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ABSTRACT

A study was conducted to explore teacher training needs related to effective use of technology in the classroom, with the specific objective of helping to improve a state-required, one-credit media competency course taken by approximately 250 teacher credential candidates each semester at a major California university. One of three surveys was administered to incoming teacher credential candidates to determine their media skills and opinions. Of the 161 students who completed the pre-course questionnaire, 103 (64%) had some experience producing instructional media, and 124 (77%) had used computer software for word processing, entertainment and educational games, spreadsheets, database packages, or programming languages. Final course evaluations indicated that 68% of the 476 students who completed the evaluations strongly agreed or agreed that they liked the course, and 86% said they would use what they had learned in a course of their teaching. A survey of 22 new teachers was conducted at the end of their first year of teaching. They described the media they had used and produced during the past year; the most common application of computers in their classrooms; the most useful media skills they had learned; the media that they most wanted to learn about; and ways in which they felt educational technology would change teaching in the next 5 years. Responses to a survey of the opinions of seven teacher education block leaders indicated that they taught objective writing and lesson planning, and most agreed that they preferred that these topics not be taught in the media courses. They also expressed their opinions on the ways in which they felt technology would change the teacher's role and responsibilities in the next 5 years. (6 references) (CGD)

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WHAT DO TEACHERS NEED TO KNOW  
ABOUT INSTRUCTIONAL MEDIA  
IN THE COMPUTER AGE?

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WHAT DO TEACHERS NEED TO KNOW  
ABOUT INSTRUCTIONAL MEDIA IN THE COMPUTER AGE?

Introduction

Most teacher credential programs nationally include training in use of technology: such training is in many cases mandated. Accreditation requirements also often dictate the inclusion of such training. A recent task force of the Association for Educational Communications and Technology has recommended that instructional technology skills and knowledge be included in teacher training.

Yet there is little agreement as to what such training should include. Trends in technology use in education are reflected in the change of the field's very name, from "audio-visual education" through "media education" to the current name, "educational technology." Many university courses have remained in the dark ages by continuing to teach student teachers old technologies which are no longer useful in the field or to teach skills which are no longer relevant, while ignoring technologies, for example, like computers for graphics, or interactive video, which are changing the nature of U.S. education.

There is relative agreement that the use of technology in classrooms can and will change the role of both teachers and media specialists in the schools. Technologists have stressed the teaching of principles of technology use in addition to practices (Gagne, Briggs, & Wager, 1988; Heinich, Molenda & Russell, 1985; Knirk & Gustafson, 1986). Such principles, for example, those involved in selecting appropriate media for given objectives and situations, can be effectively taught in basic technology courses (Higgins & Reiser, 1985). Other technologists have noted that technology training and use must take into consideration the realities of school situations (Heinich, 1984.) All agree that technology training must continually change to reflect the impact of new technologies. It also is clear that teacher input and "ownership" as well as administrator support are critical in successful use of educational technology.

This paper describes the results of a research study which investigated teacher training needs related to effective use of technology in the classroom. The study was conducted to help improve a

state-required, 1-credit media competency course taken by approximately 250 teacher credential candidates per semester at a major California university. The course is offered in several formats, normally once a week for six weeks, or two weekends, or in shorter classes over eight weeks. The course introduces teachers to systematic design of instructional materials; how to write student learning objectives and lesson plans based on Gagne's (1977) nine events of instruction; media equipment operation; production of dittos, overhead transparencies and laminated visuals; media selection, basic instructional video production; and an introduction to educational computer software evaluation.

### Methodology

#### Questions

Data were collected related to the current and anticipated technology training needs of teachers in classrooms in a large California metropolitan area. Data were collected to answer questions in the following areas:

1) Entry-level technology skills of teacher credential candidates. What technologies do credential candidates come into their programs knowing about? What instructional materials, such as videotapes and overhead transparencies, have they produced? What percentage of them already know how to operate certain equipment, such as 16mm projectors and microcomputers?

2) Final evaluations of the skills they learned in the media course by students finishing the course. What do credential students perceive as the most, and least, valuable skills they learned? What did they enjoy the most, the least, and why?

3) Perceived needs of new teachers in the field. What technology related skills, which new teachers learned in their credential programs, do they feel help them teach most effectively? What do these new teachers wish they had learned about technology?

4) Perceptions of teacher education leaders. What do teacher educators believe teachers should learn in order to teach effectively using technology?

## Procedures and Instruments

Data were collected using surveys, primarily in teacher education courses at a major university campus and at field-based education sites.

Survey of Media Skills and Opinions of Incoming Teacher Credential Candidates. As part of the normal data collection procedure for the course (EDTEC 404) during the spring semester of 1988, 161 teacher credential candidates completed a questionnaire regarding their experience with using and producing media materials on the first day of their attendance in the course.

End-of-Course Evaluations. During both the fall, 1987, and spring, 1988 semesters, 467 teacher credential candidates completed an end-of-course questionnaire to determine the students' perceptions regarding the skills and knowledge about instructional media which they learned in the course.

Opinions of New Teachers at the End of Their First Year Teaching. Twenty-two of twenty-five first-year elementary teachers participating in a new teacher retention project completed a questionnaire regarding their perceptions of the value and utility of the media skills they learned in their teacher preparation program.

Opinions of Teacher Education Leaders. Seven leaders of the elementary teacher education blocks completed a questionnaire regarding the educational media currently available in the schools, the utility and value of what their credential students were learning about media, and their opinions regarding what teachers need to know about instructional media now and five years from now.

## Results

Survey of Media Skills and Opinions of Incoming Teacher Credential Candidates. Of the 161 students who completed the pre-course questionnaire, 103 (64%) had some experience producing instructional media, while 59 (37%) did not. Of all 161 students, most had produced dittos (136, 84%), and 43 (27%) had produced overhead transparencies. Many students (29, 18%) had also produced laminations and flyers or brochures.

Of these students, 124 (77%) had used computers, while 30 (19%) had not. The software most commonly

used was a word processor (82, 51%), followed by entertainment games (60, 37%) and educational games (49, 30%). Many students (40, 25%) had used a programming language. Some students had used other types of software, such as spreadsheets and data-base packages, as well.

When asked how these preservice teachers hoped to use what they learned in the media course, half the students indicated they hoped to enhance their teaching by using media as teaching aids, 34 (21%) mentioned they would produce instructional media and visual aids, and 15 (9%) hoped to become more proficient at use of equipment.

End-of-Course Evaluations. Final course evaluations indicated that 68% of the 476 students who completed the evaluations strongly agreed or agreed that they liked the course, while 86% said they would use what they learned in the course in their teaching. They mentioned such examples of uses as overheads (51, 11%), video (48, 10%) and dittos (41, 9%).

Students indicated that they felt learning to produce dittos (206, 43%) and overhead transparencies (146, 31%) were the most useful skills they learned, followed by video production (95, 20%), followed by media selection (89, 19%) and lamination (74, 16%). They perceived video (121, 25%) and lamination (67, 14%) as the least useful skills for their teaching.

The topic students enjoyed the most was video production (282, 59%), followed by the "hands-on" experience (70, 15%), computers (39, 8%), and lamination (28, 6%). Reasons they gave for their choices were that these topics were fun (123, 26%), they enjoyed working in groups (45, 9%) and the creativity involved (41, 9%). Topics students enjoyed the least were the lectures and theory (87, 18%), dittos (33, 7%), and media selection (26, 5%). They indicated they did not enjoy some topics because they were boring or redundant or because the limited time in the course made it difficult, frustrating or unenjoyable to learn these topics.

Opinions of New Teachers at the End of Their First Year Teaching. The twenty-two first-year teachers described the media they had used and produced during the past year. Dittos were the most

commonly used medium, with 18 (82%) of the teachers having used them, and 17 (77%) having produced them. Other commonly used media were filmstrips (18, 82%), videotapes (17, 77%), audiotapes (17, 77%), and overheads (13, 59%). Teachers reported having produced laminated pictures (16, 73%), overheads (9, 41%), mounted pictures (7, 32%) and photocopies (4, 18%). Only 2 of the teachers (11%) had produced videotapes or audiotapes.

Computers were used in the classrooms of 13 (59%) of the teachers, mostly for educational games (11, 50%), word processing (6, 27%), entertainment games (6, 27%), and CAI programs (6, 27%).

These new teachers felt the most useful media skills they had learned were using the thermofax, lamination, and dittos (4, 18% each), followed by overhead transparencies, and using the 16mm projector (3, 14% each). Least useful was video (2, 11%). Two teachers (11%) said all skills they learned were useful.

The new teachers most wanted to learn about computers (3, 41%), video (4, 18%), and 16mm film projectors (2, 11%). Other topics mentioned were videodiscs and interactive video, slides, tapes, and telecommunications.

When asked how educational technology would change teaching in five years, these teachers mentioned that it would expand students' experiences, help individualize learning, and provide help through new communications media (7, 32%). Many also said there would be more "high technology" and more computers (7, 32%), and that technology would make it easier for teachers to manage and organize instruction (4, 18%).

Opinions of Teacher Education Leaders. The seven teacher education block leaders indicated that all of their field site schools (about ten elementary schools) had 16mm projectors, ditto machines and video recorders, and that most had video cameras, thermofax machines, opaque projectors and 35mm slide projectors.

All teacher educators indicated that they teach objective writing and lesson planning, with a five or seven-step clinical model, and most agreed that they preferred these topics not be taught in the media



courses, however they did indicate that the media courses should "mesh" with what is taught in lesson planning.

The teacher educators indicated that in a media course teacher credential students should be taught selection and management of media, computer skills, video use, basic equipment operation and how to use blackboards and other visual media.

In five years they felt teachers would also need to know how to use microcomputers, the management and creative use of technology, strategic planning, grant-writing, how to get equipment and curriculum alignment skills

### Discussion

The results of this study indicate that both preservice and in-service teachers value learning about production and use of media and materials commonly available in their schools, such as blackboards, dittos, overheads, mounted pictures, laminations, and use of projectors. Yet, it appears from the pre-course survey that many students already have learned these skills before they enter the required media course. Since the skills are perceived as valuable, they should still be addressed, but there are alternative means for teaching these skills. Self-instructional modules, with test-out and mastery tests, would be one method for providing students with these skills, while leaving valuable class time to pursue topics students indicate are important or very enjoyable, but which are not given enough time in the brief required course, topics such as media selection, and use of video. Topics which students already know, such as dittos, could be addressed in terms of lesson planning in the teaching methods courses.

As a result of these results, several revisions were recommended for the EDTEC 404 course. Information about use of chalkboards and other visual presentation media was added to the course. It was recommended that class time not be spent on objectives and lesson plan writing, with students being able to write objectives and lesson plans for media use and selection using any of the formats they used in their methods courses.

While computer skills were mentioned as being valuable both now and in the future by all participants, the state-mandated three course

educational computing sequence will provide students with intense hands-on experience with computers for instruction. It was recommended that the unit on video be expanded to allow students time to accomplish mastery and achieve more satisfaction with the basic video production skills. It was also recommended that the CAI software evaluation unit be replaced by a "new technologies" unit, introducing students to such technologies as interactive video, CD-ROM, and telecommunications, and such a unit was developed and is being implemented.

With the great need for teachers who are adept at performing the multiple roles required of them when they use the power of technology in their classrooms, instructional media technology courses can provide an opportunity for teachers to become "empowered" themselves. This study indicates that preservice, and inservice teachers and their educators recognize the dual need to be skilled at basic media use, while preparing themselves to skillfully use the new technologies to enhance their students' learning.

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