

# **The Current Status and Future of Industrial Teacher Education and Non-Teacher Education Programs in Institutions of Higher Education**

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The literature is clear that the context and nature of industrial education programs within higher education have changed dramatically during the recent past. Householder (1993), in reviewing technology education teacher education programs, indicated “there is no effective model or widely accepted paradigm for contemporary technology teacher education” (p. 17). Householder (1992) also studied changes occurring in the preparation of industrial arts and technology education teachers. He reported, “By every indication, the number of graduates in technology teacher education continues to decline. The number of students in the programs continues to decline even more precipitously...” (p. 17). He also reported that the number of institutions preparing such teachers was continuing to decline.

One of the most comprehensive reviews of the status of teacher education that might inform industrial educators of current trends within industrial education and vocational education was reported by Lynch (1996). Although that report was focused primarily on vocational teacher education, one portion pertained directly to industrial education. Data revealed that all areas of vocational education have been undergoing significant change and decline.

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Data on industrial arts/technology teacher education revealed that 30 technology-based teacher education programs were terminated between 1979 and 1988. Over the same period, degrees awarded in non-teaching industrial education programs within the same institutions increased 790%. Lynch (1996) summarized by saying, "These traditional programs have suffered major enrollment declines in teacher preparation in recent years. Perhaps as many as one-third of them have been either eliminated, combined with other majors or reduced to a small student census and thus produce very few teachers" (p. 24).

Pucel (1995) conducted a study of the relative amounts of research being done in various fields of industrial education and found that very little was being done in trade and industrial education. After investigating why this was occurring, he concluded that it was, in large part, due to the decline in faculty devoted to trade and industrial education in institutions of higher education.

These declines have also been reflected in National Association of Industrial and Technical Teacher Educators (NAITTE) membership. Custer (1996) pointed out, "In recent years, the number of industrial teacher educators has declined, which in turn led to corresponding decreases in NAITTE membership" (p. 8).

### **What Has Changed?**

The following is a brief review of some of the major forces currently driving the reform of higher education industrial education programs. With the coming of the industrial age at the beginning of the 20th century, the need for industrial education as part of general education and occupational education was apparent. That education took place in the K-12 system, the evolving post-secondary system, as well as in business and industry. With the growth of education related to industry, a number of sub-fields of industrial education evolved to fulfill specific roles. Society-required education, relative to industry, focused on different purposes for different groups of people in order to adequately prepare people for citizenship and employment. Eventually what became known as industrial arts (technology education), trade and industrial education, technical education, and industrial and military training were each defined to have specific purposes and the preparation of teachers/instructors in each of these fields became specialized. However, they were typically

viewed as part of a family of fields generally known as industrial education. Because they were viewed as part of such a family, in 1937, NAITTE was founded which promoted each of these sub-fields. The organization promoted the concept of industrial education through

stimulating and promoting positive change by (a) providing opportunities for professional improvement, (b) promoting cooperation among related client groups in the field, and (c) serving as an authority and advocate in the preparation of professionals in industrial and technical teacher education and industrial and military trainer training (Walker, 1994, p. 6).

Today, NAITTE continues to support each of these areas.

In order to staff these industrial education programs as they expanded over the years, many teachers were needed. Federal funding was made available to encourage teacher education program development in vocational and technical education through the passage of the Smith-Hughes Act in 1917 and subsequent vocational legislation. In response, institutions of higher education developed programs to produce those teachers. In addition, society believed that youth should be familiar with the industrial arts as part of their general education and provided funding for that program. All of the programs continued to grow through the 1960s. Most often, the size of the industrial teacher education staffs warranted separate departments in order for the programs to be managed. Depending upon the institution and the local philosophy regarding the relationship between general and vocational education, these departments assumed a variety of names. An examination of the NAITTE directory for 1963, and the departmental affiliations of those attending the Mississippi Valley Industrial Teacher Education Conference, revealed departmental titles such as: Department of Industrial Education, Industrial Arts Education, Trade and Industrial Education, and Industrial Arts and Vocational Education. In most cases, the focus of industrial education was apparent in the titles of departments housing the industrial education programs.

Why has the decline of industrial education programs taken place? Frost (1966) suggests that the role of education in society has been, and continues to be, essentially the same. "Basically education in all societies aims at orienting the individual to his (her) social and

physical environment” (p. 8). Consistent with this view of the role of education, all of education including industrial education, has mirrored the society of the times. Since times have changed, education is now being asked to engage in reform in order to meet the new needs of an information-age society. Schools of education within institutions of higher education are being challenged. “The American public education system that it (they) serve(s) is undergoing dramatic changes because of new understandings about teaching and learning, the need for a highly skilled workforce and an increasingly diverse population of students” (LaBaree & Pallas, 1996, p. 25).

As part of this reformation, industrial educators find themselves in a period of realignment of industrial education, from serving the needs of society in the industrial age to fulfilling the needs of the information age. This realignment is similar to that required at the beginning of the 20th century when society moved from the agriculture age to the industrial age. Mays (1946), in his history of the development of vocational education during the 20th century, concluded that “...outside pressures began to be felt by the schools to modify their character so as to become more closely related to the new and changing political, social, and economic life surrounding them” (p. 7). These same types of pressures are once again being felt and are fueling the need for new educational reform.

As these pressures have been felt by industrial education, new visions of industrial education programs have evolved. Industrial arts has evolved into technology education in an attempt to respond to the growing need for technological literacy across society. Daugherty & Boser (1993) have observed that over the past 10 years, technology education “philosophy, curricula, and methodologies used to guide the discipline may have changed more dramatically than they have in the preceding one hundred years” (p. 31). All fields of industrial education have been asked to work more closely with academic programs. Schmidt, Finch, and Faulkner (1995) indicate that vocational and academic teachers must move away from the historical separation of their goals and must move more toward an integrated curriculum. The Tech Prep movement, funded by the Perkins Act, fosters curriculum integration as well as articulation with post-secondary education (Bottoms, Presson, & Johnson, 1992). Post-secondary technical education programs have increasingly been moving from diploma or certificate programs to associate degree programs with sizable general education components.

### **The Future**

As these changes occur, the substantive content of each of the fields of industrial education must be re-examined, as well as how industrial education programs within institutions of higher education should be organized. "Many policy-makers and educational critics believe teacher education is ineffective" (Ashton, 1996, p. 21). This has led universities to rethink how teacher education should be delivered. Some have eliminated teacher education programs while others have combined teacher education programs into new configurations.

As the phenomenon of program closures and downsizing continues to take place, institutions of higher education must question the need for separate industrial education staffs to prepare various types of industrial education personnel. Some industrial education programs have survived while others have been eliminated. What can be learned from those that have survived?

### **Purposes of The Study**

This study was designed to determine the (a) current status of industrial teacher education programs that have survived the programmatic reductions associated with higher education reform, (b) perceptions of the future of those programs, and (c) non-teaching industrial education programs that are currently being offered along with the teacher education programs. Industrial education is defined to include those areas of industrial education served by NAITTE: technology education/industrial arts education, trade and industrial education, technical education, and training and development in business and industry. In addition, information was gathered on industrial technology programs which often accompany industrial education programs. The specific purposes of this study were to:

1. Determine the types of higher education institutions that offer industrial education programs and degrees.
2. Determine where industrial education programs currently are housed within institutions of higher education.
3. Determine the different types of industrial education programs offered within the institutions and the size of those programs.

4. Determine the number of faculty who have overlapping responsibilities for a variety of industrial education programs.
5. Determine what current faculty in industrial education programs perceive to be the future of various areas of industrial education in institutions of higher education as well as in society.
6. Present conclusions that might facilitate the survival of those programs that are attempting to refocus and flourish within the current higher education environment.

### **Methodology**

The population for this study was the 1995 membership of the 82nd Mississippi Valley Industrial Teacher Education Conference. Members of the conference were required to be actively providing leadership to one or more areas of industrial education. The group contained teacher education representatives from 20 states.

All 79 members of the conference were sent a mailed survey and asked to return it within three weeks. Non-respondents were contacted by phone. Responses were eventually obtained from 64 individuals. Usable data were received from 57 of the members who were associated with 37 different institutions of higher education. Some institutions were represented by more than one member at the conference. In those cases, data obtained from the official representative from that institution were used.

The survey was composed of forced-choice items addressing type of institution represented, size of staff, percentage of staff time devoted to various types of industrial education programs, and types of industrial education programs offered within the institution. They were asked to indicate whether they believed that various fields within industrial education would increase, decrease, or stay the same in the future. In each case respondents could add other categories if they felt they were not able to adequately express themselves within the categories provided. Open-ended items were used to determine the names of colleges and units in which the industrial education programs were housed.

## Results

### *Types of Higher Education Institutions that Offer Industrial Education Programs and Degrees*

Two questions were asked related to Purpose 1. The first question was to determine if the institutions were considered to be four-year, land-grant, and/or research institutions. Table 1 presents information on the types of higher education institutions represented by respondents. Respondents could indicate whether their institutions belonged to more than one category.

**Table 1**  
*Number and Percentage of Each Type of Higher Education Institution Represented*

Type	Number	Percent
4 year	37	100
Land grant	11	30
Research	16	43

*N* = 37

All of the higher education institutions represented were four-year institutions. Thirty percent were land-grant institutions and 43% considered themselves to be research institutions.

The second question addressed the types of degrees offered by the institutions. Table 2 presents the number and percentage of institutions offering each type of degree.

**Table 2**  
*Types of Degrees*

Type	Number	Percent
Ph.D.	9	24
Ed.D.	5	14
Masters	30	81
Bachelors	37	100
Associate	9	24

*N* = 37

All of the institutions offered bachelors degrees in one or more fields of industrial education and 81% offered masters degrees. Twenty-four percent offered Ph.D. degrees, 24% offered associate degrees, and 14% offered Ed.D. degrees.

*Location of Industrial Education Programs Within Institutions of Higher Education*

Two questions were asked related to Purpose 2. The first question addressed the names of the colleges in which the industrial education programs were housed. Table 3 presents the number and percentages of respondents who indicated that their programs were in various types of colleges. Although programs were housed in many different types of colleges, schools, and institutes, throughout this paper all are referred to as colleges.

**Table 3**  
*Types of Colleges Housing Industrial Education Programs*

Type	Number	Percent
College of education	12	32
College of applied arts & technology	1	3
College of applied science & technology	3	8
College of applied science	1	3
College of applied technology	1	3
College of arts and sciences	2	5
College of basic & applied sciences	1	3
College of business & public admin.	1	3
College of business & industry	1	3
College of business & technology	3	8
College of fine and applied arts	1	3
College of natural sciences	1	3
College of practical arts	1	3
College of science & technology	3	8
College of technology	5	13
Total	37	101

The researchers condensed the college titles into 15 major categories. The largest number of respondents indicated their programs were in colleges of education (32%). When looking across different college titles, the largest number were located in colleges

with the word “technology” somewhere in their titles (43%). Twenty percent of the colleges did not have education, practical arts, industry, or technology in their titles.

The second question addressed the names of the units in which industrial education programs were housed within those colleges. Table 4 presents the number and percentage of respondents who said their programs were housed in variously named units. The data indicated that programs were within 20 different types of units. The largest number of respondents were from “Technology” units (20%), with the second largest number coming from “Industrial Technology” units (14%). When unit names were combined in terms of common words in their titles, the largest number had the word “technology” in their titles (65%) and the second largest number had the words “industry” or “industrial” in their titles (41%). Only 6% of the units did not have technology, industrial, practical arts, vocational, or occupational in their titles.

**Table 4**  
*Types of Units Housing Industrial Education Programs*

Type	Number	Percent
Business & technology ed.	2	5
Educational HRD	1	3
Educational studies	1	3
Industrial and eng. technology	1	3
Industrial arts & technology	1	3
Industrial ed. and technology	3	8
Industrial studies	2	5
Industrial Technology	5	14
Industrial Technology ed.	1	3
Industry	1	3
Industry and technology	1	3
Occupational ed.	1	3
Practical arts & vocational ed.	1	3
Technology	7	20
Technology ed.	2	5
Technology studies	1	3
Visual communications & technology	1	3
Vocational and adult ed.	2	5
Vocational and technical ed.	2	5
No official department	1	3
Total	37	100

*Different Types of Industrial Education Programs Offered and the Relative Size of Those Programs*

Two questions were asked to address Purpose 3. The first question was to determine the types of industrial education programs contained within the represented unit. Responses were received from only 30 of the 37 institutions represented. The majority of the respondents indicated that their units had technology education (90%) and the majority had industrial technology programs (67%). Twenty-seven percent had training and development, 27% had trade and industrial education, and 13% had technical education programs (see Table 5).

**Table 5**  
*Types of Industrial Education Programs Offered*

Type	Number	Percent
Technology ed.	27	90
Technical ed.	4	13
Trade & Industrial ed.	8	27
Industrial Technology	20	67
Training & development	8	27

N=30

*Number of Faculty with Overlapping Responsibilities for Various Industrial Education Programs*

In order to determine staffing patterns associated with industrial education programs, the following question was asked related to Purpose 4. What is the distribution of total faculty time assigned to the various types of industrial education programs in your unit? Again, only 30 institutions responded to this item. Table 6 presents a breakdown of the percentage of faculty devoted to various types of industrial education programs within those units that have those programs. For example, 27 respondents indicated that some faculty time in their units was spent on technology education. The average percentage of faculty time assigned to a technology education program was 33%.

Faculty associated with industrial technology programs seem to be most highly focused on only one program area (61%). The relatively small amount of total faculty time devoted to only one program

**Table 6**

*Overall Percentages of Faculty Time Devoted to Programs Within Units That Have That Program*

	<i>N</i> having program	Avg. % faculty time for units with a type of program
Technology ed.	27	33%
Technical ed.	4	17%
Trade & Ind ed.	8	26%
Industrial Tech	20	61%
Training & Dev	8	25%

*N*=30

area suggests faculty assignments are spread out across various types of industrial education programs within the institutions.

*Faculty Perceptions of the Future of Various Areas of Industrial Education*

To satisfy Purpose 5, all members of the conference employed in institutions of higher education were asked about their perceptions of the future. Fifty-one members responded. First, they were asked about their perception of the future of the various types of programs in their own higher education institutions. The results are reported both in terms of perceptions of those who are employed in institutions where various programs now exist as well as perceptions of those from institutions in which programs currently do not exist. The results are presented in Table 7.

**Table 7**

*Perceptions of the Future of Various Industrial Education Programs in the Institutions of Higher Education*

	Have a Program Now			Do Not Have Program	
	<i>N</i>	Drop	Keep	<i>N</i>	Add
Technology ed.	47	7	40	4	1
Technical ed.	10	4	6	41	4
Trade & Ind	16	2	14	35	6
Ind Tech	33	4	29	18	4
Training & Dev	21	1	20	30	6

*N* = 51

The data revealed that the respondents' institutions were in transition. Some of the institutions that currently have a type of industrial education program anticipated dropping it, yet other institutions that currently do not have the same type of program anticipated adding it. Second, respondents were asked about their perception of the future of the fields of industrial education in society. Table 8 presents those perceptions.

**Table 8**

*Perceptions of the Future of Various Types of Industrial Education Programs*

Type	Will increase	Will decrease	Did not Respond or Did Not Know
Technology ed.	42	8	1
Technical ed.	25	9	17
Trade & Ind	11	25	15
Ind Tech	36	5	10
Training & Dev	38	3	10

*N* = 51

The perception of the majority of the respondents was that all program areas would increase with the exception of trade and industrial education. It is interesting to note the discrepancies in the perceptions of the future by those who have a program, and those who do not have a program. For example, of the 16 people who came from institutions that have trade and industrial education programs, 14 felt that their programs would be retained by their institutions. Another 6 people from institutions that did not have a trade and industrial education program felt their institutions would add the program. Yet when all members were asked to judge the future of trade and industrial education, the majority of those who responded believed that the need for the program would decrease. It also was interesting to note how many believed that they did not have enough personal information about different types of industrial education programs to make a judgment about their future. These discrepancies suggest that some respondents did not have a comprehensive view of all of the fields of industrial education.

### **Conclusions and Discussion**

This study revealed that industrial education programs exist in many different types of higher education institutions and in a variety of different types of units within those institutions. They exist in land-grant, research, as well as other types of four-year colleges. The institutions offer degrees ranging from associate degrees to Ph.Ds. The institutions still offer programs related to the goals originally established by NAITTE in 1937. They offer technology/industrial arts education, technical education, trade and industrial education, training and development, and industrial technology programs. The majority of the institutions have technology education programs (90%) and industrial technology programs (67%). About one-fourth of the institutions have trade and industrial education and one-fourth have training and development programs. Only 13% have programs in technical education.

An examination of the distribution of staff time across the various industrial education programs within institutions housing such programs suggests that faculty tend to devote their time to multiple types of industrial education programs. With the exception of those units offering industrial technology programs, one-third or less of the faculty time was devoted to only one type of industrial education program. A detailed analysis was done to determine the various combinations of programs to which faculty devoted their time. The two programs that appeared together most often were technology education and industrial technology. However, different institutions had many different combinations of industrial education programs. In addition, some faculty time was devoted to general administration such as dean of a college or teaching courses in other units such as science, social science, or business.

Apparently few institutions that have survived the declines associated with higher education reform did so by focusing on only one sub-field of industrial education. Most have developed combinations of programs designed to prepare teachers (technology education, trade and industrial education, technical education) as well as people for business and industry (industrial technology, training, and development).

The exact location of industrial education programs within institutions of higher education varied greatly. They were housed in colleges that could be categorized into 15 major titles. Although the

largest number were in colleges of education (32%), it is interesting to note that the remaining 68% of the colleges did not have the word "education" in their titles. The largest number of colleges (43%) had the word "technology" in their titles. This could represent an indication of a changing perspective concerning industrial education, with a focus less on education and more on technology.

Upon examining the names of the particular units within the colleges that house industrial education programs, the two key words appeared to be "technology" (65%) and "industry" or "industrial" (41%). Only 6% of the units did not have titles which would be associated with traditional terminology used in the past to identify one or more areas of the field. This finding suggests that industrial education has been able to maintain readily identifiable programs within institutions of higher education.

Although some of the respondents indicated that each type of program might be eliminated from their institutions during the next five years, in most cases faculty in the programs remained quite optimistic that their programs will continue. In fact, some institutions that currently do not have a type of program believe their institutions will add such programs in the next five years.

Overall, respondents believed there will be an expanded need in society for each type of industrial education program, with the exception of trade and industrial education. Yet representatives from institutions that had trade and industrial education programs also were quite optimistic. This high level of optimism is interesting in light of the less-than-optimistic findings of recent studies of vocational and practical arts programs which revealed major program declines during the past decade (Hartley, Mantel-Bromley, & Cobb, 1996; Householder, 1992; Lynch, 1996). There is no doubt that such programs across the country have been reduced greatly. However, it is possible that the remaining institutions housing industrial education programs are now experiencing an increased demand, due to the reduction of programs in other institutions. In addition, as the programs are being reformed (e.g., industrial arts to technology education, trade and industrial education to Tech Prep, post-secondary diploma and certificate programs to associate degree programs, education programs to industrial technology programs) there may be an increasing demand from society for the products of the new industrial education programs. For example, the demand across the

country for technology education teachers currently is outstripping the ability of teacher education programs to produce such teachers.

This study suggests that there continues to be a family of programs related to industry and technology that tends to exist together in institutions of higher education. Faculty in those institutions often devote various portions of their time to different programs within the family. The family appears to be composed of the types of program areas represented by NAITTE. Faculty in these institutions are optimistic about the future of their programs. Although the overall number of industrial educators associated with institutions of higher education may have gone down due to program reductions and closings, a critical mass still exists that can provide leadership in this time of educational reform. However, this study suggests that the majority of those programs that are surviving are doing so by finding ways to mutually reinforce programs within the industrial education family rather than working against each other. Few programs identified in this study were able to survive by focusing on only one sub-field of industrial education. Leaders of the programs that have survived have found meaningful ways to (a) achieve philosophical and programmatic compromises between the various areas of industrial education and (b) draw upon the strength of working together.

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