

# **Developments in Technology Education in Canada**

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## **Abstract**

*Technology Education in Canadian schools is a disparate collection of curricular approaches and influences. They range from those found in any of the well recognized technology education foundations and practices that have existed in the profession, to lesser organized ad-hoc approaches that infuse ever widening range of technological information, skill development activity, and industrial emulations into any number of subject areas. Although there is non-agreement on how technology should exist in Canadian schools, there is much evidence to indicate that that nature of technology that is in the schools responds to local needs, because long-standing accepting of diversity has made this possible. This article points out the influences that have contributed to non-conformity to any one-technology education formula. It also provides a view of how the curriculum base for technology education has changed and how it co-exists with ever growing ad-hoc technology-type offerings, particularly those related to the growing presence of computers in schools. Lastly, a review of the many technology education variations in Canada provides evidence that the creative endeavors of both technology and non-technology teachers, believing their efforts contribute to the needs of students, are motivated to continually challenge the views of what constitutes a meaningful technology education in an age of rampant technological change.*

## **Historical Foundation**

As some of you may know, there has never been a strong federal presence in promoting a common technology education program as a specific curricular area of study in Canadian k-12 schools and this has been largely due of the non-existence of legislation that would provide for this. The British North of 1867 that separated the powers of Federal and Provincial governments clearly recognized the responsibility for establishing school system as resting with each of the Canadian Provinces (Maton, 2004).

In spite of this, similar curriculum offerings evolved in Canadian schools and by the mid 1960s all Provinces offered similar industrial arts and/or craft type programs. However, when the “technology education movement” surfaced with diverging views on how to best introduce technology into schools, each Province turned to different approaches. Among these, and most notable, were the technology education views of the Canadian pioneer of technology education, Henry Ziel, who precipitated changes in the Province of Alberta schools (Evans, 1998, Fardo, 2005). Although the “Ziel Philosophy” was the focus of much debate, it only influence minor changes in the manner the Province of Prince Edward Island developed their Technology Education Program. The Province of Ontario adapted a British style design-technology program and the American based “Material and Manufacturing” style of technology education became the focus for inclusion in New Brunswick middle schools. The other Provinces were slower in adopting changes. Throughout the 70s and 80s other Provinces generally endorsed the name of Technology Education, or some derivation of it, but continued to offer Industrial Arts programs with minor technological enhancing modification. Those Provinces that had Vocational Education like offering for their senior high schools generally retained their programs.

### **Influences that Promoted Technology Offerings in Schools**

A need to offer more technology to young Canadians, though school activity, became apparent throughout the 80s and the decades that followed. The type of technology, and the manner in which it was incorporated in schools, was largely mitigated by local budgets and the availability of teachers qualified as technology teachers (Hache and Sharpe, 1992). More importantly, and by the mid 1980s, a new movement had

materialized to over shadow the slow changes occurring within the organized Technology Education models that existed in each of the Provinces. Computers, and their allied components, were introduced into school subjects and quickly became perceived as the type of technology most needed, largely underpinned by their rapid growth in all segments of the Canadian economy (Milton, 2005). This emerging trend featured a base for technology activity and a growing information provision and was readily adopted throughout Canada in deference to the ongoing, if not slower, developing curricular areas of Technology Education.

Throughout the 1980s the only consensus that prevailed among Technology Education professionals on how to view this curriculum existed only within Provinces by proponents of Technology Education. Difference and diverse views of how to organize Technology Education continued to be national norm (Sharpe and Hache, 1992). A closer look, however, reveals that two fundamentally different approaches had emerged. On one front were the views that promoted Technology Education as founded in skill attainment, career selection, problem solving with the use of tools and acquire familiarity with technological processes. Not uncommon in the profession at large, these were seen as largely based in industry and rationalized with popular imperatives that the advancing technological economy in Canada required enhanced skill. Chinien, Oaks & Boutine conducted a national survey and queried whether there was consensus on these views among educators (2002). They reported that schools based technological literacy was evident, empowering and rooted in essential skill development needed by any advancing economy. They also indicated that the base for any technology program was not unrelated to technological literacy, and provided a strong rationale for replacing the

traditional Industrial Arts programs with modern Technology Education. However they also noted a “low priority in retraining of teachers for new technology”

On the second front, deployment computers as a learning tool became evident and increasingly regarded as a viable technology-type offering. In 1992 Sharp observed increasing interest in modernizing Technology Education but cautioned that the trend risked “... overemphasizing the use of computer technology in the curriculum, ...”

(Sharpe, 1994). Sharp’s caution had already gripped Canadian view of what constituted technology education as the computer movement continued to grow and impact school.

By the end of the 1990’s Hill and Smith observed that vocational education courses that prepared students for industry were less prominent in secondary schools than they had been in previous decades, but were strengthened in post-secondary schools, both private and public (1998). In another article Hill described a view of constructivism as a vital element for emerging Technology Education programs (1997). Her views also appear to support a de-industrialization type of technological offering that were characteristic of the ad-hoc computer activities continued to thrive in any number of courses in schools where they appeared.

Increasingly, reports appeared to recommend an expansion of technology use in Canadian schools, but few recognized Technology Education as a means to convey the technology (Canadian Education Association, 2001, Industry Canada, 2005). Rather, they recommended creation of incentives for teachers to integrate technology, usually computer learning type of technology. More advisory than prescriptive, and with greater emphasis developing a learning type of technology offering, the reports served to stimulate, if not endorse, the ad-hoc computer based advancement occurring in school

curricula. Industry Canada, and others, would follow-up with the means to develop and distribute resources and information that would become useful for all teachers who wished to integrate technology into their courses. Canadian teachers, themselves became partners in the production of technological information and this featured on many present day Internet sites. The general movement to include computers in all aspects of schooling was readily supported by school administrators who found computers could easily be viewed as a tenable technology offering and an attractive alternative to the Technology Education programs that were typically laden with industrial type equipment and simulations that were often outdated, more expensive to purchase and sustain, and required hard to find qualified teachers to service such programs (Hache, 1996). The result of all of this was greater deployment of computer-based offerings in consort with, or in lieu of, Technology Education programs (Hache, 1997).

### **Provincial Documents and Revitalizing Technology Education**

When looking for an all encompassing definition for the term Technology Education in Canada one can quickly recognize a diversity of needs prevail and need to be accommodated (Hache and Sharpe, 1991, Hache, 1997). Today diversity is the standard for Technology Education as the programs continue to be deployed differently in all Provinces (Yamanski and Savage, 1998). A thorough description of the differences is, however, well beyond the scope of this paper. Nevertheless, the reader is encouraged to review the many programs that exist and explore the differences. To enable this each Province was contacted for current documentation that best describe their offering. As all provide easy-to-access Internet sites that contain information to describe their technology offering.

- Newfoundland and Labrador <http://www.ed.gov.nl.ca/edu/sp/techedu.htm>
- Nova Scotia  
[http://ednet.ns.ca/action.php?sid=865172598&url=http://www.ednet.ns.ca/pdfdocs/outcomes/by\\_subject/tech\\_ed\\_7-9.pdf&action=go&id=1341](http://ednet.ns.ca/action.php?sid=865172598&url=http://www.ednet.ns.ca/pdfdocs/outcomes/by_subject/tech_ed_7-9.pdf&action=go&id=1341)
- Prince Edward Island <http://www.edu.pe.ca/curriculum/elem-march13-02.pdf>
- New Brunswick <http://ltt.nbed.nb.ca/tve.asp>
- Quebec  
[http://www.meq.gouv.qc.ca/DGFJ/dp/programmes\\_etudes/secondaire/technoa.htm](http://www.meq.gouv.qc.ca/DGFJ/dp/programmes_etudes/secondaire/technoa.htm)
- Nunavut [http://www.gov.nu.ca/education/eng/css/progstudies7\\_12.htm](http://www.gov.nu.ca/education/eng/css/progstudies7_12.htm)
- Ontario  
<http://www.edu.gov.on.ca/eng/document/curricul/secondary/techno/techful.html>
- Manitoba <http://www.edu.gov.mb.ca/ks4/cur/teched/>  
<http://www.edu.gov.mb.ca/ks4/docs/support/tfs/>
- Saskatchewan <http://www.sasked.gov.sk.ca/docs/policy/cels/index.html>
- Alberta [http://www.education.gov.ab.ca/k\\_12/curriculum/bySubject/cts/](http://www.education.gov.ab.ca/k_12/curriculum/bySubject/cts/)
- Yukon <http://www.education.gov.yk.ca/general/services.html>
- British Columbia [http://www.bced.gov.bc.ca/irp/tech\\_ed/tetoc.htm](http://www.bced.gov.bc.ca/irp/tech_ed/tetoc.htm)
- Northwest Territories  
[http://www.ece.gov.nt.ca/Divisions/kindergarten\\_g12/indexK12.htm](http://www.ece.gov.nt.ca/Divisions/kindergarten_g12/indexK12.htm)

A review of the information contained in the above show that crafts, industrial art, industrial arts combined with technological education, technological education (design technology), computer technology education, science and technology, technology integration in a host of curricular areas, technology and vocational education hybrid, and vocational type education with technological enhancement continue to exist in Canadian schools.

Also evident in the above information is indication of a movement to establish commonality for a Technology Education offering that could be applied in eastern

Canadian Provinces, defying the long standing practice of maintaining non-similarity (Atlantic Canada Education Foundation, 2005).

### **Non “Technology Education” Technology Offerings In The Curriculum**

The second front described earlier in this article, that which revolves around the introduction of computer and its allied technology in all aspects of curriculum, and at all levels in schools, has largely been integrative in nature (Industry Canada 2003).

Computer technology has appeared in any number of hybrid, ad-hoc and formalized courses. Communications technology, agricultural technology, space technology, technology in music, and a host of others are examples. They have been largely deployed in the form of student activities, projects, guidelines, and general technology related information that can be easily integrated into existing or stand-alone courses. Teacher and student generated home page sites, information bases, and blogs compliment those offered by a host of agencies representing a cross section of Canadian interests. They are readily available to anyone accessing the Internet to profile this movement. Below are a small of the many technology offerings that are utilized in Canadian schools on this ad hoc front. Accessing these will provide ample evidence of the manner that technological information is entering Canadian schools.

- Canada Skills Net <http://www.skillnet.ca/pub/index.html?iin.lang=en>
- Industry Canada School Net <http://www.schoolnet.ca/home/e/help/faq.asp> promotes the effective use of information and communications technologies (ICT) in learning.
- Magnet School Programs in Ontario and British Columbia <http://www.vansd.org/vocweb/magnet.html>
- Canada School Net <http://www.schoolnet.ca/home/e/>

- National Education Portal BELLE  
[http://www.findarticles.com/p/articles/mi\\_m3563/is\\_8\\_17/ai\\_75508078](http://www.findarticles.com/p/articles/mi_m3563/is_8_17/ai_75508078)
- Science and Technology in Ontario  
<http://www.edu.gov.on.ca/eng/document/curricul/scientec/scientec.html>
- CanTech <http://www.canteach.ca/links/linktechdict.html>
- Learning Science and Technology <http://www.fas.org/learn/index.html>
- School net computer and technology information  
[http://www.schoolnet.ca/home/e/resources/browse\\_results.asp?LangID=1&SECTION=0&SUBJECT=16](http://www.schoolnet.ca/home/e/resources/browse_results.asp?LangID=1&SECTION=0&SUBJECT=16)
- Marc Garneau School <http://schools.tdsb.on.ca/marcgarneau/>
- Super Blog Community <http://edublog.infopop.cc/6/ubb.x>
- Industry Canada Collaborative Projects  
<http://www.schoolnet.ca/alasource/e/project.centre/gr2/project-search.asp>
- Media awareness network <http://www.media-awareness.ca/english/index.cfm>
- Technology Education Resources for Teachers  
<http://www.intel.com/ca/education/resource.htm>
- Virtual Teacher Center <http://www.virtualteachercentre.ca/pd/welcome.aspx>
- Typical Elementary School Page <http://www.cdli.ca/CITE/themes.html>
- Learn Canada Professional Development <http://www.learncanada.ca/>

After a review of some of the above links one can easily see that an ability to find, collect, review, and contextualize the information has become the main challenge for teachers who integrate technology in their teaching. But these are not unfamiliar skills for Canadian teachers who have been encouraged by increasing access to professional development, high-speed internet access, computers and allied learning technology, and general popular support, all elements that are even accessible on-line through a number of the above links.

## **Conclusion**

In writing this article, this author recognized that what might constitute a legitimate description of Technology Education in Canada is arguable at best, as it has taken on a number of interpretations and directions in recent years in Canada. He also noted that it is in keeping with the historically pattern of evoking diversity in scholastic matters, largely in direct response to local differences that exist. What was most apparent in the information and programs that were was that continue to be closely tied to local conditions. Older crafts and industrial arts programs are still sustained in communities where there is a perceived need to feature such program while programs that have industry as their central theme thrive in centers in locations where industry dominates the regional economy. Technology Education, its derivatives, and technology entering schools cloaked in computers with all its allied components are also viewed as reflecting the diverse economy that prevails throughout the Canadian landscape. Although Provincial governments provide a basis for technology education that can fit into their setting, they do so differently to allow local interpretations. Computer have made major inroads as the technology of choice in many small communities where formal technology programs had not been previously available or affordable and are even viewed as technology education in many settings. Accordingly they have also grown prominently in urban school, where formal Technology Education programs exist to add strength to these programs and in other subjects that had previously not accessed technology.

Canadian teachers themselves are the agents of technology change in Canada. They have conjured a variety technology-based learning experiences in spite of the barriers they face. Their intuitions have extended the boundaries of what Canadian teachers see as constituting a viable technology education, both in organized curriculum efforts and a

host of ad-hoc applications. In era of rapid expansion of technology teachers have found diversity and decentralization, at the core for all technology, are vital notion when it comes to technology education. In accepting diversity and change they continue to provide more opportunity, for more folks, to do more technological things, in any number of different settings than had previously been the case.

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