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Competency Based Teacher Education Program in Instructional Technology

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PURPOSE

The purpose of this paper will report on the use of technology-based competencies to educate pre-service teachers in the integration of instructional technology techniques.

BACKGROUND

A pre-service, undergraduate program exists that prepare individuals to be elementary school teachers and teachers in secondary schools in a number of disciplines. The school uses technology as a theme to help to define the program. In the freshman year, students participate in a one-credit experience in information literacy and computer literacy. They also participate in a separate one-credit experience in the advanced skills of word processing, visual presentations and virtual tours. Their next experience occurs in the junior year when they are presented with instructional design models, hyperbooks and interactive presentations. The senior year begins with web-page development for future class materials and their personal electronic portfolio and ends with database skills for the classroom. They culminate their undergraduate preparation with instructional technology artifacts created during their student teaching experience.

The candidates (pre-service teachers) create lessons based on curriculum they may be required to teach. One competency of the leading teacher as a master practitioner is that she "applies technologies that support effective teaching and learning" (Handbook of the Leading Teacher Program, 2004). This competency statement contains two segments. The first segment is concerned with applying technology. It is implied that the pre-service teacher is knowledgeable about the technology, and is skilled in its use. The second segment states that the leading teacher is able to use the technology to support effective teaching and learning. This statement implies that the pre-service teacher is knowledgeable about effective teaching and learning and is able to create lessons that provide for an enhanced teaching and learning experience.

The leading teacher acquires knowledge and skills to demonstrate this competency. Use of the ISTE (International Society for Technology in Education) standards provide a sequence of behaviors that promote the development of these skills. (ISTE, 2004). At the General Preparation level, candidates acquire the knowledge and skills of simple technology use. They learn how to locate and evaluate information. They determine which information to use in projects and papers. The practice technology skills in word processing, spreadsheets and the use of presentation software.

This is one example of using an anchored approach reported by Kariuki and Duran (2004). Kariuki and Duran report that anchored instruction provides a vehicle for motivation and relevance of learning new skills. Anchored instruction provides for a curriculum that is connected to a specific content. This connection is known as an anchor for the instruction.

All of these experiences are based on the International Society of Technology Education (ISTE) standards that define the competencies for pre-service teachers. Separate sets of standards exist for the first-year teacher, the existing teacher, students in K-12 education and for administrators in school environments. This presentation will explore the findings from surveys distributed during their freshman year and their senior year. These surveys were designed to measure attitudes and skills of the students that were based on ISTE competencies.

STATEMENT OF THE PROBLEM

Are there significant changes in pre-service teachers' technology attitudes and skills after the undergraduate instructional technology experience?

QUESTION

What is the competency level of pre-service teachers during the teacher preparation program?

Figure 1 reports the percent of a freshman class self-assessment of their expertness in various technology skills. The self-assessment scores increased in the use of Word, Excel and PowerPoint. Comments during the class indicated that the students felt they were proficient in Word, but rated themselves higher after the class. They felt that they learned a set of skills in the course.

The course required the students to save files in various formats and to create folders in a number of locations.

This task proved to be more daunting that what they learned in high school. As a result, the percent of students that rated themselves as expert in Windows skills dropped at the end of the class. Trouble-shooting printers and the requirement to fix virus and pop-up problems also led to this result. The candidates realized that they need to learn more about the operating system than what they thought they knew.

The candidates believe that the main task is to create the lesson. They sometimes fail to realize that secondary goals are in place. They also learn advanced word processing techniques, such as, forms. Candidates create drop-down boxes in a typical student handout. These forms could also be used for students with disabilities.

In order to provide real-world experiences for the candidates to learn about technology to create lessons with it, a technique known as situated learning takes place. The candidates create lessons using word processing, spreadsheets, presentation software, grade-book software, and web editors. The second course in Instructional Technology takes place in

Figure 1. Percent Self-Assessment Classification Proficiency of Selected Technology Skills

	Before Class	After Class
Expert Windows	57.6%	25.0%
Expert Word	37.5%	63.6%
Expert Excel	4.2%	48.5%
Expert PowerPoint	25.0%	60.0%

the second semester of the freshman year. In this course, the candidates prepare a handout using word processing; a slide show using presentation software; and a small web site using Word as the web page editor. The theme is based on a lesson the candidate wants to teach. They reflect on this process at the end of the class and they are pleased and proud to report that they are beginning to create teaching and learning materials using technology tools.

The situated learning continues in the junior and senior year. One course concentrates on text-based materials. Here, advanced features of Word are presented. Forms and drop-down boxes are presented as vehicles to enhance the materials and to create an environment for students with disabilities to perform. Some students in the K-12 world may not have full control of their hands and arms for writing. The drop-down boxes provide an opportunity to click the drop-down menu and to click on one of the choices. The student can then answer questions on tests with clicks and not have to rely on writing the answers. This is beneficial for students with low-level muscle control.

The situated learning experience continues with interactive slide show presentations and other visual tools. The candidates learn how to create slide shows with action buttons. The action buttons are used during the presentation of multiple choice questions and their subsequent possible choices. The candidates report a great deal of satisfaction with this learning experience. First, their experience with PowerPoint is limited from their high school classes. Some are learning about slide shows for the first time. Others may have had some experience with it, but find it fascinating that they are programming a learning environment with action buttons.

Other visual tools used are Inspiration® and Kidspiration®. These tools are used to create a visual representation of the lesson plan. The nodes represent the key concepts used in a lesson plan and the lines connecting the nodes show the relationship between the concepts. The Leading Teacher demonstrates the communication skill of the pre-service teacher as a master practitioner. The competency states, [the] "leading teacher combines formal training with self-teaching around the emerging technologies, especially the computer based ones. These experiences produce a Leading teacher who knows what the machines can do and how to make them do it" (Handbook, 2004).

The web page experience is very intriguing to most of the pre-service candidates. They learn to create a one-page web site and to post it on the university's home account area. They take pride that their work is now able to be viewed by their families, friends and former high school teachers.

Finally, candidates expressed a satisfaction with acquiring these and other competencies during their pre-service, Instructional Technology experience. They exhibited this disposition during their reflections at the end of their IT course in the seventh semester. While they acknowledged the large amount of challenging work in the program, they realized that the lessons they created were different from the lessons their colleagues created in other institutions. The depth and breadth of their technology-enhanced materials was evidenced in their e-portfolio. These electronic portfolios not only showcased their lessons, but also provided them an opportunity to reflect on their philosophy of education. They were able to comment on their goals and aspirations of becoming a Leading teacher.

This reflective process was, in itself, a competency of the program. The competency is listed as, "The Leading teacher uses reflective self-analysis with lessons to assess growth in self and others. The Leading teacher encourages involvement in growth opportunities for self and others" (Handbook, 2004). Throughout the course of study, the candidate participated in KWL tasks. In this task, the candidate is presented with a syllabus of the course and a list of the objectives of the class. The candidate has an opportunity to write about what she already (K)nows about the knowledge, skills and dispositions and then to write what she (W)ants to know. After the course, the candidate is asked to write what she learned about the knowledge, skills and dispositions presented. This task begins the reflective process. The candidate examines how the content and skills changed her behavior and/or beliefs about the teaching/learning process. Not all candidates progress in linear fashion. At some point, they experience an enlightening moment that connects the concepts, skills and dispositions of a leading teacher. However, the report on that process is reserved for another paper.

CONCLUSION

This paper began the exploration of competency-based learning in a teacher preparation program. The pre-service technology standards from ISTE (2004) and the competencies of the Leading Teacher Program (Handbook, 2004), form the conceptual framework for the courses that are presented so that pre-service teacher candidates have the opportunity to exhibit their knowledge, skills and dispositions of the teaching/learning preparation process. It is hoped that by looking at competencies that one may be able to identify the best practices that promote learning in the K-12 world. Further, it is hoped that these best practices will assist student learners to achieve to the maximum potential and to become knowledgeable and productive members of society.

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