Editor's Pages
Making Technology a Major School Curriculum — Part 2

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An earlier statement on this topic (Streichler, 2002) took a provocative stance. It remains a matter of critical importance to all technology professionals (including engineers) and their organizations, all professionals in education, persons in business, industry, and government, and other concerned citizens. Since that first statement was published, ideas continued to be generated in support of the rationale and for implementation strategies. It was thought that these would be useful to respond to readers' inquiries or challenges.

Surprisingly, another very meaningful use for these ideas surfaced in the form of an invitation to give the keynote address at the New York State Technology Education Association's 41st Annual Conference this coming spring. The ideas being collected and the material in the first statement are strikingly appropriate to the conference theme: "Technology Education: A Core Subject." Thus far it has been pleasing to consider that the stimulating, challenging, and motivating ideas will be included in a presentation that will attempt to include uplifting and positive notions about the listeners' chosen profession and about themselves.

These ideas are offered as a sort of preview of a provocative and challenging issue. Obviously, they are not in the final presentation format and they provide more information than is likely to be in that presentation. The reader is invited to come along on this "trial run" for the keynote address. While this material can stand alone, some readers may wish to read the 2002 first statement. Also, even for those who have read it, revisiting *Technically Speaking: Why All Americans Need to Know About Technology* (Pearson & Young, 2002) will provide a meaningful context for what follows here.

The Importance of Technology Studies

That technology is an important school subject is partly confirmed by recent activities of engineering educators. Creighton (2002) described a number of "innovative" programs that engineering schools have gotten underway to get kids excited about engineering. This is only part of a much broader involvement in the lower schools by engineers.

The foregoing, an aspect of technology instruction and engineering's interest, represents recognition of the need to include technology experiences in the curriculum. Other components of technology could have been used to make the preceding point, but *engineering* is intentionally used as a device to capture the readers' attention and more will be said in this article about that technique.

Regardless of why the term has been used, it is emphasized that engineering is but one important component of the much broader kindergarten through college technology curriculum.

No Go?

Technology educators may be tempted to bask in the glow of recent impressive accomplishments and accept small successes of programs in some school systems and states while being resigned to the field's current status in many other states and school districts. Such an attitude may ensure that technology will never assume its rightful place in the majority of school offerings. In fact, that attitude may contribute to an unhealthy erosion of the progress the field has made.

In considering a militant and vigorous campaign to achieve the status that technology deserves, some may respond that this is not the time in the current socioeconomic and geopolitical scene in the United States. Ideas, charged words, and slogans may be invoked to justify inaction such as unemployment, outsourcing, dependency on foreign talent, dearth of citizens preparing for the scientific and technology professions, increasing productivity with minimum job creation, a presidential election campaign, national security needs, and the war on terrorism. Some or all could be used to rationalize the status quo for the technology curriculum.

Go!

The position here is much to the contrary. The circumstances that those words and phrases suggest may indeed be the foundation and rationale for:

- a militant, self-confident, dynamic posture for the technology curriculum and those who deliver it;
- assuming leadership in research and curriculum studies that deal with the issue of

inclusion of all subjects at all levels;

• making the case that technology studies makes a vital contribution to meeting human and societal needs and matters of national necessity at least equal to that achieved by the other so-called basic subject fields;

• taking the lead in an effort to revolutionize the entire public school curriculum, the college entrance examinations, and college entrance requirements; and

• asserting the leadership and professional skills that exist in state, regional, and national professional organizations, particularly as these issues are in their self-interest. (The International Technology Education Association has demonstrated considerable effectiveness in dealing with issues as discussed here in the past several years.)

Several steps need to be taken to get the job done, but before these are discussed, it is helpful to consider the forces that have influenced the current position of technology instruction in today's schools.

Changing the Playing Field

It is not an oversimplification that today's school curriculum has not changed much in the past 100 years. If that comment raises eyebrows, what will be the reaction to the notion that the 100-year-old curriculum of the lower schools, particularly of the high schools, echoes curriculum concepts out of the middle ages?

In itself, old is not bad, but this static, slow to change condition has profoundly resulted in stifling, rigid, unresponsive college entrance requirements, which in turn drive the curricula of the lower schools.

In part, that explains the existence of English (or language arts), mathematics, science, and social studies, sometimes referred to as "the Big Four," as the dominating elements of the existing curriculum.

Clearly, there is much to be done to change the situation. But first, it is helpful to consider the forces that have influenced the current position of the technology curriculum in today's schools.

Curriculum kings (barriers to curriculum reform) are persons who currently influence the curriculum and who technology educators must be able to identify. To a degree greater than they deserve, these are persons who have achieved success in one or more elements of the Big Four and believe that everyone ought to be required

to experience it in the manner they had and ought to achieve the same level of success. So, when they become leaders in higher education or in school districts, or in other venues in society (such as politics), their values are invoked and are extremely difficult to change.

Influential universities, entrance requirements, and the college boards have positions and values that make them curriculum kings (dictators?) of a sort, but with an interesting twist. These folks fail to recognize that although the lower schools remain wed to the Big Four as a consequence of their dictates, the offerings of the nation's higher education institutions themselves evidence an impressive array of options. Many of these institutions now inventory courses and programs, and use names for colleges and departments that better respond to the changing nature of knowledge, technology, and the needs of society. The irony unfortunately is that a corresponding flexibility has not resulted, except perhaps at the community college level, in college entrance requirements. There seems to be no disposition to diminish the emphasis on the Big Four or to introduce alternatives to them for high school graduation, college entrance requirements, and the content of standardized college entrance examinations.

Can technology educators be their own worst enemies? Consider the effects upon fellow professionals from other disciplines when technology teachers engage in forms of promotion about their students' work and accomplishments. While pride in what they are doing with students is justified, is it possible that the way the promotion is done achieves just the opposite of what is intended? Might not fellow professionals who are comfortable about their subjects and place in the school curriculum wonder why that crowd in technology needs to engage in that sort of promotion? Consider, also, the possible negative effects when:

• the technology literature unintentionally promotes the difference between "academics" and technology subjects. Might persons outside the field then conclude that technology is inferior?

• it is proudly announced that technology helps students to succeed in mathematics and science. Do persons outside the field conclude that technology is only a helping experience and not a subject that should enjoy equal status with mathematics and science?

• technology educators exhibit "supplicant behavior." Throughout the discipline's history,

and particularly in the current period of budget cuts and threats of program elimination, a great deal of time, energy, and effort is spent justifying the existence of technology offerings. What impression does that make when contrasted with the behavior of professionals who populate the Big Four whose status and stature precludes such behavior and who have rarely, if ever, needed to plead to have their subject recognized and respected?

A Think Tank (Can a Good Idea Come from USA Political Parties?)

There is a constellation of ongoing good works and efforts to improve and secure the place of technology subjects in the schools. Most are conventional in nature. Here are some thoughts and approaches that may be less conventional, but equally effective, in achieving the important goal.

George Lakoff (as cited in Powell, 2003) tells us that the Republicans have two think tanks and the Democrats have responded with one of their own. In part, they draw upon such disciplines as linguistics, cognitive science, and the neurosciences, in addition to political science.

A think tank for technology ought not be unthinkable. It could draw upon those same disciplines within an overlay of other education disciplines. It goes without saying that it should be supported by the broadest possible consortium of the professional associations devoted to technology education in all its manifestations— general and occupational education, from kindergarten through postdoctoral levels. Its overall purpose would be to establish technology in the schools as envisioned here and could undertake to:

1. Work with university programs to focus at least some of the research of technology PhD programs on:

• instructional techniques and curriculum organization for effective learning in shorter time (results may tell that technology can take an equal place in the curriculum with the other basics included in the Big Four);

• the efficacy, relevancy of the curriculum of the lower and higher schools in today's society (likely to be a lifelong challenge to technology education researchers);

• the efficacy of the existing curriculum array; and

• the effects of "selling" technology experiences as motivators for learning mathematics, science, and other subjects upon the image we wish to project.

No doubt some of these items will require longitudinal studies and, most desirably, research teams should include nationally known curriculum theorists.

2. Identify the most effective language (terms, slogans, concepts) that could be used to gain the acceptance of the public, political, and educational decision makers. For example, Republicans have effectively imprinted the notion of tax "relief" in the minds of most voters. With think tank help, they have concluded that the word *relief* denotes that there is a sort of an ailment that needs to be cured or remedied. Such notions, effectively communicated, become difficult to dislodge from a person's mind, and to do that it would take an equally effective and (emotional) concept. Aha…could that be the reason that *engineering* was used in preceding paragraphs of this statement? And if it worked, what would it take to make the term *technology* as or more attractive? So, the think tank could undertake considerations of the terms and concepts that technology educators would use to communicate the message about the importance oftechnology.

3. Formulate and deliver training. Effective use of language is only one of the possible aids that could come out of the think tank that would also translate its findings into training and strategies that deal with such items as:

• technology education and academics— what's the message when these terms are used?

• providing aid to state, regional, national professional organization leaders in proper and effective:
  ✦ use language and terms;
  ✦ ways to deal with bureaucrats and politicians (how to lobby effectively?); and
  ✦ packaging and use of data and reports.

4. And, finally, the findings coming out of the think tank could well provide the proper and effective language to promote what "Leaders on Leadership," (2003) reports about M. James Bensen's use of the term *myth*. Successful organizations and movements have an underlying myth. This term is not used negatively. It connotes such things about an organization or of a curriculum movement, as in the case of technology, the purpose, the good, the benefits, the glow of the products. A think tank entity could provide advice to all members of the profession, from individual classroom teachers to professional organization leaders, on proper and effective behaviors and techniques:

• to make the case for technology or when technology offerings come under threat of

reduction or extinction.
• that avoid the role of supplicant because such a role may confirm for decision makers that technology is inferior to the basic courses with which technology strives for equal status?
• to communicate that technology instruction:
  ✦ manifests one of the most effective learning environments in the schools;
  ✦ includes subject matter that responds to the nation's and individual needs;
  ✦ maintains student interest to a high degree;
  ✦ provides effective exploratory, problem-solving, and creativity experiences;
  ✦ accentuates activity learning that effectively promotes content mastery;
  ✦ achieves extraordinarily positive effects on students;
  ✦ has highly motivating to students;
  ✦ as one of the historically first to adapt and apply activity, continues to accentuate activity in an affective manner while encouraging creativity, problem solving and mastery of content knowledge and technological capabilities and skills;
  ✦ is by its very nature a totally relevant subject (several ways to look at that); and
  ✦ uses methods, historically original and unique, that other disciplines have adopted and adapted.

5. What are the things that can be embedded in the minds of citizens, politicians, and education bureaucrats and will work toward the establishment of the technology curriculum? Could it be *all* that good stuff enumerated above

communicated within a theme with the following "charged" terms or concepts?
  • Technology studies responds to a national need.
  • Technology studies is equal to the other basics (Big Four?) such as social studies, mathematics, science, and English.
  • Technology studies articulates to higher education programs in business, engineering, architecture, design, environmental studies, biotechnology, computer science, and technology in the same way, for example, that social studies articulates with higher education disciplines and majors as political science, sociology, psychology, government, and foreign affairs.
  • Technology studies helps meet the United States' need for engineers and scientists and:
    ✦ reduces need to import talent;
    ✦ helps the nation to maintain its high rate of productivity in the global competitive market; and
    ✦ plays a critical role in ensuring that all citizens understand the effects upon them and society of technology and technological change.

Members of the technology profession, particularly those responsible for delivering the program in the lower schools, are inheritors of a good doctrine of which they should be justly proud. With fellow technology professionals from other venues, and hopefully with the aid of the preceding ideas and suggestions, they will gain proper acceptance of their programs. And when that occurs, the citizens and the nation will benefit greatly and the school day will be much enriched for all.

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