Technology Education Issues in British Columbia

by

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Abstract

This paper follows from a qualitative study conducted in 2008 that sought to expose issues in Technology Education curriculum in British Columbia, Canada, as perceived and articulated by Technology Education teachers and their administrators. Although there appears to be persistent Technology Education problems, they lack consistent or province-wide agreement. This paper concludes with recommendations to the community about the purposes of the Technology Education curriculum in the greater context of education and to the Technology Education teachers about uniting toward a common front.

Introduction

Technology Education, or *Tech Ed,* is known by a variety of names even in Canada, e.g. vocational education, industrial arts, trades [and] technology or shop, with each title meant to encompass a variety of trades-related fields. I will be using "Tech Ed" throughout this paper, which is not to be confused with Ed Tech, or computing technologies in education. Tech Ed in B.C. comprises several branches of practical skills-oriented curricula, such as woodworking, drafting and design, metal fabrication, automotive technology, welding, carpentry and joinery, and construction. Some schools also might offer electronics and other specialized courses, such as medieval armoury or small engine mechanics; however, these depend on the initiatives of individual Tech Ed teachers. Having worked with several Tech Ed teachers in the Okanagan valley of British Columbia over the past six years as part of a university-community and program building effort, as well as holding membership in the provincial Technology Educators Association (BCTEA), it became apparent early on there were problems but not being addressed on a broader, regional scale or they remained unresolved for yet-to-discover reasons. I wanted to understand those reasons, to explore concerns to see if they were universal among Tech Ed teachers throughout the province, or if the issues were valid.

To study these issues, I developed a 17-question survey instrument (Appendix A), which is discussed in sections below. If there were systemic problems recurring, then it would be vital to the sustainability of Tech Ed to comprehend such afflictions and to seek solutions. On the other hand, if they were but routine dissatisfactions within education in general, then such findings should benefit Tech Ed teachers and their administrators by exposing the nature of the complaints.

In a preamble to the questionnaire for participants I wrote: "This questionnaire is a beginning step aiming to help determine the critical issues to Tech Ed education. The findings could benefit Tech Ed teachers, administrators, parents, students and policy makers by enabling each of those groups to

attend to the deficiencies and build on the strengths." Also, I wanted to provide a written account of my findings targeting stakeholders–primarily Tech Ed teachers and their administrators, B.C. Ministry of Education officials and parents–to examine concerns, especially substantiated ones, in order to take corrective action.

According to the BCTEA (2008) there are about 600 Tech Ed teachers in B.C. By extrapolation there are at least as many administrators who must be involved with Tech Ed programs in their schools even if only in management roles. Although only four administrators participated in this study, the somewhat surprising revelation was the mere 10% response rate from the Tech Ed teachers themselves. Without a follow up study to determine reasons for non-participation, I can only speculate the majority of Tech Ed teachers and their immediate administrators were a) not aware of the study because they did not hear about it (failure to check emails or, in the case of administrators, the Association website, or were not part of either organization), or b) they did not believe it was worthy of the time to complete the questionnaire (approximately 10 minutes) perhaps resigned to accept their lot as the norm and complaint as a psychological outlet. The former is reasonable given that not all Tech Ed teachers in the province are part of the BCTEA or a Learning Specialist Association, or LSA, in their region (some regions have no LSA organizations) and, apart from word of mouth, they would not have known about the questionnaire. The latter, however, does have merit as a reason for the low participation. In the Central Okanagan, where I have enjoyed some inroads with the Tech Ed teachers and some of the Okanagan College Trades Technology Teacher Education[1] instructors, I emailed the questionnaire to the local LSA and Okanagan College instructors and personally encouraged people to complete it. Nearly 50% of the local Tech Ed teachers and TTTE instructors participated.

[1] The TTTE program is a two-year diploma study that covers the Tech Ed curriculum for the British Columbia Ministry of Education and ladders into the University of British Columbia's Secondary Teacher Education Program - Trades Technology Specialization.

The Questionnaire

The Tech Ed Issues in B.C. questionnaire comprised seventeen "questions" seeking details about participants' background, demographics about teaching and work experience, credentials, perceptions on various socially related interests, and opportunity on most questions to provide feedback, clarification and additional viewpoints. Some participants did add their comments specifically about the questionnaire, voicing political concerns about the study's findings and to what end, or sweeping critique and criticism of some of the questions. In any study examining the perceptions of participants a range of viewpoints is to be expected, including taking to task the investigator. For the benefit of the reader the stated purposes of the study is as follows:

The following questions of this questionnaire seek to clarify the issues [Tech Ed Issues in B.C]:

a) What are the perceptions of Tech Ed teachers, instructors and administrators about Tech Ed?

b) What are the critical issues in Tech Ed and what are some possible solutions?

c) For TTE [Trades Technology Education] instructors, does prior school teaching experience in Tech Ed or school ensure a better-prepared pre-service teacher?

i) What criteria are necessary to determine such a correlation?

Herein lies the political bent of this study: to offer help and clarity of issues for stakeholders, including Tech Ed teachers, to be better informed about community perceptions of Tech Ed and thereby become proactive regarding its future directions and students' school leaving choices.

I added in questions that, at first glance, appear unrelated to Tech Ed. The first six questions were meant to provide background details on the participants in order to discover if there might be possible correlations between personal work details and issues. These questions sought teaching experience, how current assignments were determined, work experience and education. Questions 7-9

were reworded issues raised by various Tech Ed teachers that were told to me over the past six years. I related question #10, "Ways to increase the number of people entering the trades in BC…", to issues in Tech Ed because it, too, was raised by Tech Ed teachers as worthwhile for the government to consider. Question #11 asked outright what the "critical issues in Tech Ed include" followed by #12 asking what their cause or causes were. Questions 13-16 were meant to determine how broadly Tech Ed teachers thought about education, from its purposes or goals, to its effectiveness, and the role of parents and government. My thinking here was there might be a correlation between depth of understanding or perceptions about education in general and Tech Ed issues. The final question, #17, invited participants to add details they thought might be pertinent to be included in the study.

Discussion

Despite the recommendation, among many, of the government initiated Sullivan Report (Sullivan, 1988) two decades ago that upon completion of grade 10 students should "be considered eligible for entry into career programs offered at community colleges, vocational institutes, or authorized private vocational-training institutions in British Columbia (p. 106), the BC Progress Board (Jago, 2006), an independent NGO comprised of business and higher education leaders, queried,

> Despite human resource shortages in trades and technical careers, 2005-2006 statistics show that only 1,910 of approximately 200,000 secondary students are enrolled in "career technical programs."
>
> What barriers prevent students from enrolling in these programs? What initiatives should be undertaken to increase the number of trades and technical students? What groups and/or structures are best positioned to undertake such initiatives? (Question #4, p. 43)

One means of attending to these barriers by the government has been through education and business and/or college partnership programs, such as the Secondary School Apprenticeship program but greatly

altered in the early part of this decade. However, perhaps there is a more fundamental question which continues to be missed, that of educational purposes or goals.

Purposes

There are well-meaning mission statements and even solid-sounding goals, such as, "The ministry is committed to providing a high quality education for K-12 students." (B.C. Ministry of Education, 2008a), or:

> The Ministry's vision is an education system that is measurably the best in Canada. The system's mission or mandate is set out in the School Act:
>
> The purpose of the British Columbia school system is to enable all learners to develop their individual potential and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy, democratic and pluralistic society and a prosperous and sustainable economy. (B.C. Ministry of Education, 2008b)

A more current update of the purposes of education in BC can be found in the Honourable George Abbott's (B.C. Ministry of Education, 2011) circular in which he states:

> Our Government continues to focus on ensuring all children receive a high quality education in British Columbia. As the world around us continues to change in the 21st century, the way we educate our children must be flexible and reflect those changes. We are committed to a public education system that will be tailored to the unique needs and interests of every child so that B.C.'s students will be prepared to compete in a world-wide job market.
>
> …
>
> We need a system in B.C. that aligns with the needs of students, parents, and teachers—one that gives students the skills they need to participate in a knowledge-based society, while also

allowing them to explore an educational path that is best suited to their interests, their capabilities, and their chosen future.

I am deliberately using the term "purpose" here to mean reason for being rather than "goal," which implies a terminal point, or multiple terminal points, in a premeditated, ideal direction. Public education has goals, obviously, and these are determined by their correlation to the underlying purpose(s). If education in B.C. truly is to function most optimally as a system, not just in literacy and numeracy or science and problem solving, then decision makers will need to reassess how educational purposes might better align with the form those purposes should take and the necessary infrastructure to ensure their achievement. Thus, there needs to be congruity between what I call the three systemic clusters of Purposes, Form or Design and Infrastructure (Després, 2008b, 2008c). "Systemic clusters" refers to groupings of most related components or elements

As an example of what I mean by the degree of congruity between systemic clusters, the Ministry of Education's vision will continue to be handicapped by its own shortcomings in ensuring adequate resources (infrastructure) in order to achieve its mandate. Despite the BC Progress Board Report (Jago, 2006), which encouraged the provincial government to follow through on its mandates, the government, baldly grandstanding about increased funding to education, reduced funding to school districts which left them scrambling to ensure proper education for its students (see Beresford & Fussell, 2009; Kilian, 2009; Malcolmson, 2007; B.C. Ministry of Education, 2008d, 2007). Whether due to poor planning or deliberate undermining, the disconnect between the Ministry's education mandate and its actions leaves one to wonder just how serious and realistic it is about "meeting the challenge of change" (B.C. Ministry of Education, 2008c). The Ministry states: "The [education] system must build upon the successes it has achieved today in order to meet tomorrow's challenges. The Ministry must set and communicate clear expectations for the education system, ensure resources

are focused where they are most needed, monitor progress, and continue to seek ways of making schools better" (*ibid*). The inadequate and inconsistent government action on its own mandates, evidenced by the impromptu and seeming *ad hoc* cuts in funding and lack of a long term education vision, will not help B.C.'s adolescents especially in an increasingly competitive, global economy (see Macdonald & Hursh, 2006, re the political and economic decision making that thwarts educational goals). This in turn will have a negative social and economic impact. It is a seeming common political rhetoric transcending borders and cultures. Indeed, MacDonald and Hursh claim, "It takes schooling to be primarily a political and economic project, not an educational enterprise" (p. 3).

The BC Progress Board report (Jago, 2006) notes, despite recent curricular additions such as the Accelerated Enrollment in Industry Training (ACE IT) program, "[i]n the almost two decades since the completion of the Royal Commission Report, as the majority of respondents for this study agreed, trades training has been in retreat in British Columbia's high schools" (p. 25). Of course the question remains about the purposes of Tech Ed. Is it training? Is it a holdover from bygone days reluctantly maintained depending on the administrative decision makers at any given time in any given school? Is it merely "fluff" added on to the curriculum along with music, art, drama and other not-so-academic additions to the core (read serious and more worthy) subject areas, as tends to be the perception of the affected teachers?

When I asked in the questionnaire for participants' views on the purposes of education (question 13), a variety of responses indicated to me that in general they are not understood clearly among stakeholders, nor can it be said that they truly represent the majority desires of at least the sub-culture of Tech Ed. The many opinions about what constitutes educational purposes speaks to the divide between what is declared (Ministry of Education Vision and Mission) and what people perceive especially when the declared fails to delineate how and in what form those purposes will be achieved.

As it is the majority of participants in this study agreed with one of the possible selections for the question, “preparation for life and work.” Other comments ranged from utilitarian, such as, “to generate decent, moral, hard working taxpaying citizens that contribute to our society as we know it”, to criticism, such as, “This question begs many others and panders to a lowest common denominator mentality. Of course it's different for different students.” If the majority of stakeholders do not appropriate a state’s purposes of education, one has to wonder about the rationale for the bureaucratic choice. It is also beneficial to comprehend the grand culture’s perceptions of educational purposes, the topic of another study.

Survey Questions

This section will examine some of the pertinent questions in depth as germane to the discussion about Tech Ed issues. Some of the questions sought general information with the view in mind that the details would provide additional insights into those issues. For example, in questions one through six, I wanted to uncover the background experience and any special credentials of participants in order to see if there were discrepancies or convergences between the demands of their teaching job and their training background. Indeed, what one might expect as vital experience for teaching in and how one is hired specifically for Tech Ed seem opposing concepts. As an example, there were four respondents with drafting experience (or perhaps participants forgot to mention it?); yet, there are more drafting programs being taught than experienced or credentialed people. The same is true for metalwork and electronics. As one participant said,

> [Tech Ed classes] are so watered down by mixed levels being taught by teachers that don't know what they are doing. EG [sic], myself being hired as an electronics teacher even though I was an electrician. I knew very little about electronics. I teach drafting and have never been trained in it. Hire carpenters to teach carpentry. Hire mechinests [sic] to teach new machiniests [sic].

> Hire inivative [sic] well rounded people (knowledge in electronics, metal, auto etc) to teach technology education. (Després, 2008a)

Indeed, there does appear to be some correlation between educational attainment, credentials and experience, and the participants' current teaching role, albeit not strong or direct. A way to combat against any such credential deficiencies is to establish an adequate bridging program admitting experienced trades people and prepares them in the Tech Ed curricular areas. This is, in fact, what the British Columbia Institute of Technology (BCIT) and Okanagan College (OC) have in place, OC being the most recent technology college to offer such a program in B.C. However, what has been told to me and evident in some of the responses in the questionnaire was that school districts, which turn over local decision-making to school administrators about hires, allow people who lack proper credentials to fill positions, an activity evidently condoned by the British Columbia Teachers Federation (BCTF).

Question 7 sought participants' opinions about background credentials and experience related to Tech Ed teaching. Thirty-nine respondents—about 61%— thought college instructors in a Tech Ed stream program, whether at BCIT or OC, ought to have prior teaching experience in school and/or certification, whether instructor training or a Bachelor of Education degree. Clearly the majority—52 respondents, or 81%—indicated these college instructors ought to have some teaching experience either in a Tech Ed program or at least in secondary schools. Comments that backed such a large-scale belief included, "it takes one to know one," "The importance for the instructors to have some public school experience cannot be overstated as that can provide invaluable insights into the reality of day to day teaching/working in a public school," "Prior teaching in a school setting would provide invaluable insight for a more complete preparing of any pre-service Technology teacher. However, exceptional circumstances or unique abilities would possibly mitigate this expectation and still make a TTE [Trades Technology Education] instructor a valuable trainer." Other comments noted the difficulty or

complexity of demanding prior experience and the differences between teaching secondary students compared to college level students. What is missing is literature on whether there is a correlation between college instruction effectiveness and Tech Ed or secondary education experience. It is unclear, in other words, that Tech Ed teachers are more effective because of prior teaching experience—Tech Ed or secondary school—of their TTE instructors.

In question 9 I sought participants' thoughts on how best to ensure a ready supply of Tech Ed teachers to fill open positions throughout the province. Thirty-eight per cent agreed the government should provide some kind of financial incentives "for enticing trades people to get into a TTE program." Nearly 36% commented under "Other" that included suggestions such as "pay for past experiences," more attractive starting salaries, advertising, "improve facilities and teaching conditions," "Create a culture in the school system that does not look down upon tech ed." On a similar tone as the last comment, one participant argued:

> Ensure the shops and programs meet certain criteria that will ensure the success of the teacher and the program that he/she is in charge of running…[The government] also removed tech. ed. as a middle school requirement and also as a high school requirement.1.We need infrastructure. At our school we are teaching automotive in a room with no bay door. That's like teaching foods without a kitchen. 2. From my experience tech. ed. in the high schools and middle schools is a low priority item. The school board's accountability agenda speaks only to math and literacy. 3. Funding. I don't know whose idea it was to put 1000's of laptops in the hands of kids but I think it was Bill Gates…4. The gov't promotes the trades but not at the high school shop level. Over the last ten years traditional shop settings have been usurped by computer "technology"…To summarize: This district has moved away from traditional tech. ed. in favor of "technology" in the school and towards dual credit trades programs out of

> the school. The gov't throws money at anyone who will dream up solutions to problems. Our district solved them in the above way. Tech ed teachers were left out of the solutions. I wouldn't mind so much if tech. ed. in the school was well taken care of but it's not a high enough priority. (Després, 2008a)

Another individual offered:

> You have qualified tech ed teachers leaving teaching field as we speak because of the poor wages for and political climate around teaching. What the government needs to do is reduce class size, give teachers more prep time and wages that reflect the amount of education, skills and time that teachers invest in the profession. A Second or third year carpentry apprentice now makes as much or more than a fully certified high school teacher with 5 years experience or less. The only carpenters that you will be able to attract with the above insentives are those that have to leave industry because of an injury, industry downturn or a poor skill set. (Després, 2008a)

In these two responses we can hear the frustration of Tech Ed teachers caught between policy makers and being enabled to practice professional autonomy in the best interest of a quality Tech Ed program. The responses also speak to the next question about how to increase the number of entrants into trades and apprenticeships.

Presumably by increasing emphasis on Tech Ed in the school system along with the benefits to high school leavers, students would have a better idea of options and possibilities for career choices. But emphasizing a program's benefits and features are only as effective as the marketing skills and campaigning strategies of the Tech Ed teachers will permit. Parents appear disinterested in their children learning a trade much less in becoming a tradesperson, which compounds the problem of maintaining, let alone increasing, the integrity of the Tech Ed curriculum in BC schools. Core curriculum—math, English and sciences—dominate the timetable and help sway people to believe

academics is the more lucrative or honourable pathway to success in life. Governments as well as community members can alter this perception by becoming more informed about the lifetime benefits of learning a trade regardless of whether or not one continues on to post-secondary education and to proactively support it. A dual "pathway" integrating both the academics and Tech Ed is possible and apparently effective according to at least one writer (Hoachlander, 2008). Several participants offered this latter point. Question 10 was a related one—"Ways to increase the number of people entering the trades in BC…"—and garnered responses that both included government and community participation in policy and practical changes, and receiving credits for Tech Ed for university entrance.

Forty-six respondents in question 11 believed the critical issues in BC were mostly about funding, which is ultimately a government problem. How best to tackle this issue remains unresolved and more so in the current state of financial woes. Of near high importance—38 respondents each—was the belief that post-secondary preparation dominated the high school agenda or that Tech Ed courses tended to be a "dumping grounds" for administrators looking for ways to ensure students had enough high school leaving credits regardless of these students having prior credits in Tech Ed. Twenty-five participants believed "shop design and/or equipment" demanded attention and another 25 thought there were "not enough Tech Ed teachers," something which could be changed by increasing Tech Ed teachers' salaries and increasing public attention to Tech Ed to entice experienced and credentialed teacher prospects. Five respondents specifically commented the class sizes were too large either for safety or for effective instruction, including the addition of children with high needs and Certified Educational Assistants. That latter point presents its own subset of issues in that these CEAs lack the training of Tech Ed teachers. Hence, safety and quality of the curricular outcomes for students are severely hampered or compromised.

Other issues mentioned were variations on the main ones cited or involved larger, cultural shifts about Tech Ed and trades, and one comment about "lack of cohesiveness amongst practitioners of Tech Ed." If the main issues in Tech Ed, as perceived by the practitioners, are to be resolved or at least moved to the place of dialogue between parties, then there needs to be a concerted effort by a concerned majority. Part of the difficulty of resolving issues is determining the source or root of the problem, which is the purpose of question 12.

According to question 12, the communicated issues in Tech Ed in the province were seen primarily to be "due to" government (32 respondents) and "an unsympathetic, uninformed or apathetic community or society" (30 respondents). Comments about the government had to do with inadequate funding and promotion of Tech Ed, "Grad Requirements," "crowded curriculum," or "lack of real commitment or support." Participants viewed community or society with near equal suspicion eliciting such comments as:

> Most parents think there [sic] child should go to university. Our society need [sic] to look at how we value the trades person. I do believe Europeans place as much value in a master trades person as an educated person with a degree. We have to change the way society thinks about the trades, as all people are important to a well developed and functioning society.

> It seemed that for years parents all felt that success for their kids would only come with a university degree. Our system is geared for 20% or so of the kids that go onto post-sec (of which 12% will finish); what are we doing for the 80% that don't go to post-sec??

> Informing the community is mostly our job. Societal needs dictate educational requirements.Inform your community of what you have to offer and how you can help them get

> where they are going. Don't expect sympathy period, but especially if you do nothing to promote your own area and don't work hard at making sure you provide a quality outcome.
>
> …poor understanding of what we can do for our students and the role of tech ed in schools. (Després, 2008a)

Individual comments included students—"Too many of the high school students are simply not accountable"—or to programming: "competion [sic] with increasing number of elective courses, along with what I see as lowering standards for graduation." Twenty-two participants thought administrators were partially or wholly to blame, which included feedback such as lack of commitment or understanding of the Tech Ed program and possibilities, which in turn tended to leave the perception of uncaring and/or uninformed managers. Nineteen participants admitted "Tech Ed teachers themselves" were the cause citing such reasons as:

> We're not proactive, we would rather work on cars, build homes, etc.; and not being professional educators
>
> Informing the community is mostly our job. Societal needs dictate educational requirements. Inform your community of what you have to offer and how you can help them get where they are going. Don't expect sympathy period, but especially if you do nothing to promote your own area and don't work hard at making sure you provide a quality outcome. (Després, 2008a)

Indirectly related to the issue parents and community, question 16 sought participants' comments about whether they believed "that parents participate adequately in the education of their children." Thirty-three disagreed citing such reasons as:

Canadian parents believe that schools are doing a good job because they, for the most part, came through the same system their children are presently in. Ignorance is ruling the day.

True, parents have become more involved in their children's schools; however, by and large most parents are ignorant in how to help their children succeed or even what is best for them.

With most families having 2 working parents, kids are more on their own than ever. Most parents do not understand the political function within the school, grad requirements, the pac, the spc, etc. I find myself more and more teaching life skills that should be taught at home.

Many parents unaware of what their children are doing at school. Many [are] unaware of the opportunities available during high school for their children to pursue.

In many cases I feel the parents just expect us to babysit their kids for them. Hands off approach from Grade 8 on.

I think that our society is part of the problem is the way we view blue collar workers. We hold academics at a higher value. We are also missing out in teaching trades basic skills in grade 7 and eight and educating students at that young age about trades and technology. I am finding that many grade 10 students lack the basic hand skills that you would see previously at the grade 8 and 9 levels. I personally like the streaming system from Europe. First you are a tradesman, then a professional. We also need higher education to give some credit to those who have completed trades and want to continue their education. (Després, 2008a)

As a balance perhaps, but equally a rallying call to teachers, one respondent claimed, “I don't believe any parent wakes up in the morning determined to do a bad job of parenting their kids. Of course it would make our lives a lot easier if every kid behaved, listened and learned exactly as instructed, but they don't, for a variety of reasons, not just because they have uninvolved parents. It takes all of us working together to raise kids. If you think parents need to be more involved, then involve them.” However, that is a far easier challenge than reality given the demands on parents by work, materialistic desires and global changes.

Question 13 asks for participants’ perception of the purposes of K-12 education. A majority of participants agreed it is the “preparation for life and work,” which is a paraphrase of the Ministry of Education’s main purpose statement on its homepage of the Ministry website. Additional responses included “babysitting,” exposure to “the widest ranges of experiences possible” and “to give young people the skills to become lifelong learners” and become responsible, contributing citizens.

The rationale behind this question was to discover if Tech Ed teachers might have a more hands-on view of the purposes of education. From the responses it is clear they have similar perceptions of purposes as their teaching peers (Després, 2003), which primarily is preparation for work. If Tech Ed programs have something different to offer in the education of young people, there were no examples offered.

At the same time, 38 respondents in question 14 disagreed “that school adequately prepares adolescents for life and/or work” (17 agree it was). I interpret this to mean that according to these participants, school could both do more and be more for children given the social responsibilities ascribed to the system of education. Some of the more poignant comments include:

> We do a great job of filling students with facts, but miss the mark regarding knowledge and wisdom.

> School is geared around preparing students for university.
>
> …not enough focus on meaningful subjects. I feel we try to prepare the majority of kids for a university /college path using ethereal courses like calculus
>
> I find that many students are inadequately prepared for college or university. They don't seem to learn the organizational and discipline skills that are required at a higher level of education. On the other hand, much of what they learn in high school will never be used. It is more about life skills rather than using the specific things they learn
>
> As society changes so must education to meet society's needs. Changes may occur in a variety of forms but the most important one is to keep education as current as possible so it can meet society's demands.
>
> The unrealistic perception that all students will go on to be high end professionals, and the artificial academic push by the academic institutions rob many students of real life opportunities and careers. (Després, 2008a)

Following up on question 14, the next question asked if participants believed that "government performs adequately in its responsibilities to education." Forty-nine respondents disagreed while nine agreed commenting:

> Inadequate funding, administration with little or no education experience, focusing too much on university/college and not enough on the majority of the student population to help prepare them for work/trades, etc.
>
> …reading and writing are still the main focus of education, govt. very slow to move.
>
> Our government looks at the dollars and cents of education and cares less about the development of students as contributing citizens. (Després, 2008a)

It is understandable perhaps that there tends to be a negative reaction to governments and their education system. After all, being in control of the policy-making and purse strings does seem to lend itself to hierarchical strongholds and limited collaborations. In this sense of the bigger picture of curriculum, Tech Ed is no different than most others. Perhaps the difficult "pill to swallow" is that Tech Ed, although providing an introduction to hands-on work, does not enjoy the royal priviledging offered to those core curricula of English, math and science, or the current pendular fads of numeracy and literacy. Were governments and communities to reexamine the potential of the role of Tech Ed in the lives of most school children, perhaps society in general would reap even greater benefits.

Conclusions

I had hoped for a larger sample upon which to discuss the main purpose of this study, which was to uncover the critical issues in Tech Ed in B.C. Only about ten percent responded of the nearly 600 Tech Ed teachers in B.C.. Four administrators participated, no superintendents or assistant superintendents responded (despite a request to the executive office of their association that the questionnaire plus proposal be hosted on their website or emailed to their membership), and only six out of a total of 17 college instructors of (Trades) Technology Teacher Education programs at BCIT and OC participated. The low return causes me to wonder that if the questionnaire just did not invite high interest for whatever personal reasons, then any Tech Ed plight or issues become weakened by virtue of lack of consensus and political will.

Regarding the low response rate from the contact groups, what is to be said? One of the uncontrollable variables in this study was the means of contact and representation. The BCTEA does not represent all Tech Ed teachers across the province, for example. Membership is a choice. Not all school districts in the province have Tech Ed LSA groups where local members are able to meet,

discuss, plan or encourage one another. The BCTEA and a couple of LSA groups graciously agreed to send an electronic copy of the questionnaire to their members.

Although the low number of participants puts severe limitations on the findings, it need not dampen the effect. Again, recall in the purposes for this study I declared the "findings could benefit Tech Ed teachers, administrators, parents, students and policy makers by enabling each of those groups to attend to the deficiencies and build on the strengths" (Després, 2008a). Even with the limited and varied responses, I anticipate more discussions will take place. I also hope more stakeholders, including government, would become better attuned to the dilemmas in schooling coupled with job issues, and how the education system in B.C. could be improved even further. But that demands more than dialogue and political rhetoric.

Tech Ed in B.C. remains a troubled curriculum. From my work in systemic thinking (Després, 2008b, 2008c), "issues" in Tech Ed have most to do within the systemic cluster of Infrastructure, that is the governance, actions, resources and timelines necessary to implement and sustain the Purposes (mission or goal) and the Form or Design (design, form or setting; see Després, 2008b, 2008c). Meanwhile government appears bootstrapped by lack of long-term vision and substantial means of attaining its mandates, mission or vision. One Ministry of Education offering in Tech Ed–ACE IT–has some beneficial outcomes but is saddled with suspicion by Tech Ed teachers and fraught with issues of practices, such as withheld portions of funding until conditions are met, that will likely hamper progress.

The BC Progress Board report cites a number of problems related to Tech Ed, such as cost sharing between schools and colleges, schools selecting participants for the program who are known successful candidates to ensure funding, and concerns about inadequately trained teachers and poorly designed or outfitted "facilities [that] lead to a wide variation of training standards throughout the

province, raising safety concerns about inadequately trained students entering the workplace" (see Jago, 2006, pp. 26). This also leads into questions about credentials for the instructors of pre-service Tech Ed teachers and the Tech Ed teachers themselves.

Should beginning Tech Ed teachers apprentice after their teacher training with experienced Tech Ed teachers? Should instructors in Tech Ed programs have special certification, training or apprenticeship in schools? Credibility seems to be the important factor in this discussion. Are the instructors capable of and adequately prepared for the incomparable intensity of teaching in woodworking and automotive shops or metal fabrication and small engine mechanics shops where many dangerous objects and tools are being handled by adolescents while managed by a single instructor? Should Tech Ed teachers be paid more for their background, real-world experience as both an incentive and a bonus that would also correspond to higher credentials and education? The BCTF decries merit pay, preferring instead a one-pay-fits-all mantra regardless of effort, training, education or experience, a sore point for those teachers who believe some work deserves higher pay consideration.

Despite such negative issues, Tech Ed teachers adapt as well as can be expected to the near hostile environment in which they work. I say hostile because Tech Ed does not enjoy—indeed, has not enjoyed—an equal acceptance with academic courses either professionally or socially in Canadian society, some regional differences notwithstanding. This is an historical point that would find part of its roots in the establishment of this nation. Tech Ed tends to be impugned by some administrators and rebuffed by a society that places greater emphasis on higher education despite the fact that a large percentage of high school leavers do not go on to higher education. In a New York Times article, the author claims:

> The imperative of the last 20 years to round up every warm body and send it to college, then to

> the cubicle, was tied to a vision of the future in which we somehow take leave of material reality and glide about in a pure information economy.
>
> …But there are also systemic changes in the economy, arising from information technology, that have the surprising effect of making the manual trades — plumbing, electrical work, car repair — more attractive as careers. The Princeton economist Alan Blinder argues that the crucial distinction in the emerging labor market is not between those with more or less education, but between those whose services can be delivered over a wire and those who must do their work in person or on site. The latter will find their livelihoods more secure against outsourcing to distant countries. As Blinder puts it, "You can't hammer a nail over the Internet."
>
> …One shop teacher suggested to me that "in schools, we create artificial learning environments for our children that they know to be contrived and undeserving of their full attention and engagement. Without the opportunity to learn through the hands, the world remains abstract and distant, and the passions for learning will not be engaged." (Crawford, 2009)

The BC Progress Board report states, "improving opportunities for trades and technical education throughout the province should be a government priority of the highest order. Such an effort will probably involve rethinking what we expect of secondary education and loosening the influence universities exercise over the contents of the high school curriculum" (p. 26). Government and education decision makers and the public might do well to consider the following:

1) Rethink K-12 education as preparation for post-secondary institution entrance. The privileging of academic core courses under serves a large group of high school leavers.

2) Make Tech Ed a mandatory portion of the high school leaving program that includes a practical part or apprencticeable credits. This is a workable possibility that could incorporate some of the current academic course offerings.

3) Ensure genuine quality of Tech Ed programs through concerted efforts and consistent high standards. Tech Ed is not for "dummies" and Tech Ed teachers are more than trades people in teacher garb. Actual certified Tech Ed teachers tend to have more "real world" work experience than their teaching peers, and that affords them broader and more tangible connections beyond academics from which students and schools could benefit.

4) If the safety of students in Tech Ed programs is a genuine concern of school districts, and if the government is truly concerned about ensuring an ongoing labour pool of qualified people, then Tech Ed teachers need to be properly trained and recognized for the additional experience they bring to the lives of young people in school. The BC Ministry of Education's *Heads Up for Safety* manual, a subject of another study (Silver, 2009), likewise needs to be reworked to make it current and vital in the Tech Ed program. Because no public statistics are kept regarding the number, frequency or degree of severity of accidents in Tech Ed (ibid.), and because few Tech Ed teachers actually use it, the manual's utility beyond basic safety for machinery and Tech Ed environments of a past era is questionable.

5) Convene meetings with the critical purpose in mind to engage Tech Ed teachers, administrators, industry representatives, government, post-secondary and community members about the issues in Tech Ed as a community matter. Tech Ed teachers, who have been in the field and the majority of whom have industry experience, need a public as well as respected opportunity to share their views of teaching Tech Ed and consideration of their practical solutions. The morale booster alone in the follow up on this point would have a great, positive impact in the schools provided more than lip-service is paid them.

6) Finally, work closer with industry to open creative avenues between Tech Ed and life after schooling. This entails decision-making that is inclusive of industry and business input, educating parents and educators, and marketing a new mindset.

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