Editorial

The Educational Technology is Technology Education Manifesto

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Technology education (Tech Ed) is equal to educational technology (Ed Tech). The deception of difference can no longer be sustained. The emperor of technology education and the emperor of educational technology have no clothes. Without the dress of technobabble – stripped naked – technology education and educational technology, for all intents and purposes, are the same. It is time to recognize in theory what is true in practice. It is time to stop the accusations and whining; it is time to put down the swords and shields. This is *not* a call to arms; this is a call to action. This is a manifesto for a new politics, where Ed Tech is Tech Ed.

Can the masses, who believe that educational technology is equal to technology education, be so ignorant and so wrong? Must we continue to concede to what we believe is false? Must the International Technology Education Association (ITEA) and the International Society for Technology in Education (ISTE) continue attempts to fool the masses? Must a falsification be fabricated to destroy our idol? No! Can we not believe that technology education and educational technology are equal? Can we not hold this belief in our idol and at the same time know it is the truth? Yes! The end of deception will bring the end of concession for the masses; and the end of concession will bring the end of distinction between the ITEA and ISTE (the associations).

And so it shall be demonstrated, for once and for all: Ed Tech (ET) is Tech Ed (TE). Upon this demonstration, the masses will be vindicated, the agnostics converted, and the associations impugned. I come to speak truth to power – as a witness. I have witnessed the resemblance. I have practiced the uniformity. And I come to tell you it is good for the masses and it is good for the associations. I am not here to preach to the converted. I am here to tell you that you are free to believe what you hold to be self-evident: TE and ET as one.

Some of the ITEA among us have come to see ET as an evil replicant, rising out of the ashes of the failed audiovisual revolution, like a charred, virtual

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phoenix. Some among us have come to see ET as a bad, threatening imposter, and regard the harmless, little face of the monster with contempt. Some of the ISTE among us have come to see TE as a lumbering old golem, suspicious for its new suit assembled from pieces during the failed post-industrial revolution.

Some among us have come to see this TE golem as foolish and mindless, and regard the weary face of the monster with scorn. Some among us accept these monstrous configurations and hold ET to be the head and TE to be the hands. They await the arts or humanities to deliver the heart, the moderator between the head and hands. But I tell you, these arts, these humanities – this prophet – of the heart are as false as the associations' construction of the monsters! There are not two monsters: there is but one. ET is TE.

In the beginning…

In the beginning, we can all confess, there was industrial education (IE) and audiovisual education (AV). They were different. IE, a legitimate school subject by the 1920s, was formed out of a concern for the working classes and the new industrial technologies. The intent was to provide working class children, mostly boys in those days, with knowledge, skills, and values necessary to surviving the effects of industrialization. The intent was industriousness, as Karen Zuga (1994) noted, or "industrial intelligence," the precursor to technological literacy. AV, a legitimate teacher education subject by the 1920s, was formed out of the new mass communication technologies in education, namely cinema and radio. The intent was to provide teachers, mostly women in those days, with knowledge, skills, and values necessary to adopting the new audiovisual technologies in the classroom. Note that IE was a subject with school workshops dedicated to instruction and AV was a subject with university laboratories dedicated to instruction.

Fast forward to the 1950s and 1960s. A series of polemical indictments of schooling published in the mid to late 1950s championed disciplinary knowledge, such as Bestor's *Educational Wastelands* and *The Restoration of Learning* and Vice Admiral Hyman Rickover's *Education and Freedom*. The disciplines of technology education and educational technology were born at this time and matured throughout the 1960s. TE, still called IE (Canada and the US) or craft, design, and technology (Britain) expanded to include systematic instruction in technology, including the new analog and digital electronic technologies. Many a teacher in IE instructed her or his high school students in digital logic and built stereos and personal computers during the 1970s. ET, still called AV, expanded to include systematic instruction in technology including programmed instruction, teaching machines and the new analog electronic technologies. AV expanded to acquire space in the schools for instruction in the late 1960s, mainly in the form of television studios. Many a teacher in AV, come ET by the late 1970s, instructed her or his university students how to use the new AV equipment and program personal computers. Note that in the late 1960s and 1970s, IE was a subject with school electronics laboratories and workshops dedicated to instruction and ET was a university subject with a

number of television studios in the schools for programming and production (Petrina, 1998, 2002).

The microcomputer innovations of the late 1970s and 1980s changed all of this. By the early 1990s, it was evident that the cultural changes underway were not merely about microcomputers. Instead, the changes were expansive, suggesting to analysts nothing less that a revolution – a digital technology revolution. The operative word was no longer computer; the operative word was *technology*. The digital technology revolution, marked by convergences, altered the identities of IE and AV for good. It blurred the distinctions.

Apple II computers were introduced into the schools during the late 1970s and early 1980s in Canada and the US. The early adopters were lone adopters, teachers in electronics, mathematics, and science. By the early to mid 1980s, computer laboratories were assembled in the high schools, and courses were offered in computer science. In many schools, typewriter labs were transformed into computer labs. During this time, educational technologists became technology educators as they shifted their interests from AV to computer literacy in the schools. The courses in computer science were generally taught by business, electronics and math teachers who privileged the use and programming of computers over its cultural aspects – they privileged applications over implications. For many who taught the course, computer educator Annette Wright (1980) noted, the stress was "on the technical and mechanistic aspects of computers, to the detriment of their sociological aspects – privacy, security, convenience, learning modes and problem solving" (p. 8). As historian Doug Noble (1984a, 1984b) pointed out, computer literacy, like others such as technological literacy, was linked tightly to the economic needs of the computer vendors and the state (Petrina, 2001).

Industrial educators responded to the microcomputer revolution with a change in bath water, although some would dispense with baby, bath water, and all. Course innovations were made with the new digital technologies of interest. For example, I bought two Apple computers for my high school drafting course in 1984, effecting a small transformation of the curriculum from board drafting to computer aided design (Petrina, 2003). During this time, industrial educators became technology educators as they shifted their interests from industry to technological literacy in the schools. Most associations for IE changed their monikers to TE during the mid 1980s in Canada and the US. Like computer literacy, technological literacy was constructed in the early 1980s as industrialists, the media, and politicians in the US lamented the loss of competitive advantages in labor-intensive industries. The IE come TE teachers, like their AV come ET come TE teachers, privileged the use of technology over its cultural aspects – they privileged applications over implications. But for many IE come TE teachers, the ET come TE teachers usurped their enrollments and jurisdiction. Many IE come TE teachers lamented the increasing conflation of technology with computers and argued, *ad nauseum*, that technology was not just computers.

At the same time, Seymour Papert, LEGO, and LOGO happened. We could actually say that Papert single-handedly brought TE and ET together during the mid 1980s. But we won't. Instead, we will recognize that Papert and his MIT Media Lab colleagues, such as Sherry Turkle, were not interested in the divisions between TE and ET – it was all E in and about T. Papert and his MIT team developed an interface between Apple IIs and a bunch of LEGO compatible motors, creating robots that could be programmed to manipulate LEGO building block sets. In their philosophy of "constructionism," the Media Lab integrated motor skill manipulation with cognitive manipulation, design and building with computers. Of course, what they did was effectively merge TE with ET. They did their work in the elementary schools, the place where there is no time to differentiate between TE and ET – TE and ET are the same (Brand, 1987, pp. 119-130; Papert, 1980). By the 1990s, LEGO-LOGO was all the rage, and continues to be an indispensable part of the TE = ET equation. The rest is history, but there is more.

If identities were blurred during the early and mid 1980s, by the early to mid 1990s, distinct identities for TE and ET were nonexistent. Differences were unrecognizable. A TE lab looked and functioned basically like an ET lab. Practices were nearly identical in each locale, even if the tools were different. To make matters worse, the practice in computer science, or computer studies, in the schools was changed to information technology. Rarely in the schools these days, except in the most specialized of instances, does one refer to computer courses as computer science. Information technology (IT), or information and communication technology (ICT), is the name of the game today. During the 1980s, course titles in TE were changed to communication technology (CT) or IT. By the mid 1990s, about two thirds of ET was IT or ICT, and about one third of TE was IT, ICT or CT.

As if this was not enough of a convergence, something else happened. The masses began to refer to ET as TE, understandably enough. The revolution was about technology, not merely computers. Dissatisfied with the connotation of ET as AV, ET began to refer to itself as TE. And dissatisfied with the narrow connotation of computer literacy, ET began to advocate technology literacy. These were power moves, and this is the stuff that makes our tasks as analysts necessary.

Currently, the ITEA is promoting its standards for "technological literacy" and ISTE is promoting its standards for "technology literacy." In one glance or one sustained study, it is readily apparent that both are the same. One may be a subset of the other, but they are cut from the same cloth. Now, twenty years after the dawn of the microcomputer revolution, the identities of TE and ET are indistinct. There is no definition that will alter this. Both TE and ET were on the move during the last twenty years. And the movement was toward convergence. Both TE and ET have shifted from a discourse of use and utility (i.e., technology is a tool to be used) to a discourse of engagement (i.e., technology is a subject to be studied). The movement was from the mere technocratic use of technology toward the study of technology as a social force

and product. This is the momentum, albeit against long traditions of ET and TE and other areas of education, such as the arts, where technology is seen as a mere tool (Petrina, 2002, 2003). This is also a movement that is counter to the naïve notion that technology ought to be integrated and not studied as a separate subject (Bryson, Petrina, Braundy, and de Castell, in press).

At this moment, both the National Teachers Association (NEA) and the American Federation of Teachers (AFT), representing the masses of teachers, conflate TE with ET. The Mid-continent Research for Education and Learning group (McREL), that publishes *Content Knowledge*, the most exhaustive compendium of standards in the world, see no difference between TE and ET standards. The masses are correct. The convergence has happened. TE = ET. Those of the ITEA among us may complain that teachers in ET classrooms are not doing IT right. Those of the ISTE among us may complain that teachers in TE classrooms are not doing IT right. Whine as they might, the convergence has happened.[1]

The Associations and the Masses

The convergence does not sit well with the ITEA and ISTE. After twenty years of defining TE and ET against each other, after twenty years of witnessing the convergence erode away the definitions of distinction, the associations continue to persuade the masses that their beliefs are wrong. After twenty years, the associations continue to fail! The masses know what has been true for some time. Recall that in the mid 1990s, the ITEA carried this message to the masses:

> Technology education is different from instructional technology, also called educational technology. Educational technology, which involves using technological developments, such as computers, audio-visual equipment, and mass media to aid in teaching all subjects, is concerned with creating the optimum teaching and learning environment through the use of technology. Technology education is a school subject designed to develop technological literacy, while educational technology is used as a tool to enhance teaching and learning. (ITEA, 1996, p. 27)

ET was a monster, said the ITEA, a bad imposter! The ITEA tried an old trick: isolate one discipline (or culture) in time and define it in terms of stability, and isolate another and define it in terms of change and progress. ET, as we noted, was never merely "a tool to enhance teaching and learning." ET has been on the move, just as TE. ET, like TE, is a culture and practice that cannot be locked in time.

More recently, the associations themselves converged for a time, once again, to take their message to the masses. Understandably, the masses did not

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[1] For NEA and TE, see (http://www.nea.org/technology/). For AFT and TE, see (http://www.aft.org/esea/downloads/qatech.pdf). For McREL and TE, see (http://www.mcrel.org/compendium/browse.asp).

change their beliefs in the mid 1990s. In fact, the masses witnessed the
convergence of ET and TE. They would not be persuaded by a mere definition!
"There is much confusion today when attempting to understand the differences
between technology education and educational technology," the associations
asserted. "Both are important components of education; however, the confusion
harms both fields of study" (Dugger and Naik, 2001, p. 31). Surely, the masses
are not so easily confused! There was, in fact, no confusion! There was no
confusion because the masses were not foolish! They believed what they
witnessed. The two spokesmen for the associations continued:

> Unfortunately, there is major confusion between technology education and
> educational technology. Many times superintendents, principals, curriculum
> development specialists, and others simply do not know the differences
> between technology education and educational technology. This is unfortunate
> since those responsible for administering education in the states and localities
> around the country are ignorant about two major areas of education. It is
> unfortunate that they confuse how to use technology with technology
> education. Without proper knowledge about important areas in education,
> confusion will cause even more misconceptions and lack of understanding in
> the future. (Dugger and Naik, 2001, p. 35)

But to call the masses "ignorant" is foolhardy! To try and reconvert the
converted is futile! Do not believe what you see, they tell us. Believe the
associations, they insist, for the mere existence of two separate associations is
proof that TE is not ET. Yet, their proof is no proof at all. The emperors of TE
and ET have no clothes!

The associations insist, once again, that definitions – denotations – prevail
over observations – connotations. They give us definitions; they cite the liturgy:

> **Technology education** (sometimes referred to as technological studies) is "a
> study of technology which provides an opportunity for students to learn about
> the processes and knowledge related to technology that are needed to solve
> problems and extend human potential" (ITEA, 2000, p. 242)…. Educational
> technology is sometimes referred to as instructional technology or
> informational technology. A very careful analysis of words and terms related
> to educational technology gives one a better understanding of the differences
> between it and technology education.
> **Educational technology** is concerned with technology <u>in</u> education. It is
> involved in the <u>use</u> of technology as a "tool" to enhance the teaching and
> learning process across all subject areas. (Dugger and Naik, 2001, p. 32)

But we believe our observations. We believe what we see in practice, not
their definitions. And we see that TE is ET. We see that in the schools, ET has
danced around, calling their practices IT. We see that TE has danced around,
calling their practices IT and CT. We see that ET is IT and TE is IT. We see
that IT is IT and ET is TE.

We see the students in the schools using the computers in the TE labs. We see the range of information and communication technologies in TE: cameras, CD and DVD burners, MIDI, networks, plotters, printers, projectors, robots, scanners, servers, and speakers, for example. We see the students in TE animating virtual worlds, creating web sites, programming LEGO robots, publishing e-zines, giving presentations, managing spreadsheets, and configuring networks. We walk into ET labs and see the same activities and the same technologies. We see the problem and project based learning in ET that characterized TE for a century. We see the resemblance in practice and know it to be the same. We have witnessed the convergence.

We cannot – we will not – be persuaded by the doublespeak of the associations. The associations insist that the masses do a "very careful analysis of words and terms." They want us to believe only *their* words and terms. They do not want us to believe what we see in practice. But we believe the reality of what we see in practice! We see the same goals, objectives and standards in TE and ET. We see the intent of the ITEA's and ISTE's standards to be the same, even when they tell us they are different. We see that the ITEA's "technological literacy" is the same as ISTE's "technology literacy," even though we are told they are different. We see the organizers for the ITEA's standards for technological literacy to be the same as the ISTE's standards for technology literacy (ISTE, 2000; ITEA, 1996, 2000) (Table 1).

Granted, ET may be a subset of TE; the Standards for Technological literacy cover a fairly comprehensive range of technologies that include the information technologies. But when it comes down to IT, TE and ET teachers are technology teachers. They are the same. They use the same infrastructures and tools (e.g., labs, cameras, computers), pursue the same goals (e.g., technology or technological literacy) and conduct the same practices (e.g., design. problem solving, projects). So, the masses are not foolish, as the associations make them out to be.

In teacher education, TE educators are ET educators, or instructional designers as well. Any boundaries that once existed between TE and ET have eroded in the universities as well as the schools. For example, in the US, "TE" professors who teach communication technology courses necessarily practice TE and ET at the same time. Most, if not all, of TE's digital technology practices (e.g., animation, digital portfolios, graphics) in CT are the same practices found in ET. In my own practice at the University of British Columbia, distinctions between TE and ET are unnecessary. My students and I practice what my ET colleagues practice: IT, ICT, digital design, digital portfolios, digital videos, on-line learning, Web-CT and etcetera. I present, publish and write in TE and ET journals. Last year, I published a major history of ET, and this year will publish a history of TE (Petrina, 2002; Petrina and Dalley, in press). The history yet to be written is the history of convergence,

Table 1
The Technological Literacy Organizers of ITEA and ISTE

ITEA Organizers	ISTE Organizers
• Technological Concepts and Principles	• Basic Operations and Concepts
• Technological Design • Developing and Producing Technological Systems • Utilizing and Managing Technological Systems	• Technology Communications Tools • Technology Productivity Tools • Technology Problem Solving and Decision Making Tools
• Linkages • Nature and History of Technology • Assessing the Impacts and Consequences of Technological Systems	• Technology Research Tools • Social, Ethical, and Human Issues

such as I sketched out in the previous section. I find more and more TE colleagues attending ISTE conferences and the like. It is unnecessary to distinguish between ET and TE. Technology educators are technology educators and it is time that what is true in practice be recognized in theory!

Rise up for IT!

In theory, the associations continue to tell the masses that ET is not TE. In practice, the masses are unwilling to accept the lines drawn in theory by the associations. Long ago, Max Weber noticed that bureaucracies, such as professional associations, often exist to justify their own existence. So from this perspective, we can see the politics necessary to define TE differently than ET. There are two associations rather than one. The ITEA is wants IT both ways: ITEA made IT a core subject and wants to coexist with ISTE. ISTE wants IT both ways as well: ISTE made IT a core subject and wants to coexist with ITEA. The associations want to do the same thing with IT, but claim that they are doing different things with IT.

The associations are wont to paint over the political conflicts that unfold daily at the grass roots levels of school and teacher education practices. When ET and TE are reduced to IT, effective political strategies are essential. In practice, neither ET nor TE is willing to give IT up to the other. And it is no

wonder. The digital technologies happen to be the hottest, most relevant technologies in the schools these days. Whoever teaches IT, be it TE, ET or business education will harness the tremendous power and resources that IT brings. For example, in 1998, the British Columbia government committed $123 million to spend between 1998 and 2004 in IT and telecommunications networks.

When the Educational Testing Service (ETS) (2002) produced their report on ICT literacy, they did not refer to either ET or TE. They avoided the politics of difference by propping up ICT literacy as an issue of policy and measurement.   As they are wont to do, the ETS recommended large scale assessments of ICT in the US and most countries in the world. Large pools of resources will be forthcoming and any form of technological literacy that does not include a fair component of ICT literacy will be nearly irrelevant. Whoever defines itself against IT will *not* be a player in future technological literacy scenarios. It is time to switch from a politics of difference, which has been practiced with few tangible results over the past twenty years, to a politics of commonalties.

But, the identity of IT is also on the move and under contention. As a field of study, IT is both a sub-discipline of computer science, business management and engineering technology and a school subject (Figure 1). Currently, the *term* "information technology" (not the practices) is losing its currency, as most researchers argue that the new digital technologies extend well beyond information and communication technologies. Digital technologies engage a wide range of actions and senses and are not merely conveyances of information with technology. Digital design is becoming the new term of choice. Digital design focuses on the design of animated and interactive content for the internet, TV, CD, DVD, and other media environments. Digital design signifies the new digital curriculum in the schools, such as animation, computer aided design, web design and digital video.
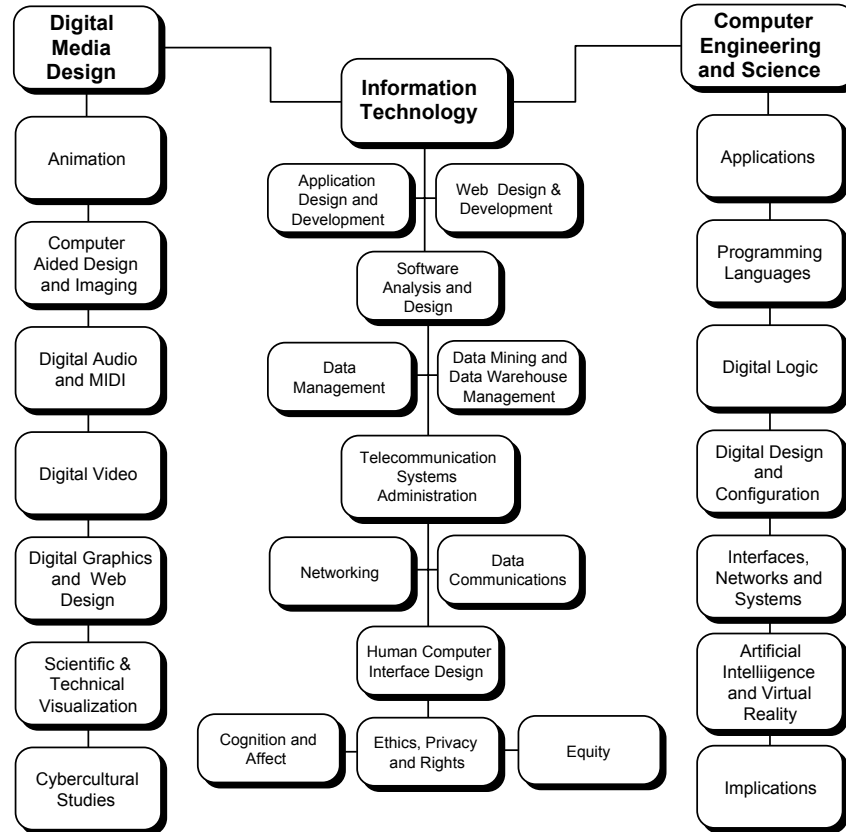
Figure 1. *The Scope of IT*

So now is the time to rise up and take hold of IT. Do not be discouraged by the associations and their accusations that the masses are confused. Rise up for IT and accept no more quibbling about whether IT is TE or ET. The masses know that ET is TE. We do not care to split hairs between the ITEA's technological literacy and ISTE's technology literacy. We will not let the resources and power of IT slip through our hands through a politics of difference. ET is TE. Ed Tech is Tech Ed. We are technology teachers, in one, big unhappy family of technology studies (Petrina, 2003). We are one, united in practice. Divided we fall in policy and theory!

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