Journal of Vocational and Technical Education

Editor:
Kirk Swortzel: kswortzel@ais.msstate.edu

Volume 13, Number 2 **Spring 1997**

DLA Ejournal Home | JVTE Home | Table of Contents for this issue | Search JVTE and other ejournals

LESSONS FROM HISTORY: INDUSTRIAL ARTS/TECHNOLOGY EDUCATION AS A CASE

Patrick N. Foster
Department of Practical Arts and Vocational-Technical Education
University of Missouri-Columbia

In focusing chronologically on the past century of American education, this study suggests that the current state of American practical and vocational education is not unique, even given the popularity of school-to-work legislation and programs, tech prep, applied academics, and the like. Furthermore, if history is any indication, these advances will be lost in the coming decades unless past mistakes are not repeated. Particular attention will be paid to the case of industrial education.

Thus far in the twentieth century, practical, vocational and career-oriented education has been recognized as an important and urgent objective for American education. At the close of the century, educators are, for a third time in a hundred years, hearing internal and external calls for schools to be accountable for the future occupations of students.

The first time this trend was manifested -- as the popularity of manual training gave rise to federally-funded vocational education in the early years of this century -- there was no tightly knit community of vocational educators. There were, however, several vocational teachers organizations in existence at the time. The National Society for the Promotion of Industrial Education, for instance, was founded in 1906; the Vocational Association of the Middle West was formed in 1914. Finally, when the two groups (and others) merged in 1926 to become the American Vocational Association, a true national vocational teachers association existed in the US (Barlow, 1967).

By the second time the trend was manifested in the form of the career education movement of the early

1970s the industrial education field had been clearly split between general and vocational educators. The result was an inability to employ the popularity and momentum of the career education movement to advance the objectives of industrial education.

Today efforts by educators both vocational and general have resulted in a third opportunity for vocational educators to have a positive impact on all students. "This time there is a large, organized community of such professionals who have a sense that 'our moment is at hand'" (Reis, 1995, p. 54). Finally, education in general seems to have recognized the value in vocational education. Although this discussion will pay particular attention to industrial arts/technology education, much of it may apply to other fields of practical arts and vocational education as well.

American Education in the Twentieth Century

The Manual Subjects

The 1876 Philadelphia Centennial Exposition is often cited as a defining moment in the history of vocational and industrial education (Barlow, 1967); it was important in the history of American education as well (Button & Provenzo, 1989). The legend goes something like this. Calvin Woodward, the "father of manual training" (Miller & Smalley, 1963, p. 20), influenced by a Russian tool-instruction exhibit he saw at the exposition, returned to Missouri, where he soon established the famous St. Louis Manual Training School (Coates, 1923). Apparently the story of Woodward s viewing the Russian exhibit is completely fictional (Barlow, 1967), but so are many stories about George Washington and Abraham Lincoln (Hirsch, 1987) and these stories have served American education well.

Although some of its advocates regarded manual training as a comprehensive subject (Zuga, 1980, for a discussion of the Woodward case specifically), in practice its threefold purpose, at least in the late nineteenth century, was to keep boys in school, "provide vocational skills," and "develop leisure-time interests" (Gerbracht and Babcock, 1969, p. 8). Later objectives included instruction in the basic principles, processes and materials of industry.

As a term, manual training "has seemed to mean all good things to certain educational reformers and much evil to others. It has always been subject to a new direction and, like the tariff, always a live subject for discussion when all others, except the weather had been exhausted" (Bennett, 1934, p. 235). In fact, shortly after the turn of the century, manual training and supervision were the top professional issues in all of education (Wright, 1981).

The move toward general education

Of course, any two manual training programs operated by different teachers were unlikely to be very similar. Felix Adler s Workingman s School, founded in 1897, is often cited as having possessed an exemplary curriculum (Gerbracht & Babcock, 1969; Snyder, 1992). The components thereof were tools, machines, and processes. Students were expected to learn the correct use of each of these, as well as to gain an understanding of the need for tasks to be done with them. Eventually, Adler began to integrate other subject areas. "He felt, for example, that aesthetic values and mathematical and physical principles would be better taught by working with material things" (Gerbracht & Babcock, 1969, p. 9). Adler, who specifically assumed that manual training was to be a part of general education, is considered to have been an influence on Woodward (Bennett, 1934). Woodward s program was probably heavily influenced by the abstract version of the "Russian system" of manual training presented in the U. S. in 1876 (Bawden, 1950; Barlow, 1967), but it eventually evolved beyond tool instruction, into a more cultural study (Bennett, 1934). In fact, descriptions make many of the exemplary manual-training programs sound as if they were intended as general education.

In 1907, Bennett contrasted a growing "industrial education" movement in the schools, which was "cultural by virtue of being highly vocational," with manual arts, which he saw as "work that is cultural first and then vocational" (p. 190). He recommended that the manual arts profession, which he regarded as differing only

in emphasis from vocational industrial education, make specific and deliberate adjustments to meet vocational demands (p. 193-195).

The Vocational Education Act of 1917

Bennett s article was published while influential leaders in industrial education, such as Richards and Prosser, were helping draft federal legislation to recognize and fund vocational education. In 1917, after much labor from a makeshift coalition of advocates (Hillison, 1995), US President Woodrow Wilson signed the Smith-Hughes Act, which initially provided $1.86 million in funding for vocational programs in public schools. As Snyder (1992) noted,

There were now two similar, yet distinctly different, forms of industrial education provided for by the American public educational system. Traditional general education programs, whether they were called manual training or industrial arts, were now in company with the new vocational education program (p. 96).

Prior to 1917, "federal educational aid to states had been given either for general education on the normal public school level (elementary and high schools through grants of land) or for special types of higher education, largely through the land-grant colleges" (Allen, 1950, p. 72). Before the enactment of the Vocational Education Act, many states had established vocational education systems. Not surprisingly, after 1917, "every State in the Union made some provision for the use of federal funds to stimulate local communities in this work" (Prosser, 1930, p. 12).

But some citizens, including educators and legislators, felt that vocational training had no place in publicly funded education. As Butts (1955) recounted,

Practical-minded persons argued that education was derelict in its duty if it did not give students a practical training for some job in life and for earning a living. Others were equally convinced that the distinctive task of schools and colleges was to give students a well-rounded liberal education that would fit them to lead a full and worthwhile life, leaving specialized training to other agencies" (p. 570).

The founding of industrial arts

The Vocational Education Act was enacted during the development of a new conception of industrial education at Columbia University s Teachers College. Teachers College faculty members Bonser and Mossman (1923) employed the term "manual training" to identify the prevailing interpretation of industrial education in the 1920s. In Industrial Arts for Elementary Schools they listed the components of manual training to which they objected:

Investigation of the courses proposed and taught in our schools leads one to note these prominent inadequacies in manual training:

Want of relationship of the work to life. The sequence of the models was in terms of tool processes.

Failure to provide for the individuality of the child. Each must conform to the system.

Lack of motivation. The work was all prescribed in a fixed course.

Placing the emphasis upon the product as the objective, rather than upon the growth of the child (p. 479).

Bonser and Mossman, along with Teachers College Dean Russell, and many others at the college, developed a comprehensive system of industrial education which, although never implemented on a large scale, has been the theoretical basis for industrial education in the U. S. for most of the past 70 years (Foster, 1994, 1995).

To this day, many of the philosophical problems in industrial education stem from internal disagreement as

to whether the field is general or vocational. One side of the debate has historically been represented by William E. Warner s American Industrial Arts Association. The AIAA (now the ITEA) has always been non-vocational. Meanwhile the National Association of Industrial and Technical Teacher Educators (NAITTE) and the Technology Education Division of the American Vocational Association (AVA-TED) are smaller groups representing a comprehensive conception of industrial education.

In general, these organizations all recognize Bonser and Mossman as having provided significant philosophical direction for the field. So did Bonser and Mossman (1923) advocate general or vocational industrial education? In fact they advocated both, reserving general industrial arts for the elementary grades (Lewis, 1996).

But by the time their work was being widely published, interest in manual training was giving way to a new educational trend.

Progressive education

The Progressive Education Association was founded in 1918, and for the next "15 or 20 years the dominant interest (in American education) was to release the individual capacities of children in the 'child-centered' school. (Butts, 1955, p. 571)." "Learning by doing," Butts went on to say, "became the watchword" (p. 574).

As made clear by Bonser and Mossman (1923), industrial arts was a product of the progressive movement. Even without the benefit of much hindsight, educational historians of the 1920s declared industrial arts – social industrial education -- to be an old idea, one which had been popular in Europe in the sixteenth, seventeen, and eighteenth centuries (Anderson, 1926). In other words, it has been a recurring trend in Western education for hundreds of years, and a trend which had never taken hold. As aforementioned, despite what many of its historians have suggested, industrial arts was not an outgrowth of manual training, which at the time was at the height of its popularity. Quite to the contrary, it was a reaction against manual training. This relationship provides a microcosm of the interaction between the two major rationales for public education in the first quarter of the twentieth century the social-efficiency and student-centered theories.

Although many proponents of vocational education today and in the past favored education for and about work on the basis of the good it would do for individual students, the initial success of vocational education in securing federal funding was largely due to the benefits it promised society and business. To be sure, it provided industry with better-trained workers. This "social efficiency" rationale for vocational education was hotly debated in the years preceding the passage of the Vocational Education Act in 1917 (McPherson, 1978). Since that time much debate has focused on whether the social-efficiency argument was advocated by the field s leaders.

Although it has not always presented as such, progressive education may be viewed as a reaction to the social-efficiency function of schools. Progressives emphasized (some would say overemphasized) treating each student as an individual. Politically, progressive education, popular between the two World Wars, could not have come at a more opportune time. Not surprisingly, it began to fade during the depression, and was all but completely gone by the McCarthy era. As politically right-of-center as the goals of social efficiency had been, so had progressive education been viewed as left-of-center. Now the tide had turned.

"The spokesmen for educational tradition and for classical learning" Bramfeld, noted at mid-century, "against whom Dewey and his lieutenants took the offensive in the earlier years of our century, have themselves begun a counteroffensive" (1950, p. 178). But by the time Bramfeld wrote these words, progressive education had fallen out of favor in American education. The Cold War, the launch of Sputnik II in 1957, the red scare, and the like had contributed to a political climate in which progressive education was unlikely to prosper.

Somehow, a movement that for a half century, enlisted the enthusiasms, the loyalty, the imagination, and the

energy of a large segment of the American public and the teaching profession became, in the decade following World War II, anathema, immortalized only in jokes. (Cremin, 1961, p. vii).

By the 1950s, even the Soviet Union s official media outlets had "increasingly and sometimes insultingly opposed Dewey s views and the kind of education for which he (stood)" (Bramfeld, 1950, p. 179). Progressivism in American education was dead at least for a while.

American Education Later in the Twentieth Century

The post-World-War II era

The years following World-War II may have been the strongest for industrial arts. This may seem odd in light of the earlier portrayal of industrial arts as having been the product of progressive education. Certainly the 1950s were not a time for progressive education. But in practice, industrial arts had never really been progressive (Volk, 1995). The superficially similar manual training, popular in schools in the 1910s and 1920s, exerted sufficient gravity on the new field of industrial arts that little more than the latter s name remained (Petrina & Volk, 1995a; 1995b, for further discussion). By the 1950s, industrial arts was in a dubious position.

The "essentialist" trend in American education after World War II (Button & Provenzo, 1989) was decidedly conservative. Educators were criticized and held accountable for the condition of education. Why Johnny Can t Read was a bestseller. Schools and teachers, the argument went, were not instilling patriotism in students. Many felt that the prevailing philosophy of education was out of line with societal sensibilities. More than a few of these criticisms originated within education as had the movements in favor of manual training and progressive education.

The industrial education of the 1950s was probably rarely accused of being unpatriotic or otherwise philosophically unacceptable. In fact, insofar as it promoted American industry and self-efficiency, it fit the political landscape well. Despite this, it was not essential to the curriculum, and by the time the National Defense Education Act, the original legislative reaction to Sputnik, was signed, industrial arts was not viewed as playing a vital part in preserving the American way of life. Enrollments began to wane.

Educational trends during the 1960s and 1970s. Unfortunately for these already decreasing enrollment trends, industrial arts remained conservative when more liberal conceptions of education (Button & Provenzo, 1989) came to the fore in the 1960s and 1970s. Once again, public schools were under proverbial attack. This time, the criticism was from the left.

> Our public schools, as mirrors of our society, have played a significant role in creating the conditions that have led to the waste of talent and ability and to the subsequent loss of dignity and self-worth on the part of millions of our citizens. (Hickerson, 1966, p. i).

The roots of the movements of this time period, including competency-based education, open-access schooling, child-centered activity, career education, and the like, may be found in the progressive era; to be sure, some of these movements are popular once again in the mid-1990s. In the mid-1960s, social concerns also resurfaced in education. Goodlad (1979), for example, discussed how, in the spring of 1968, social events not directly related to education inspired him to ponder the question for which he is known: what are schools for?

On the eve of the 1960s, the industrial arts profession was reacting strongly to the recommendations educational pundits were making after the launch of Sputnik II, symbolic of the Soviet victory in the space race of the late 1950s. Knight, for example, wrote that "industrial arts shops may become excellent laboratories where the practical applications of scientific principles can give depth to understandings" (1958, p. 18). Paton (1958) agreed, calling for more training in the sciences and mathematics for industrial arts teachers. Those teachers, Maley wrote, "must accept the basic fact that mathematics and science (can benefit from) a truly significant contribution by industrial arts" (1959, p. 12). Spencer (1959), meanwhile,

extolled the virtues of capitalism in the industrial arts laboratory. The rhetoric seems to have paid off in the form of the inclusion of industrial arts under Title III of the National Defense Act, as amended in 1966 (Decker, 1966).

Many of today s critical issues in technology education identified recently by Wicklein (1993) were issues in industrial arts during the 1960s. The conflict between the general and vocational purposes of technology education, for example, is a recognized problem in the mid-1990s. It was no less a conflict in the mid-1960s (Bell, 1964). An excellent testimony to this is Powell s (1966) article A Boat Needs Two Oars.

Powell, a high-school teacher from Colorado, was serving as the AIAA s vice-president for classroom teachers. In the article he described a fishing trip he took with a lawyer and a doctor. The lawyer mentioned that he was a member both of the American Bar Association and a more specialized national organization of patent lawyers. The doctor, in turn, described his membership in a national organization for internal medicine his specialty as well as the American Medical Association. From this, Powell reasoned that industrial arts teachers should belong to both the AIAA as well as a more overarching professional organization. But he did not advocate membership in the AVA. The "over-all" professional organization to which industrial arts teachers should belong, Powell said, was the National Education Association.

Another current problem in technology teacher education is a serious shortage of teachers (Householder, 1992 ; 1993) which, given its current rate, has been predicted to result in the demise of the profession (Volk, 1993). By the 1960s, the problem had existed for some time, and although teacher education enrollments were on the rise (Boyd, 1966), the teacher shortage was considered to be a top professional issues in industrial arts (Babcock, 1967; Decker, 1967).

Just as education in general was being criticized for its inadequacies, so was industrial arts. Marshall Schmitt, industrial arts specialist for the US Office of Education, said in 1967 that "the current industrial arts curriculum does not even measure up to the program recommended by the profession ten to 20 years ago" (p. 52-53). "Industrial arts is lucky to be alive today," Good (1967) agreed. "Few industries could survive this long with so little improvement" (p. 9).

Career education

One product of the return to more progressive conditions in education in the US was the career-education movement. Sydney Marland (undated), US Commissioner of Education and career education s foremost advocate, said of career education that "in essence we are trying to answer a very large question: what is right and what is wrong with vocational education in America today ? (p. 1, emphasis added). Yet many considered career education to be quite separate from vocational education:

Since the 1960s, when then U. S. Commissioner of Education Sydney Marland was strongly advocating "career education," the term has often been misused as a fancy term for vocational education. Preparation for a single job or vocation cannot be called career education without doing violence to the English language. (Woodring, 1983, p. 11).

Nonetheless, for the second time in the century, practicality and vocational orientation not only became popular in education, they became a substantial part of the envisioned solution to many societal woes. Indeed, as Barlow (1973) suggested, "criticism of education in 1912, in relation to the lack of vocational education, reads much like the criticism of the 1970s, in relation to the lack of career education" (p. 31).

But neither vocational education nor general industrial education wholeheartedly embraced the concept of career education. Some in the general industrial arts field felt that it was a "fact that administrators, curriculum developers, and teachers have expected industrial arts to contribute too much to career education programs. This has actually worked to the detriment of both industrial arts and career education" (Smith, 1982, p. 113). Industrial arts, some felt, was general education, and as such, had no more to offer career education than any other subject. Resisting the temptation to take more of an advantage of the popular career education movement must have been difficult for these educators. But they did resist on the principle that it

was too vocational.

The opposite seems to have been true of vocational education. The American Vocational Association appears to have welcomed the trend (Magisos, 1973), but as always, the question remained as to the base purpose of vocational education -- some in the profession felt that its role was to educate for general employment; others were of the opinion that vocational education should prepare youths and adults for employment in a specific trade. From the latter standpoint, career education was laudable, but not part of vocational education. It was too general.

The profession of practical arts and vocational education is in a surprisingly similar situation today, with the popularity of applied academics courses. Whereas there appears to be a consensus among vocational educators that school-to-work and similar movements in education at large are favorable and beneficial to the cause of their field, there is not a consensus that applied academics, for example, should be promoted by the American Vocational Association. Again, the argument is that applied academics is sensible and beneficial to students, but that it is not vocational education. Yet with the demise of general education appearing to only be a few years away, vocational education may also have to change.

However, history suggests that the profession of vocational education, in an effort to maintain internal tranquillity, will ultimately -- and for better or worse -- pass up the opportunity to promote efforts to "bridge the gap" between vocational and general education. Clearly, gains have been made in American education, gains toward recognizing the fact that many students will learn better when allowed to apply theories. If the past is any indication, when the next backlash comes, and it may come soon, much of what was gained will be lost.

The back-to the basics movements of the 1980s

If the gains, in a progressive sense, made by American education during the 1960s and 1970s were not completely lost in the following decade, they were at best suspended. A major catalyst for educational change in the 1980s was the publication of several status reports on American education (e. g., Boyer, 1983) which, taken together, strongly suggested that education was failing to do its job properly.

Again it was a time of educational conservatism, but industrial arts, conservative as it was, was unable to take advantage of the situation. The litmus test in the 1980s was not whether any given component of education was liberal or conservative, but whether it was a basic. And despite the efforts of the newly re-christened International Technology Education Association to establish the field as essential to the education of all children, technology education was not a basic. The 1980s were not a good time for technology education, or, for that matter, many similar fields. Since then, the field has been stagnant (Volk, 1993; Waetjen, 1992).

Learning from the Past without Living in the Past

History can do at least two things: It can show what historical ingredients have gone into our present beliefs and practices and what problems face us when inherited traditions confront new conditions and new demands; and it can show how other peoples in other times have solved similar (though not identical) problems. (Butts, 1955, p. vii).

Is the present, the mid-1990s, an "essentialist" or "progressive" era in American education? The back-to-the-basics movement of the 1980s may appear to be over, but have the conditions under which it flourished have remained essentially the same?

US Secretary of Education Richard Riley (1995) noted that "we are no longer a nation at risk" (p. 3), but to author Hedrick Smith, there are more problems than there is progress. In a recent interview ("Talking with Hedrick Smith," 1996), Smith cited a recent report of the Education Committee of the States, which said "only about 5 percent of schools in America had begun significant school reform. Only 1 percent had gone far enough" (p. 32). Smith also criticized vocational education as "spotty" (p. 32).

Meanwhile Berliner and Biddle (1996) claimed that on average, "kids today are a lot smarter than their parents" (p. 37). And while Berliner and Biddle employed present statistics to argue that education in the US is improving, Bracey (1995) looked to the past in "debunk[ing] once and for all the notion that there was once a Golden Age of American education from which state we have fallen and must strive to return" (p. 27).

Whether or not the ills reported in the last decade have been corrected, or even addressed, many signs of progressivism are evident -- career education may have disappeared more than a decade ago, but "career paths" (a different concept with similar goals) are becoming popular. "Individualizing instruction" a popular phrase of the 1970s, is similar in intent to "constructivism" (although it differs substantially in orientation). Interestingly, some of the educational reports which appeared later in the 1980s, and which bemoaned the condition of American education as much as those released in 1983 and 1984, may account for the popularity of at least some of these educational movements. The sense remains that for the US to remain globally competitive, employees need better, and, to some degree, different, "basic" skills. Thus, the reasoning goes, education needs to change.

And this is where vocational education appears to come in. These educational pundits were not making recommendations for vocational education, but for education as a whole -- many made no specific mention of vocational education. Yet if it is to contribute to a new, improved conception of American education, perhaps vocational education must change as well.

This would also require technology education (formerly industrial arts) to change. This is especially true if its advocates view it as a general-education field. In a time when the concept of an educational "discipline" is felt to be outmoded, considerable effort is being expended by members of the field to establish technology education as an "academic discipline" (Waetjen, 1992, p. 25). Almost certainly, segregated-subject general education will not be the model of American education in the future. Like any educational institution, technology education will survive for some time even if it is no longer needed; but given the recent emphasis placed on applied academics, coupled with the erosion of separate disciplines, technology education, with its "hands-on" nature, is in a unique position to contribute to the education of many students. Still, if the past is an indication of the future, the profession will not concede the discipline issue, and will insist that it delivers content important to each child which is not deliverable by any other subject in the school, and in so doing will continue to reach a decreasing minority of students.

Final Thoughts

Once again, practical educators, be they vocational or general, have the opportunity to reach all students in US public schools. In the past, vocational and technology education have responded to these opportunities with indecision. Each time, internal division has resulted in inaction. This history may lead one to believe that perhaps present opportunities are not significantly different from past ones. What this means is that if practical education responds now as it has in the past, these opportunities may once again evaporate.

Perhaps a first step in not repeating past mistakes is for advocates of general technology education and proponents of comprehensive or vocational technology/industrial education to begin an open dialogue. Although this has begun, it has been quite limited and not well publicized. Such a dialogue seems to have been missing at critical points in the past. Secondly, all technology and industrial-arts educators might benefit from knowledge of the field s history. A greater sense of urgency might develop if teachers and teacher educators regarded the present as only the third opportunity in a hundred years for practical, technological education to play an important role in education in the US -- and if they regarded the previous two opportunities as missed ones.

Whatever the purpose of history is, it is not to criticize actions of the past. Educational trends cannot be seen clearly except with the benefit of many years of hindsight. With any luck, though, that clarity of vision may inform action in the present and future.

References

Allen, H. P. (1950). The federal government and education: the original and complete study of education for the Hoover Commission Task Force on Public Welfare. New York: McGraw-Hill

Anderson, L. (1926). A history of manual and industrial school education. New York: Appleton.

Babcock, R. J. (1967). The problem Journal of Industrial Arts Education, 26(4), 32-34.

Barlow, M. L. (1967). History of industrial education in the United States. Peoria: Charles A. Bennett.

Barlow, M. L. (1973). Historical antecedents to career education. In J. H. Magisos (Ed.), Career education: The third yearbook of the American Vocational Association. (p. 30-39). Washington: American Vocational Association.

Bawden, W. (1950). Leaders in industrial education. Milwaukee: Bruce.

Bell, C. A. (1964). A comparison of the American Industrial Arts Association and the Industrial Arts Division of the American Vocational Association with opinions concerning certain issues in industrial arts. [Unpublished Doctoral Dissertation.] Columbia, MO: University of Missouri Columbia.

Bennett, C. A. (1907). The manual arts: to what extent shall they be influenced by the recent movement toward industrial education Manual Training Magazine, 8 (4), 189-195.

Bennett, C. A. (1934). What s in a name? Industrial Education Magazine, 36 (5), 239-240.

Berliner, D. & Biddle, B. (1996). In defense of schools. Vocational Education Journal, 71(6), 36-38.

Bonser, F. G. & Mossman, L. C. (1923). Industrial arts for elementary schools. New York: MacMillan.

Boyd, G. (1966). recruit we must. Journal of Industrial Arts Education, 25(5), 12-13.

Boyer, E. (1983). High school: A report on secondary education in America. New York, NY: Harper & Row.

Bracey, G. W. (1995). Variance happens Get over it! Technos, 4(3), 22-29.

Bramfeld, T. (1950). Patterns of educational philosophy: A democratic interpretation. Yonkers-on-Hudson, NY; World Book Company.

Button, H. W. & Provenzo, E. F. (1989). History of education and culture in America. Englewood Cliffs, NJ: Prentice Hall.

Butts, R. F. (1955). A cultural history of Western education. New York: McGraw-Hill.

Coates, C. P. (1923). History of the Manual Training School of Washington University. Dept. of the Interior, Bureau of Education Bulletin, 1923, No. 3. Washington, DC: U. S. Government Printing Office.

Cremin, L. (1961). The transformation of the schools. New York: Alfred A. Knopf.

Decker, H. S. (1966). And to those who helped . Journal of Industrial Arts Education, 26(2), 22.

Decker, H. S. (1967). A solution. Journal of Industrial Arts Education, 26(4), 35.

Foster, P. N. (1994). Technology education: AKA industrial arts. Journal of Technology Education, 5(2), 15-30.

Foster, P. N. (1995). The founders of industrial arts in the US. Journal of Technology Education, 7(1), 6-21.

Gerbracht, C. & Babcock, R. (1969). Elementary school industrial arts. New York: Bruce.

Good, J. E. (1967). Get up and live. Journal of Industrial Arts Education, 26(1), 9-10.

Goodlad, J. I. (1979). What schools are for. Bloomington, IN: The Phi Delta Kappa Educational Foundation.

Hillison, J. (1995). The coalition that supported the Smith Hughes Act Or a case for strange bedfellows. Journal of Vocational and Technical Education, 11(2), 4-11.

Hirsch, E. D. (1987). Cultural literacy. Boston: Houghton-Mifflin.

Householder, D. L. (1992). Redesign of technology teacher education: model programs for the future. In International Technology Education Association: Camelback Symposium: critical issues in technology education (p. 4-9). Reston. VA: International Technology Education Association.

Householder, D. L. (1993). Technology teacher education: status and prospect. Journal of Technology Studies, 24(1), 14-19.

Knight, R. O. (1958). Applied sciences in industrial arts. The Industrial Arts Teacher. 18(1), 17-18.

Lewis, T. (1996). Accommodating border crossings. Journal of Industrial Teacher Education, 33(2), 7-28.

Magisos, J. H. (Ed.). (1973). Career education: The third yearbook of the American Vocational Association. Washington: American Vocational Association.

Maley, D. (1959). Research and experimentation in the junior high school. The Industrial Arts Teacher, 18(4), 12-16.

Marland, S. P. (undated). Career education now. Springfield, IL: Division of Vocational and Technical Education, Board of Vocational Education and Rehabilitation.

McPherson, W. (1978). Humanism in American education: An overview. In L. Anderson (Ed.) Industrial arts in the open access curriculum. Bloomington, IL: McKnight & McKnight.

Miller, R. & Smalley, L. (1963). Selected readings in industrial arts. Bloomington: McKnight & McKnight.

Paton, A. (1958). Upgrading science training for industrial arts teachers. The Industrial Arts Teacher, 18(1), 17.

Petrina, S. & Volk, K. S. (1995). Industrial arts movement s history, vision, and ideal: Relevant, contemporary, used but unrecognized Part I. Journal of Technological Studies, 21(1), 24-32.

Petrina, S. & Volk, K. S. (In press). Industrial arts movement s history, vision, and ideal: Relevant, contemporary, used but unrecognized Part II. Journal of Technological Studies.

Powell, S. D. (1966). A boat needs two oars. Journal of Industrial Arts Education, 25(4), 63.

Prosser, C. A. (1930). Evening industrial schools. Chicago: American Technical Society.

Reis, R. A. (1995). Make room for Dali. Vocational Education Journal, 70(4), 54.

Riley, R. W. (1995). Turning the corner: From a nation at risk to a nation with a future. The Technology Teacher, 54(7), 3-5.

Schmitt, M. L. (1967). Present. Journal of Industrial Arts Education, 26(3), 52-54.

Smith, D. F. (1982). Industrial arts and its contribution to career education. In D. Maley & K. N. Starkweather, (Eds.). The contributions of industrial arts to selected areas of education. (pp. 113-129). Bloomington, IL: McKnight Publishing.

Snyder, M. (1992). The transition from industrial arts to technology education in the United States: A historical perspective. [Unpublished doctoral dissertation, Virginia Polytechnic Institute and State University].

Spencer, T. (1959). Mass production in industrial arts. Industrial Arts and Vocational Education, 48(8), 22-23.

Talking with Hedrick Smith. (1996). Vocational Education Journal, 71(4), p. 32-34; 59.

Volk, K. S. (1993). Enrollment trends in industrial arts/technology education teacher education from 1970-1990. Journal of Technology Education, 4(2), 46-59.

Volk, K. S. (1995). The politics of technology education: Right to the end. Paper presented at the 1995 International Technology Education Association Conference, Nashville, TN.

Waetjen, W. (1992). Shaping the future of a profession. In International Technology Education Association: Camelback Symposium: Critical issues in technology education (p. 25-30). Reston. VA: International Technology Education Association.

Wicklein, R. C. (1993). Identifying critical issues and problems in technology education using a modified-Delphi technique. Journal of Technology Education, 5(1), 54-71.

Woodring, P. (1983). The persistent problems of education. Bloomington, IN: The Phi Delta Kappa Educational Foundation.

Wright, R. T. (1981). Manual training: Constructive activities enter the public schools. In R. Barella & R. T. Wright (Eds.), An interpretive history of industrial arts: The interrelationship of society, education, and industrial arts. Thirtieth Yearbook of the American Council on Industrial Arts Teacher Education. (pp. 87-129). Bloomington, IL: McKnight.

Zuga, K. F. (1980). The St. Louis Manual Training School-A future oriented school. Industrial arts: The spirit of progress. Addresses and proceedings of the 42nd National and 9th International Annual Conference of the American Industrial Arts Association, St. Louis Missouri, March 24-28, 1980, (pp. 94-95). Washington DC: The American Industrial Arts Association.

URL: http://scholar.lib.vt.edu/ejournals/JVTE/v13n2/Foster.html
Last modified: 12/10/09 10:47:20 by SS