideas to

technology-rich instructional situations. Although the workshops had already provided more than half of the workshop time to hands-on activities, the redesigned workshops focused on making quality use of this time by increasing the emphasis on specific activities that practice technology integration skills.

Project-based approach. Although faculty members were told to come to the workshops with course content and program improvement ideas, many showed up emptyhanded. As a result, the workshops were redesigned to maximize the amount of time spent on creating practical products that would be immediately useful in the classroom, regardless of whether faculty members came prepared. Templates, Web resources, and project-starters helped faculty members who had difficulty envisioning classroom applications of technology. Faculty members were encouraged to develop and follow projects from start to finish and actively work on course materials throughout the workshops. Maduakolam and Bell (2003) found that professional development activities were most successful when they focused on product development rather than the technology itself.

Modeling. Many studies have emphasized the importance of modeling effective use of technology (Carlson & Gooden, 1999; Cooper& Bull, 1997; Kinslow et al., 2002). When reflecting on the workshop format, modeling was identified as one area where workshop materials could be revised. More emphasis was placed on how each tool could be used in instruction along with the provision of concrete examples that were modeled within the workshop. For example, a WebQuest was designed for use as a workshop activity.

Overall, the Year 2 workshops placed emphasis on modeling effective uses of technology. Participants were frequently asked to reflect upon how each tool might enhance classroom instruction. Simple, practical activities that required participants to brainstorm ways these techniques would apply to specific teaching situations were embedded in the workshops. These inquiry-based activities were designed to promote realistic projects and facilitate faculty member follow-through.

Examples. The first year workshops focused on introducing a wide range of technology that could be integrated into the PK-16 classroom. However, some faculty members had difficulty identifying practical applications of the technology in their particular college courses. The development of practical, meaningful, content-area examples was a primary concern in the workshop revision. Future workshops incorporated additional resources in the form of a Web site with training materials, templates, and other support materials. The TIPT Web site (http://tipt3.utoledo.edu/) provided subject-area resources, templates, and other resources to help faculty member use technology more efficiently.

Ongoing assessment. A few faculty members seemed uncomfortable and were unable to be productive in the workshop setting. Some seemed intimidated by their peers, while others disliked working on an unfamiliar computer. As a result, some people become lost or fell behind. To address this concern, the revised workshop materials were developed as short modules that could easily be assessed. Faculty members were asked to produce frequent basic level samples of their progress, just as they would expect from their students. Assessment of progress both provided faculty members with formative feedback and allowed for individual attention directed to those of differing skill levels.

Timesavers. Many faculty members expressed frustration over the amount of time needed to plan for technology integration. Time savers were developed to assist faculty members in making best use of planning time. For example, Web page templates were provided for developing online versions of course syllabi, vita, activities, and assessments. University logos and content-area clipart and photographs reduced the time spent

seeking copyright-free visuals. Sample PowerPoint presentations were provided that could easily be adapted for specific content-area needs.

Teachers Info-Port to Technology (PT3) Workshops: Year 2

A second group of 30 faculty members participated in a series of professional development workshops the following year. In this second year, 26 faculty members completed the professional development evaluation form. Faculty members found the workshop activities to be useful and the content to be appropriate. Twenty-five of the 26 respondents found the workshops to be useful (9) or very useful (15). They found the content to be appropriate (11) or very appropriate (12). Faculty members were split, however, as to the amount of content covered. Six of the 26 respondents wanted more content, and 9 said too much content was covered. Most felt the length of the individual sessions to be adequate, but 31% felt the workshop as a whole should have been longer. Faculty members found the imaging, desktop presentation (i.e., PowerPoint), and Web development (i.e., Dreamweaver) workshops to be most useful.

Faculty members were asked how the workshops helped in their teaching, as well as to provide two examples of how they might integrate technology into their teaching. Of the 26 respondents, 20 provided two examples, 1 respondent provided only one example, and 5 respondents left the item blank. Course syllabi are in the process of being collected for this group.

Lessons From Year 2

Based on the results of the formal and informal evaluations, the second year of the professional development program was even more successful than the first year. Concerns noted in the completed evaluations and the personal comments of the participants the second year were focused more on individual needs than on general workshop issues. These types of concerns were much more difficult to address within the context of the traditional workshop format. A two-pronged approach was used to enhance the professional development program prior to the final year of the project. These two areas included differentiated instruction and expanded opportunities.

Differentiation. The results of the workshop evaluations reflected the varying levels of technology skills among the participants. Some faculty members wanted more content and others less. A majority of faculty members enjoyed the length of workshops, while a third wanted more depth. Although the workshops provided activities and examples to address individual interests and entry skills, some faculty members may have felt overwhelmed by the choices. As a result, workshop revisions were made to assure that individual differences were more adequately addressed. For example, rather than providing an overwhelming number of examples in the workshop, more use was made of the TIPT Web site to supplement the workshop materials. Moreover, additional one-on-one assistance was promoted inside and outside the established workshops.

Many faculty members expressed an interest in additional time to work on areas of interest. There was a need to provide added depth and assistance to them. Some wanted more help with the basics, while others were ready for advanced applications. Additional optional workshops were offered to those faculty members interested in more individualized attention in particular technology areas. For example, a small group had difficulty with file management and uploading documents to their Web space. A focused, hands-on workshop was designed for this group.

Expanded Opportunities. Many of the concerns of faculty were best met with a combination of traditional workshops and other types of professional development opportunities. For example, it was noted that some faculty members would benefit by observing a colleague modeling the use of technology in a "real classroom." Others expressed an interest in sharing their projects or working in small groups on projects. Many studies have found that faculty technology mentoring programs are effective in promoting faculty integration of technology (Chuang, Thompson, & Schmidt, 2003). The final year workshops incorporated opportunities for mentoring, sharing, and development of cohort groups. According to Chizmar and Williams (2001), faculty members desire to interact and compare notes with peers on campus who are involved in instructional technology at comparable levels. During the final year of the project, first and second year project participants were encouraged to team with faculty members entering their first year. The TIPT Web site was expanded to promote faculty sharing and interaction.

Implications

The results of this project suggest that well-designed faculty development workshops can be effective in training teacher educators to design technology-rich university curriculum. Based on 3 years of experience designing and implementing professional development opportunities for faculty in the area of technology integration, nine elements were identified as useful in creating increasingly successful workshops. Table 3 outlines each element and summarizes ideas for implementation. These nine ideas can be easily incorporated into technology integration initiatives at other teacher education programs. Elements added after the first year included additional depth, hands-on practice, a project-based approach, modeling, examples, ongoing assessment, and timesavers. The second and third year placed emphasis on individualizing workshops to meet faculty needs and expanded opportunities, such as mentoring, sharing, and development of cohort groups.

Table 3
Nine Elements for Successful Workshops

Element	Suggestions
Depth	• More time with fewer technologies • Build on skills over time
Hands-on practice	• At least 50% of workshop for practice and creation • Quality time on task with focused activities
Project-based approach	• Focus on practical products • Templates, Web resources, and project-starters provided • Follow projects from start to finish
Modeling	• Use technology to teach integration • Demonstrate practical classroom applications

Examples	• Examples of technology use in content areas • Examples of technology integration • Web site based resources and templates
Ongoing assessment	• Short modules; simple products; frequent assessments
Timesavers	• Web page templates, logos, copyright-free visuals • PowerPoint presentation samples • Step-by-step review sheets (see http://tipt3.utoledo.edu/tools.html)
Differentiation	• Address individual differences in interests, speeds, ability levels • Web site based supplemental materials • One-on-one assistance: in workshop and out of workshop
Expanded Opportunities	• Mentoring opportunities • Sharing options • Cohort group development

Conclusion

This article reported the results of a 2-year project, highlighting the process of preparing and implementing the faculty development workshops for the College of Education and College of Arts and Science faculty at The University of Toledo. Professional development workshops provided faculty members with the skills needed to integrate technology across the curriculum. This project was intended to assist faculty members as they began modeling effective technology integration in the college classroom. Faculty members found the content and format of the workshops useful. Upon completion of the workshops, many faculty members integrated technology in their courses to enhance student learning in the classroom. In addition, the majority of participants designed course syllabi that clearly demonstrated the use of technology in the course.

A variety of tools were used to evaluate the effectiveness of the program. At the end of the first year, seven ways were identified to enhance the professional development experience. These revisions were implemented in the second and third years. The workshop format was found to be an effective professional development tool. However, some faculty members required support beyond the workshops. The third year placed emphasis on addressing the individual needs of faculty members and providing expanded professional development opportunities, such as mentoring and professional sharing. As a result of the professional development program, faculty members are better prepared to meet the challenge of integrating technology to enhance student learning.

The outcomes of this project indicate that a careful analysis of professional development workshops can inform the process of revision. By applying professional literature to address specific workshop needs and weaknesses, professional development planners will see impressive improvements in their subsequent workshop experiences. As technology continues to change and educators learn more about the effective use of technology in teaching and learning, the process of creating practical, meaningful faculty development opportunities will continue to evolve.

Note

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Table 1
Professional Development Workshop Technologies, Approaches, and Examples

Topic	Technologies	Approaches	Examples
Workshop 1 Imaging	• Use of scanner, digital camera, digital video camera • Editing images in Photoshop • Editing movies in imovie • Inserting images in Word, PowerPoint	• Selecting the best technology for the imaging need • Visual design • Visual literacy	• Historical & archival photos in classroom • Photos in questioning, writing, discussions • Video in self-evaluation • Video in evaluating field experiences
Workshop 2 Internet	• Use of web browsers, bookmarks, search tools	• Website evaluation • Search strategies	• Professional websites • Instructional websites • Pre-selected websites for specific assignments
Workshop 3 Presentations	• Use of PowerPoint audio, video, graphics, animation, transitions, buttons	• Nonlinear, interactive presentations • Use of visuals, video & audio in classroom • Questioning techniques	• Media-rich presentations • Virtual field trips • Question-rich presentations • Student-recorded audio for poetry, science

Workshop 4 Instructional Design		• Instructional systems design	• Lessons from varied content areas • Examples of various technology in lessons
Workshop 5 Distance Learning	• Use of Web-CT • Use of text, images, video, and audio content online • Use of email, chat, discussion boards	• Demands of online teaching • Encouraging online discussion • Evaluating student online work • Managing student work	• Course materials: syllabi, lecture notes, presentations • Sample discussion
Workshops 6, 7, 8 Technology Integration		• Copyright • Plagiarism • Teaching and learning • Resource selection • Online tools	• Links to content-specific resources • WebQuest use • Links to online tools
Workshops 9, 10 Electronic Portfolios	• Use of Word, PowerPoint, and Inspiration • Use of Adobe Acrobat • Use of LiveText	• Purposes of portfolios • Options for electronic portfolios • Issues of storage & updating	• Sample student portfolios • Sample teacher portfolios • Sample faculty portfolios • Sample multimedia portfolios • Portfolio templates
Workshop 11	• Use of Dreamweaver, Word	• Software options • Website design	• Sample faculty pages • Sample instructional pages