Technological Innovation and the Commonplaces of Curriculum

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Resumo: Este artigo descreve um estudo de caso sobre inovação tecnológica, analisada sob a ótica teórica das estruturas curriculares de Schwab/Reid. O Watershed foi um sistema de aprendizado geográfico dirigido a estudantes do ensino médio de uma escola a sudoeste de Ontário, no Canadá. O foco do estudo não é técnico, antes os aspectos políticos e organizacionais surgidos durante sua implantação, os quais levaram ao seu insucesso e desintegração. Mediante o exame dos vários contextos entorno desta inovação e de entrevistas com participantes, o artigo procurou descrever o entendimento sobre as forças que afetaram tal desafio e sugerir algumas lições a serem aprendidas com a experiência.

Palavras-Chave: teoria Schwarb e Reid, sistema de aprendizagem, inovação tecnológica.

Abstract: This paper reports on a case study of technological innovation, analyzed through the theoretical lens of the Schwab/Reid "commonplaces of curriculum." The Watershed was an interactive geographical learning system targeted at secondary school students in southwestern Ontario, Canada. My main focus in this paper is not on the technical aspects of this software system, but on the political and organizational issues it confronted during its introduction, which ultimately led to its failure and disintegration. Through an examination of the various contexts surrounding this innovation, and through interviews with the participants, the paper attempts to draw out some understanding of the forces affecting such endeavors, and to suggest some lessons that can be learned from the experience.

Keywords: Schwab and Reid theory learning system, technological innovation.

1 INTRODUCTION

This paper reports on a case study of technological innovation, analyzed through the theoretical lens of the Schwab/Reid "commonplaces of curriculum." The interactive curriculum system examined here was known at different times as the *Watershed Information System*, *MapConnections*, or *Point of View,* which I will refer to simply as *The Watershed*. My main focus in this paper is not on the technical aspects of this software system, but on the political and organizational issues it confronted during its introduction, which ultimately led to its failure and disintegration.

The Watershed was an interactive geographical learning system targeted at secondary school students in southwestern Ontario, Ca-nada. Among its distinguishing features was the fact that it was *not* another instance of the imposition of government-developed curriculum and technology, as is common in Ontario and elsewhere. Instead, it was privately developed, produced, and promoted. It embodied some genuinely fresh and innovative thinking, both in terms of the technological applications involved, and the context in which they were positioned. Despite such positive qualities, *The Watershed* struggled (and ultimately failed) to define for itself a new space within the Ontario school system. In some ways, the difficulties that beset this technological initiative re-enacted a classic pattern of educational innovation and resistance; in other ways, they highlighted the particular aspects of the social and political context encountered by this effort.

Technology-based innovations like *The Watershed* present important potential for reshaping schools in the twenty-first century. However, such efforts also face a range of complex hurdles, both within their local school contexts and in the larger social and political milieux. In assessing *The Watershed* as a technological innovation I have employed an analytical framework based on the work of Joseph Schwab (see Schwab, Jackson, Westbury, & Wilkof 1978) and developed by William Reid (1992; 1999) and others: the "commonplaces of curriculum." Reid identifies five "common places," which he defines as "generally agreed-upon places where we should search" for clues to understanding curriculum-related phenomena. (REID 1999, p. 202). These are: the teacher, the student, the subject matter, the milieux, and the process of curriculum making. All of these commonplaces have some import for understanding the evolution of *The Watershed*. I will start by situating the system within its various milieux, and then move into the more particular commonplaces from there.

2 THE CONTEXT OF INNOVATION IN ONTARIO

The global milieu in which *The Watershed* arose was shaped by the enormous growth of new digital and educational technologies that began in the late 1970s and continues still, and by the government-backed integration of these new technologies into classroom teaching. Within this milieu, the increase in the use of digital information and communication technologies (ICTs) specifically – computers and their communications networks – has been particularly remarkable (see OTA 1995; Stats. Can. 2002). Growing access to the internet and the World Wide Web has provided an explosion of information resources for teachers and students.

Despite this pattern of growth, however, new technologies are used by many teachers as "just another tool," with little fundamental impact on their basic pedagogical practices (GOODSON & MANGAN 1995; LANKSHEAR 1997; LANKSHEAR & BIGUM 2000). Many educators who use new technologies have not taken full advantage of the possibilities they present for restructuring curriculum and pedagogy. To some extent, Hannafin's observation of fifteen years ago still applies: "Advances in computers and related hardware technologies have far out-stripped prevailing [instructional] design methodologies." (HANNAFIN 1992, p. 49). However, it must also be acknowledged that there is a growing body of theory and practice that incorporates constructivist learning theory and collaborative curriculum designs into technology-rich classroom environments (see KOSCHMANN 1996; ADAMS and HAMM 2006). Canada has been a primary site for some of these developments (see SCARDAMALIA & BEREITER 1996; HARASIM 2002).

Parallel to the growing field of educational ICTs has been a growing policy emphasis on incorporating digital technologies into school curricula, and a corresponding emphasis, at least in some jurisdictions, on integrating curriculum subject areas. To some extent, this may be nothing more than a pendulum swing in curriculum policy and practice, which typically vacillate between creating new subject boundaries and tearing down old ones (GOODSON 1985). It may also, however, reflect a neo-liberal interest in having schools serve more closely the interests of the "real world" of work, in which academic distinctions are seen as largely irrelevant (see GEE, HULL, & LANKSHEAR 1996; ROBERTSON 1998). In Ontario, these parallel trends were highlighted when a mid-1990s Royal Commission reinforced earlier government policy statements and strongly supported both integrated approaches to curriculum and expanded use of information technologies (Ont. RCoL 1995; Ont. Min. of Ed. 1995).

These general trends have survived successive political regimes that have seen all three major Ontario political parties in power over the last twenty years. Having said that, however, it remains the fact that implementation of *The Watershed* may have suffered from bad political timing as much as anything. A stunningly rapid set of reforms was instituted by the Progressive Conservative government of Mike Harris in the latter 1990s, including an

entire new curriculum, re-centralized adminis-tration of economic and organizational deci-sions, and a number of measures designed to reinforce control of teachers' work. These re-forms were considered draconian by many teachers, and were actively resisted in many cases. The result was that throughout the period from 1997 to 2004, Ontario teachers (especially in high schools) were faced with a series of new demands that placed them under enormous stress. As we shall see, this political and organizational context had a great deal to do with the prospects *of The Watershed* as a curricular innovation.

3 THE SOFTWARE APPLICATION AND ITS CURRICULUM CONNECTIONS

The Watershed Information System was inten-ded to be a response to some of the challenges of using digital information and communi-cation technologies in new ways, and of deve-loping curricular activities that would be both integrated and integrative. That is, the concept underpinning its design was the inclusion of activities from a number of different discipli-nes. Paralleling this approach, new curriculum was developed to accompany the technology, designed to encourage students to become involved with their school, their local com-munity, and the rest of the province (and the world) in novel ways.

The Watershed was originally conceived by architect and environmentalist Fred McGarry and his colleagues. It was designed and imple-mented by a team of university professors and researchers, private software developers, business sponsors, and teachers and students in the high schools of the Grand River Water-shed, in and around Cambridge, Ontario. It was designed to challenge not only traditional forms of curriculum and pedagogy, but many traditional educational relationships: relation-ships between schools and their communities; between vendors and consumers; between the producers of information and the end-users; between subject areas within the school; and between teachers and students. The project,

then, did not lack for imagination or forward thinking. However, the scope of innovation that was being attempted subjected the project to unforeseen problems and forms of resistance from many different directions.

Reid's "commonplace" of subject matter provides us with a useful launching pad for discussing the actual content of *The Watershed Information System*. From this vantage point, the fundamental ideas behind the application are seen readily as cross-curricular and integra-tive in nature, but with an emphasis on geogra-phy—a discipline that itself takes pride in inte-grating a variety of sub-disciplinary forms of knowledge (GOODSON 1992). Content was deli-berately designed to offer a wide variety of information that could be indexed and acces-sed by means of an object-oriented "clickable" map of the area in which a participating school was located. The oft-cited metaphor of "map-ping information" was to be taken literally within *The Watershed.* Its multi-layered data-base of economic, demographic, and environ-mental information was hyperlinked to finely detailed digital maps of a given area. Users could point-and-click on various parts of the map to call up information about the natural features, buildings, history, and demographics of the region.

As envisioned by the developers, the edu-cational uses of this layered database would be many and varied. Students could explore local history, genealogy, economic develop-ment, and environmental change. Moreover, the envisaged educational applications of *The Watershed* were not limited to its use as a databank for information "withdrawals." The students were also expected to make important deposits by creating and maintaining the various databases. In other words, the deve-lopers' intention was that the neighborhood databases would be updated and expanded continuously by the users themselves. To a significant extent, this vision was realized during the early implementation of the system as class projects were locally developed. One project, for example, included mapping a lo-cal cemetery. For each headstone, the epitaph

was recorded as text, a video image of the stone was captured, and the precise location was determined using surveying techniques. All of these data were then incorporated into the on-line database. Learning outcomes accrued as a result of this particular project included a greater appreciation of local historical artifacts, as well as presenting students with "real-life" opportunities to apply mathematics, media studies, English, historiography, and computer-science skills (Pollock-Ellwand 1998). Teachers involved with this and similar projects reported such high enthusiasm among students that many worked on *Watershed*-related projects during after-school hours, and even after classes had ended for the summer.

Another important dimension of *The Watershed Information System* was the way it promoted interaction between each participating school and its surrounding community. When fully developed, *Watershed* databases were designed to be accessible to anybody in the community. Individual citizens who wished to research their family history or the context of a heritage building site, for example, would be able to do so by accessing relevant *Watershed* databases from any internet-connected computer. Moreover, existing community resources, such as those produced independently by oral historians or housed within private memorabilia collections, could be incorporated into "neighborhood databases" within the *Watershed* system.

A number of curriculum-development projects were launched concomitantly with software development. These projects were designed deliberately to make explicit, practical bridges between *The Watershed* and the prescribed curriculum of Ontario. Initially, these projects were designed and implemented by volunteer teachers in concert with program developers. As the project began to struggle, the developers hired a professional curriculum consultant to come up with lesson plans explicitly linked to the provincial curriculum.

In addition to technical and curricular initiatives, *The Watershed* had several important and innovative "off-line" aspects to it. For instance, although there was already in existence a list of software approved by the Ministry of Education for use in schools, McGarry and his associates decided not to seek this form of official approval. Instead, they chose to work directly with local schools and teachers to develop curriculum resources to be used with *The Watershed*. Rather than seek provincial subsidies for schools to buy their product, the developers set out to craft "partnerships" between schools and businesses by finding corporate sponsors to pay for the installation of the software within each school. On the one hand, this approach dovetailed nicely with the Conservative government's promotion of private involvement in schools; on the other, it conflicted with that government's initiatives to re-centralize and micro-manage curriculum at the provincial level

Although their approach involved a good deal of extra sales effort on the part of the developers, it reaped some immediate benefits. Not the least among these was the fact that only those teachers and schools that exhibited enthusiasm and commitment to the project became involved in the initiative. This effectively avoided the need to convince reluctant participants to join the effort, or having to deal with their resistance during implementation. To some extent, this approach was successful, especially in the early stages of the project. Demonstrations of the prototype software were held at a number of high schools in the Kitchener-Waterloo-Cambridge area, and several of them, primarily in the smaller, more rural communities of the region, signed on as eager participants.

4 THE COPPER TRUST AND THE ON-LINE ACADEMY

A further innovative aspect of *The Watershed Information System* was that the entire effort was supposed to be financed through a non-profit trust that sponsored an "on-line academy." The Copper Trust was a registered non-profit corporation established by the developers of *The Watershed*. Their intention was that

eventually the development of the software and associated curricular material would be undertaken collectively by the schools who subscribed to the system, via an "On-line Academy" (Point of View 2000). Although the applications were geared to the official Ontario curriculum, there was also a clear intent to replicate the *Watershed* model by building up a corpus of users who would develop and share their own resources outside of the official guidelines and other curriculum documents.

The On-line Academy, other key features of the Copper Trust, and the *Watershed* system in general, could be seen as "counter-hegemonic," as least in comparison with the usual proprietary concerns of private developers and the official education system in Ontario. The contents of the student-built databases were intended to be publicly accessible, and owned in common by all participants through their membership in The Copper Trust. Once the developers accomplished the basic implementation of *The Watershed*, further development was to be conducted by using the telecommunications capabilities of the network to conduct ongoing dialogues and online "town hall" meetings among student and community participants. It was intended that students, teachers, and private users would all have equal input to these discussions. The On-line Academy would also supervise annual awards recognizing "best practices" in using the system. These "academy awards" would be given based on feedback from all participants, and were intended to foster a sense of pride among those involved (Ibid.).

The development and marketing of *The Watershed* thus came close to embodying some of the novel features of the new information economy discussed by web visionaries such as John Perry Barlow (2000). To the extent that the developers expected to profit from bringing the product to market, they saw their income being generated by the initial funding of the project and its sale to schools, supported by corporate donations. Once the system was in place throughout the province (and possibly throughout Canada or even the world), it was

to be turned over to the jointly managed Copper Trust, after which its further growth would be in the hands of its users.

5 THE VISION MEETS THE REALITIES OF SCHOOLING

From the descriptions presented so far, it should be clear that the *Watershed* concept did not lack for vision. Not only was it an innovative software concept, but the entire nexus of relationships around that concept had been rethought: from the way the software was developed and financed, to the ways in which participants were recruited and funded, to the curriculum concepts underlying the project, and on into the kinds of sustaining relationships that were to be encouraged and supported, almost everything about the project had a different slant from more traditional curriculum development efforts. The developers seemed to have faith that this revolutionary approach would allow them to succeed where others before them had had little impact. Unfortunately, however, there were a number of pitfalls awaiting the *Watershed* project, some of which were predictable, some of which were perhaps just bad timing. Ultimately, these pitfalls led to the abandonment of the project. To the extent that it will be remembered at all, its main legacy may be to serve as another example of the confrontation between innovative ideas and the various forms of inertia and resistance within the established school system.

From a research standpoint, it is worth examining the problems that prevented the full realization of the *Watershed* concept, because we may be able to learn something about the prospects for other, similar innovations. The problems facing such innovations include technical problems of hardware and software availability and training; finance; integration with existing curricula; and the organizational pressures of restructuring. In the remainder of the paper, I will examine these influences through the use of interview data collected from some of the participating teachers, as well as other reports from the

developers, and public sources such as newspapers. The names of participating schools and teachers have been replaced by pseudonyms to protect the confidentiality of the informants. In the excerpts from interviews that follow, "Lauren" is a social studies teacher who was working in the small community of "Wexford," while "Denise" was a history and English teacher from the larger town of "Denton." Although I interviewed a number of other teachers and principals, I report only excerpts from these two teachers here, as their quotations accurately summarize the feelings of many other staff.

6 THE TECHNICAL MILIEU

It may not be surprising to educators who are familiar with information technologies to discover that the technical resources required by a project like *The Watershed* often outstripped what was available in schools at the time, especially those in smaller communities:

MM: Did you have the sense that the software required some pretty sophisticated hardware to run? Did it actually require that it has its own computer dedicated to it?

Lauren: I think this computer essentially worked as a server for the program. And because we didn't want to put it on at that time, they were working through the University of Waterloo's computer bank, so I think the computer we had was kind of the intermediary. …. Was it as sophisticated? It was more sophisticated than what we were working with in individual classrooms C not necessarily the computer labs. It was, the stuff above what the school system was having, but you could still use what the school system had to produce the materials. The content. But you had to have this one machine to work with.

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Denise: I've never used it, because it won't go on our school network, and my home computer is not powerful enough to run it without a lot of help from someone else.

MM: So it is a pretty, kind of, demanding piece of software, then?

Denise: Yeah, well, you couldn't put it on the network, and you see, that's what we have, and if it's just on a stand-alone computer, it's not terribly useful for a class.

MM: Right. So, is it meant to run on the local area network, or is it meant to actually use the World Wide Web?

Denise: I think it's meant to – the material you're publishing – is meant to go on the World Wide Web. But you have to have something to work on it, to set up the web pages.

MM: So the hardware and the software never got together while you were at Denton?

Denise: No. Now, we may have individual stand-alones that are powerful enough to run it, but um.., Now I think there's a new map that came out in the final version, which I haven't seen, but the first map took almost an hour to download.

The problems with the map being referred to here involve the fact that, in order to achieve the level of detail envisioned by the developers, simple graphic maps were not enough. Instead, fully digital databases in the format required by Geographical Information Systems (GIS) were required, and these constituted huge files by the standards of most home and school computer systems. It would appear, then, that the developers, who were used to working with powerful systems of their own, overestimated either the level of computing power available in most schools, or their ability to convince corporate and community sponsors to supply the required state-of-the-art equipment. The result was that, as Denise relates, the system never became fully operational at her school.

The other clear impression from these quotations is that the technical details of the software and hardware configurations were only understood by the teachers in a general, indeed a fairly fuzzy, sort of way. Their priorities were in using the software, not installing and

maintaining it, and that is probably as it should be. Unfortunately, since the system was fairly sophisticated, this fuzzy understanding of its requirements may have been another impediment to its full implementation and use.

7 THE FINANCIAL MILIEU

Related to the question of sophisticated hardware and software was the expense involved in the project. As mentioned above, the original concept was that no funding would be required from the provincial Ministry of Education, nor from the local school district. Instead, each school would be partnered with a corporate sponsor, who would presumably reap some good-will publicity from making a contribution in cash or in kind. However, this plan also ran into problems.

MM: Were there corporate sponsors involved, and did they buy hardware as well as the software for the school? Or did you use the school's own computers?

Lauren: At one of these points Wexford had a 75th school anniversary and we made some money, so some money from that was devoted to the computer. Um, computer or software, one of those we never did pay for.... We did have some donations from local corporate sponsors – not a lot I don't think – but I think most of them came from this fundraising that we had. And I'm not exactly sure how that money was disbursed. But we did end up with a dedicated computer which was high-end enough. And we had lots of problems getting the internet connections and whatever, just because the school didn't have them all. So we had to get all that in, too.

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Denise: We had interest and support, but not connected to any money. So I think it all came from our school, but I may be wrong about that.

MM: Really? Oh. So there wasn't a big announcement of a corporate sponsor at some point?

Denise: I think the principal and Fred and several others went around and made various presentations, but I don't think we got a corporate sponsor.

Thus, despite a good deal of rhetoric from the Ontario Ministry of Education about the importance and desirability of such partnerships, neither of these schools was able to locate a sponsor who was actually willing to invest in the project. The developers' slightly maverick attitude may in fact have hurt them here, because it might have been easier to locate such a sponsor with some government help. Whatever the cause, however, the project found itself looking for significant financing in a time when governments were cutting back and consolidating, and when locally-oriented, smaller businesses were reluctant to commit their own funds. It was thus left up to the schools themselves to come up with funding in most cases.

8 THE INSTITUTIONAL MILIEU

Alongside the difficulties in securing financing faced by participating schools, there was a parallel crisis in establishing secure bases of personnel. As described to some extent above, the province had just imposed new curricula for almost every subject at every grade level, and had legislated increased teaching time, and new schemes for guiding and advising students. These new demands were combined with decreases in specialized support staff, amalgamations of school districts, and generally dwindling budgets. The increased burden on teachers led to both massive early retirements and escalating forms of resistance among teachers. As a result, teachers in Ontario generally became more mobile. As older teachers retired, those that remained sought placements that would minimize their extra stress loads. They also became less inclined to experiment, or to participate in efforts to fund-raise, train peers, or develop new lesson plans to take advantage of new technological possibilities. Lauren expressed the ways in

which the technical problems and the other sources of stress came together for teachers in classrooms:

I'm extremely frustrated with how slow the computers got, and the computer programs etc.... And then, we've just been downloaded so much more in the last years, it's difficult to do. I thought, you know, 'Oh, this is great – I can go!' Well, you can't get there that fast.

The situation was described by Denise as follows:

It almost needs a consistent teacher over a number of years, working on ironing out the bugs as you go along. And that again, I think, is increasingly one of the difficulties. I don't know whether that's going to be as possible in the future, in the next few years, as it's been in the past.

The teachers themselves, then, were quite aware of the ways that Ministry restructuring initiatives affected their everyday practice, and the general conditions of their work. Consciously or unconsciously, the developers were also aware of these repercussions. The people who developed the system were aware of the permanent state of tension between teachers and their political masters. That was one of the reasons they chose to work outside of the official regulatory framework, and to take advantage of the scant opportunities remaining for teachers to exercise their discretion and their academic freedom in deciding on curricular tools. We are thus led from our consideration of the various milieux of this innovation back to the everyday realities of the classroom. By looking at the commonplaces of teachers and students, we can see where *The Watershed* achieved some partial successes, despite the many problems it confronted.

9 *THE WATERSHED* IN PRACTICE: STUDENTS AND TEACHERS

From my description of the difficulties which faced this project, it would be easy to assume that the participants found it to always be a source of frustration. The surprising thing is that many felt quite the opposite.

MM: So it sounds like some of these technical problems were a big disappointment. Do you think it was still kind of a learning experience, though?

Denise: Oh yeah.... It was a *really* exciting project. I'm just so glad I got involved with it. It was disappointing that I never got the stuff on the internet, but the bottom line for me was, the kids did some really neat research. Over the three years I was working on it, I think we interviewed – let's see, almost forty people, and those transcripts are stored at the town Archives. And so, it was collaboration with the Archives and the school that really was very beneficial to both. It was exciting to see the involvement of the kids. The first year I did it, there were kids who came in after school to finish working on the school computers, to get the transcripts worked out. I tried to make them realize that they were making a commitment, not only to the school project, but also to people in the community. And they had to finish it.

Lauren at Wexford school had some similar experiences:

MM: One of the one real innovative thrusts of this idea as I understood it was to encourage collaboration across subject areas and so forth. Did that happen in your school, and how?

Lauren: Yeah yeah, you know, it just goes on and on and on and on. One year we did marketing, we had the local blueberry grower come in.... So, they came in, presented their information to my marketing class, my marketing class then took that and they were to create a pamphlet, web pages, information about them. We took that information, gave it to the computing class and they typed it up and they generated pamphlets and information from that. And then this, some of this, was to go into *MapConnections*.... Roy was basically computers, so anytime we had data he inputted it that way. Carolyn ... I think she had the grade eleven media class do the web pages.

Took those web pages to the senior classes and had them peer-edit them.... So lots of integration… Every teacher at Wexford knew about *MapConnections*. They may have not had actual input into it but I know the geography class mapped the working cemetery. You know, we did the pioneer, which was the old one, and geography class used it to map the newer cemetery. Now I don't know how much that got *onto MapConnections* but they did that *because* of *MapConnections*. And the art class got involved in the historical society and built heritage.... So almost every department got involved in some way or was able to be involved.

10 CONCLUSION

During the time of its development and promotion, the developers of *The Watershed* and a few enthusiastic teachers and principals sought to expand the scope of their schools' technological sophistication, as well as the range of their curriculum and the involvement of their students with local communities. But the history of the project demonstrates that this enthusiasm encountered many of the same constraints that have faced other efforts to reform and restructure schooling. There is room for innovation, but there are also powerful forces working to reproduce and reinforce the power relations and institutional arrangements that have been in place for decades. Against this background, there are a number of important lessons that might be learned from the disappointing outcomes of this project.

Perhaps the first and most important lesson is that there are imaginative and creative educators at work who are committed to developing new visions of integrative curriculum employing information and communications technologies. The possibilities presented by projects that incorporate access to comprehensive local databases and global connections by means of new and emerging ICTs are more fruitful than some critics may imagine. Nevertheless, the development of these possibilities and potentials must still take place within school systems that have shown themselves to be remarkably resistant to change at times, and are subject to both old and new constraints.

Scrutinizing the commonplaces of "curriculum making" reveals many familiar, and some not-so-familiar, barriers to genuinely new forms of technology-rich instruction. Among the familiar constraints is funding, which is almost never adequate to satisfy many educators. As the participating teachers pointed out, the lack of funding had many negative effects on the progress of *The Watershed*. The kind of computing power required to maximize the efficacy of a system as complex as *The Watershed* is expensive, and thus was not readily available to many schools — despite the glitter of a few showcase examples eagerly promoted by business and government. The other familiar constraints of infrastructure (internet wiring and lab space, for instance), hardware compatibility, and difficulties of training and maintenance, were only exacerbated by the demands of this high-tech project.

New ICT applications such as *The Watershed* will always encounter complex interactions among the social, political, economic, institutional, and technical milieux that surround public schooling. These milieux often present formidable obstacles to any fundamental change, and can be expected to intrude even where participants are not acutely aware of them. But in an environment in which wholesale restructuring has been imposed by government, the obstacles are heightened. In Ontario at the time of this study, decreased teacher morale, increased rates of retirement and mobility, escalating workloads and wholesale revisions to curriculum conspired to create a milieu that was clearly antagonistic to innovative technological applications. Despite paying lip service to an interest in educational innovation, the Conservative government of the day had other priorities that ranked higher than the promotion of innovative and integrative curriculum.

Perhaps the lesson of *The Watershed* has been that, in at least some cases, the most

important function of innovative applications of technology may lie in their role as catalysts. The fact that they are sometimes able to inspire enthusiasm and commitment where both are waning, that they may be able to re-energize dispirited teachers and catch the imagination of technologically oriented young people, may allow them to catalyze new commitments to liberating forms of learning. Indeed, it is instructive to note that many of the imaginative and non-traditional aspects of *The Watershed* were implemented despite difficulties with the technology and the bureaucracy. Cross-curricular, community-related projects were launched at several schools. Teachers and students expressed enthusiasm and satisfaction with these projects, even if only a few found their way onto the internet for public access.

Somewhat surprisingly then, the most important effects of this technology-based innovation may not have been related directly to the technological application. It may turn out that some of the curricular and pedagogical goals that were designed to accompany the technological innovation were the only things to survive beyond the limited lifespan of the project. But perhaps those "goods" were more important than the technological innovation anyway, and have served a more lasting and constructive purpose than the software package that inspired them.

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