

Research

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The Nature of Instruction and Community in a Virtual High School

by
Scott Tunison

This report is a summary of a Doctoral Dissertation by Scott Tunison, University of Saskatchewan. The virtual school can be seen as education's response to the digital age. This report includes:

- ✓ An overview of the instructional and administrative issues related to the operation of a virtual high school.
- ✓ An overview of the relevant literature.
- ✓ Staff and student perceptions of their experiences with a particular Canadian virtual high school in its early stages of development.
- ✓ Practical and timely advice to school boards that wish to pursue the development of virtual school operations.
- ✓ A discussion of the implications of the findings for administrator and board action, for future research and for school practice.

Research Report #04-02
September 2004

The Nature of Instruction and Community in a Virtual High School

An SSBA Report

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A digital tornado of epic proportions is sweeping across the planet at light speed, transforming everything it touches. It has affected everything by allowing us open access to information. (Thornburg, 2002, p. 6)

The digital tornado referred to above is the proliferation of the computer in our society and, in particular, the incredible spread of the Internet. While public education is often perceived to have been reluctant to keep up with the changes in society spawned by the wide-spread use of computers, the virtual school, in some ways, can be seen as education's response to the digital age.

This report provides an overview of the instructional and administrative issues related to the operation of a virtual high school. In general, it examines a particular Canadian virtual high school in its early stages of development through the lens of the professional learning community as it relates staff and student perceptions of their experiences with this school. It is hoped that this document will provide practical and timely advice to school boards that wish to pursue the development of virtual school operations.

Part I of this report provides an overview of the relevant literature. Part II presents and discusses the findings of the study while Part III provides a discussion of the implications of the findings for administrator and board action, for future research and for school practice.

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INTRODUCTION

The virtual school or cyberschool is a relatively new phenomenon that takes advantage of modern technologies such as computers and the Internet to provide an educational program to students – usually at a distance. Tuttle (1998) defined the virtual school as, “One of a new breed of schools that uses e-mail, on-line chats, Internet resources, and archived resources to teach courses. No classrooms. No lectures. No surprise quizzes. No buses. No buildings” (p. 46). In 1997, Van Horn made the following prediction:

Within the next year or so, one or more virtual schools will come into existence. I nearly said come into existence in the U.S., but, of course, virtual implies “without place”. Like more traditional schools, a virtual school has a curriculum, a faculty, students, maybe an administrator or two, and facilities – except all of these entities lack many attributes with which you are familiar. The curriculum will invite students to inquire. Students, faculty members, and staff members will “plug into school” from locations in school buildings, businesses, homes, churches, or wherever. A class will comprise students who are both local and remote. Indeed, it is likely that groups of students will move about from place to place – an attendance center being defined as a high-speed internet connection. (p. 481)

This prediction has been borne out with the creation of a wide range of virtual school offerings in many languages and in many countries.

Virtual schools have been widely discussed in the educational literature by both supporters (e.g., Kay, 1997; Van Horn, 1997) and detractors (e.g., Postman, 1995; Putnam, 2000) arguing that they are either positive or negative for public education. This document provides a brief summary of the research literature concerning virtual schools and their place within the current framework of national and international public education. It also reports a recent study (Tunison, 2003) which examined a Canadian-based virtual high school from the points of view of both faculty and students. Finally, it provides suggestions and challenges for future practice.

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(Mitchell & Sackney, 2001)

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(Tuttle, 1998)

RELEVANT LITERATURE

“One of the perplexities of education is whether schools as they are currently structured enhance learning or limit it” (Mitchell & Sackney, 2001, p. 1). There are large bodies of research which support either side of this statement. However, a prevailing theme in the literature is that schools are organised to suit the needs of Industrial Age employees rather than Information Age contractors placing education on a crossroads of sorts requiring a change in response to the societal conditions characteristic of the New Economy. Gardiner (2000) observed that “a human being miraculously transported from 1900 to our time would recognise much of what goes on in today’s classroom – the prevalent lecturing, the emphasis on drill, the decontextualised materials and activities” (p. 30). Thus, education is currently structured to transmit short-term knowledge in an environment that encourages and, perhaps, requires students to be passive and uncritical recipients, “[which is] an inappropriate focus for education” (Thornburg, 2002, p. 40). However,

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(Gardner, 2000)

The Internet [and the prevailing attitudes and skills required for success in today’s Information society] puts students in a position of having to deal with integrating information from multiple accounts of a story by different authors who may have different motivations for telling the story and who do not necessarily agree in their accounts ... [therefore] being able to filter and evaluate the variety of kinds of information they will encounter [is crucial]. (Britt & Gabrys, 2001, p. 74)

The quality jobs of the future will belong to ‘symbolic analysts’ – people who solve, identify, and broker problems by manipulating images.

(Thornburg, 2001)

The skills necessary to be able to filter and evaluate information are often referred to as information literacy (Papert, 1993). Information literacy as well as Information Age employment opportunities require students to become not only active participants in their own learning during their school years but also active life-long learners. “The quality jobs of the future will belong to ‘symbolic analysts’ – people who solve, identify, and broker problems by manipulating images” (Thornburg, 2002, p. 32). In fact, “today’s workers need to learn completely different

skills than did their Industrial Age forebears” (p. 32); that is, they must learn how to learn.

Joinson and Buchanan (2001) suggested that the Internet, and consequently the virtual or cyberschool, may be just the environment to develop in students the skills and attitudes being described by other writers as being necessary in contemporary society.

There is the possibility that the Internet does not simply enhance students’ learning, but it might introduce new ways of learning [as well]. For example, Internet technology in learning will change the traditional balance of students’ educational experience, with less emphasis (and time) on reading, and more on practising and doing (p. 238).

In a sense, virtual schools could be seen as public education’s response to the challenges presented by the information age. While it is true that “distance learning broke the personal face-to-face contact which many saw as a vital part of the educational tradition” (Merricks, 2001, p. 8), “over 60 percent of the U.S. economy is involved in the creation and use of information as value-added activities” (Cortada, 2001, p. xxi). consequently, a school alternative which exists as a result of the very technology so common in today’s New Economy appears to be both justifiable and necessary.

Students have always found the need for self-directed or individual instruction that allowed them to have a flexible schedule while still completing formal educational tasks.

WHAT IS A VIRTUAL SCHOOL?

Virtual schools seem to have evolved from the wide variety of distance education initiatives that have been in existence since around 1900 (Papert, 1995). For a variety of reasons, students have always found the need for self-directed or individual instruction that allowed them to have a flexible schedule while still completing formal educational tasks. Correspondence schools, for example, have been providing educational opportunities to students for many years. Thus, the notion of a student working at his or her home (or somewhere other than at the traditional classroom) is not a particularly novel one. As McLean pointed out, “cyberschools are [often] considered fourth-generation correspondence

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(McLean, 1998)

Virtual schools may choose to deliver their courses in either an asynchronous or a synchronous format (or, perhaps, a combination of both) which could allow participants to work either at times of their own choosing or at pre-determined times.

schools ...” (p. 36). The real innovation offered by virtual schools is that they provide instruction via the Internet and “make use of technological abilities and tools that have been developed, with the integration of advanced computer uses” (Mittleman, 2001, p. 85). according to Dolence and Norris, (1995), virtual instruction is also innovative because it has the ability to provide “just in time” education; an innovation which permits students to pursue knowledge acquisition activities precisely when they have the need for that knowledge - making the knowledge and the process of acquiring that knowledge more relevant and enhancing the retention of and facility with that knowledge.

Virtual schools may choose to deliver their courses in either an asynchronous or a synchronous format (or, perhaps, a combination of both) which could allow participants to work either at times of their own choosing or at pre-determined times. However, as Mittleman pointed out, most of virtual schools are asynchronous - permitting a truly global educational experience because teachers and students can be in varied places and in different time zones around the world and still participate in all aspects of the course. Thus,

In the framework of virtual instruction, the teacher organizes the study material, presents its sequence, and sets the pace of learning and assignments ... and the students read the course study material, participate in directed [or non-directed] discussions in small or large groups, carry out individual and group projects, and may even conduct an educational seminar for probing further the topic under study. (Mittleman, 2001, p. 86)

WHAT ARE THE BENEFITS?

The spectrum of benefits touted by virtual school supporters is as wide and as varied in content and scope as there are authors and students who are connected to them. The educational literature suggests that, among other things, virtual schools provide or address: literacy

issues, an engaging educational environment, authentic environments and tasks, and collaborative structures.

LITERACY

When teachers mention student literacy, they are typically being product-orientated and, thus, betray their industrial age biases by viewing literacy only from the consumer point of view “of being able to read and write” (Papert, 1993, p. 10).

However, thinkers who try to look more deeply into what education means have written scathingly in criticism of the idea that illiteracy can be remedied by teaching children the mechanical skill of decoding black marks on white paper. Much more is involved. (Papert, p. 10)

Therefore, to be considered literate in today’s world, one must be capable of a broad range of competencies. For example, the sheer volume of information bombarding us in our society requires at least one new facet of knowledge: information literacy. Information literacy implies that a person is not only able to find the information that he or she wishes to find but also that he or she is able to discriminate and evaluate that information as to its comparative quality and value.

The sheer volume of information bombarding us in our society requires at least one new facet of knowledge: information literacy.

The virtual school provides a venue from which multiple sources of information can be accessed, read, communicated, and critically analyzed, resulting in a more knowledgeable, informed, and self-empowered citizenry. (Alvarez, 1997, p. 71)

Involvement with virtual schools also develops another new literacy, technological literacy, which, coupled with information literacy, will be essential tools for the future. “This inclusion of learning *with* instead of *from* technology provides learning contexts that involve social interactions between teachers, students, and members of the community so that new information is incorporated rather than compartmentalized” (Alvarez, p. 71). In other words, technology becomes an integral part of the learning process and all partners in education begin to see the computer simply as another tool with which to learn.

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ENGAGING LEARNING ENVIRONMENT

In general, students in the virtual learning environment tend to interact with learning materials for longer periods of time and, therefore, also tend to internalize the material more effectively. Technology produces exciting new ways of learning thus, “it is possible that its impact is due to social factors such as motivating students to spend more time with the subject matter than they might otherwise have” (Reyna et al., 2001, p, 35). In addition, Wolfe (2001) argues that “the Web places greater demands on students than traditional modes of instruction” (p. 2) which lead to the development of essential information age skill sets in students.

In some respects, the learning environment in a virtual school is so new for students that they will have no choice but to mobilize their mental effort and, thereby, engage more fully in their learning activities.

If a multimedia approach to learning [as offered by virtual schools] prompts an otherwise unengaged student to stay in school, and it inspires that student to tune in to the subject matter with greater interest, wouldn't that approach benefit the student? (Thomas, 1998, p. 7).

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AUTHENTIC ENVIRONMENTS AND TASKS

In educational contexts, authentic tasks usually refer to the development of skills or the provision of tasks for students that mimic or resemble skills and tasks that are required in the “real world”. Dolence and Norris (1995) stated that the virtual school provides exactly that environment. Since the information age requires all members of society to interact with and use computers and the Internet in their daily lives, an educational environment residing on the Internet and requiring the students to integrate their learning activities with computer and Internet use represents an authentic learning environment and provides the potential for authentic learning tasks as well. The lines between work

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COLLABORATIVE WORK STRUCTURES

One aspect of education that has been particularly resistant to change despite a great deal of research and reform effort to address it is the isolated and solitary nature of the classroom for both students and faculty. However, the educational literature reveals a variety of collaborative work structures which are either created or enhanced by the addition of a virtual school environment. One argument suggests that working within a virtual school environment enhances faculty collaboration (Mittleman, 1998; Zak, 2000). Tuttle (1998) observed that collaboration between rural and urban students could be a positive outcome of virtual school learning. Moursand (1997) argued that since students are often more adept at using technology than are their teachers, “This provides an excellent opportunity for collaborative learning activities among students and teachers where all are able to contribute and learn” (p. 3).

The virtual school provides an excellent opportunity for collaborative learning activities among students and teachers where all are able to contribute and learn because the differential in skill sets between students and teacher is often in favour of the student.

POTENTIAL DRAWBACKS OF VIRTUAL SCHOOLS

The computer and its associated technologies are awesome additions to a culture, and are quite capable of altering the psychic... of our young. But like all important technologies of the past, they are Faustian bargains, giving and taking away, sometimes in equal measure, sometimes more in one way than the other. It is strange - indeed shocking - that with the twenty-first century so close, we can still talk of new technologies as if they were unmixed blessings - gifts, as it were, from the gods. (Postman, 1995, p. 72)

There are several potential dangers or cautions associated with virtual schools that prudent educators must be aware of. Salomon (1998) presented five key cautions:

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1. with the search for information to solve the open-ended questions that students will encounter in much of their virtual school work, there is the risk that intellectual shallowness that may replace the more in-depth treatment of subject disciplines that usually accompanies the traditional school environment;
 2. as the structure and organization of the new media becomes the norm in students' minds, there may be a growing tendency to think in terms of the fragmented and disjointed media they encounter resulting in a sort of MTV stream of consciousness;
 3. the astonishing amount of information could lead to information overload;
 4. as the student becomes swamped by the vast amount of seemingly useless or unreliable information, there may be a tendency toward the devaluation of information in general; finally,
 5. virtual schooling may lead to increased social alienation as the Internet turns our face-to-face communal experiences into individual experiences in a communal environment.

Other authors have a more negative view of the potential effects of technology on education. For example, Byun and his colleagues (1998) observed that it takes 2.5 to 3 times more time to develop an online course as compared to a "traditional" course. Particularly for the novice on-line teacher, learning to use web authoring tools and to design appropriate learning environments and tasks for the Web presents a significant burden in addition to developing course content. In addition, faculty may find teaching an online course to be more stressful because not only does it take 2 to 5 hours more per week to address class-related work but also, the course enrollment could potentially number in the thousands because class size is not limited to the size of a class room or lecture hall. Thus, technology could further burden already under-resourced educators

Part 2

A STUDY OF THE NATURE OF INSTRUCTION AND COMMUNITY IN A CANADIAN VIRTUAL HIGH SCHOOL

Tunison's (2003) study had two primary purposes: to determine the nature of instruction used in a virtual high school and student responses to that instruction; and, to determine the nature and parameters of community that develop in that virtual school. Consequently, this project was a case study of Crestview Cyberschool (CC), a Canadian-based virtual high school operated under the auspices of a large, urban school division serving approximately 15,000 students from Kindergarten to grade-12. At the time of study, CC had a staff of fourteen part-time course developer/teachers, a full-time in-house administrator, and three additional administrators who had responsibility for various aspects of its operation.

CC offered a wide range of high school-level courses to its students. These courses included: Grade-9 mathematics; Grade-10 Information Processing and Christian Ethics; Grade-11 Chemistry, Physics, Mathematics, and Christian Ethics; and, Grade-12 Chemistry, Physics, Christian Ethics, English as a Second Language, Calculus, and two separate English Language Arts courses. With the exception of Information Processing and Grade 11 Mathematics, each of these courses was being taught by the faculty member who had developed the course.

WHAT IS THE NATURE OF INSTRUCTION IN A VIRTUAL HIGH SCHOOL?

In general, all of the teachers saw their role as learning facilitators or guides – and that this role was in some way *different* from their role in a conventional classroom. For example, TD5 stated that his role in an

on-line course differed from his role in a conventional class in at least two key ways: (i) he had to develop the course anticipating all of the needs of all potential students before they even enrolled in the course (rather than making adjustments as the course progressed), and (ii) he saw himself as a co-learner with his students because he was still learning the skills necessary to teach in an on-line environment.

While the terminology used by teachers in this study was essentially uniform, further probing revealed that their conceptions of what one does to facilitate student learning differed greatly. A few teachers saw themselves as mediators between their students and the course content – which is very much in the spirit of facilitation advocated by Griffin and Brownhill (2001) and Gardner (2000) – allowing students the freedom to interact with course material while providing support and being available to help when needed. In a majority of cases, however, CC’s teachers revealed a more teacher-led transmissional perception of facilitation with statements like “I tell them where they need to be”.

[Cyberschool] creates more of an independent atmosphere, with more freedom in completing assignments. But it also, builds self reliance in getting assignments done, because there is not anyone [sic] always constantly nagging you to get stuff done.

The students favoured the mediator role for their on-line teachers. Over 90% of the students indicated their preference to solve problems for themselves but appreciated the freedom to contact teachers for assistance when necessary. A grade-12 student pointed out,

[Cyberschool] creates more of an independent atmosphere, with more freedom in completing assignments. But it also, builds self reliance in getting assignments done, because there is not anyone [sic] always constantly nagging you to get stuff done.

This independence, according to another student, leads to “assignments being more honest because we know that we won’t have to read them aloud or be singled out in class”.

THE ROLE OF THE STUDENT

Administrators and teachers alike believed that the virtual school environment was, itself, a valuable learning experience for students

because it encouraged them to take a more active role in their own learning. As pointed out by Dolence and Norris (1995), “The learner is [now] responsible for value received” (p. 109) in the virtual school context.

Students indicated that they were comfortable with this new responsibility – in fact, they viewed it as being empowering. In general, the students in CC welcomed the opportunity to get on with their educational tasks without having to wait for their teachers to tell them what to do, or to wait for their “slower” classmates to grasp concepts before they could move on. Even those students who had been unsuccessful indicated that they recognized both the allure and the effects of procrastination, and were ready to accept the consequences, both positive and negative, of their choice.

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INSTRUCTIONAL STRATEGIES

A key aspect of the instructional strategies in a virtual school is the learning environment or atmosphere created in the on-line classroom. To live up to its potential and, at the same time, to provide the experiences necessary to help students develop essential New Economy skills, instruction in the virtual school must incorporate collaborative activities (Dede, 2000; Shaffer, 2000; Thornburg, 2002) in a discovery or inquiry learning environment (Van Horn, 1997) that uses technology in authentic ways (Alvarez, 1997; Dede, 2000; Zirkle & Guan, 2000). Most of the teachers in CC acknowledged that they had been only partially successful in developing this sort of learning environment.

There was evidence that collaborative work structures had been incorporated into a few of the courses offered by CC. A few teachers indicated that they had designed activities intended to encourage collaboration among students. However, most students (86%) indicated that they preferred to work individually. In fact, for many students, the main reason for having enrolled in a cyberschool course was to avoid the

According to the teachers, no training in computer use for instruction, web-page design, or the pedagogy of on-line instruction had been provided for them.

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collaborative or group assignments prevalent in contemporary classrooms.

A frequent observation among the faculty and students was that CC's environment was full of unrealized potential. One possible explanation for this was that, according to the administrators, staffing decisions for CC had been based on teachers' expertise with subject content rather than on their technological abilities. On one hand, this staffing approach is commendable because it focusses on student learning rather than on producing glossy web-pages. However, on the other hand, it also caused substantial problems because the teachers were responsible for producing both the content and the technical aspects of their courses. In the presence of this kind of situation, the difficulties could have been ameliorated somewhat with the provision of training in the technical aspects of on-line course design. However, according to the teachers, no training in computer use for instruction, web-page design, or the pedagogy of on-line instruction had been provided for them. Consequently, as a coping strategy, most of the teachers had simply converted their conventional course procedures and activities into on-line versions. Therefore, it is not surprising that 84% of the students rated the quality of technology used in their courses as poor. It seems that, if school systems intend to embark on the development of an on-line school, they must be prepared to provide teachers with the necessary training to ensure that the educational environment is pedagogically and technologically sound and, at the same time, reflects the best of what the Internet has to offer.

IMPACT OF INSTRUCTIONAL STRATEGIES ON STUDENTS

Although many of CC's courses were largely teacher-directed, a common student observation was that they were given considerable flexibility over when, where, and, in some cases, how they worked on their cyberschool courses. A common perception was that this flexibility

had forced them to develop better time-management skills and fostered a level of independence that did not exist in the conventional school environment. According to the students, this independence led to better and more thorough student submissions for at least three reasons:

- (i) students had nowhere to hide allowing teachers to track more closely what had been done;
- (ii) students felt more freedom to experiment with new activities; and,
- (iii) students knew that they would not be put on the spot to read their work in front of the class.

One administrator raised an important question about whether the cyberschool was creating independent learners or just catering to those who already were independent learners. The data from the students, particularly their preferences to avoid group work and their disdain for the “wasted time” that they say is typical in conventional classrooms, suggests that CC was catering to independent learners rather than creating them. However, 77% of the students believed that they had become more active learners while 75% stated that they had developed new time-management skills as a result of their experiences in CC.

If students completed all of the tasks required of them, they would likely achieve better than they had even done before.

Nevertheless, both teachers and students indicated that the quality of student work was significantly better in the on-line context. Teachers observed that there appeared to be very little middle ground in the sense that students either performed very well or very poorly. However, one teacher (TD3) pointed out that if students completed all of the tasks required of them, they would likely achieve better than they had ever done before – suggesting that the on-line environment leads to higher student accountability for completing tasks. Most students said that the quality of their work was better in their on-line classes because they spent more time on their cyberschool work than they would have on the same assignment in a conventional course.

The on-line environment was superior to the conventional classroom because the awkwardness of face-to-face meetings no longer existed, leading to a greater sense of freedom and more authentic interaction among students.

In addition, many students stated that they found cyberschool to be “more difficult than regular school because we were forced to work things out for ourselves” (a grade-12 student). Perhaps due to this perception, students tried harder to do well or, because they actually did have to work out more things for themselves, they internalized more of the materials and concepts contained in their courses.

Finally, students appeared to be positive about their virtual school experiences, in part, because of the absence of peer pressure—particularly when they did not understand something they could ask a question without their peers having a negative opinion of them. Most of the students in this study – girls in particular – stated that the on-line environment was superior to the conventional classroom because the awkwardness of face-to-face meetings no longer existed, leading to a greater sense of freedom and more authentic interaction among them. Perhaps this greater personal freedom also led to greater engagement and, ultimately, to higher achievement.

THE IMPACT OF INSTRUCTIONAL STRATEGIES ON TEACHERS

Both administrators and teachers alike believed that instruction was better in the cyberschool. Teachers indicated that they spent very little time on discipline; consequently, they felt free to spend more time providing feedback and encouragement to students. Teachers indicated that they felt that the increased instructional time led to a more personalized instructional environment and enhanced the quality of interactions between students and teachers. In addition, the increased instructional time led to better self-actualization among teachers in that they felt more satisfied with their performance. Despite the high level of frustration among teachers at the lack of support provided by the school division, they were generally happy to be involved and felt positive about their roles as on-line teachers.

A majority of the students stated that even though they had less communication with their on-line teachers in contrast to conventional teachers, the quality of the communication was better because it was in the form of more timely, frequent, and helpful feedback. One grade-11 student observed, “More of the communication is giving us feedback instead of nagging us to get our work done.” In addition, several students indicated that they were appreciative of the “turnaround time” for assignments which, they noted, was very quick in CC as compared to their conventional classes.

More of the communication [between teachers and students] is giving us feedback instead of nagging us to get our work done.

Interactions with parents also had an impact on teachers in CC. Muirhead (2000) observed that, “Online education ... is characterised by more extensive interaction with parents than in traditional classrooms” (p. v). CC’s teachers did not specifically indicate concerns over their interactions with parents but, one of the administrators indicated that a policy requiring teachers to communicate with parents via a weekly parent email had recently been initiated. In addition, he indicated that parents were encouraged to log on to their children’s courses both to monitor their progress and to see what the courses were like. This does represent an incursion into the teachers’ traditional autonomy in the classroom that had not yet become an issue but may, in the future, become one.

Online education ... is characterised by more extensive interaction with parents than in traditional classrooms.

(Muirhead, 2000)

WHAT IS THE NATURE OF COMMUNITY IN A VIRTUAL HIGH SCHOOL?

There were two distinct types of community in CC: the community among faculty and the community of the virtual classroom.

THE FACULTY COMMUNITY

With the exception of three administrators, CC’s staff was housed together in a large room in a building connected to a large conventional high school. It contained an individual computer work

station for each faculty member – located around the perimeter of the room, several communal peripheral devices (e.g., scanners, digital cameras, printers, etc.), and a small lounge area. The teacher/developers had been recruited from the conventional high schools in the division thus nearly all of them also had duties at both CC and their home schools. According to one of the administrators, these dual roles had made an impact on the cyberschool faculty community in at least two ways:

- (i) because each of the teacher/developers had a different home school schedule, it was rare to have everyone together at the cyberschool at any given time – even for a cyberschool staff meeting and,
- (ii) these dual roles also tended to pull the staff members in two directions – toward their cyberschool duties and their home schools' expectations.

The teacher/developers had been recruited from the conventional high schools in the division thus nearly all of them also had duties at both CC and their home schools which tended to pull the staff members in two directions – toward their cyberschool duties and their home schools' expectations.

They were expected to attend all scheduled events at their home schools even if attendance at those activities infringed on their previously-scheduled cyberschool instructional time.

The lack of a common schedule for cyberschool staff created a need for an innovative way to communicate. Consequently, the administrators had begun using e-mail and paper memos to ensure that staff members stayed informed. Staff members also communicated among themselves with e-mails or notes left at individuals' work stations. Nevertheless, despite the difficulties in communication, staff members were very satisfied with the nature of the community that had developed within CC. The nature of that community is analyzed here according to the conceptual framework of the learning community including the interpersonal, personal, and organizational capacities.

The interpersonal capacity. The school's administration believed that, given the lack of technical and software support provided by the school division, belonging to the community of developers was the only effective way to socialise new members into the cyberschool culture and

to help them to learn how to manage WebCT in addition to the software necessary to develop and teach on-line courses. This expression of group dynamics within a culture of mutual support adheres with Mitchell and Sackney's (2001) conception of the interpersonal capacity for learning communities. They theorized that groups shape the environment within which people learn and that the group structure and climate have a significant effect on the quality of that learning. The structure of CC's faculty group played an important role in mediating the considerable learning curve associated with creating and sustaining a successful cyberschool. Mitchell and Sackney suggested that in order to build interpersonal capacity, a group must build both affective and cognitive climates within a collaborative atmosphere. Similar to Muirhead's (2000) findings, CC's teaching faculty developed a collaborative atmosphere almost from the first day the original development group gathered. Barker and Wendel (2001) also found that teachers found the on-line school environment to be rewarding, in part, because of the collaborative atmosphere that emerged among them. One of the teacher/developers pointed out that the original cyberschool people had to work together because, as individuals, they had very little computer experience. Thus, as new people were added to the group, they were invited both to participate and to contribute. According to Mitchell and Sackney's model, then, the affective climate had been built because people in the group felt that their contributions were welcomed and valued (affirmation) and their participation was explicitly sought (invitation).

Groups shape the environment within which people learn and that the group structure and climate have a significant effect on the quality of that learning.

(Mitchell & Sackney, 2001)

"We [the original cyberschool people] had to work together because, as individuals, they had very little computer experience."

Nevertheless, a threat had emerged with respect to the long-term stability of the interpersonal capacity. This threat developed, in part, due to a lack of communication between the senior administration and the teacher/developers. At issue was the vision and mission of the cyberschool. A comparison between the statements of the administrators and the rest of CC's faculty revealed a significant lack of agreement among their respective visions. The administrators indicated that they

intended to split up the instructional faculty and house them in smaller pods at various schools around the school division; however, the entire instructional staff believed that the common work area and the community that had developed within that work space was essential to successful cyberschool course development.

Poor communication about CC had also impacted negatively on the larger community of the school system. On one hand, the local schools had become very dependent on CC's courses to help solve student timetable problems. But, on the other hand, the advisability of CC's existence had been questioned by several of the faculty in the conventional schools. In particular, the relative merits of delivering certain courses via the Internet had led to questions about CC's impact on the school community as a whole. Further, the administrators indicated that they had not responded effectively to these questions fuelling further animosity.

A learning community must address the isolation of individuals typical of most contemporary organizations and encourage collaboration and shared decision making.

The organizational capacity. Mitchell and Sackney (2001) suggested that, in order to develop the organizational capacity for a learning community, special attention must be paid to the socio-cultural arrangements. In particular, a learning community must address the isolation of individuals typical in most contemporary organizations and encourage collaboration and shared decision making. With respect to the important decisions, however, the structural arrangements within CC were not different from the structures in place in the conventional schools. In fact, many of the faculty believed that the model of school governance being used in CC was inappropriate. Many of the teachers argued that the methods used for decision making were too inefficient and slow-moving to respond to the types of problems encountered in a cyberschool. According to Mitchell and Sackney's model, the root of the problem may be the lack of shared vision and purpose. Everyone directly associated with CC indicated that its primary purpose was to serve the needs of the students of the school system. However, beyond that

agreement, there seemed to be a definite rift between the view of the administrators and the teacher/developers – as evidenced by the earlier discussion regarding the location of the cyberschool pods, but which was more pervasive than that. An observation by one of the teachers was indicative of the conflict, “We see potentials that they [administrators] don’t even think about but, we can never move on them until they tell us we can.” DePree (2001) suggested that innovators and organizations must have a special relationship permitting growth and, at the same time, organizational stability. In an attempt to provide for that stability, both two of the administrators saw their roles as gate-keepers. They believed that it was up to them to “put the brakes on” and keep CC’s growth and evolution under control to ensure that it continued to fit within the organizational confines of the school division. In other words, the administration wanted to ensure that, while CC was different, it did not become *too* different.

Innovators and organizations must have a special relationship permitting growth and, at the same time, organisational stability.

The personal capacity. The personal capacity, as described by Mitchell and Sackney (2001), requires both an internal and an external search. The internal search exists at the intersection of the individuals’ espoused theories and their theories-in-action. This type of search requires reflection about action and, in the case of a learning community, assumes that there is a high level of congruence between these actions and the theoretical underpinnings of those actions. In CC, the personal search had only just begun. Some of the veteran faculty members were beginning to question their original assumptions about course delivery in the cyberschool context. One of the teachers, for example, pointed out that he had recently noticed the need for change in his course delivery model. Through both the dialogue with other CC staff and the biennial course self-evaluations required by the school administration, he had realized that his course was organized to encourage basic information transmission. While he believed that on-line learning should be different, he was not sure how to achieve that difference. He expressed desire to

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explore what would best be described as an inquiry method of instruction, but had not yet conceptualized a way that would ensure that the students would learn the required content. In short, he realized that his theory-in-action did not match his espoused theory. In view of the paucity of pedagogical and technical in-service training, as well as the inadequate amount of course development time available to CC's developers, it is not surprising that many of them resorted to teaching on-line in much the same way as they teach in a conventional class. Fullan (2001) argued that, in education, the recent pace of change has been so great that educators have experienced "innovation overload". This pace, according to Kay (1997), encourages people to re-frame new approaches and tools "only as better versions of old ones" (p. 19). Dede (2000) theorized that a learning community which "fosters dialogue" about the implementation of innovations could moderate implementation difficulties and, perhaps, could enhance the internal search. CC's internal searches had begun but had not, as yet, achieved completion.

THE COMMUNITY OF THE CLASSROOM

In education, the recent pace of change has been so great that educators have experienced "innovation overload". This pace encourages people to re-frame new approaches and tools "only as better versions of old ones" (Kay, 1997, p. 19).

Much of the learning community literature assumes that those who populate the physical community wish to take part in the intellectual community. Schwier (2001), for example, observed that, particularly in the case of virtual learning communities, the members of a community tend to come together because of a common interest and a desire to participate. Further, Haythornthwaite (2002) observed that, particularly in an asynchronous on-line environment such as was present in CC, motivation plays a key role in the amount of communication that takes place in the group and in the quality of that interaction. Additionally, according to Mitchell and Sackney (2001), a key facet of a learning community is collaboration.

Many of the students in CC were particularly adamant that they had no interest in collaborative activities. In fact, several students indicated that

their decision to pursue on-line education had been based on the belief that there would be no group work or collaborative learning activities in the on-line environment. Clearly, students had little motivation to engage in collaborative or cooperative activities – thus, community-building posed a major challenge. However, there was a glimmer of hope for community in several instances.

In general, while students recognized the potential of community in their classes, there was very little evidence of community among students in those classes. In terms of establishing reasons for this lack of community, a student comment may be the most useful. She stated, “... most people don’t take the time to be sociable – they just want to get done.” In other words, they were not exactly disinterested in building community but rather, due to their busy and complex lives, they just did not have the time to devote to building community. Yet, many students did acknowledge that they saw their fellow students as potential sources of information and occasionally posed questions on their course’s bulletin board and answered others’ questions.

Several students were also intrigued by the community-building possibilities afforded them by the creation of personal web-pages, particularly as a means of establishing a personal identity. A few of them indicated that they had chosen to use the personal web-page development tools provided in CC’s WebCT platform and they appreciated that others had also done so. However, they felt that these means were under-utilized. Instead, they indicated that the bulletin board was the primary venue for peer-related community building. Consequently, students tended to feel that they were able to get to know each other a little bit through the bulletin board postings during their on-line discussions – which, it should be noted, occurred infrequently.

Nevertheless, while they were indifferent toward the value of interpersonal relationships with their peers, students were very concerned about developing a personal relationship with their teachers. In particular,

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(Grade-12 student)

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the students believed that their true identities were not entirely revealed via the assignments they completed and that there should be a forum for further explication of they were “really like”. While their primary motivation for developing a personal relationship with their teachers appeared to be driven by their hope that such a relationship might translate into higher grades; students did, nevertheless, stress that they wanted their teachers to get to know them on a more personal level. In addition, a few students suggested that occasional face-to-face meetings should be organized, at least for those students who lived in CC’s home community, to facilitate collaboration and to allow community to be established.

According to Putnam (2000), a key consideration of an examination of community is the extent to which social capital is built and sustained. A common concern is that current technological developments such as the Internet might impact negatively on interpersonal relationships and, by extension, further erode already declining levels of social capital (Postman, 1995; Putnam, 2000). While it is true that a cyberschool could easily fall into the trap of allowing students to isolate themselves from the “outside” world, this did not appear to have taken place in CC. The model of on-line course delivery in CC would best be described in Mittleman’s (2001) terms as a *hybrid cyberschool* in which students were taking both on-line and conventional courses. In addition, several students indicated that some of their assignments required them to interact with people in their communities by attending and reviewing concerts and art shows, completing community service, and conducting mini research studies and interviews. Actually, considering students’ comments that they had been required to do things in their communities that they may never have done otherwise, the cyberschool environment may have actually enhanced the development of traditional social capital for students.

Several students indicated that some of their assignments required them to interact with people in their communities by attending and reviewing concerts and art shows, completing community service, and conducting mini research studies and interviews. Actually, considering students’ comments that they had been required to do things in their communities that they may never have done otherwise, the cyberschool environment may have actually enhanced the development of traditional social capital for students.

PART 3:

IMPLICATIONS FOR ADMINISTRATIVE AND BOARD ACTION

The cyberschool environment is eminently flexible and meshes well with contemporary students' busy lives. Several authors (e.g., Fingar & Aronica, 2001; Hiebeler, Kelly & Kettelman, 1998; Thornburg, 2002) have suggested that, in order to be successful in the current economic climate, organizations must place a great deal of emphasis on the preferences of their customers. In this case, CC's customers were the students and, by extension, their parents. Many of the students indicated that their primary reason for having registered in an on-line class was to benefit from the flexibility associated with the cyberschool platform. Several students pointed out that the flexible nature of cyberschool program delivery allowed them to pursue their other interests or responsibilities such as athletics, jobs, dance, and caring for their own children.

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Dolence and Norris (1995) predicted that the development of the on-line school would lead to a child-centred learning environment permitting instructors to provide instructional opportunities in a just-in-time framework modelled after contemporary Japanese manufacturing methods. Further, McNair (2001) argued that on-line schools have the potential to be appropriate instructional media for contemporary society because they can so easily incorporate activities that borrow from constructivist methodology to require students to learn how to select and manage the information that they require and to add value to it. In addition, Muirhead (2001) found that teachers viewed the virtual school positively because they felt that it was a "tool to enhance student learning" (p. v). While it appears that an online school may have the potential to provide this type of learning environment, it was not doing

While it appears that an online school may have the potential to provide this type of learning environment, it was not doing so at this time – at least in CC.

so at this time – at least in CC. The just-in-time framework implies that students would be given access to information precisely when they needed it or when it was relevant to them. In addition, constructivist methodology is a very individualized approach that takes into account the student's pre-existing knowledge and focusses on building on that knowledge (Winner, 1998). CC's courses, for the most part, had been conceived as teacher-led, content-driven courses. As pointed out by the teachers and students, very few of the courses permitted students to engage in the inquiry-based activities so common in constructivist instructional methodologies. Consequently, while there was considerable satisfaction among both students and faculty with regard to the current instructional practices employed in CC's classes; the school, overall, had not yet reached its potential as a truly new and innovative educational environment.

In coherence with the studies conducted by Barker and Wendel (2001), Rourke (2000), and Muirhead (2001), the faculty group exhibited several characteristics of a learning community. Particularly among the teacher/developers, a very strong and cohesive group had been established. As stated earlier, learning communities, especially virtual learning communities, typically form spontaneously as a result of the group members' common interests. In the case of CC, the teacher/developers had formed a learning community around their common challenge to create on-line courses without technical or pedagogical training. The group was a tight-knit cadre whose members worked together to solve technical problems and to challenge each other's assumptions about what an on-line course should look like. Several members of this group noted that the community that had formed was not only the best thing about their involvement with cyberschool but also was essential to successful course development given the lack of resources available. This group exhibited key elements from Mitchell and Sackney's model such as affirmation and invitation as well as the

The relationships between the instructional group and the administrators was strained.

cognitive and collaborative climates. Nevertheless, the relationships between the instructional group and the administrators was strained. Muirhead (2000) found that communication of vision and mission was problematic in the virtual school, in part, because the vision of the faculty often exceeded current capacity. This also appeared to be the case in CC. The administrators' actions and, in some cases, lack of actions frequently left the teaching faculty without a sense of affirmation and invitation and often led to feelings that resembled an "us versus them" attitude – a situation that could hardly be referred to as a collaborative climate. The faculty expressed a vision for CC that, in many cases, far exceeded the visions of the administrators. The problem was further exacerbated by a lack of formal or, for that matter, informal communication of the two groups' visions.

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Mitchell and Sackney (2001) suggested that the socio-cultural and structural arrangements in the organization were critical elements of the learning community. One aspect of these arrangements was the nature and condition of leadership in the organization. The cyberschool platform provided a leadership structure that was truly unique. On one hand, much of the instruction in CC was still teacher-led and tended to focus on content rather than on process – a situation that did not adhere well with the parameters of the new economy (Thornburg, 2002). However, students were still provided with an unusual leadership opportunity in the cyberschool context. As theorized by Blake and Standish (2001), the traditional hierarchical relationship between students and teacher had become partially reframed in CC. Since many of the students were more proficient with the technology inherent in cyberschool course delivery as compared to their teachers, some students felt like co-learners with their teachers. As a result, students were more likely to see each other as potential sources of information and to help each other rather than to wait for the teacher to respond to questions.

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The issue of appropriate on-line instructional pedagogy emerged as a glaring issue in CC. Even though many students and teachers expressed satisfaction with current practice, instruction in this school was not structured to take full advantage of the opportunities afforded by technology in general and by the Internet specifically.

While this study did not specifically examine pedagogy, the issue of appropriate on-line instructional pedagogy emerged as a glaring issue in CC. Even though many students and teachers expressed satisfaction with current practice, instruction in this school was not structured to take full advantage of the opportunities afforded by technology in general and by the Internet specifically. Muirhead observed that the virtual school context presents significant challenges for teachers due to the ever-changing nature of authoring software and the immense amount of time necessary to stay abreast of these changes. In light of Fullan's (2001) work, it seemed that the school division had made the classic error of force-fitting a new technology into an old mould. In this case, the school system had chosen faculty for CC from among its best classroom teachers but assumed that good instruction in the classroom was necessarily transferable to good instruction on-line. This assumption was proven to be erroneous. While it is commendable the best staff were chosen, it cannot be assumed that they can make the leap to proper on-line pedagogy without assistance. Bull and his colleagues (1997) observed that effective innovation takes place only when teachers have the benefit of professional development germane to the innovation being attempted. However, the school division had not provided these professional development opportunities and the result was a number of courses which were formed in the likeness of traditional classrooms rather than in ways unique to and appropriate in on-line instructional environments.

IMPLICATIONS FOR FURTHER RESEARCH

The following is short list of research activities that may shed further light on the phenomenon of the virtual high school.

1. First, this study did not include the perceptions of parents. A future study may well benefit from their input because they may be able to more clearly define the students' difficulties and challenges.

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2. A study that examines student learning processes on-line and which develops a profile of a successful on-line student would be very useful in informing cyberschool operations.
 3. A study of the relationship between the screening procedures used by on-line schools and those schools' dropout rates would also be very useful.
 4. Further examination of the optimal administrative structures for effective on-line school development and delivery would be useful as well.
 5. A study of the nature of discourse between students and teachers and among students may assist on-line teachers in providing effective feedback to students and enhance the development of on-line learning communities.
 6. A study of the availability of pedagogical training for on-line teachers as well as the type of training that teachers feel they need might impact on the nature of the on-line courses they develop.
 7. A longitudinal study which examines virtual school effectiveness – particularly as it relates to student learning outcomes – would be useful in providing a “best practice” benchmark for new and existing cyberschools.
 8. A comparative study that examines several on-line high schools in different jurisdictions may find that the results from this school were anomalous.
 9. A study of the effects of the cyberschool on the school system overall might yield some interesting information regarding the perceptions of faculty and students who may not be directly involved in an on-line school situation but would, nevertheless, be relevant to the operation of a cyberschool.

IMPLICATIONS FOR PRACTICE

Administrative structures, for example, will need to be substantially retooled to effectively manage the challenges presented by the innovators who are typically involved with on-line schooling.

The organizational structure of an innovative project must resemble the improvisational structures of jazz in order for creative people to be truly innovative.

(DePree, 2002)

This study revealed several issues with which on-line schools will have to grapple. Administrative structures, for example, will need to be substantially retooled to effectively manage the challenges presented by the innovators who are typically involved with on-line schooling. Handy (2002) pointed out that, just as elephants and fleas need each other to survive, organizations – even traditional ones such as school divisions – need innovators to force growth and change. In this school division, the existence of the cyberschool had impacted the school division overall by heightening student demand for new on-line courses and by placing the focus on the use of technology in schools. It also had begun to impact on the instructional methods used by teachers (both those involved in cyberschool and those who were not) in their regular classrooms primarily because of student demands for the greater flexibility and more freedom that was present in the cyberschool courses. Nevertheless, the management style chosen by the senior administrators did not fit with the innovative nature of the cyberschool. While as Cuban (2001) pointed out, personnel selection is critical for effective innovation, DePree (2002) stated that the organizational structure must resemble the improvisational structures of jazz in order for creative people to be truly innovative. In addition, Sabatier and Mazmanian (1979) opined that organizations must provide effective and poignant in-service in order for an innovation to be properly implemented and developed. The school division chose personnel well but, tried to manage them in a traditional hierarchical command and control structure. For example, cyberschool teachers were expected to uphold all obligations to their home schools even when they interfered with their previously-scheduled cyberschool instructional time – forcing them to perform their cyberschool duties on their own time. The steering committee was narrow in scope and composition and

communication about cyberschool operations was both infrequent and incomplete. This led to wide-spread mistrust among the teachers in the various home schools and frustration among cyberschool staff as they continually felt the obligation to justify their existence. These issues left a residue of resentment among the teacher/developers which could easily have been avoided.

The high drop out rates and unacceptably high numbers of unengaged students must also be examined. This study revealed that as many as 50% of the students enrolled in the cyberschool did not participate on a regular basis if at all. One must wonder why. After all, those students who were participating were generally very happy and appeared to enjoy their cyberschool experiences. This study did not examine the admission processes used by CC, or, for that matter, whether there were screening procedures in place to ensure that prospective students had a reasonable chance of success in the cyberschool environment. However, if Gardner's theories of multiple intelligences are accurate, not all students will be equally successful in cyberschool because not everyone learns in the same way. Perhaps cyberschools will have to determine a profile of a successful on-line student in order to develop more effective screening and counselling procedures. In addition, the current procedures for student admissions often placed some students in on-line classes up to three weeks later than their peers. Several students indicated that the stress of starting out behind everyone else and the recognition that they would have to work extra hard to catch up often seemed too intimidating and many of them simply chose to drop out rather than risk having a failure grade on their transcripts. Therefore, CC is challenged to develop student placement procedures that permit all students to begin at the same time and, thus, to have the same chances to succeed.

This study revealed that as many as 50% of the students enrolled in the cyberschool did not participate on a regular basis if at all.

While the nature of community among teacher/developers appears to be excellent, the school must address the nature of community among students. Several students indicated that occasional face-to-face class meetings – at least for students in a particular community – would enhance their enjoyment of the cyberschool experience and encourage them to interact with each other more. In addition, in view of the significant body of pedagogical literature concerning the methods for facilitating on-line chats and communication (e.g., Palloff & Pratt, 1999), teachers must be encouraged to familiarize themselves about these techniques as well as to experiment with them in an attempt to increase student to student communication.

It is apparent that online instruction needs to be significantly different from traditional instruction in order to take full advantage of the opportunities afforded by the milieu.

In conclusion, it is apparent that online instruction needs to be different from traditional face-to-face instruction in order to take full advantage of the opportunities afforded by the milieu. On-line instruction ought to be oriented toward discovery or inquiry learning approaches. As well, it is evident that the nature of community in an on-line school will have a different focus. Collaboration, for example, is less of an interest for on-line learners. Communication of interests, on the other hand, developed through learning modes or networks can achieve a particular kind of learning community that students find of value. Interestingly, on-line learners did desire some personal contact with their teachers.

References

- Alvarez, M. (1997). Thinking and learning with technology: Helping students construct meaning, *NASSP Bulletin*, 81 (597), 66-72.
- Barker, K., & Wendel, T. (2001). *E-Learning: Studying Canada's virtual secondary schools*. Society for the advancement of Excellence in Education research series #8, Kelowna, B.C.
- Blake, N. & Standish, P. (2000). Introduction. In N. Blake & P. Standish (Eds.). *Enquiries at the Interface: Philosophical problems of online education*. (pp. 1-18). Malden, MA: Blackwell.
- Britt, M. & Gabrys, G. (2001). Teaching advanced literacy skills for the World Wide Web. In C. Wolfe (Ed.). *Learning and teaching on the World Wide Web*. (pp. 73-90). San Diego, CA: Academic Press.
- Bull, G., Nonis, A., & Becker, F. (1997). Realizing technology's potential, *Principal*, 76(3), 29-31.
- Byun, H., Hallett, K., & Essex, C. (2000). Supporting instructors in the creation of online distance education courses: Lessons learned, *Educational Technology*, 40(5), 57-60.
- Cortada, J. (2001). *21st Century business: Managing and working in the new digital economy*. Upper Saddle River: NJ: Prentice Hall.
- Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.
- DePree, M. (2001). Creative leadership. In F. Hesselbein, M. Goldsmith, & I. Somerville (Eds.). *Leading for innovation and organizing for results*. (pp. 31-38). San Francisco, CA: Jossey-Bass.
- Dolence, M., & Norris, D. (1995). *Transforming higher education: A vision for learning in the 21st century*. Ann Arbor, MI: Society for College and University Planning.
- Fingar, P. & Aronica, R. (2001). *The death of E and the birth of the real new economy: Business models, technologies and strategies for the 21st Century*. Tampa, FL: Megan-Kiffer Press.
- Fullan, M. (2001). *The new meaning of educational change* (3rd Ed.). New York: Teachers College Press.
- Gardner, H. (2000). Can technology exploit out many ways of knowing? In D. Gordon (Ed.). *The digital classroom: How technology is changing the way we teach and learn*. (pp. 32-35). Cambridge, MA: Harvard Education Letter.
- Griffin, C., & Brownhill, B. (2001). The learning society. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 55-68). London, UK: Kogan Page.

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-
- Handy, C. (2001). Fleas and elephants. In F. Hesselbein, M. Goldsmith, & I. Somerville (Eds.). *Leading for innovation and organizing for results*. (pp. 23-30). San Francisco, CA: Jossey-Bass.
- Haythornthwaite, C. (2002). Building social networks via computer networks: Creating and sustaining distributed learning communities. In K. Renninger & W. Shumar (Eds.). *Building virtual communities: Learning and change in Cyberspace*. (pp. 159-190). Cambridge, UK: Cambridge University Press.
- Heibeler, R., Kelly, T., & Kettelman, C. (1988). *Best practices: Building your business with customer-focussed solutions*. New York, NY: Simon & Schuster.
- Holford, J., & Nicholls, G. (2001). The school in the age of learning. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 134-146). London, UK: Kogan Page.
- Joinson, A. & Buchanan, T. (2001). Doing educational research on the Internet. In C. Wolfe (Ed.). *Learning and teaching on the World Wide Web*. (pp. 221-242). San Diego, CA: Academic Press.
- Kay, A. (1997). Technology and powerful ideas, *The American School Board Journal*, 184 (7), 16-19.
- McLean, C. (1998). Virtual school, real benefits, *Alberta Report*, 26(2), 36-40.
- McNair, S. (2001). Social, economic, and political contexts. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 16-26). London, UK: Kogan Page.
- Merricks, L. (2001). The emerging idea. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 3-15). London, UK: Kogan Page.
- Mitchell, C., & Sackney, L. (2001). *Profound improvement: Building capacity for a learning community*. Lisse, The Netherlands: Swets & Zeitlinger.
- Mittleman, T. (2001). The establishment of a virtual high school in Israel, *Educational Technology Research and Development*, 49 (1), 84-93.
- Moursand, D. (1997). Alternative histories, *Learning and Leading with Technology*, 25 (3), 4-5.
- Muirhead, W. (2000). Teachers' perceptions of online education. Unpublished doctoral dissertation, University of Alberta, Edmonton, AB.
- Palloff, R. & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco, CA: Jossey-Bass.
- Papert, S. (1993). *The children's machine*. New York, NY: Basic books.
- Postman, N. (1995). *The end of education: Redefining the value of school*. New York, NY: Alfred Knopf.

-
-
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Simon & Schuster.
- Reyna, V., Brainerd, C., Effken, J., Bootzin, R., & Lloyd, F. (2001). The psychology of human-computer mismatches. In C. Wolfe (Ed.). *Learning and teaching on the World Wide Web*. (pp. 23-44). San Diego, CA: Academic Press.
- Rourke, L. (2000). Exploring social communication in computer conferencing. Unpublished Master's Thesis, University of Alberta, Edmonton, AB.
- Sabatier, P. & Mazmanian, D. (1979). The conditions of effective implementation: A guide to accomplishing policy objectives, *Policy Analysis*, 5(2), 481-504.
- Salomon, G. (1998). Technology's promises and dangers in a psychological and educational context, *Theory into Practice*, 37(1), 4-10.
- Schwier, R. (2001). Catalysts, emphases, and elements of virtual learning communities, *The Quarterly Review of Distance Education*, 2 (1), 5-18.
- Schaffer, D. (2000). This is Dewey's vision revisited. In D. Gordon (Ed.). *The digital classroom: How technology is changing the way we teach and learn*. (pp. 176-177). Cambridge, MA: Harvard Education Letter.
- Thomas, R. (1998). Supporting the learning process, *Thrust for Educational Leadership*, 27(5), 6-8.
- Thornburg, D. (2002). *The new basics: Education and the future of work in the telematic age*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Tunison, S. (2003). *A Study of the Nature of Instruction and Community in a Virtual High School*. An unpublished Doctoral Dissertation, University of Saskatchewan.
- Tuttle, H. (1998). What is a virtual school? *Multimedia Schools*, 5 (3), 46-48.
- Van Horn, R. (1997). The virtual school, *Techniques*, 75 (5), 22-25.
- Winner, L. (1998). Resisting technoglobalism's assault on education, *Education Monitor*, 2, 13-17.
- Wolfe, C. (2001). Learning and teaching on the World Wide Web. In C. Wolfe (Ed.). *Learning and teaching on the World Wide Web*. (pp. 1-22). San Diego, CA: Academic Press.
- Zirkle, C., & Guan, S. (2000). The journey into distance education, *Techniques*, 75 (5), 18-21.
- Zak, K. (2000). Some it thrills, others it chills: Is teaching online for you?, *Teach*, March/April, 27-29.