From Industrial Arts to Technology Education: The Eclipse of Purpose

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This is the final article in a three-part series examining the historical relationship between industrial arts and technology education. The previous two articles, appearing in Volume XXII, Number 1, Winter/Spring 1996, and Volume XXIII, Number 1, Winter/Spring 1997, examined the curricular underpinnings of industrial arts from the 1930s to 1970s, and the historical and conceptual relationship to technology education. This article focuses on the subsequent development of technology education from the 1980s to the present. **JS**

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Technology education is a product of the educational change of the 1980s and 1990s, but its conceptual roots extend much deeper. The genesis of technology education can be found in the work of DeVore (1964), Olson (1958), Warner (1965), Ziel (1971), and others. These educators proposed that the study of industry could best take place within the framework of technology. Throughout the 1960s and 1970s, the profession struggled with how to make industrial arts more relevant, particularly in relation to national curriculum trends and the application of technology to instruction ("Industry/Education," 1972; "Special Report," 1966). Other school subjects, such as math and science, were linking content to technology in order to achieve greater instructional relevance (Ford & Pungo, 1964). Technology, it was suggested, could be used similarly to enhance the teaching of industrial arts. A number of innovative curriculum practices were formulated that made substantial use of technological concepts as the profession searched for ways to increase the instructional appeal of industrial arts.

In the early 1980s, however, a significant change occurred. Professional discussion shifted from reforming industrial arts to replacing it altogether with a new subject—technology education. By the mid-1980s, a professional consensus emerged that industrial arts was no longer relevant and had been eclipsed in purpose. Not only was a new name required, but the older curriculum concepts underlying industrial arts had to be significantly restructured (Oaks, 1991).

Technology education, however, remained inextricably linked to its historical and conceptual roots in industrial arts. Despite the consensus in favor of rethinking the curricular underpinnings, little change occurred. Curriculum design failed to indicate what was programmatically new or different about technology education. Today, the most widely used curriculum model continues to be the Jackson's Mill curriculum theory for industrial arts (Oaks, 1991), which is not a theory in the formal sense, and which was originally a model for industrial arts. Its most widely applied feature is the categories of construction, manufacturing, transportation, and communication, which function as program organizers. But the approach is hardly new; the categories reflect the early work of Warner (1965) and Olson (1958). Teachers have tended to rename industrial arts programs "technology education" while continuing to do what they had been doing all along (Virginia Polytechnic and State University, 1982).

This article examines technology education in the 1980s and 1990s, looking both to the past and the future. Technology education is still struggling to define its curricular dimensions, and to a large degree, professional discussion is bounded by earlier curriculum concepts characterizing industrial arts. Reflection on the past helps to clarify present issues. This article takes a retrospective view of the curriculum legacy of industrial arts.

It also looks to the future. If technology education is going to survive as a viable program area, it must confront current curriculum trends that are driving change in American public education. Many of the curriculum concepts that technology education formerly related to are undergoing development or revision. Some argue that technology education's public appeal has been sharply curbed by the changing educational climate and the failure of the field to clearly articulate its educational purpose. Technology education is ostensibly a new program area that would provide a more relevant education and replace the outdated industrial arts. But is technology education itself becoming eclipsed by the emerging educational issues of the 1990s?

RESTORING THE CONSERVATIVE AGENDA

Technology education was introduced into schools during a time Shor (1986) referred to as the "conservative restoration." Previous decades were marked by curriculum battles over liberal, radical, and conservative educational perspectives (Newman, 1994; Spring, 1997). The Reagan administration came into office in 1980 with the declared purpose of restoring conservative influence and reforming education. To a large measure, it succeeded. Federal aid to education was reduced, greater business involvement in education fostered, and alternatives to public schools supported. Advocacy groups drummed up calls for reduced taxes, school choice, curriculum change, and standardized testing. Technology education was profoundly shaped by the conservative agenda of the 1980s. Educators tried to merge its curriculum concepts with those being promoted by reformers. But cuts in funding, reductions of course offerings, and an emphasis on academic preparation at the expense of supposedly less important subjects contributed to marginalizing the subject field. Before discussing the response of technology education supporters, let us first examine in more detail the larger debate within the educational community over competing curriculum perspectives.

The Curricular Implications

The Reagan reforms reinforced what is termed today the *academic rationalist* curriculum perspective. Academic rationalists argue that instruction for all students should be organized around a core of basic studies representative of the academic disciplines. Instruction itself should be highly teacher-directed, rigorous, and designed to promote intellectual and moral development.

Since the 1950s, two basic variations of academic rationalism have been popular. *Essentialism*, formulated in the 1930s by Bagley (1938), contends that the most important function of the school is to equip all students with a common core of the "basic academic" skills required to survive in contemporary society. Morality and values also should be taught. The work of Bennett (1992) best represents Bagley's ideas today.

A second variation of academic rationalism is represented by the work of the *structuralists*, such as Bruner (1960), who argued that while all students require exposure to a basic core of academic subjects, the most important learning that instruction can provide is an understanding of the underlying fundamental structure of the subject. The various subject matter elements of the disciplines are organized in patterns that make up the structure of the discipline. Recognizing and knowing this structure is essential to learning and using knowledge, Bruner (1960) argued. As we shall see, both of these curriculum perspectives had a major influence on the early advocates of technology education.

Early Academic Rationalism

Academic rationalism has considerable appeal. It was advocated strongly in the 1950s; as in the 1980s, it reinforced the political agenda of groups highly critical of public education. A conservative attack led by Bestor (1953), Lynd (1950), and Smith (1949), to name some of the more effective critics, had brought to the surface deep public divisions over public education (Bowers, 1969). Academic critics were joined by religious and anticommunist groups who agitated for less taxes and mounted campaigns to purge schools of "un-American" and corrupting influences, censor textbooks, reform curricula, and require teachers to take loyalty oaths (Nelson & Roberts, 1963). Confidence in education was further eroded in the late 1950s by accusations that the poor quality of public schools constituted a major threat to national survival in the cold war contest with the Soviet Union. Instruction lacked substance and intellectual rigor, it was claimed (Spring, 1976). One result was greater emphasis on the teaching of science and mathematics. Another was a drive towards major national curriculum reform in all subjects, including industrial arts. As in the 1980s, considerable emphasis was placed on teaching the "basics." But unlike the 1980s, greater, not less, support was given as public money was poured into education in the quest for improved instructional quality.

By the 1960s, the academic rationalists had joined forces with those educators, such as Popham and Baker (1970), who supported highly functional and practical instructional outcomes. The merger resulted in what we call today competency-based education, founded on concepts of behavioral psychology, and reflecting what is referred to as a *technical/utilitarian* curriculum perspective. Industrial arts programs reflected technical/utilitarian curriculum designs because of the perceived technocratic character of the subject, and this design pattern continues to influence technology education.

Reform of the 1980s

The reform of the 1980s was motivated in part by the perception that the earlier conservative educational reforms promoted in the 1950s and 1960s had not achieved their objectives. Education was neither as rigorous nor as efficient as some wanted. Pedagogy had become "soft," some critics contended, and suspect political and social ideas had reemerged (Spring, 1997). The quality of instruction was compromised, it was suggested, by accommodating less academically talented young people, by student-centered pedagogy, by promoting ethnic diversity, and by subjects such as consumer math, family living, and a range of practical arts and vocational offerings (Newman, 1994; Shor, 1986).

Despite increased levels of federal and state money, critics argued, much of what the conservative reformers had envisaged in the 1950s and 1960s had gone unaccomplished. Indeed, according to these critics, reform had become sidetracked by the war on poverty, vocational legislation, the civil rights movements, and special needs laws, as the country struggled with questions of poverty, diversity, equality, and economic opportunity

(Aronowitz & Giroux, 1985). Conservative-minded critics lamented the 1960s and 1970s, during which, in their view, social concerns had come to dominate academic concerns, weakening what Bestor, Lynd, Smith, Bruner, and their colleagues were trying to do.

The civil rights movement and the war on poverty legislation of the 1960s embodied the educational beliefs of progressives and contrasted sharply with the beliefs held by conservative reformers of the 1950s. Desegregation and busing, the community school movement, emphasis on diversity and student rights, less emphasis on academic rigor, and more emphasis on student interests and differences were among the more contentious educational issues that separated "liberals" and "conservatives." Progressive ideas, based on the work of Dewey (1916), Kilpatrick (1927), and Bonser (1932), had been influential since the turn of the century (Cremin, 1961); however, except for during the 1930s, they were never a dominant influence, and by the 1950s they were under severe attack by conservative critics. The educational and social policies of the Kennedy and Johnson administrations helped to strengthen the hand of progressives, but by the early 1970s they had lost considerable ground. Conservatives were of the opinion that heightened concern over questions of equity and opportunity resulted in less emphasis on quality and efficiency, and falling national test scores seemed to confirm that judgment. A more permissive school environment appeared to tolerate, if not foster, what many viewed as a breakdown in moral values and social cohesion during the tumultuous 1960s and early 1970s (Newman, 1994; Spring, 1997). By the late 1970s, the American public was highly polarized over school issues. Reagan's educational policies helped to accelerate a process of division and fragmentation that was already well underway by the time of his election.

The conservative political leadership of the Reagan administration sponsored many reforms that were designed to counter perceived "liberal" excesses of the 1960s and 1970s (Giroux, 1988; Newman, 1994). Reform centered on returning to the "basics," de-emphasizing social objectives, and reducing electives. State followed state in undertaking to strengthen math, science, and language requirements, giving concrete form to what Bagley and the essentialists had argued for in the 1930s, and to what Bestor and the Council for Basic Education had tried to accomplish in the 1950s. The influential Holmes Group (1986) set out, in the 1980s, to make "the preparation of teachers more intellectually solid" (p. 4).

In the 1980s, then, the academic rationalists had strongly reasserted their position. Backed by political conservatives, such as Bennett (1992), Finn (1991), and Ravitch (1985), the case for educational reform was made on grounds of increased international economic competition and changing labor requirements. The new essentialists, however, allied themselves with the competency-based movement of the 1960s, stressing measurable outcomes and standardized testing. This is an indication of how the rationale of efficiency undergirding the technical/utilitarian curriculum perspective has come to dominate educational thinking. "What is different about the latest back-to-basics movement," Newman (1994) observed, "is that behavioral psychology is influencing the schools to a far greater degree than ever before, as educators learn to combine behaviorism and essentialism in powerful new ways" (p. 188). Bruner and the structuralists have been pushed into the background by the new essentialism.

THE EMERGENCE OF TECHNOLOGY EDUCATION

In the 1980s, "technology education" came into favor in response to a widely held view that industrial arts was linked to an older production system and no longer had relevance. Significantly, though, no accompanying curricular design took place that would indicate in what ways technology education was different programmatically. A relatively small but vocal and highly influential group of theorists, largely inspired by the work of DeVore (1964, 1968), turned their efforts to identifying the "structure" of the "discipline" of technology, proposing that the content of technology education would be revealed through such a structure. This line of curriculum inquiry was hardly surprising, given the strong influence since the 1960s of Bruner and the other structuralists. But there were a number of negative consequences to this work.

Technology is a multidimensional concept, and it does not reflect a formal structure in the sense that math, economics, or physics do (Frey, 1989; Herschbach, 1995). Whatever structure that exists comes from the application of technological knowledge to specific activities (Skolimowski, 1972). Technology is interdisciplinary in its use of knowledge, and the concept of technology does not lend itself well to a separate subjects curriculum orientation. For these reasons, it is impossible to pin down a definitive structure underlying technology, in terms amenable to curriculum development patterned after the academic rationalists.

Furthermore, its preoccupation with technology in and of itself has led the profession to ignore the more crucial educational questions for an emerging field that aspires to capture a niche in an already full school curriculum. While national political and educational leaders were arguing about the poor quality of education, low student achievement, diversity, a faltering economic system, global competition, crime, and disintegrating communities, technology educators were discussing among themselves such topics as human adaptive systems, technology as a human/cultural activity, and technological processes and resources. The focus was on the discipline of technology rather than on the mainstream educational, social, and economic issues that were dividing the educational public and, moreover, that technology education had to show itself capable of addressing if it wanted to gain public support. Technology educators have been too preoccupied with the intricacies of their field to make clear to the educational public why its study is important in terms that address the fundamental educational issues of the day.

Finally, the preoccupation with the structure of technology education has put the subject field at odds with the new essentialists, such as Bennett, Ravitch, and Finn, who emphasize a return to the basics and more rigorous academic preparation for college. Because of the influence of the new essentialists, many came to regard Bruner and his fellow structuralists as not being relevant. Technology education, then, became linked to a branch of academic rationalism that was quickly going out of fashion. Although, as Newman (1994) observed, the new essentialists acknowledge the importance of subjects such as technology education for "some students," the overriding reason that they support it is because of its value in preparation for work, that is, because of its practical use, and not because it leads to an understanding of the "structure of technology" or the "body of technological knowledge," curricular themes stressed by early technology education advocates. Thus, the leadership itself has helped to marginalize the movement. The essentialists are primarily interested in utilitarian outcomes and efficiency.

The recent effort among technology educators to integrate the teaching of academic subject matter with technical content demonstrates the strong hold of the new essentialists on the present national educational agenda. Calls for more rigorous academic preparation, greater emphasis on the basics, and more attention to values, morality, and discipline in the classroom suggest the practical outcomes that a concerned educational public is receptive to. Technology education has only recently begun to align its program design with an essentialist curriculum perspective.

THE CASE OF TECH PREP

The most significant curriculum challenge to technology education probably is Tech Prep because of its close identification with the essentialist perspective. Its supporters have been successful in aligning the subject with the academic preparation of community college-bound youth; in addition, its curricular concepts are being rapidly generalized to other programs. Tech Prep functions, however, as a corollary to academic preparation rather than posing as academic preparation itself. In the spirit of Dewey (1916), Bonser and Mossman (1924), and other early progressives, Tech Prep attempts to correlate technical activity with subject matter from a number of content areas, functioning as the means through which formal knowledge is applied and learned. In other words, Tech Prep uses knowledge in the technological sense, that is, as information that enables things to get done, and not as abstract, formal constructs. Technology itself is treated as subject matter to be used, and not as a formal discipline to be learned. At the same time, Tech Prep is supported by the new essentialists because it reinforces academic learning but makes no pretense to being academic instruction. Moreover, it is undergirded by a rationale of efficiency, and its focus is on clearly defined outcomes.

While technology education proponents were busy debating the relative structural characteristics of the discipline of technology, Tech Prep more or less adopted a curriculum design that was associated historically with the progressives and industrial arts, reconfiguring it to address the concerns of the new essentialists. Although there is considerable recent interest among technology education supporters in academic integration, it remains questionable whether or not the initiative can be regained. Technology education lacks a clearly defined student population to be served, as in the case of Tech Prep, and has yet to develop a coherent conceptual framework supported by learning theory that integrates activities with intellectual development.

With the more recent emphasis on academic integration, technology educators are responding, in part, to the new essentialists' agenda. For the immediate future, if technology education is going to survive in the public schools, it probably is going to have to continue to redefine itself in terms that appeal to the new essentialists. Its curriculum will have to reflect the merger of academic rationalism and technical/utilitarian curriculum perspectives being forged by the new essentialists. The Technology for All Americans Project appears to be a move in this direction (Satchwell & Dugger, 1995).

ACTIVITY AND EFFICIENCY

In their haste to stake out a separate curriculum claim for technology education, a number of its supporters in the late 1970s and early 1980s strongly criticized "traditional" industrial arts because of the wide use of manipulative activities, even though a well-defined alternative to an activity-based instructional program had not yet been clearly thought out. Manipulative activities were too "vocational," it was claimed. "Wood shop" became a particular target of derision. Technology education had to go "high tech," and by inference become more abstract and cerebral.

Manipulative activities had always been a part of the progressive tradition in industrial arts because they appealed to students, were an effective way to correlate the teaching of diverse subject matter, and brought self-directed behavior into an interplay with ideas and knowledge, and not because the primary purpose was to create craftsmen or technicians (Bonser, 1932; Petrina & Volk, 1995). In other words, activity-based instruction resulted in better learning (Resnick & Klopfer, 1989). There still are compelling educational reasons, even for woodworking. On the other hand, there are also compelling educational (not to mention vocational) reasons for deemphasizing craft-based, manipulative activities and shifting the instructional focus to technologies and activities that are more meaningful in today's work context. However, there remains at least two largely unresolved issues concerning activities. One is linked to the progressive tradition of the field, the other to technocratic uses of the subject.

The first issue is that technology educators have yet to make a clear case for the *educational value* of activities. The progressives of the 1930s and 1940s had fashioned a strong program rationale for activities based on learning theory (Petrina & Volk, 1995). As suggested earlier, in the 1950s and 1960s industrial arts became more technocratic, largely in response to attacks on progressive education and as a reaction to the general emphasis by the academic rationalists on academic, practical, and utilitarian objectives of education. Conservative educational doctrine, the cold war arms race, concern over social and employment issues, and the expanding role of the state in the development and management of human resources drove these changes (Spring, 1997). Svendson (1963) observed that the potential of progressive thought was never fully developed; instead, industrial arts educators rushed to bring programming into line with competency-based instruction and the work of the academic rationalists.

Similarly, the potential effectiveness of technology education as an interdisciplinary, activity-based subject grounded in real-world activities that form the foundation for effective learning has been largely ignored by a profession overly occupied with the technocratic and structural dimensions of technology. This is surprising, since one of the most powerful rationales for technology education is its potential as a learning tool. Little professional attention has been given to current learning theory and how it relates to technological activity and instruction. Technology educators appear to be largely oblivious to the highly influential work of cognitive theorists outside of the field, such as Brophy and Alleman (1991), Glaser (1984), and Resnick (1987, 1989), among others. Working within the tradition of progressive education, these researchers have built a persuasive case for positioning activity-based learning at the center of educational reform. They have been reformulating older progressive curriculum concepts to fit into newer theories of cognitive psychology.

In order to redirect the field along the lines of these newer developments, technology education must move beyond programming that focuses mainly on technical content to more active forms of learning that use technology itself as a way of helping students create meaning for themselves. Technology is a powerful tool to use. As Resnick (1989) suggested, the acquisition of knowledge cannot be separate from the context in which it is constructed, used, and reconstructed. In a technology-driven world, technology education has a potentially large contextual role. However, with few exceptions (Raizen et al., 1995), the profession has not demonstrated that it is even aware of the potential for creating a curricular framework grounded in contemporary learning theory based on technological activity. To build such a framework, however, would move the field away from more utilitarian uses of the subject.

Activity also has utilitarian value, and this is the second unresolved issue. Technological educators have not yet arrived at a consensus on how best to treat the utility value of the subject. As previously discussed, the technical/utilitarian curriculum design pattern was widely used among industrial arts teachers, and it continues to be used by technology education teachers (Clark, 1989). But there is no clear accompanying educational rationale for technical activities that speaks coherently to public concern over employment and work issues.

Industrial arts educators developed the concept of "prevocational education" to convey to the educational public its utilitarian worth. Students would acquire general "skills" that would equip them to move on to more specialized training and schooling. Nevertheless, industrial arts educators continued to struggle with the inconsistency of trying to provide "general" education for specific ends in a shop class that itself was organized around a single subject area, such as metal or woodworking. One strategy in the 1960s and 1970s was to align the subject with the competency-based movement promoted by the proponents of efficiency. This would at least convey objectives in a form that the educational public understood. Technology educators today, however, face a more complicated task.

The new essentialists place high value on the utilitarian, indeed, the vocational value of instruction, but it is the academic subjects that are perceived as being of most worth on the job market. While the cold war crusaders of the 1950s and 1960s argued that more rigorous instruction in science and mathematics was needed in order to beat the Russians, today the new essentialists argue that more rigorous academic preparation is required to counter the Japanese and Germans in the war of global economic competition. As suggested earlier, the appeal of Tech Prep is precisely because it is couched in academic preparation terms. Technological activity is put to use for the learning of academic subject matter. In the case of technology education, on the other hand, the focus has been on technology itself, and it is not clear what the utilitarian value of the subject is, at least in terms clear to the new essentialists. It is perhaps important to note, for example, that the report *A Nation at Risk* (National Commission on Excellence in Education, 1983) and the *Goals for 2000* campaign (U.S. Department of Education, 1991) make no mention of objectives that can be closely identified with the *study of* technology itself.

The reluctance of the profession to come to terms with the technical skill development value of activities has made it difficult to coherently address public concerns over job preparation and employment issues. There is nothing inherently wrong with the idea that technology education can contribute to the preparation of students for work by helping to develop marketable skills. The challenge is for the profession to figure out how this can be done while still working within the pedagogical framework of technology education.

There has probably been too much wishful thinking about how technology education can function as an academic discipline or general educational subject for college-bound youth, and not enough critical thinking about how the subject can interface at both the secondary and community college levels with programs that prepare students for work. How does technology education, for example, interact with vocational education and Tech Prep? What contribution can it make to school-to-work transition programs? And how does it feed into industrial technology programs at both the community college and college levels? These questions have not been pursued sufficiently to establish for technology education a primary place within the cluster of programs preparing youth for work. To say that technology education has not sufficiently come to terms with the utilitarian value of the subject field, however, is not to say that this should be the only, or even the most important, objective of instruction.

REEMERGENCE OF THE PROGRESSIVE IMPULSE

If there is one thing that technology education has been consistent about during its short sojourn on the educational stage it is in emphasizing the nonutilitarian, social dimensions of technology. To a probably even greater extent than the early industrial arts educators who identified with the progressives, technology education supporters consistently reference the educational importance of the human, social, cultural, political, and economic dimensions of technology (American Industrial Arts Association, 1985; Savage & Sterry, 1990). The literature is full of discussion on how technology impacts the social structure, conditions how people live and work, extends human potential, shapes values, and affects the environment. Yet there is little evidence to suggest that the field has moved very far from its own technocratic roots. Social concerns generally are not translated clearly into program elements.

Whereas the progressives conceived of the study of technology as emancipatory, that is, as a means of empowering individuals as well as transforming society, technology educators primarily view an understanding of the social dimensions of technology as a means of better using technology and adapting to its influence. Technology educators study the social dimensions of technology in order to establish a context within which the technocratic aspects are taught and applied, and not to challenge its unbridled use, probe its destructive aspects, or discuss issues of equity, economic justice, or quality of life, as the early progressives proposed.

The progressive movement was fractured following the conservative attacks in the 1950s and 1960s, and never regained its collective influence on American education. Following the demise of the cold war, there has been a reemergence of the progressive impulse in the form of critical pedagogy, although the movement continues to be attacked by the new essentialists because it is "liberal." In the tradition of the progressives, critical pedagogy (or critical theory) contends that if there is any hope of regenerating society, schools themselves have to be transformed by empowering individuals to directly confront and critically examine issues of opportunity, equality, justice, work, and democracy (Girioux, 1988; Kincheloe, 1995; McLaren, 1994; Simon, 1992). Critical pedagogy values technology education to the extent that it is emancipatory and empowers individuals to chart their own work lives by examining assumptions about technology and society, work preparation, and work relationships, and by assisting individuals in defining and building a democratic work culture. Critical pedagogy, however, does not support a technology education that is highly technocratic in substance and undergirded by a rationale of efficiency.

Technology educators generally have not grasped the fact that they often speak with mixed signals. Emphasizing the importance of the social dimensions of technology on the level of program rationale seemingly puts the subject field into the curricular camp of the critical theorists, at least in the eyes of the new essentialists with their emphasis on outcomes-based education. From their point of view, such emphasis makes the subject pedagogically suspect. To the new essentialists, the social dimensions of technology are of little or no importance in the drive for greater academic efficiency. At the same time, the inability to clearly translate social concerns operationally into emancipatory instructional practices limits the appeal of the subject to critical theorists. As a result, technology education has been marginalized by both sides in the continuing struggle between the conservatives and liberals over possession of the soul of the public school.

THE ECLIPSE OF PURPOSE

School subjects only continue to occupy a significant curricular niche if they serve what is perceived by the educational public as a distinct and important educational purpose. Early industrial arts educators grappled with the task of defining the movement in terms of the major educational issues of the day, and they attempted to reformulate programs to conform to dominate curricular themes. In the divisive and fragmented educational climate of the 1950s, 1960s, and 1970s, however, they were only partly successful. They also struggled to accommodate technological change in program design.

Technology education emerged at a time when the programming assumptions sustaining industrial arts education were being eclipsed by a conservative pedagogical climate that de-emphasized social objectives and emphasized a return to the basics, more vigorous academic preparation, fewer electives, and a reduction in public financial support. The academic preparation of college-bound youth became the primary focus of secondary education. Technology education, however, has not been able to articulate a program purpose that addresses mainstream educational issues or gains the wide support of the new essentialists or the educational public. The profession has not formulated program designs that appeal widely either to educational liberals or conservatives. To be sure, the subject has largely replaced industrial arts in name, but it has not succeeded in capturing a secure place within the secondary school curriculum. It may be that technology education, like its predecessor, is in danger of becoming eclipsed in purpose.

LOOKING TO THE FUTURE

We live in a time of contentious educational debate. The role of public institutions is being challenged by significant economic, social, and political developments. The very form of public education is being questioned. Technology education will continue to face formidable challenges. In order to survive, the subject field will have to clearly convey its educational purpose, but in terms that relate to the issues of the day. The field will also have to relate its own programming more closely to the major curriculum perspectives embedded in public debate over the purpose, substance, and form of public education.

Since the 1980s, the essentialists have controlled national debate over public education. Academic rigor and "back to the basics" have been promoted in the name of improving the nation's relative ability to compete in the international economic arena. A separate subject curriculum comprised of essential academic studies, traditional teaching methods, testing, and behavioral psychology has been emphasized. Technology education, however, has not linked up with the reform thrust embodied within the conservative agenda of the 1980s. It has remained captive to its own preoccupations with an increasingly obsolescent curriculum perspective, one that has also proved ineffective in addressing the curricular dimensions of technology. Only recently has technology education sought to accommodate an essentialist position. By doing so, the subject field can no doubt gain greater public support over the short term.

A more crucial and long-term challenge is to resolve issues over the instructional use of activity. Technology education has yet to capitalize on its potential effectiveness as an interdisciplinary, activity-based subject that engages students in meaningful learning through contextualized instruction. It has yet to make full use of activity as a curricular framework for bringing together the learning of abstract knowledge with its purposeful application. At the same time, considerable professional ambivalence exists concerning the utilitarian uses of activity. The field has yet to determine the instructional uses that it wants to promote and how these best can be rationalized in the context of prevailing and competing concepts of curriculum construction. Until these uncertainties are addressed, technology education will not be able to build fully from what is probably its most important curricular contribution as a field grounded in activity.

The educational battles of the 1980s tended to undermine confidence in public education and accentuate a process of fragmentation already underway. The curriculum battles fought in the 1980s are still continuing. Whether or not technology education will play a significant future educational role depends in part on events external to the field. But unless the profession can address the curricular challenges that it faces, its future role probably will depend on events outside of its control.

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