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2. Evolving Models of Technology Teacher Preparation

by William D. Paige

For years we have read articles, observed presentations at conferences, and heard reports of numerous research efforts concerning the shortage of teachers for technology education programs across the country (Householder, 1993; Volk, 1997; Weston, 1997; Young-Hawkins, 1996). There are many reasons for the shortage of technology education teachers, and the problems are complex. This article attempts to provide an overview of one facet of this issue by first outlining the traditional way in which teachers have been prepared and licensed and/or certified to teach in the public school systems in the United States. Second, several alternative methods of obtaining teaching licensure and/or certification are presented, followed by some personal thoughts about these alternatives and the future of our profession.

Historically, the most common way to prepare for a career in teaching in any field of study has been to complete a four-year bachelor's degree program in education. This traditional college- and university-based teacher preparation program is based on the belief that "becoming a teacher requires several years of preservice professional training and supervised practical experience prior to assuming full-time teaching responsibility" (Stoddart & Floden, 1995). According to Sullivan (1995), traditional teacher certification programs are usually characterized by a specified number of credit hours to be earned in (a) content area, (b) professional coursework, and (c) an internship. After the candidates successfully complete all requirements for the baccalaureate degree in education, the colleges or universities verify that they have met the minimum state licensing requirements. These state licenses and/or credential requirements signify to the public that people with either of these endorsements possess a level of professionalism and high standards and are at least minimally qualified to teach in our schools (Sullivan, 1995).

Householder (1993) explained that many of today's teachers of technology education were and are being prepared in programs based on the traditional historical model of teacher preparation. One might question the wisdom of this approach when considering that the traditional process of teacher preparation has received much negative attention in the past decade. Specifically, reports from the National Commission on Excellence in Education's (1983) publication of *A Nation at Risk,* the Carnegie Task Force on Teaching as a Profession (1986), and the Holmes Group (1986) among others, have all raised questions about the quality of our education system, including the process of teacher preparation. Concern has been voiced regarding the declining average ability of students and the trend of more academically able students choosing careers other than teaching (Schlechty & Vance, 1983). The recognition of the importance of quality teaching, the low college entrance test scores of those wanting to teach, and the reality of a future teacher shortage are among the factors that have led to numerous propositions demanding changes in higher education and proposals to reform the way teachers are prepared.

One of the proposals for reforming teacher education would require that teacher preparation programs be extended to five years. This proposal is based on the assump-

tion that students in extended programs will take additional coursework in the subjects they are preparing to teach, resulting in an increase in their effectiveness as a teacher. Furthermore, it is believed that by extending the length of the program the status of the profession of teaching will be enhanced (Hawley, 1992). Whether or not these assumptions are correct, or if extending the length of the programs will have any major impact on the profession, remains to be seen. Simply extending the length of time it takes to become a technology education teacher does not seem to do anything but compound the problem of the teacher shortage.

One model that could help eliminate the shortage of technology education teachers would be to provide an avenue for those persons who already hold a baccalaureate degree in a technology-related field to earn a teaching certificate by obtaining the necessary coursework in education without having to go through a full teacher education program. Such alternative certification programs were introduced in many states during the 1980s in response to the severe teacher shortage that existed primarily in the areas of math and science. Alternative certification programs were established to help alleviate the teacher shortages that existed in rural and urban schools (Duhon-Haynes et al., 1996; Rubino et al., 1996; Rubino et al. 1994).These programs were established by school districts, boards of cooperative services, independent schools, institutions of higher education, state departments of education, and private foundations either independently or in concert with them.

Supporters of these alternative certification programs believe that individuals who demonstrate subject matter knowledge can learn to teach effectively. Typically, such programs begin with preparation in teaching methods and classroom management before the program participants enter the classroom to begin teaching. During their first year of teaching, participants are given support and guidance by a mentor/master teacher. Following this first year of teaching, the program participants usually return for additional coursework and preparation to fulfill any other requirements for licensure/certification.

One example of this model of alternative teacher preparation is a program at Christopher Newport University, which offers an alternative licensure program for people with an earned degree in liberal arts or science. For this program, the education courses have been re-sequenced so that the students take an entire semester of only education courses (18 credit hours). The following semester the students participate in an internship program and take an additional two courses (16 credit hours). At the end of the second semester, the program participants have completed all requirements for licensure. A review of this program found that although it worked, the program would have been better if a summer session had been added to ease the students' load during the year (American Association of State Colleges and Universities [AASCU], 1995).

The Tarleton Model of Accelerated Teaching (TMATE) is an alternative certification program operated by a consortium of school districts in Texas and Tarleton State University. Participants in this program take a block of 12 semester credits in teaching methodology, classroom management, and instructional design that includes practice teaching in an enrichment program for K–8 students during summer school. In the fall they assume full-time teaching responsibilities under the guidance of a school-based mentor and a university supervisor. During this school year, the participants also attend a series of weekend seminars. The next summer session involves a post internship block that prepares them to take the licensure examination. In the eight years this program has operated, over 400 persons have successfully completed all requirements and 93% of those have been placed in teaching positions in rural schools (AASCU, 1995).

In 1990, 48 states reported having alternative certification programs (American Association of Colleges for Teacher Education [AACTE], 1990). Feistritzer (1992) reported that from 1985 to 1990 approximately 20,000 candidates were certified through alternative routes and that number had increased to 40,000 by 1992. The AACTE 1996 directory of postbaccalaureate programs lists 328 programs in colleges and universities for individuals with a bachelor's degree who want to earn a teaching license. Table 1 lists the schools from that directory that reported having a postbaccalaureate program in technology education, industrial technology education, or industrial arts education. Another beneficial source of names, addresses, and telephone numbers for each state's teacher certification personnel is the *Manual on Certificators and the Preparation of Educational Personne*l prepared annually by the National Association of State Directors of Teacher Education and Certification. Even though post-baccalaureate alternative certification programs may vary widely from state to state in content, specificity, structure, and base of organization, the typical alternative certification program has the following general characteristics:

1. Uses a rigorous screening process to ensure the selection of talented, qualified teacher interns who are academically and personally competent.
2. Provides high-quality pre- service training in methodology, classroom

Table 1. ***Postbaccalaureate Programs in Technology Teacher Education***

University	Program Name	Area
University of Central Arkansas	Postbaccalaureate Teacher Licensure	TE
Central Connecticut St. Univ.	Post-Graduate Certification Program	TE
Illinois State University	Second Bachelor's Option	IT
Ball State University	(No Name)	IT
Northwestern St. Univ. of LA	Alternate Certification	IA ED
Mankato State University	Master of Arts in Teaching	TE
Jackson State University, MS	Second Degree Program	IA
Central Missouri St. Univ.	Post-Baccalaureate Teaching Cert.	IA &T
Southeast Missouri St. Univ.	Certification-Only Program	IT
Montana State University	Non-Degree Cert. only Program	TE
Western Montana College	Certification only	ITE
Keene State College	Postbaccalaureate Teach. Cert.	TE
Montclair State University	Post BA Teacher Certification Prgm.	TE
California Univ. of PA	Postbaccalaureate Certificate	TE
Oregon State University	Professional Teacher Educ. Prgm.	TE
Southwestern OK St. Univ.	Certification-Only Program	TE
Tennessee State University	Postbaccalaureate Teacher Educ.	T
Old Dominion University	Military Career Transition Program	TE
	MS Education Licensure Program	
Fairmont State College	Alternative Program	TE

management, and human development.

3. Consists of a structured, well-supervised induction period that includes guidance by a mentor teacher for the period of one year.
4. Requires ongoing professional development, including seminars, workshops, and university course work, that addresses the specific needs of the teacher-intern.
5. Follows up with post-internship training to ensure continued effective training (Littleton & Holcomb, 1994).

Another alternative certification model provides an individual who already holds at least a bachelor's degree along with a teaching license/certificate in a subject area other than technology education an opportunity to obtain the requisite knowledge and experiences to teach technology. Householder (1993) indicated that "the British have been quite successful in using the in-service model to provide the experiences in technology that are needed to prepare primary and secondary teachers to implement technology in their national curriculum" (p. 18).

An example of an American-based in-service program is South Carolina's Industrial Technology Education Add-On Certification Program. This program, which is funded by the State Department of Education, is in its fourth year of operation at both Clemson University and South Carolina State University. The program consists of 36 credit hours of technology education course work, taken over a three-year period, and is provided at no cost to the participants.

The program was designed to provide the participants with 12 semester credit hours in the spring and summer sessions, enabling them to obtain an out-of-field teaching license for the following school year to teach technology education. The participants then take 12 credit hours per year for each of the following two years, followed by area examination of the National Teachers Examination. Program participants are then fully certified to teach technology education in South Carolina's public schools.

Individuals who have at least a baccalaureate degree, who have had a successful career in business, industry, or the military, for example, and who are interested in teaching are another source of future technology education teachers. Providing these individuals an opportunity to complete the academic requirements for a teaching certificate and retrain for another career can help alleviate the present shortage of qualified personnel in our classrooms. Persons who have had positive life experiences and previous careers and who also have a strong desire to help youth as they grow, often become outstanding teachers. Simpson and Jackson (1997) wrote:

> Teacher education candidates who know something about the complexities of life, who have grown through their non-academic educational experiences—and perhaps their own difficulties in school—and who can share their insights with their colleagues and students may have important and relevant experience to contribute. Perhaps this experience explains why many second career and late entering teachers receive praise today for their ability to "relate to" all students. (p. 161)

Programs such as the Military Career Transition Program at Old Dominion University and the MS in Industrial/Technology Education at U. W. Stout are successful examples of re-training programs that are providing avenues for very talented individuals to become teachers of technology education.

One can only imagine exactly what the future holds for teacher education programs. What new avenues may be available for teacher education programs as new technology impacts the classroom? Many fundamental questions come to mind such as the following: Will the classrooms have four walls? Will the teacher be in the classroom with the students, in the same building, or even on the same university campus? Will they even be in the same state or country? With the use of today's technology, the answer to all of these questions is probably a resounding NO! Daugherty (1997) recently wrote:

> A new day is dawning in technology teacher education. The preservice teachers in class today will most likely begin their teaching careers in the 21st century. Technology teacher education must enter the new millennium with new structures, new approaches, and a shared base of knowledge about teaching that the new professional technology teacher can apply in daily practice. Members of the profession must resolve themselves to developing new approaches to teacher training and the career development of teachers. The recruitment and selection of teachers is critically important worldwide, and the initial preparation of teachers and their continuing professional development are key factors in improving technology education at all levels. (p. 52)

Whether future teachers for technology education classrooms are prepared in traditional programs or gain certification through one of the various alternative programs that are presently available, they must be both technically and professionally competent. The use of assessment instruments such as Praxis Series can be used to help provide evidence of a person's professional and subject specific knowledge and skill. This type of documentation is essential in the licensure and certification process to maintain quality teachers in our technology education classrooms. Until the time comes that there is no longer a shortage of technology education teachers, we, as a responsible profession, must examine every possible avenue that will allow us to bring qualified people into our programs and prepare them for positions in our classrooms and laboratories. The alternative preparation programs outlined in this article admittedly have not eliminated the teacher shortage, but they have helped the situation by providing some outstanding technology education teachers in areas where there is a critical shortage. Providing opportunities through alternative preparation programs for people who are excited about learning and teaching technology education and share their enthusiasm with students will do nothing but enhance the overall future of our profession.

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3. A Collaborative Approach for Redefining a Program

by Brenda L. Wey and Mark Estepp

Graduate education plays a vital role in the overall mission of comprehensive universities. A quality graduate program enhances faculty opportunities to become involved in research projects, provides research and teaching opportunities for graduate students, and raises the overall prestige of the department. An active graduate program enlivens the department by allowing close interaction between faculty and students on an advanced level. Graduate level courses allow curricular experimentation and implementation of a wide variety of teaching techniques that are sometimes difficult to apply at the undergraduate level.

Curricular change is essential to the continued success of all academic programs, but particularly essential to technology-related disciplines. Falling behind in curriculum matters is often a matter of months in technical fields, where in other disciplines it is a matter of years.

However, curricular change should not be entered into lightly. The process should be designed to be thought provoking and offer the opportunity to gain insights, information, and ideas from fellow colleagues and professionals from industry. This documents the challenges and processes involved when a collaborative approach is used to develop and implement curriculum change. It offers perspectives on creative collaborations used to revise a graduate curriculum and shares the rewards of this collaboration beyond the scope of just curriculum changes. It creates a cooperative and revitalized commitment within the department to graduate education.

The Setting

Appalachian State University was recognized as one of the top industrial arts programs in the southeast during the 1960s and 1970s. During the 1980s the department changed its emphasis from preparing students for careers in teaching to preparing students for professions in industry and business at both the graduate and undergraduate levels. This change reflected a national trend based on student demand for nonteaching industrial technology degrees. The undergraduate program evolved from a degree in industrial arts at the undergraduate level to technology education and a degree in industrial technology with concentrations in appropriate technology, construction, electronic technology, graphic arts and imaging technology, industrial drafting and design, manufacturing technology, and technical photography.

The graduate curriculum remained basically the same through the 70s and early 80s . Changes that occurred in the mid 80s added a concentration in industrial technology for nonteaching majors and included a revision of core classes.

Program Review

In 1992 the graduate program was evaluated in accordance with the university's graduate program review process. The Graduate School dean appointed a review committee that included a mix of faculty from other departments and the Department of Technology. The committee collected and summarized information from interviews, surveys, and graduate records such as applicant information, students' scores for admission, graduation rates, and enrollment data. The review process included sending surveys to all graduate students currently in the program, all alumni who graduated in the previous five years, and all graduate faculty in the Department of Technology. Selected graduate students and alumni met to discuss their views on the graduate program. This meeting was conducted by committee members from other departments; technology faculty were not present.

These efforts resulted in a comprehensive evaluation of the department's gradu-