

**A Study of the Nature of Instruction and Community
in a Virtual High School**

A Dissertation
Submitted to the
College of Graduate Studies and Research
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in the Department of Educational Administration
University of Saskatchewan
Saskatoon

By

Scott Tunison

April, 2003

© The author claims copyright. All rights reserved.

Permission to Use

In presenting this dissertation in partial fulfilment of the requirements for a Doctor of Philosophy degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this dissertation in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my dissertation work or, in their absence, by the Head of the Department or the Dean of the College in which my dissertation work was done. It is understood that any copying or publication or use of this dissertation or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my dissertation.

Requests for permission to copy or to make other use of material in this dissertation in whole or part should be addressed to:

Head of the Department of Educational Administration
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0X1

Abstract

The two-fold purposes of this study were: to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. A case study in one Western-Canadian virtual high school was conducted in two phases. Phase I focussed on the perceptions of faculty and included interviews with four administrators, seven teacher/ developers, and four developers. Phase II focussed on the perceptions of students and included an on-line survey and four focus group interviews.

Phase I data were analysed using content analysis procedures. Phase II textual data were analysed using content analysis while the descriptive statistics from the survey data were obtained using SPSS. The conceptual framework for analysis was derived from Mitchell and Sackney's (2001) model of the learning community in which they suggested that a learning community must build capacity in three arenas: interpersonal, personal, and organisational.

This study found that, due to factors including a lack of course development time, a paucity of technical and software support, and insufficient pedagogical training for the teacher/developers, this on-line high school looked very much like a traditional high school with the exception that its classes took place on the Internet. Instruction was typically teacher-led and context-driven. It consisted primarily of static text-based web-pages delivered to students via the Internet. Students indicated that they chose to enroll in this on-line school for several reasons including: the desire for a flexible schedule to

facilitate work, athletics, or child care needs; the desire to take extra classes that were either not available at their home schools or were impossible to include in their timetables due to school scheduling inflexibility; or, the desire to try something new. A surprising finding was that many female students had enrolled in the on-line school courses because they had become frustrated with instruction in their regular school classes. They indicated that there were two particular sources of frustration: they did not approve of many of their fellow students' off-task behaviours and teachers' responses to that behaviour and they felt that there were too many cooperative learning activities and group projects in their regular courses and that they wished to be able to work alone more often. However, it was also found that there was a very high drop out rate and a high level of student disengagement within this virtual school.

It was also found that the existence of a virtual school had exerted considerable pressure on the other schools and teachers in the school division to make changes. Students had begun to demand a more interactive and flexible learning environment in their regular classes and the school division's faculty associations had begun to focus on the use of technology in face-to-face classroom settings in their professional development activities. In addition, the existence of particular virtual school classes had become a point of contention within the school division as teachers of the regular face-to-face versions of the courses objected to the existence of on-line versions of their courses.

This study surfaced key implications for theory such as: in the initial stages, an on-line course will look much like a typical face-to-face course unless adequate course

development time and sufficient pedagogical and technological training for teachers are provided, the traditional bureaucratic management style does not fit well with a cyberschool project, and the cyberschool appears to have a positive impact on student learning. In addition, implications for practice included the need to address the high student drop out and disengagement rates as well as the students' desire for more structured community and course procedures. Implications for further research included the need to develop an effective screening process for prospective on-line students, a further examination of the administrative structures necessary for effective management of on-line schools, and a longitudinal study of virtual school operation to develop a set of correlates of virtual school effectiveness. A reconceptualisation of the theoretical framework was offered indicating that the metaphor of a learning community was an apt description of an on-line school but, the traditional models of learning communities did not go far enough. The learning community, for the on-line school context, needs to account for greater student input and must reframe the student-teacher relationship in terms of being co-learners. Finally, the potential future directions of on-line learning such as the proliferation of on-line learning objects and hybrid schools were explored.

Acknowledgements

A study such as this one does not take place in a vacuum. I depended upon the goodwill and assistance of many people and organisations to make this study possible.

First, I must thank Dr. Margaret Haughey from the University of Alberta for acting as my external examiner and for raising pertinent and timely questions which extended my ideas and my study as well. I must also thank my committee members: Drs. Gord McCalla, Brian Noonan, and Pat Renihan for their helpful suggestions and encouragement.

Next, I must express my sincere gratitude to my advisor Dr. Larry Sackney for both his expertise and his good humour. I was able to complete this study in such a short period of time because of his willingness to meet regularly, offer suggestions, and provide both editorial and procedural advice. I also wish to acknowledge his assistance and moral support of me at both the AERA and the CASEA conferences this year – without his help, I may not have been able to attend these conferences to present my papers. No one could ask for a more supportive mentor.

I must also thank the faculty of Surfside School Division and, in particular, the faculty of Crestview Cyberschool. It is a fact that, in order for a study to be conducted, there must be something to study. Even though they were very busy, the faculty of Crestview – particularly A4 – was supportive and cooperative with me in innumerable ways.

I must also acknowledge two very good friends and fellow beginning scholars – Paul Newton and Bill Gowans. They were always willing to provide timely editorial

advice and to act as sounding boards for many of my more wild ideas. In addition, I thoroughly enjoyed our daily lunches, regular coffees, and trips to various conferences.

Finally, I must acknowledge the role of my family. In many ways, my grandmother, Joan Tunison, has always been an inspiration to me. It was through her that I have developed both a love of reading and a thirst for learning new things. In addition, most students (and their families) will agree that the decision to pursue graduate studies requires a great deal of financial sacrifices as well as a sacrifice of quality family time. I want to thank my wife, Leslie, for her patience, encouragement, and love without which this study would not have been possible. Yes, you will get your husband back!

Table of contents

Permission to Use	i
Abstract	ii
Acknowledgments	v
Table of Contents	vii
List of Figures	xvii
List of Tables	xviii
Chapter 1	1
Background to the study	2
Statement of the problem	7
Research questions	7
Significance of the study	8
Delimitations	10
Limitations	11
Assumptions	13
Definition of terms	13
Organisation of the dissertation.....	15
Chapter 2	17
Pragmatic issues concerning the engineering and metaphysics of virtual schools	23
Engineering virtual schools: what are they and were do they exist?	24
What is a virtual school?	24
Early virtual school projects	28
St. Gabriel's cyber school	28
The Florida virtual school	29
Virtual high school	31

The Israeli virtual high school	31
Benefits of virtual schools	33
Literacy issues	34
Engaging educational environment	38
Authentic environment and tasks	40
Collaborative work structures	42
Specific student needs	45
Organisational benefits	47
Potential drawbacks of virtual schools	47
Conditions for success in creating a virtual school	50
Initiation	51
Implementation	53
Adequate technical support	54
Relevant on-going instructional support	55
Institutionalisation	56
Relative importance	56
On-going data collection and evaluation	58
Social issues concerning the engineering and metaphysics of virtual schools	59
Engineering virtual schools: what works?	59
Social capital: A definition	60
Social changes: The dissolution of social capital	62
Societal change	63
Institutional change	65
Interpersonal capacity for organisational learning	69
Building the affective climate	69
Affirmation	70

Invitation	70
Building the cognitive climate	71
Building the collaborative ethic	72
Virtual communities	73
Virtual social capital	73
Potentials of virtual social capital	74
Constraints on virtual social capital	75
Organisational issues concerning the engineering and metaphysics of virtual schools ..	77
Paradox of success	79
Elephants, fleas, and skunks	84
Organisational capacity for organisational learning	87
Socio-cultural and structural arrangements	87
Leadership structures	88
Personal issues concerning the engineering and metaphysics of virtual schools	89
Freedom	90
The “dark” side	94
Constraints on freedom	97
Potentials of freedom	99
Personal capacity for the creation of virtual learning communities	101
The search for knowledge	101
Internal search	101
External search	103
The process of knowledge construction	104
Conceptual framework	106
Summary	110

Chapter 3	112
Research design	116
The nature of the case study approach	117
Units of analysis/site selection	119
Data collection	120
Phase I	121
Phase II	123
Data analysis procedures	126
Establishing trustworthiness	128
Transferability	129
Credibility	130
The credibility of data collection via electronic methods	131
Member checking	133
Triangulation	134
Ethical considerations	135
Summary	137
 Chapter 4	 139
Phase I: The respondents and their contexts	139
The system	140
The school	140
The faculty	142
Faculty perceptions	143
Administrators' perceptions	144
Why create a virtual school?	144
Individual student needs	144

Organisational effects	145
A response to changing social conditions	148
Commodification of education	149
Conditions necessary for successful cyberschool development	150
Faculty issues	150
Bureaucratic/organisational issues	151
Challenges to sustaining an on-line school project	153
Vision and purpose	154
Organisational structure	155
Equity	156
Impact of the on-line school on SSD.....	156
Impacts on the learner	157
Impacts on instruction	158
Impacts on the organisation	159
Summary of administrators' perceptions	161
Teacher/developer perceptions	164
Nature of instruction in Crestview Cyberschool	165
The role of the teacher in the on-line school context	166
The role of the student in the on-line school context	167
Instructional strategies	169
Impact of these strategies on teachers	171
Student response to on-line instructional strategies	174
Trust in the cyberschool	175
The nature of community in Crestview Cyberschool	176
Community within the classrooms	176
Community among the staff	179

Organisational response to Crestview	181
Administrators' responses	181
Traditional school responses	181
Organisational conditions necessary for cyberschool development	183
Time	183
Technical support	185
Training	186
Summary of teacher/developer perceptions	187
Developer perceptions	190
The nature of instruction	191
The role of the teacher	191
The role of the student	192
Instructional strategies	193
The nature of community in Crestview Cyberschool	194
Community among the staff	194
Organisational response	195
Home school response	195
Fellow teachers' responses	196
Organisational conditions necessary for cyberschool development	196
Summary of developers' perceptions	197
A synthesis of the data	198
 Chapter 5	 202
Phase II: The respondents and their contexts	203
Student responses and perceptions	205
Communication patterns	205

Use of communication tools	206
Bulletin board	206
Chat room	208
E-mail	209
Level and use of communication	210
Frequency and nature of communication	210
Summary: the nature and quality of communication	213
The nature of instruction and student response to that instruction	214
The impact and role of technology	214
Where do students work on cyberschool tasks?	215
Quality of technology	216
The importance of technology to cyberschool	218
The importance of an on-line learning preparation course	220
Information necessary in a preparation course	220
Instructional issues	222
Nature of instruction and instructional techniques	222
Student preferences	224
What services do students want from a cyberschool?	226
What were students learning?	226
What did students expect from their cyberschool experiences?	227
What does a prospective on-line student need to know?	231
Student satisfaction with cyberschool experience	232
In what way does cyberschool help students to be better learners?	235
Summary	237
Students' perceptions of community	239
Students' experiences of community	239

Communication as community	239
Instances that denoted community	242
Summary	244
Chapter 6	246
Summary, analysis, and discussion of findings	246
What is the nature of instruction in a virtual high school?	247
The role of the teacher	248
The role of the student	249
Instructional strategies	250
Impact of instructional strategies on students	253
Impact of instructional strategies on teachers	256
What is the nature of community in a virtual high school?	258
The faculty community	258
The interpersonal capacity	259
The organisational capacity	262
The personal capacity	263
The community of the classroom	265
What school system-level structures and supports facilitate the development of a learning community in a virtual high school?	266
Initiation	267
Implementation	268
Institutionalisation	269
What do students and faculty perceive to be the strengths and drawbacks of learning in a virtual high school?	270
Strengths of the virtual school	270
Drawbacks of the virtual school	273

What structures and supports do students believe to be necessary for them to be able to learn effectively in the virtual context?	274
Technical supports and structures	275
Interpersonal structures and supports	275
What prompts students to pursue virtual high schooling?	276
What impact has societal environment of the New Economy had on the development, instruction, and participation in a virtual high school?	278
Streetwise	279
Innovative	280
Fast	282
Fun	283
Chapter 7	284
Summary, conclusions, and recommendations	284
Summary of the study	284
Methodology	286
Unit of analysis/site selection	286
Data collection	287
Data analysis	288
Conclusions	288
Personal capacity	289
Interpersonal capacity	291
Organisational capacity	293
Reconceptualisation	296
Implications	302
Implications for theory	302
Implications for practice	307

Implications for further research	310
Concluding comments	311
References	318
Appendix A	333
Letter of invitation (Phase I)	334
Survey participation invitation (Phase II)	335
Interview consent form	336
Survey consent form	338
Transcript verification form	340
Appendix B	341
Interview schedule	342
Appendix C	345
Student perception survey	346
Appendix D	353
Research ethics board approval	354
Appendix E	356
Statistics table	357

List of figures

Figure 2.1 – The sigmoid curve	79
--------------------------------------	----

List of tables

Table 3.1 – Research question matrix	137
Table 4.1 – Phase I respondent coding contexts and demographics table	141
Table 5.1 – Demographics of Phase II survey respondents	204

Chapter 1

The Problem

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 in Thornburg's comment is the proliferation of the computer in contemporary society and, in particular, the meteoric spread of the Internet. While it is true that "the Internet has [only] recently enjoyed its 30th birthday [it began at the University of California in 1969]" (Blake & Standish, 2000, p. 1), the Internet has become an almost ubiquitous thread in the fabric of today's globalised economy. In fact, it is akin to asking the famous "chicken or the egg" question – has the Internet fuelled the globalisation of the economy or has the globalised economy spurred the development and spread of the Internet? Whatever the answer, it is undeniable that the Internet plays a critical role in the new economy. It provides a platform for economic and informational exchange on a global scale that has never before been possible. It also provides a platform for the creation of virtual schools or "cyberschools" which not only present new educational opportunities to students via the Internet but also create an environment which has the potential to be the most interactive and student-centred educational opportunity currently available.

This chapter presents an introductory exploration of the thesis that the virtual school is not only a valid educational environment but also an essential one in the

context of contemporary society in that it provides students with the opportunity to gain and practice authentic, real-world Information Age skills in a learner-driven context. However, the realisation of this potential depends upon a number of factors. First, since the virtual school environment is clearly different from the traditional school context, especially in the context of significantly altered teacher-student and student-student interactions, teachers' instructional practices and the school's organisational constructs must also be significantly different. In addition, the students' approach to their role in and ownership of their own education must also change. Nevertheless, in light of the customer-focussed traditions which have become so prevalent in the Internet Age, the virtual school's potential can be realised only when learners are consulted with respect to the supports they need and the communications and learning environments they prefer. In the words of Cortada (2000), "the heart of e-business [and, by extension, e-education] is the move from mass marketing and production to mass customisation, building and doing for one" (p. 138), thus creating more interest in the customer's own personal market share.

Background to the Study

While the Internet has doubled in size every year since its creation, it is its use not its size that is interesting (Thornburg, 2002). The Internet "shifts control" from producers of information and products to consumers. In fact, in some ways, the consumer becomes the producer and vice versa. For example, it is possible for a consumer to log on to the websites of manufacturing companies and custom order products such as automobiles, computers and clothing with precisely the features he or

she wishes and expect delivery of those products in a relatively short time. This shift of control to consumers has significant implications for education.

Education has traditionally been organised according to a factory or Industrial Age model (Dolence & Norris, 1995; Lankshear, Peters, & Knobel, 2000) that is characterised by discrete pieces of information (subjects) being transmitted by teachers (largely via lectures) to students who were expected to memorise and demonstrate their knowledge of these subjects on objective exams. These bits of information are typically disjointed and, from the point of view of the learner, appear to have little or no connection to each other or, for that matter, to real life (Thornburg, 2002). This model of education worked fine in the Industrial Age because it simulated the conditions of the factory floor; thus preparing young people for their likely economic and occupational futures. The students did not need nor would have conceived of having had control of their own education. Therefore, education was typically teacher-centred rather than student-centred and focussed on content rather than the process of learning. While educators have long spoken about stimulating in students the desire to be life-long learners, the structure of school with its aged-based grades and formal graduations has long stood in contrast to the ideal of life-long learning (Thornburg, 2002). According to Sandbothe (2000), traditional education makes four assumptions:

1. Knowledge is to be conveyed in schools and universities. It is to be localised, detached from its concrete contexts of use, and relocated in a specifically academic realm of theoretical knowledge transfer.
2. Lessons are to take place as communication among people who are present (conceived as face-to-face communications).
3. Teachers are given the authority of omniscient knowledge administrators.

4. Knowledge is understood as a stock of established facts, standing in a hierarchically arranged context of order (p. 60)

These assumptions fly in the face of contemporary societal reality.

Society is experiencing what is sometimes called, among other terms, a knowledge-value era (Thornburg, 2002), a New Digital Era (Cortada, 2000), or an Information age (Dolence & Norris, 1995). There has been a subtle shift in society in that the value of the information available from teachers has diminished significantly (Thornburg, 2002). In other words, driven by the availability of instant access to much of the world's collected information via the Internet, "a transition is currently taking place from an educational culture shaped by the printed word and spoken speech to a form of educational practice in which working in the Internet's multimedia environment assumes central importance" (Sandbothe, 2000, p. 59). Consequently,

the Internet not only allows sense and meaning to appear in a different epistemological light: at the same time, our dealings with interactive data networks also lead to a reassessment of the status and function of sense and meaning itself. Knowledge no longer appears primarily to be a copy or construction of a reality that is to be cognised, but turns out in its pragmatic function to be a tool for the active and experimental changing of reality and shaping of the world. (p. 63)

Thus, the authority once ascribed to teachers due to the information they could impart to students has largely become less significant and, in turn, the sheer glut of information "out there" makes any one bit of information less valuable and reduces the shelf-life of information overall.

Yet, according to many leading economists, the world's economy (at least the economies of the western world) has evolved into what is often termed a New Economy

or a “New Digital Economy” (Cortada, 2001). “In its strictest sense, the ‘New Economy’ can be defined as the series of changes in the economic landscape that resulted from industry’s massive investment in new information and communications technologies (ICT’s) over the past ten years or so” (LeBlanc, 2002, p. 6). However, it is not the computing power itself that has spurred the New Economy. Rather, the technological changes have led to a world-wide overabundance of computing power which has essentially resulted in a New Economy that trades in information rather than in manufactured goods (DeLong, 2002). Consequently, the business climate is currently in a state of flux straddling the precepts of the traditional Industrial Age economy and the less familiar new Information or Digital Age. “This duality of cultures ... also plays out in policies of governments rooted in the Industrial Age but trying to figure out when [and how] to do things differently in the Information Age” (Cortada, 2001, p. xxiii).

Contemporary educational institutions face a similar challenge. They tend to have one foot planted firmly in the Industrial Age and the other foot tenuously searching for a foothold in the quagmire of the digital age. Therefore, educators and schools are faced with the very real likelihood that they are providing educational opportunities to children based upon stale or obsolete information thus setting those children up for a very large fall indeed. In order to avoid this mismatch between educational experience and “real life”, Sandbothe theorised that the assumptions made by traditional schools should be reframed for the contemporary context as follows:

1. The open semiotic world of the Internet challenges the notion of a closed realm of knowledge. Learning takes place in an open space that transcends the limits of the classroom.
2. Synchronous and asynchronous communication assumes equal value online.
3. Knowledge has a “short half-life”. Teachers acquire a new educational responsibility for evaluation and communicatively pragmatic navigational tasks.
4. No intrinsic order appears to be dominant in hypertextual Internet space. Knowledge is contextual and constructed rather than in existence in an a priori fashion. (pp. 61-62)

Regardless of one's view of the value or potential of the Internet, one cannot deny that it represents both a significant opportunity as well as a challenge for education. Blake and Standish (2000) suggested that there are four principal possibilities of change in education that could be brought about by the Internet (two are conservative and two are rather more radical):

1. The first of the conservative possibilities is that the Internet will have no real impact except to assist us in doing the things we already do in education (but more efficiently or effectively).
2. The second of the conservative possibilities is that the educational importance of the Internet will rest mainly with a few new practices that it might add to our educational repertoire (eg. video conferencing, electronic searches of texts, etc.).
3. The first of the radical possibilities is that the medium makes a difference, even a profound one, both to the character of old practices translated to the 'Net and any new ones that may evolve in the new medium (eg. new concepts of textual authority, new forms of interpersonal communication that modify concepts of identity and community, etc.).
4. The second of the radical possibilities is that critical implications will sometimes arise from the mismatch and differences between conventional institutions and practices and their nearest equivalents in cyberspace. Comparisons may reveal the weaknesses and strengths of both which may lead to a situation that online practices may present a strong condemnation of conventional practice. (pp. 6-7)

Even if the radical possibilities are discounted, “the advent of the Internet to education is still virtually certain to alter the agenda of philosophy of education [and of education in general] . . . because the social reality of education will itself change” (Blake & Standish, p. 8) by creating greatly extended participation in education in terms of both the numbers of learners and their ages – it may allow the development of a society of life-long learners which has thus far eluded educators. It will also change the shape and potential purpose of individual educational careers and may alter funding relationships between governments and schools. Finally, “it will alter our conceptions of student independence, the nature of teachers and teaching, raise questions about authority, issues in the distribution of educational opportunities and their accreditation, [and raise] questions about the content and structure of curricula under changed patterns of participation” (Blake & Standish, p. 8). These changes are, in fact, not mere possibilities but transformations that have already begun.

Statement of the Problem

The purposes of this study were two-fold: to determine the nature of instruction required in the virtual high school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual high school context.

Research Questions

The purposes were addressed through the following research questions:

1. What is the nature of instruction in a virtual high school?
2. What is the nature of community in a virtual high school?

3. What school system-level structures and supports facilitate the development of a learning community in a virtual high school?
4. What do students and faculty perceive to be the strengths and drawbacks of learning in a virtual high school?
5. What structures and supports do students believe to be necessary for them to be able to learn effectively in the virtual context?
6. From the New Economy point of view of seeing students as users or consumers of education, what prompts students to pursue virtual high schooling?

Significance of the Study

“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,

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 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) theorised 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)

Thus, "an obvious common-sense hypothesis is that with [Internet-based] technology, factors such as learners' computer skills, availability of computers for learners' use, and learners' access to the Internet, the Web, e-mail, and related resources will be predictors of learning outcomes" (Reyna, Brainerd, Effken, Bootzin, & Lloyd, 2001, p. 30).

However, “to make plausible judgements about the Internet’s social [and educational] practices we need to know a lot more about what [students] do there than we know at present” (Lankshear et al., 2000, p. 22). Consequently, a base line study such as this is significant because it will establish a body of knowledge about students’ perceptions about on-line learning and provide educators with direction regarding the construction and organisation of on-line courses. If on-line learning or virtual schools are going to be truly student-centred, students must be provided with a voice in the organisation of their learning environment and experiences rather than assume that, as educators, we know what they need or should want and this study will attempt to accomplish that task. Ultimately, the significance of this study will be determined by the increased awareness of students’ needs and wants with respect to their on-line learning experiences and the uses that educators make of that information. In addition, while student desires are, of course, important, they are not definitive with respect to the real educational needs for the New Economy. Therefore, this study also raised awareness of those needs and the extent to which they are met in a virtual high school context.

Delimitations

This study had the following delimitations:

1. This study was conducted in two phases in one Canadian-based virtual high school midway (approximately two to three months) through the school year’s first semester. Consequently, data collection took place from October through December, 2002.

2. This study was concerned with collecting perceptions of faculty using semi-structured interviews.
3. This study was concerned with collecting perceptions of students using an on-line survey as well as a series of focus-group interviews.
4. Phase one addressed faculty intentions and perceptions of the effects of their actions to assist their students to be successful in the virtual context.

Specifically, faculty were asked to identify the specific actions they employed in their on-line courses to enhance student success and to facilitate the creation of a virtual learning community and the extent to which they attempted to address the educational challenges presented by the New Economy.

5. Phase two addressed student perceptions of being learners in the virtual context. Specifically, students were asked to describe their experiences as on-line learners, to estimate the value of and processes required to create community in the virtual context, and to identify those processes that they believe assisted and/or hindered their successful completion of on-line educational tasks.

Limitations

This study had the following limitations:

1. The perspectives of individuals other than faculty and students were not considered. Therefore, pertinent insights from other school system and societal constituents may have been overlooked.
2. The data collection took place over a relatively short period of time mid-way through the school year's first semester. The perceptions of both students and

faculty, while valid at the time they were given, may not have been completely informed because some students, in particular, may not have completed an entire virtual school course.

3. The phase I respondents knew the researcher as a colleague and this may have affected their responses. Phase II respondents may have known the researcher as an on-line teacher and this may also have affected their responses.
4. This study was conducted in a virtual high school setting. The perceptions and conclusions derived from this study may not be applicable to other virtual high schools and may not be able to inform other virtual education initiatives.
5. A large portion of the data for this study was collected via on-line survey which, according to Markham (as cited in Fontana & Frey, 2000), “make it easy for respondents to manufacture fictional social realities without anyone knowing the difference” (p. 666). However, while this possibility existed, the on-line member check (described in Chapter 3) devised as a triangulation technique mediated the possible effects of a fictional reality on this study.
6. Perceptions were not reality and current practice was not necessarily representative of optimal practice.
7. The particular virtual high school under study was actually a blended or hybrid virtual school. In other words, it existed within the context of a traditional school system and provided on-line learning opportunities to its students primarily as a supplement to their face-to-face educational programs.

Assumptions

In this study, the researcher made the following assumptions:

1. That social contact is different in the virtual school.
2. That teaching and learning in a virtual school are affected by organisational aspects such as school division organisation and the nature and quality of support for such innovations.
3. That respondents responded truthfully, honestly, and thoroughly and resisted the temptation to construct fictional realities.
4. That student-centred approaches to organising learning environments are beneficial to designing virtual schools.
5. That perceptions of students and faculty were indicative of real attributes of virtual schools.
6. That, because I have been directly involved as part of the faculty of Crestview Cyberschool, I may have brought several assumptions and biases to this study which I have attempted either to make explicit or to control for in this study.
7. That the virtual school is uniquely positioned to provide the type of instruction suggested by the information age context (e.g., discovery and project-based learning activities).

Definition of Terms

The literature in the following chapter will provide a comprehensive development of salient terms that had an impact on this study. However, it may be

useful, at the outset, to supply definitions for key terms in this study for the purposes of clarification.

Virtual high school (or on-line high school): For the purposes of this study, the virtual high school was a school which offered an approved educational program for students in grades nine to twelve entirely via the Internet. The particular school used in this study was what Barker and Wendel (2001) referred to as a type 3 school that “provides a taste of virtual schooling in the conventional setting” (p. 3). This school, while free-standing and accredited to grant credits in its home province, existed primarily to provide an alternative educational experience for the students of a particular Canadian public school system.

Faculty: For the purposes of this study, the faculty of the school under study was considered to be both teachers and administrators who had direct and specific responsibilities for the virtual high school under study.

Community: For the purposes of this study, favours Shumar and Renninger’s (2002) definition of community as follows: “community can be thought of as a reference group with whom one shares information and interests that extend beyond the kind of physical connection one might hope for in a neighbourhood” (p. 65).

Internet: For the purposes of this study, the Internet was “a network of networks formed by the connecting together of computers and computer networks around the world through telephone and high-speed data transmission lines” (Haughey & Anderson, 1998, p. 12).

Webpage: A web page is a document that has been developed using Hypertext Markup Language (HTML) instructions or “tags” that is intended for viewing on the Internet.

Globalisation: Globalisation “may be described as the process by which societies are connected through rapid, large-scale networks of political, social, and economic interaction” (Lelliott, Pendlebury, & Enslin, 2000, p. 45).

Synchronous computer mediated communication (CMC): Synchronous CMC is produced when communication takes place between two or more computer users who communicate in “real time” via the Internet much like a telephone or face to face conversation.

Asynchronous CMC: Asynchronous CMC is produced when communication between computer users is not simultaneous (e.g., e-mail).

The New Economy: The term, New Economy, refers to the economic shifts that have been precipitated by traditional industry’s massive investment in new technologies. This investment has created new economic patterns as information, rather than manufactured goods, has come to the fore as the dominant economic commodity.

Organisation of the Dissertation

This chapter presented the background, the rationale, the research question, and both the limitations and delimitations of this study. The second chapter presents the review of literature pertinent to this study. The third chapter presents the issues surrounding the research design, methodology, and data collection and analysis techniques. The fourth chapter presents the data from phase I while Chapter five presents the data from phase II. Chapter six presents a synthesis of the data as well as a

discussion and analysis of that data. Finally, Chapter seven provides a summary of the study, several implications for theory, practice, and further research as well as a reconceptualisation of the conceptual framework.

Chapter 2

Review of Literature

In considering how to conduct the schooling of our young, adults have two problems to solve. One is an engineering problem; the other, a metaphysical one. The engineering problem, as all such problems are, is essentially technical. It is the problem of *means* by which the young will become learned. It addresses the issues of where and when things will be done, and, of course, how learning is supposed to occur. The problem is not a simple one ... there is no one who can say that this or that is the best way to know things, to feel things, to see things, to remember things, to apply things, to connect things and that no other will do as well. In fact, to make such a claim is to trivialize learning, to reduce it to a mechanical skill. But to become a different person because of something you have learned – to appropriate an insight, a concept, a vision, so that your world is altered – that is a different matter [it refers to the metaphysical problem]. (Postman, 1995, p. 3)

As Postman illustrated here, education is a multifaceted endeavour which, at its best, provides students with engaging and enlightening opportunities to grow and develop as human beings and, at its worst, becomes, as Postman suggested, “a mechanical skill”. While there are many challenges in contemporary education, one of the most difficult challenges that educators and society in general grapple with is the purpose of education and, therefore, what principles should guide the educational enterprise. On the surface, this challenge seems simple – many parents and members of society in general might say that the purpose of education is to help students prepare for either future occupational or educational pursuits that the student may wish to pursue, since, “education appears to have been redefined as an instrument of the [new]

economy” (Tosey & McNair, 2001, p. 103). However, this simplicity is deceptive.

Questions such as who should decide what children need to know and what procedures should be used to ensure that students gain that knowledge are notoriously difficult to answer. Nevertheless, the answers to those questions provide direction in resolving both the engineering and the metaphysical problems facing education and are what drives educational innovation and practice.

The engineering problem identified by Postman rests on the means by which children are educated. The educational landscape is rife with “experiments” in both content and program delivery. For example, Postman related a rather disconcerting story of “one school system in the state of Florida [that] has adopted a story requiring teachers and students to believe that the United States is superior to all other nations—one assumes, in all respects” (p. 65). Nationalistic content such as this is an example of education at its worst.

With respect to educational program delivery, educators have also experimented widely by exploring the potentials of such processes as the open school concept, correspondence schools, and, recently, virtual schools. While not all of the experiments have been successful, if one accepts Gardner’s (2001) theories of multiple intelligences, one must also concede that there are multiple appropriate and necessary ways to learn and be taught and that educators must continue to experiment and try new things. In fact, according to Lyotard (as cited in Lankshear, et al., 2001), in this post-modern world, the grand-narrative perpetuated by the traditional school structure has largely disappeared.

The nature of knowledge itself has changed in the post-modern new economy, the future is increasingly unpredictable and unstable. What we know today is quickly obsolete and what counts as knowledge and truth in this environment is called into question. (p. 29)

The metaphysical problems of education, however, tend to hide in the background of educational discussions. Koestenbaum and Block (2001) illustrated this point with their observation that “this focus on what works – our instrumental nature – creates a vacuum for the question of ‘what is the point,’ which rises from our human nature” (p. 6). Perhaps due to the immediacy of the “How” of schooling, educators tend to be concerned with engineering educational delivery to the exclusion and, in some cases, total obliteration of the “Why” of schooling. Thus, the observation “all the how-to-do-it books have been written. What is needed is a book on *why* we are doing it and the ways we can experience our freedom, regardless of the particulars of our workplace” (p. 7) is appropriate and should inform the development of virtual schools. Virtual schools are particularly vulnerable to getting bogged down in the engineering issues. The technical challenges could easily outweigh the more philosophical considerations such as whether virtual schools should exist and, if so, why should they exist. After all, just because the technological means exist to create virtual schools, it does not automatically follow that they should exist.

In one sense, virtual schools could be seen as 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 prevalent in today’s New Economy appears to be both justifiable and necessary.

At one point in history, “American culture knew what schools were for because it offered fully functioning multiple narratives for its people to embrace” (Postman, 1995, p. 13). Those narratives were the struggle for independence and the challenge to make a coherent and stable culture from a people with multiple backgrounds and traditions. Thus, education was guided by a profound purpose founded on the desire to ensure that citizens “would know when and how to protect their liberty” (p. 13). In this way, the metaphysical or philosophical underpinnings of American education were built on the foundation of ensuring that citizens learned to share (and contribute to) the common narrative that defined their nation. It directly addressed the “Why” question of education. In other words, “public education does not serve a public. It *creates* a public” (p. 18). Thus, a fundamental philosophical question for virtual schools is “What kind of public do we want and how can the virtual school be positioned to contribute to this structure?”

In the global society, the nature of culture building does not manifest itself in the same way as it did in the past. The Internet and other communication technologies have created a paradoxical situation which has made the existence of a national cultural identity nearly obsolete and at the same time, encouraged a move toward localisation of culture. With one click of a mouse button, people from all over the globe can have

access not only to much of the world's accumulated knowledge but also to each other. Young people, or anyone else for that matter, can instantly buy the latest fashions from Paris, hear the hottest music from Brazil, watch the latest movies from America and "chat" with each other regardless of their physical locations on the planet or the time zones they live in. Yet, "living in a world with ubiquitous and unavoidable access to information means that people will increasingly have to restrict access to this information, in order to maintain control of their lives. They will only allow access to information that relates to their own interests (professional and personal)" (McCalla, 2000, p. 178). In addition, "the model of citizenship [in the New Economy] or [post-modern society] is now much more entrepreneurial and inclusive ... and a model of the citizen is increasingly of one who is both self-employed and self-educated" (Griffin, 2001, p. 47) and, at the same time, unavoidably connected to one or more vast computer networks.

Consequently, people in contemporary society are both pushed "outward" toward the vast stores of information residing in web pages on the Internet and pulled "inward" toward narrowing and focussing specifically on whatever interests them. Of course, this push and pull has major implications for education in general and virtual education in particular. By being pushed outward, students are encouraged to become surface skimmers of information because they cannot critically review and study the sheer volume of information that is "out there". However, by being pulled inward, students run the risk of becoming narrow-minded or, perhaps, single-minded in their pursuit of information that is of interest to them excluding a great deal of valuable or

important information which may not be relevant to their interests directly but may, indeed, be relevant to living life in society or simply good things to know. Thus, learners will also become increasingly entrepreneurial. According to Griffin and Brownhill (2001),

In the educational sphere, the notion of self-directed learning has a tendency to de-institutionalise the educational process, for, as self-directed learners, students will not need traditional educational institutions, which offered, in return for submission to their authority, the possibility of knowledge ... a teacher is no longer seen as an authority but as a resource to be used, a purveyor of either useful or useless information and skills, a competent or incompetent technician. (p. 64)

In some respects, the relative uniqueness of many of the world's cultures has largely disappeared. In fact, due to the communications technologies currently in use along with global free trade initiatives, it could be said that national borders have all but been rendered anachronistic affectations. What, then, is the purpose of education in this climate? Should education stick to its traditional role of cultivation of a shared narrative or is change implied? If so, what changes are warranted? Further, what roles does/should computer technology and the Internet play in those changes?

The focus of this chapter is to examine the literature as it applies to the critical constraints and potentials related to virtual school initiatives. It is separated into two sections. The first section presents a variety of pragmatic issues regarding virtual schools. It describes the virtual school, presents an overview of current virtual school projects, outlines a number of benefits and drawbacks ascribed to virtual schools, and discusses a number of issues relating to the strategies necessary to create virtual schools. The second section examines the two central problems facing virtual

schooling (and education in general) identified by Postman: engineering and metaphysics. It is organised according to three broad headings emerging from the literature: social issues, organisational issues, and personal issues. In addition, the concepts of organisational learning, learning communities, and virtual learning communities, impinge on each of the three broad areas and are, therefore, interspersed throughout the sections as appropriate.

PRAGMATIC ISSUES CONCERNING THE ENGINEERING AND METAPHYSICS OF VIRTUAL SCHOOLS

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. If this sounds like science fiction, read on! (Van Horn, 1997, p. 481)

Bold predictions indeed from futurist Royal Van Horn in one of his frequent articles for the Phi Delta Kappan. However, to what extent has this prediction come to fruition? The following section provides an overview of pragmatic issues concerning virtual schools. It begins by identifying and describing virtual schools in general as well as some current virtual school projects. Then, the benefits and potential drawbacks of virtual schools are discussed. Finally, a number of factors concerning the successful implementation of a virtual school are forwarded.

Engineering Virtual Schools: What Are They and Where Do They Exist?

The virtual school is the latest in a long line of technological innovations that have made their way into mainstream education. While not yet commonplace, the virtual school – sometimes known as “cyberschool” – provides educators with some interesting opportunities and challenges. This section begins by defining and describing, in general, the virtual school. Then, it provides a brief overview of early virtual school projects.

What Is a Virtual School?

The virtual school, or cyberschool is a school that takes advantage of technological tools such as computers and the Internet to provide an educational program to students. Tuttle (1998) defined the virtual school as “one of a new breed of schools that uses e-mail, online chats, internet resources, and archived resources to teach courses. No classrooms. No lectures. No surprise quizzes. No buses. No buildings” (p. 46). Johnston (2000) extended this definition with “in a virtual school ... the classroom is always open ... the opportunity to learn is available 24 hours a day, 7 days a week” (p. 52). Further, Rutkowski (1999) stated that virtual schools

Can be simply defined as places of learning that do not have a geographic building. [In other words] they serve the educational needs and interests of a geographically dispersed rather than geographically determined community of learners ... using primarily broadcast or networking technologies, or a combination thereof. (p. 74)

Virtual schools seem to have evolved from the plethora of distance education initiatives that have been in existence since around 1900 (Papert, 1993). For a variety of reasons, students have always found the need for self-directed or individual

instruction that allows 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 the traditional classroom) is not a particularly novel one. As McLean (1998) pointed out, “cyberschools are [often] considered fourth-generation correspondence 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” (Mittelman, 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 acquisition of that knowledge more relevant and enhancing retention of and facility with that knowledge.

Nevertheless, according to Barker and Wendel (2001), there are at least three purposes served by the development of on-line schools. These purposes include: “(1) the need to provide access to formal learning programs in rural and remote communities; (2) the intention to provide choice in program delivery to students and their parents; and (3) the opportunity to explore the uses and benefits of ICT to education and training” (p. 3).

The virtual school may choose to deliver its 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 Mittelman pointed out, most of the educational opportunities offered by 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. (Mittelman, 2001, p. 86)

There are several approaches to the delivery of virtual schooling. For example, Barker and Wendel (2001) identified three types of virtual school in Canada. These schools are described as follows:

1. Type 1 schools are totally virtual, and exist predominantly in Alberta. Students choose to access their entire instructional program, aside from physical education and practical arts courses, through electronic means.
2. Type 2 schools provide a mix of virtual schooling and conventional distance education, particularly in British Columbia. Students can choose to access a portion of their program through electronic means.
3. Type 3 schools provide a taste of virtual schooling in the conventional setting, as evidenced in Ontario. Students [typically] access on-line learning in the classroom and not necessarily by individual choice. (p. 3)

As mentioned earlier, virtual schools have evolved naturally from the variety of distance education initiatives that have been in place in Canada for many years.

According to Haughey and Roberts (1996), all provinces and territories in Canada have launched virtual school initiatives in various forms. However, the paths to those initiatives have been different according to the political climates and social structures in

the various provinces. “Across Canada, some provinces chose system-wide change while others chose a more conservative, incremental approach” (Haughey & Roberts, 1996, p. 63). Regardless of the approach used, however, government initiatives followed three major thrusts: (1) technological infrastructure development, (2) decentralisation of open and distance education, and (3) development of shared resources (Haughey & Roberts).

In Saskatchewan, the provincial government chose to begin by focussing on the development of a provincial network and then explored the problems of correspondence education. Thus, school infrastructures were developed as part of a larger initiative (Haughey & Roberts). In 1989, the Saskatchewan Communications Network (SCN) was established by the Saskatchewan legislature “to provide increased access to information for the people of the province. Through its interrelated networks, SCN provides the people of Saskatchewan with cost-effective educational, informational, and cultural programming and training opportunities” (<http://www.scn.sk.ca/el/about.php>). SCN is a Crown Corporation which provides service through three networks:

1. The SCN E-Learning Network, that “delivers post-secondary and high school classes to over 180 classrooms in more than 150 communities, and is available to businesses and organisations for satellite conferencing and professional development opportunities”;
2. The SCN Broadcast Network, that “operates on Saskatchewan’s cable, wireless, and satellite television systems and delivers a wide variety of informational programming that highlights the rich culture and heritage of our region and our country”; and
3. SCN Technology Services, that “use satellite-delivered video compression technology to provide five video/audio channels and data transmission capability to deliver SCN’s E-Learning, and Broadcast Network programs. Satellite technology is also used to provide high-speed Internet access to rural and remote communities as part of the

CommunityNet initiative, and to broadcast the proceedings of the Saskatchewan Legislature to communities throughout the province” (<http://www.scn.sk.ca/el/about.php>)

Early Virtual School Projects

Van Horn’s bold prediction regarding the creation of virtual schools was not, in fact, really so bold but was also not entirely accurate. A review of the literature reveals that at the time of the above prediction, several virtual high schools were already in existence throughout the world, among them – St. Gabriel’s Cyber School headquartered in St. Albert, Alberta; Florida Virtual High School (FLVS) in Orange County, Florida; and the Virtual High School (VHS) out of the Hudson, Massachusetts public school system. Since Van Horn’s 1997 prediction, literally hundreds of virtual schools have begun operation across the educational spectrum offering classes ranging from Kindergarten to University graduate programs. A thorough listing and comparison of all virtual school projects currently in existence is beyond the scope and intent of this literature review. However, in the interests of providing a sense of the nature of virtual school projects in existence, to include at least one school from each of the three types of virtual schools identified by Barker and Wendel, and, to provide an international flavour to the descriptions, the three schools identified above as well as a fourth school – the Israeli Virtual School (a Type 3 hybrid virtual school which combines virtual and traditional courses) – are described in the sections below.

St. Gabriel’s Cyber School

In 1994, St. Gabriel’s Cyber School began offering virtual courses to 25 students (McLean, 1998). Since then, it has expanded and formed partnerships with

virtual schools centered in neighbouring communities. During the 1997-1998 school year, St. Gabriel offered programs to over 400 students in grades 6 to 11 (<http://www.stgabe.com/>, accessed Jan. 5, 2002). In 2001, St. Gabriel expanded again and now offers a full-service school program to students from grades 4 to 12 as well as an international student program (<http://www.stgabe.com/> accessed Jan. 5, 2002).

While St. Gabriel is most appropriately described as a type 1 school – meaning that it offers its program to students entirely on-line, it also provides some services to its students which are unique among the early virtual schools. It organizes a number of “Spirit Days” during which students who are able to participate come together for activities such as science fairs, drama productions and sports games (<http://www.stgabe.com/> accessed Jan. 5, 2002) These activities provide the social dimension which is missing in many other virtual school programs. Liz Ayliffe, a St. Gabriel’s student, said:

It’s sure better than public school ... my brother had a friend over, and he said that in his public school they had to get the police to break up a fight. There were even broken arms and noses ... there are no invisible boundaries, no stereotypes ... [cyberschool] lets you figure out who you really are and not always trying to be someone else ... [besides] my marks have gone up 3%. (McLean, 1998, pp. 37-38)

Florida Virtual High School

The Florida Virtual high school (FLVS) was formed in 1996 as a joint project of the Orange and Alachua counties. Its motto, “any time, any place, any path, any pace” (Johnston, 2000, p. 52) implies an extremely flexible and self-directed student learning environment.

FLVS began delivering courses in 1997 and currently offers over 60 high school courses to an estimated 8000 students (<http://www.flvs.net/> accessed Jan.5, 2002) in a blended framework. In other words, while it offers its complete high school program entirely on-line, it is a type 2 school because it provides on-line educational opportunities to its students in conjunction with both conventional face-to-face schooling and other forms of distance education. “Giving students a choice in how, when, and where they learn is the primary reason for the development of [FLVS]” (Johnston, 2000, p. 52) and the school’s mission statement “to take full advantage of current instructional technology and rapidly expanding resources of the information age to provide comprehensive programs which will enable students to be productive, life-long learners” (<http://www.flvs.net/> accessed Jan. 5, 2002) resonates with its motto and quite likely provides a rewarding educational experience for its students. While there are a range of testimonials published on the school’s home page, the following quotation from a Grade 12 student speaks to the quality of educational experience available at FVHS:

An online course with Florida Virtual School is a great alternative to a public high school course because it fosters self-learning, encourages contact with teachers, and has a flexible schedule to accommodate any student. Taking a course with Florida Virtual School instills independent learning techniques, which help students long after they graduated from high school. Online students have instructor support available upon request but self-learning is a skill that is encouraged. I believe a student will get a head start in the world by taking a Florida Virtual School online course. It is a great opportunity! It teaches independent learning, time planning, and communication skills. The Florida Virtual School experience will definitely assist the individual in his or her college endeavors and professional career. The student will gain more than just academic knowledge with the online learning experience. (Moulavi, 2001, <http://www.flvs.net/> accessed Jan. 5, 2002)

Virtual High School

The Virtual High School (VHS) was formed in 1996 with a five-year United States federal Technology Challenge Grant. The project was developed by the Hudson, MA, public schools system with assistance from the Concord Consortium (Roblyer & Elbaum, 2000, p. 59). VHS has a unique collaborative structure that requires local schools to train a teacher and offer a course in its network in order to register its students in a course (<http://vhs.concord.org/website.nsf>). Any school offering a cyber course in the VHS network is permitted to register 20 students in any course(s) offered by VHS partners in return for agreeing to offer a course to other schools' students. Presently, there are 200 member schools offering 156 high school courses to approximately 3000 students (<http://vhs.concord.org/website.nsf>).

Students and staff appear to be satisfied with the school and its offerings. One student wrote "I just wanted to let everyone know that I'm hearing-impaired, and that I love VHS because I never have to ask anyone to repeat themselves, and I never miss hearing when a teacher makes an announcement (or an assignment!)" Another stated,

In VHS, a student doesn't have to be afraid of appearing "too intellectual" (often associated with unpopularity) in front of your friends, or in front of other kids in school who might mock you. VHS allows students to voice their true opinions without having to censor themselves, because in VHS, you know that people take classes because they really care about them, and it's taken seriously. No one is going to make fun of you, and even if they do, chances are they live 10 states away. (<http://vhs.concord.org/website.nsf>)

The Israeli Virtual High School

In January, 2000, the Israeli virtual high school (IVHS) was established as a three-year experimental project by a private funding agency. It was created to address

concerns that the current structure of schools in Israel was insufficiently meeting the varied needs of students (Mittelman, 2000). The school's organizational structure is based on the VHS model with some interesting and fundamental differences. "The model is based in the best teachers in the traditional system being the conveying link of the new framework, and one of its central goals is to find ways to integrate the new framework into the existing educational system" (p. 90). The desire to integrate the virtual school platform into the traditional brick and mortar school system is what differentiates this approach from the VHS or the FLVS approaches. This difference creates a **hybrid virtual school** or, to use Barker and Wendel's parlance, a type 3 school that seeks to supplement and expand the traditional school curricular offerings and co-exist with traditional schools rather than replace traditional schools altogether.

The issue of faculty training was also addressed in an interesting manner. "A group of 15 teachers, from several content areas, was selected for training ... the training process took place as a year-long virtual course in the 1999-2000 school year" (Mittelman, 2000, p. 90). This aspect of the training was innovative and logical. Traditional teacher training models assume that prospective teachers have had personal, first-hand experience in the type of classroom they are preparing to work in; this assumption cannot be made for cyber-teachers. Thus, training teachers via a cyber course gives them first-hand knowledge of the difficulties faced by students in the on-line environment and may lead to more effective teaching strategies. In addition, each course was developed by teams of teachers – usually in pairs – and are also taught in teams. This aspect of the development and delivery of the courses also differentiates the

IVHS from the other models presented here. It creates a collaborative structure which may lead to more effective collaborative activities for the students. Finally, the last major difference is that each member school has appointed a coordinator “who serves in the role of educator for the students from that school who are learning in the various virtual courses” (Mittelman, 2000, p. 90). Thus, the students have someone to consult with and report to in a face-to-face manner when they encounter difficulties or challenges in their virtual courses.

The balance of the IVHS operational structures are similar to the VHS structures. There is a consortium of 12 schools which are allowed to register approximately 30 students each in any of the 6 courses offered (Mittelman, 2000). The IVHS has experienced only one problem of note – the student demand to take the virtual courses offered has significantly exceeded the capacity of those courses.

Benefits of Virtual Schools

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 following typology has been employed as an organizational device in order to facilitate discussion of these professed benefits. The literature suggests that virtual schools provide or address: literacy issues, an engaging educational environment, authentic environments and tasks, collaborative structures, various student needs and school organizational issues.

Literacy Issues

As stated earlier, it is a common belief that society has progressed from an industrial age into an information age. Therefore, Papert (1993), among others, advocated a new definition of literacy which reflects the new reality of societal interaction. In the information age, “students [and people in general] are both consumers and producers of ... information” (Alvarez, 1997, p. 68). However, when teachers focus on student literacy, they are typically being product-oriented and, thus, betray their industrial age biases by viewing literacy only from the consumer point of view “of the state 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” (p. 10). Consequently, to be considered literate, one must be capable of a range of competencies. For example, the sheer volume of information bombarding individuals in today’s society requires at least one new vision of literacy which is sometimes referred to as 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 veracity and comparative worth. The virtual school environment has two advantages which allows it to respond to this “new literacy”.

First, it makes use of and exists in the largest information source in the world – the Internet or information superhighway (which is also a primary platform of the New

Economy). “[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). According to McNair (2001), “Where key skills of the ‘old’ economy were specialisation and obedience to managers with superior knowledge, those of the New Economy include knowing how to select and manage information and add value to it, for one self or for a potential client” (p. 19).

Second, involvement with virtual schools develops another new literacy, technological literacy, which, in concert with information literacy, will be essential tools for the future (Dolence & Norris, 1995). As Alvarez pointed out, “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” (p. 71, emphases in the original). In other words, technology becomes an integral part of the learning process and all students begin to see the computer simply as another tool with which to learn and to interact with society. “The manufacturing economy used only the intellectual effort of a small minority of managers, leaving the majority as ‘hands’ without ‘brains’. The New Economy has no role for hands alone, and those excluded from the knowledge process represent both a waste and a threat to the firm” (McNair, 2001, p. 28). Therefore, the virtual school simulates the structures of the New Economy by requiring an intellectual and technological effort from everyone involved.

Actually, this change has already begun. Students appear to have a perception of computers which is different from attitudes prevalent in adult society. “A generation that has grown up with computers and multimedia does not isolate them in opposition to the ‘real stuff’ they had as children” (Kolb, 2001, p. 147). Consequently, computers have become an integral part of students’ daily lives.

The argument for a new definition of literacy goes even further. Papert (1993) argued for a differentiation between the terms literacy and letteracy. He posited that the traditional definition of literacy is really just letteracy – a term he uses to signify the ability to manipulate text-based information. Literacy, according to Papert, must reflect the breadth of abilities necessary in the information age. In fact, even the term “computer literacy” is suspect because it has “come to be defined, especially in the context of School [sic], as a very minimal practical knowledge about computers. Someone who had so minimal a level of knowledge of reading, writing, and literature would be called illiterate” (p. 52). He viewed literacy not as a degree of knowledge but rather, as kinds of knowledge. In other words, just as the traditional definition of literacy implies that an individual not only “knows literature” but also that he or she “has certain ways of understanding the world that derive from an acquaintance with literary culture” (p. 52), literacy in today’s world must refer to the kinds of knowledge expected or required of an individual in society and, therefore, must include computer literacy which “should refer to the kinds of knowing that derive from a computer culture” (p. 52). Actually, “computer literacy might figure as a convenient metonym for social inclusion in the Twenty-first Century” (Blake & Standish, 2001, p. 9).

In addition, media of various types have infiltrated our collective consciousness in a variety of ways. “A media culture has emerged in which sounds and spectacles help produce the fabric of our everyday life” (Kellner, 1995, p. xiii). These media have a significant impact on the information we ingest and make use of – particularly in this information age. Since, “We are immersed from cradle to grace in a media and consumer society ... it is important to learn how to understand, interpret, and criticise its meanings and messages” (p. xiii). Thus, students must be encouraged to develop a critical stance about the veracity and trustworthiness of the media – a quality often referred to as media literacy (Tyner, 1998).

An examination of Gardner’s work reveals a similar sentiment. He advocated the use of technology and, by extension, the virtual school, in the development of “cultural literacy” in students. He posited that “computer technology puts all the information in the world at one’s fingertips, quite literally. No longer will we have to spend long periods of time hunting down a source or a person – these can be found instantaneously” (p. 31). In this way, he argued, students will develop instant cultural literacy simply due to the Internet’s ease of information gathering. However, information literacy will have to be incorporated into the education milieu in order to counteract the variability of veracity of information sources (Gardiner, 2000).

Finally, Salomon (1998) stated that the nature of knowledge itself has changed and therefore, so must the definition of literacy.

It is not so much what one knows but whether one knows *how to get* to the knowledge and whether one knows *what to do with it* once it has been accessed. In other words, knowledge is not just some accumulation of facts, perhaps even

connected in a network, having been constructed for idle purposes, sitting there waiting to be called upon; rather, knowledge is sought after, accessed, and situationally and purposefully constructed *ad hoc*. (p. 5, emphasis in the original)

One could argue that the virtual school, if properly organized to encourage thoughtful and discriminating use of information, could address and develop in students these new literacies.

Engaging Educational Environment

The general thrust of the literature regarding student engagement with electronic learning environments suggests that because the virtual school environment is so new and different from the traditional classroom environment, students interact with the material for longer periods of time and, therefore, 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, Brainerd, Effken, Bootzin, & Lloyd, 2001, p. 35). In addition, it assumes that if children are more engaged with their learning environments, they will also achieve higher grades. In some literature, it is suggested that particular subjects are best suited to virtual schools. For example, Alberta learning (2001) found that, in 1999, achievement of students in English Language Arts virtual schools tends to be similar to that of students in separate and public but lower in math.

Wolfe (2001) theorised that the Internet itself has a significant effect on student learning. He argued, “The Web places greater demands on students than traditional

modes of instruction” (p. 2) which leads to the development of an important skill set in students that is essential in the current information age. These demands include greater cognitive demands on text processing stemming from the non-linear nature of the Web, mismatches between learners and technology arising from the heterogeneity of information and/or technology on the Web, demands for greater cognitive flexibility, and more demanding environments for social interaction. Therefore, learning on the Internet leads to an advanced literacy skill because “all students working with heterogeneous information [as is found on the Web] must confront contradictions among sources and address issues of quality” (p. 4).

Papert (1993) stated that learning with computers is more engaging due to the tendency for children (and adults) to view the use of a computer as play. However, the activity may be designed to instruct while learners play. In this way, learners do not realise that they are learning. For example, the LOGO computer programming language, an early foray into computer programming for children, was developed at MIT by Papert. The original versions of LOGO provided children with opportunities to use their math skills to animate objects on a screen. More recent uses of LOGO include Web animation and simple robotics programming (Caggiano, 2002, <http://www.atlantic.net/~caggiano/index.html>). While the use of LOGO has the “feel” of play to the children, it actually gives them an opportunity to develop advanced mathematical skills (Papert).

Salomon (1998) pointed out that “the learning environment of the classroom, its climate and socially shared way of perceiving what is going on, determines whether the

individual learners are more likely to rely on their abilities or intentionally mobilize their mental effort” (p. 6). In this light, one could argue that the virtual school environment is so new for the students that they will have no choice but to mobilize their mental efforts and thus engage more fully in their learning activities. Finally, Thomas (1998) offered words that encapsulate both the engaging nature of the virtual school and its potential effect on students:

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? (p. 7)

In some ways, the conventional classroom could be seen as being a barrier to effective student learning due, primarily, to a variety of issues regarding peer pressure. Barker and Wendel, for example, found that students felt that they learned better because they were relieved of peer pressure allowing them both to learn at their own pace and in their own way and to ask their teachers for individual assistance without negative reactions from their peers. Rourke (2000) found that a majority of students found the online environment to be “trusting, warm, friendly, disinhibiting, and personal” (p. v).

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 virtual school environments provide 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 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. Further, they theorised that the lines between work and learning will blur as the information age progresses and the virtual school environment will provide that easy transitional bridge between work and learning. Actually, Alvarez (1997) argued that the virtual school environment has the potential to provide an authentic environment because it recultures students to see a computer as it really is – a tool to manage information and to communicate electronically with people – rather than as something separate from “real life”. Zirkle and Guan (2000) posited that the technology skills developed in a virtual school environment are what authenticate the students’ experience because those skills are immediately transferable to the workplace.

Van Horn (1997) insisted that, in the virtual school environment, “Student investigation will look a lot like what is best known as inquiry teaching” (p. 482) and this inquiry or resource-based method mimics the information management skills required by society’s workplaces. Thornburg’s (2002) observation concurred with Van Horn’s views. However, Thornburg cautioned that staff selection can play a significant role in the realisation of inquiry-based instruction. “Teachers whose backgrounds are in fields other than the ones they teach tend to rely on the more traditional instructivist method of teaching, which may help students learn the vocabulary of a topic, but essentially digs no deeper than providing responses to multiple-choice tests” (p. 54).

Barker and Wendel (2001) found that students are “overwhelmingly positive” about their on-line learning experiences, in part, because: (1) they were able to learn independently, (2) the virtual school environment was self-paced, (3) they had greater access to teachers (particularly when they were working at home), (4) their progress was assessed more objectively, (5) they were able to use computers in authentic ways, and (6) they perceived that learning on-line was beneficial to them in later life (they were learning important skills).

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 the students and the teacher. Especially in high schools, teachers and students tend to operate behind closed doors in individual classroom units, with set periods of time governing learning and with little or no interaction between students and teachers, among students, or, for that matter, between teachers (Mitchell & Sackney, 2001). “The modern structure of . . . schools dates back to the Industrial Revolution in the middle of 19th century, when the job of schools was to prepare students to be productive members of an industrial society. Fixed class periods marked by bells, repetition, and rote memorization were excellent preparation for factory life” (Shaffer, 2000, p. 176). Terms such as factory model (Dolence & Norris, 1995) or clockwork model (Mitchell & Sackney, 2001) have been used to describe this traditional structure of schools. However, changes in society have positioned contemporary education to appear like a deer caught in the headlights of society. “We

have inherited industrial schools, but the Information Revolution is transforming our economy from manufacturing to services - and changing us from a society of factory workers to a society of knowledge workers” (Shaffer, 2000, p. 177).

In some respects, the changes in society have caught modern education systems flat-footed. Dede (2000) argued that educational systems have been, thus far, unable to make the cognitive jump to methodologies which will foster in students the skills required of the information age. “Students – and teachers – need to master new skills that the current curriculum may not address, skills that were not central in the industrial society of the past century but are vital in the knowledge-based economy of the new one” (p. 171). Further, those skills are, themselves, also constantly changing.

The inventory of skills purported to be necessary in contemporary society is wide and varied. For example, McNair (2001) posited that “to cope in the [post-industrial – New Economy], individuals will need increasing skills in self management, to be good at anticipating and responding to change, and perhaps above all, to be good listeners” (p. 23). Dede surfaced other skills which include “the ability to collaborate with diverse teams of people – face-to-face or at a distance to accomplish a task; to create, share, and master knowledge by assessing and filtering quasi-accurate information” (p. 171). Holford and Nicholls (2001), on the other hand, have quite a different view of the skills that ought to be addressed in schools.

Schooling is designed to prepare children for life. One of the assumptions of ‘life-long learning’ as a policy [particularly in the environment of the New Economy], of course, is that we cannot realistically now say what particular skills people will require throughout their lives. They will change their jobs, even their careers, quite frequently. Therefore, it no longer makes sense for

schools to teach specific skills, especially in vocational areas. Rather, they should develop skills and attitudes that will enable children to mature into capable adult learners, providing them with [more general] skills [that will permit them] to readjust and reposition themselves throughout their working lives. (p. 138)

The literature reveals a variety of collaborative structures which are either created or enhanced by the addition of a virtual school environment. One argument which gets a significant amount of attention in the literature is that working within a virtual school environment may enhance faculty collaboration (Mittelman, 1998; Zak, 2000). Barker and Wendel (2001) also found that faculty identified the opportunity to work collaboratively with colleagues via the Internet as a major benefit for teachers to be involved in a virtual school project. Tuttle (1998) observed that collaboration between rural and urban students could be a potential outcome of virtual school learning. More basic student collaboration is also argued to be a potential outcome of the virtual school environment (Coulter et al., 2000; Salomon, 1998). Moursand (1997) argued that since students are often more adept at using technology than their teachers are, "This provides an excellent opportunity for collaborative learning activities among students and teachers where all are able to contribute and to learn" (p. 3). Finally, Underwood (2001) argued that the introduction of technology into existing groups in traditional schools actually encourages and enhances collaboration which leads to the possibility that conducting an entire class on computers (via the internet) may also yield this effect.

Specific Student Needs

The virtual school appears to address a number of student needs. “The most common reason for selecting a virtual school program was dissatisfaction with conventional schooling” (Barker & Wendel, 2001, p. viii). Further, Williams (2000), posited that virtual schools may be in an excellent position to offer youths in detention facilities a wider range of curricular options that would be possible otherwise. The needs of rural students who are either storm-bound for part of the year or who attend small schools that cannot offer specialized courses can also be addressed via virtual schools (Husain, 1998; Tuttle, 1998; Williams, 2000). Rutkowski (1999) identified flexibility as a key benefit of virtual schools. She stated, “students enter and leave traditional school buildings and classrooms at regular times that are somewhat arbitrarily crafted and have little to do with the individual’s optimal learning clock or space” (p. 74) which is reminiscent of Papert’s (1993) admonition that learning takes time. Sometimes an individual has not had the time to adequately internalize a concept yet the bell sounds ending the class and putting a stop to the learning process. This need not happen in a virtual school.

Students with special needs may also benefit from the virtual school environment. An example of this was provided by the deaf student from VHS quoted earlier who stated that she truly appreciated being on equal “footing” with the other students in her class. Gardiner (2000) supported this with his observation that virtual schools have the potential to provide individualized instruction for all students.

“Computers will permit a degree of individualization – personalized coaching or tutoring – which in the past was available only to the rich” (p. 31).

It is suggested that particular types of students are best suited to the virtual school environment. Barker and Wendel (2001) found that, typically, there are two types of student who choose to take part in virtual schooling. The first is “a self-directed learner with clear expectations and goals and who choose virtual schooling as a first resort” (p. ix). These students are usually over-achievers who may wish to finish their high school programs early (by taking extra courses on-line) or who wish to take course either not offered in their conventional schools or who wish to explore their horizons with exploratory courses. The second is typically an “underachiever for whom virtual schooling is a last resort” (p. ix). These students have usually experienced failure in their conventional educational programs and select on-line education because it offers a last chance for them. According to Barker and Wendel, the former is much more likely to be successful than the latter.

Finally, flexible scheduling is also a frequently-identified benefit of virtual schools. “Students can schedule schooling around their everyday lives without being constrained by the rigidity of regular class hours and the necessity of being in a physical classroom” (Byun et al., 2000, p. 57). In advocating virtual schooling at the post-secondary level, Ridley and Sammour (1996) stated, “Scheduling conflicts are common for students who work, as most of our students do ... since online programs enables students to overcome all such conflicts, it is reasonable to anticipate greater efficiency in students’ progress toward their degrees” (p. 338). This observation is also valid at

the high school level. Many high school students work and the virtual school may make it easier for them to arrange their schedules or to compete for better-paying day-time jobs.

Organizational Benefits

Williams (2000) argued that the virtual school may ease the pain of teacher shortages, particularly in rural areas, by providing a viable and relatively low-cost option to school divisions. Van Horn (1997) stated, "After several years of gut-busting work (in school improvement) at a local urban school, we were making good progress. Then 40% of the faculty members were transferred to other schools. That's not likely to happen in a virtual school" (p. 481) because the geographic location of the instructor is irrelevant in the virtual context.

In a recent study examining the effectiveness of Canadian virtual schools, Barker and Wendel (2001) identified several organisational benefits in the form of perceived purposes for the creation and existence of virtual schools. For example, principals indicated that the virtual school was positive for the school organisation because it provided an educational environment that was more flexible, allowed more individualised teacher attention to student needs, and provided for greater student and teacher personal safety and comfort (Barker & Wendel, 2001).

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)

The above quotation from Neil Postman, a prominent techno-critic certainly contradicts some of the benefits touted by virtual schooling's advocates. His comments draw to mind the world described in the classic short story *The Feeling of Power* by Isaac Asimov (1958). In this story, the protagonist, a computer programmer named Myron Aub, is distrusted and feared because of his hobby, which he called "graphitics". It seems that Aub had "found out" the magic of simple mathematics and had learned how to perform various mathematical operations "without the use of a computer"! This "discovery" singled him out as an oddity and set him apart from mainstream computer-driven society.

There are some potential dangers or cautions that must be observed by virtual schools in order to avoid simply causing new problems for students and teachers.

Salomon (1998) presented five key cautions:

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 of 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 – a sort of MTV

stream of consciousness could result;

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.

Winner (1998) posited, “[In the technological future] you will be evaluated solely on your ability to ‘add value’ in the global marketplace” (p. 13). This view, according to Winner, will lead to the erosion of social safety nets and the enactment of

a new social contract which reflects a new “social Darwinism in which everyone is defined as an entrepreneur who must struggle to get ahead in the dog-eat-dog world of the ‘free’ market” (p. 13). One outcome of this new contract may be that education, as it is currently organized, will be deemed too costly because it does not generate enough “return”. Thus, the “business of education” will emerge and will see education as a potential source of profit (witness the Edison for-profit schools program). In addition, virtual schools were seen by Winner as a form of out-sourcing which could potentially have serious negative effects on teachers. “What the outsourcing of anti-lock brakes is for GM workers, distance education will be for teachers and professors ...” (Winner, p. 14). Noble (1998) also saw the integration of information technology as being potentially problematic for faculty. He argued, “technology is being deployed by management primarily to discipline, de-skill, and displace labour ... to reduce autonomy, independence, and control over [employees’] work and to place workplace knowledge and control as much as possible into the hands of the administration” (p. 7). Further, he pointed out that there are risks inherent in the development of virtual schools including: (1) the issue of ownership and control of intellectual property, (2) the extension of working hours for faculty, and (3) the opportunity for management to hire less-skilled and less-expensive course deliverers once the virtual school courses have been developed.

Conditions for Success in Creating a Virtual School

Since the creation of a virtual school requires a fundamental change in the structures, procedures, and assumptions of a traditional school, it may be useful to

examine change theory in order to glean some clues to ease the transition. Fullan (2001) identified “three broad phases to the change process” which he called “initiation, implementation and institutionalisation” (p. 50). The following discussion of the change process is organized according to these headings.

Initiation

Initiation, according to Fullan, is when “someone or some group for whatever reasons initiates or promotes a certain program or direction of change” (p. 50). It would be hoped that the vast body of evidence which advocates the establishment of a stronger focus on technology and calls for the institution of virtual schools would provide schools systems with the motive to initiate change. However, they may ask “How? Where do we start?” Perhaps, then, it would be valuable to examine the successful initiation procedures of a couple of schools in order to identify a possible strategy in this regard.

Lowe and Vespestad (1999) outlined the initiation process of the West Junior High School in Lawrence, Kansas in the following way. The school began with a group of students expressing an interest in computer programming. They convinced a teacher to provide supervision and began a club to learn from each other. Over the course of a few years, the program grew until the school community recognized a need for and created a new mission statement reflective of the growing importance of technology in the lives of students and in society in general. The school stated this mission as follows: “... student work should incorporate a variety of complex information sources that will motivate a desire to expand the knowledge base. For teachers, professional

development goals include achieving an instructional transition from a teacher-centred to a facilitative, learner-centred, constructivist environment that supports [local] exit outcomes” (p. 30). From there, the school went about implementing or operationalising the mission statement and has created a virtual learning community which recognises the importance of technology in word and deed.

A more general but similar strategy was advocated by Mehlinger (1997). He suggested that schools form broad-based committees made up of teachers, administrators, and community members (parents) which should lead the planning process and define the mission. Instrumental to the success of this plan, in his view, was that “... a small group ... should not decide key issues without consultation with others” (p. A23). However, many other authors would suggest that the key issues in most successful innovations could be and often are decided by a small group (perhaps one or two people initially) or the innovation may never get off the ground because it gets bogged down in the consultation process. Nevertheless, this committee (whatever the makeup), according to Mehlinger, should develop a vision, assess the available resources, decide on goals and objectives, decide on an action plan and evaluate the project regularly and objectively.

The above plans were echoed in much of the literature. However, Bull and his colleagues (1997) identified an additional aspect of the change which seems likely to be a key ingredient if the creation of virtual schools is to be successful. They emphasized the need for pointed professional development for teachers at the initiation stage in order to create an informed faculty and, perhaps, a more receptive one as well. In

addition, it is suggested that “... one of the chief barriers to developing technology [interest] in teachers was lack of sufficient access to computers ...” (Sheingold & Hadly, as cited in Bull et al., 1997, p. 30). Since “educational change depends on what teachers do and think ...” (Fullan, 2001, p. 115), a “reculturing (how teachers come to question and change their beliefs and habits)” (Fullan, p. 34) will be necessary. Thus, getting the faculty “on-side” both from a philosophical and a practical point of view would be an important step at the initiation phase. This could be addressed, at least in part, by providing teachers with access to and instruction in the use of computers.

Finally, Fullan identified eight factors affecting initiation. Virtually all of the factors can be brought to bear on the decision to initiate a virtual school project. In the interests of brevity, only the factors with the most impact on the process have been identified here. With respect to the existence and quality of innovation, it is clear that a variety of models exist (e.g. West Junior High). It would not be difficult for a school to adopt an existing model or to develop one of its own based on an existing model. Technology, itself, might be seen as an external agent for change; nevertheless, the change in society which precipitates virtual schools definitely is. Which leads to an overwhelming community pressure on schools to change in this way.

Implementation

Implementation of a new idea is a complex process. It involves moving beyond the abstraction of the idea itself to operationalising that idea in concrete terms. In other words, it requires action. No longer can the stakeholder community stand back and tacitly support an idea in principle – they must become involved and make the idea

work. Fullan (2001) supported this notion with the observation that “educational change is technically simple and socially complex” (p. 69). Further, he posited “implementation is critical for the simple reason that it is the *means* of accomplishing desired objectives” (p. 70, emphasis in the original). If the initiation stage defined the objectives and set the course for change, implementation involves following that course in an attempt to reach those objectives. However, it should be noted that once the implementation of an innovation of any kind begins, it often evolves in ways that were not predicted or foreseen at the outset.

If one is to identify issues critical to the successful implementation of a new virtual school project, a perusal of accounts of successful implementation in various school districts may again provide some suggestions. Bull and his colleagues (1997) identified two key factors of implementation success around which the following discussion will be organized – adequate technical support and relevant ongoing instructional support.

Adequate Technical Support

If school divisions truly wish technology to become integral in the educational process, they must ensure that the technology is “up and working” at all times and that there is a support person available to manage the inevitable technical glitches presented by computers. “[When] teachers cannot rely on a computer or printer being in working condition, the use of technology quickly takes a low priority and rarely becomes an integral part of the educational process” (Bull et al., 1997, p. 31). This probably requires that virtual schools have a full-time computer technician. Yet, “the number of

schools that allocate a full-time, non-teaching position to coordinating teachers' use of technology is small" (Becker, 1998, p. 24). Nevertheless, a critical factor in determining the success of implementation is having reliable functioning hardware and having someone available to address concerns when they arise.

There is also the issue of software support and training as well as development of new software customised to instructors' needs. With the ever-growing list of software applications available to virtual school instructors, it is essential that the school system provides relevant support both in terms of ensuring that software usage issues can be addressed in a timely manner and of providing training in the use of those software applications.

Relevant On-going Instructional Support

Too often, teachers are expected to "do more with less". They are often provided with ill-advised and episodic in-service which appears to be "... 'one-shot' or [of] short duration ... [which has] little or no impact [on instruction]" (OTA, as cited in Bull et al., p. 31).

In addition, a school must create a culture in which change is seen as a positive and necessary means to a valuable educational end. Perhaps, in a virtual school, this notion of change is a given, however, the experiences in traditional schools regarding change may inform practice in a virtual school context. Lowe and Vespestad (1999) described the key professional development goal in West Junior High School as achieving instructional change. From that perspective, they say "... we have created opportunities for teachers to engage in results-based staff development by providing

released time for learning, practice with feedback, ongoing coaching, collaboration, mentoring, and planning” (p. 32).

Many of the other accounts of successful implementation also point out the need for relevant and on-going teacher development. In fact, “... this kind of support and encouragement is the most important factor in determining successful [implementation] of educational technology” (Becker, as cited in Bull et al., 1997, p. 31).

Institutionalisation

The institutionalisation or continuation of this or any educational reform will be influenced by the perceived importance of the change relative to other district initiatives as well as the level of active support for the continuation provided by the school or school system. In addition, the provision of mechanisms for on-going data collection and assessment must also be addressed. These issues will be discussed in the following sections.

Relative Importance

School systems and individuals within them often suffer from what Fullan (2001) called “innovation overload”. He says “the main problem is not the absence of innovation in schools, but rather the presence of too many disconnected, episodic, fragmented, [and] superficially adorned projects” (p. 21). Other authors, notably Sabatier and Mazmanian (1979), in their examination of the reasons that educational planning sometimes fails, stated that “any particular policy [reform] decision is susceptible to an erosion of political support as other issues become relatively more important over time” (p. 499). Further, Fullan (2001) pointed out that “the problem of

continuation is endemic to all new programs ... negative school cultures, unstable districts, and uncoordinated state policies all take their toll” (p. 89).

These observations paint a somewhat dismal picture of our attempts to herd the technological elephant in our schools. They imply that the odds of successful creation of virtual schools are quite long indeed. However, in the face of the overwhelming evidence suggesting the need for this change to be successful, this is one innovation that simply should not be ignored or allowed to be eroded over time. Sabatier and Mazmanian (1979) suggested five strategies which tend to maximize the likelihood of successful integration and institutionalisation of innovations over time. They include having a sound theoretical base, an unambiguous policy directive, well-trained leaders, active support from the school board, and an on-going indication of high priority of the innovation (p. 483).

The sound theoretical base supporting the creation of virtual schools can certainly be constructed. Of course, it is important for teachers to know why this change has been proposed in the first place and what impact it will have on them and their students. Having well-trained leaders, in this case, is probably related to establishing the strong theoretical base. It seems that if teachers are going to be asked to implement the use of online instruction – an area that many of them may not be familiar with – they will need some well-trained leaders to provide support and encouragement. In addition, it would seem prudent to add the additional dimension of teacher training in this context. “Teachers are the key to effective and efficient technology utilization” (Jefferson & Edwards, 2000, p. 140). The technology which is

being proposed here was not in existence when many current teachers were trained. A constructivist approach to in-service opportunities, in which teachers are provided opportunities to begin learning about educational technology from the point at which their personal computer knowledge begins, may be the most successful strategy.

The remaining three strategies are grouped together in this case for ease of discussion. It may not be necessary to enact a specific policy directive because of the nature of the innovation. However, support from the school board is often seen at the school level as money. If a school board wants technology to be fully integrated into the instructional delivery of the classroom particularly as it relates to the virtual school, it will have to specifically attach a significant amount of money over a long period of time to the acquisition and maintenance of computers and their related software as well as to teacher training. It may be essential, then, to include a budget line indicating the school board's support of this endeavour.

On-going Data Collection and Evaluation

This aspect of managing change needs to be monitored closely both from the point of view of whether the requisite funds and support structures are in place and whether the desired instructional changes have been made. Admittedly, it will be difficult to monitor the implementation of virtual schools. However, instructional supervision may provide assistance. Perhaps, it will be possible, over time, to alter the supervisory culture to allow effective and instructive instructional supervision of online teachers without being too invasive. It will require the development of a new vocabulary for supervision and new supervisory structures as well. Nevertheless, it is

hoped that the virtual school will ultimately become a part of the fabric of public school culture and will no longer be viewed as an innovation at all. Again, the goal is to integrate technology so seamlessly into the context of the educational experience of students that computers almost vanish in their use and the decision to use them becomes as commonplace as picking up a pen or a book.

SOCIAL ISSUES CONCERNING THE ENGINEERING AND METAPHYSICS OF VIRTUAL SCHOOLS

Social issues concerning the development of virtual schools revolve around the concepts of community and social capital. A key philosophical question for virtual schools with regard to the social issues that concern them relates to the impact that virtual schools may have on the already struggling social structure in society. Will virtual schools encourage people, who are already disengaging from all aspects of community life, to further disengage themselves? This section is designed to address the social issues confronting virtual schools. Towards that end, a short definition of social capital will begin an examination of the societal changes that have influenced and precipitated the development of virtual schools.

Engineering Virtual Schools: What Works?

The virtual school is an interesting and innovative development in terms of educational program delivery in the sense of the possibility of offering truly individualised education to students. While the notion of individualised instruction seems quite logical in the sense that students probably have different needs and bring to the classroom a variety of strengths and weaknesses as learners, is it possible to carry

the individualisation of instruction too far, and to the detriment of society? Will virtual schools continue the process of the dissolution of social capital by encouraging learners to disengage further from society by allowing students to stay at home for their education? This is a central question as the following sections are developed.

Social Capital: A Definition

Social capital refers to the ties and bonds that exist within our society and the extent to which those ties and bonds influence interpersonal relationships. Putnam (2000) stated that “social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 19). But, what, exactly, is social capital and why is it important?

“Social capital” is, to some extent, merely new language for a very old debate in American intellectual circles. Community has warred incessantly with individualism for preeminence in our political hagiology. Liberation from ossified community bonds is a recurrent and honored theme in our culture, from the Pilgrims’ storied escape from religious convention in the seventeenth century to the lyric nineteenth-century paeans to individualism by Emerson, Thoreau, and Whitman to Sherwood Anderson’s twentieth-century celebration of the struggle against conformism by ordinary citizens ... to the latest Clint Eastwood film. (Putnam, p. 24)

The notion of social capital appears to have underlying currents of contention in American society. On one hand, the importance of social capital is quite obvious. “Social capital is crucial for ‘getting ahead’” (p. 23) and for survival in harsh climates. Since pioneering days, we have built our communities on the strength of helping each other. From barn raising parties to threshing bees, working together for mutual support has been fundamental to the North American way of life. On the other hand, however, society has provided a variety of powerful lures to draw people away from the

interpersonal interactions that typically build social capital. Popular media images in film and print glamorise the lone stranger who rides into town, cleans it up and rides off again, alone, into the sunset.

Television, video games, video cassette recorders, movie rental companies, the Internet, and the telephone perpetuate the solitary lifestyle by encouraging people to engage in activities in their homes separate from each other. The competing draws of individualism and community are aptly identified in the following illustration from the television series *Star Trek Voyager*:

Seven of Nine, a member of the crew of the star ship Voyager was at one time a member of the Borg collective - a vast network of beings who are connected by neural transponders and transceivers and who, mindlessly, serve the interests of the group mind. At one point in the series, Seven finds herself on the ship during a brief alliance between the Borg and the Captain of Voyager. She becomes "separated" from the collective (meaning that her neural link with the collective is severed) and is forced to develop her individuality. She constantly struggles with the balance between acting as an individual with her own interests and desires and acting according to the codes and policies of a Star Fleet vessel. She is often frustrated with the conflicting issues of following orders and acting as she wishes and often comments that the Borg collective, with its blind compliance with behavioural norms, is far more efficient than is the human way of allowing freewill to enter the behavioural equation. However, as she becomes more comfortable with having her own identity, she recognises that there is a major difference between the Borg collective and the human community in which she now lives. That difference is that people in a human organisation behave the way they do, for the most part, because they *want* to not because they are *required* to (although duty does also play a role in motivating behaviour). She also discovers that humans support each other, in part, because of the social ties or bonds among them.

Seven's confusion and frustration illustrates, as argued by Putnam, that "social capital has both an individual and a collective aspect" (p. 20) that is reminiscent of basic Hobbesian social contract theory. Hobbes said that we do not enter into society

for its own good but for the benefits we accrue as a result of our association with society (Hobbes, 1997). First, individuals form relationships that are beneficial to themselves. An example of this tendency is found in the common contemporary job search. “One pervasive stratagem of ambitious job seekers is often called ‘networking’, for most of us get our jobs because of whom we know not what we know – that is, our social capital, not our human capital” (Putnam, p. 20). The collective aspect of social capital resides in the wider consequences of our personal connections. “Not all the costs and benefits of social connections accrue to the person making the contact” (Putnam, p. 20). The community seems to benefit when a dense network of personal connections exists among its residents. For example, someone who does not participate with his neighbours in a community crime watch will still benefit from the resultant lower crime rate. Thus, social capital resides in issues of reciprocity and mutual advantage.

Societal Changes: The Dissolution of Social Capital

Over the last three decades a variety of social, economic, and technological changes have rendered obsolete a significant stock of America’s social capital. Television, two-career families, suburban sprawl, generational changes in values-these and other changes in American society have meant that fewer and fewer of us find that the League of Women Voters, or the United Way, or the Shriners, or the monthly bridge club, or even a Sunday picnic with friends fits the way we have come to live. (Putnam, p. 25)

The above quotation from Putnam provides a springboard for a discussion about both the philosophical constraints and potentials of virtual school initiatives as well as the impetus for the creation of virtual schools. After all, virtual schools, with their

promise of education on demand and their use of technology which permits students to learn from home, can be seen, at least in part, as a response to society's changing attitudes and desires. However, demographic and philosophic changes in educational institutions have also fueled virtual school development. This section examines these changes in an attempt to explain some of the underlying philosophies driving the development of virtual schools.

Most people will agree that society, along with many of its social institutions, has changed. For example, service and social clubs in American communities, which enjoyed almost continuous growth in membership during the first half of the twentieth century (Putnam) have found that their membership rolls are no longer being replenished by cohorts of younger members as existing members quit or pass away. Thus, both society as well as the institutions themselves have had to come to grips with change. In order to provide a context for an examination of the philosophical potentials and constraints of virtual schools, this section opens with a brief examination of social change and the dissolution of social capital followed by a discussion of the nature of contemporary institutional change.

Societal Change

Alexis de Tocqueville, during his nineteenth century visit to America, found a society characterised by high levels of civic participation. In addition, dozens of studies have found that civic participation in American society had been on a fairly consistent increase throughout the first half of the Twentieth Century. Lane, in his 1959 study of political involvement in American society, wrote "the ratio of political activists to the

general population, and even the ratio of male activists to the male population, has generally increased over the past fifty years” (as cited in Putnam, p. 17). In fact, “even the simplest political act, voting, was becoming ever more common. From 1920, when women got the vote, through 1960, turnout in presidential elections had risen at the rate of 1.6 percent every four years” (p. 17).

The 1950s and 1960s were not exactly the “Golden Age” for American civil rights and equality – particularly if one was poor, black, gay, or female. Nevertheless, from the point of view of American social reformers, the prospects for enacting wholesale societal changes seemed quite promising due, in part, to the burgeoning interest in and importance ascribed to the pursuit of education. During this time, “education seemed to be the key to both greater tolerance and greater social involvement” (p.18).

Sometime during the mid-1960s, however, things began to change. Participation in civic life in America began to wane. Community organizations were no longer being continually revitalized, as they had been in the past, by cohorts of new members. What social scientists now call social capital, which refers “to the connections among individuals and groups, social networks, and the norms of reciprocity and trustworthiness that arise from them” (Putnam, p. 19) began to become less important as individuals chose to participate less and less in public affairs. Putnam offered the following observation as an example of the decline of public involvement:

Between 1973 and 1994 the number of Americans who attended even one public meeting on town or school affairs in the previous year was cut by 40 percent. Over the same two decades the ranks of those who had served as an

officer or a committee member for a local club or organisation ... were thinned by an identical 40 percent. (p. 42)

If Putnam's observations about the disintegration of social capital are correct, and yet interpersonal skills are purported to be among the key skills necessary for success in the New Economy, the virtual school may have a credibility problem. There is no question that the virtual school breaks the traditional model of face-to-face contact among teachers and students. Nevertheless, the public still believes that school is the primary place that students learn how to interact with each other. This presents a key challenge to virtual schools that may be answered, in part, by creating what Schwier (2001) calls a virtual learning community (which is discussed in detail in a later section).

Institutional Change

Institutions have been the focus of a great deal of research for many years; however, "theorists have [recently] attacked institutional questions with renewed vigor and creativity in the name of 'the new institutionalism'" (Putnam, Leonardi, & Nanetti, 1993, p. 7). Concepts such as organizational learning, participatory democracy, and metaphors describing organizational behaviour in terms of neural networks have been forwarded and examined as potential institutional change agents or, at least, new institutional structures that reflect contemporary societal mores. It seems, however, that regardless of the innovations proposed by organizational researchers, the central question they seek to address is "what are the conditions for creating strong, responsive, effective representative institutions?" (p. 6). While there is little agreement among

researchers in the field of institutional behaviour with respect to this question, Putnam and his colleagues suggested that there appears to be at least three points on which they agree:

1. Institutions shape politics. The rules and policies that form institutions shape those institutions by structuring political behaviour within them;
2. Institutions are shaped by history. What has come before, even if accidental, shapes the decision possibilities that come later. The institutions exist, to a degree, outside of the current decision-makers in the sense that they are confined to the decisions that have been made in the organisation's past and the decisions made today will shape the decisions made by those who come later; and,
3. Institutions are shaped by their social context. Just as individuals tailor their behaviour and decision making for different contexts, institutions also differ in their behaviour in different contexts. (pp. 7-8)

Thus, virtual schools as institutions, have an interesting challenge. While they are shaped by and, perhaps were conceived, at least in part, as a result of societal change, the importance of education as well as the current state of social capital in society means that virtual schools cannot afford to be complacent with respect to the cultivation of interpersonal relations and community.

As stated earlier, educational institutions have had difficulty responding to the challenges presented by the New Economy or Digital Age. In particular, they have been, thus far, unable to make the transition to methodologies which will foster in students the skills required of the information age. Thornburg (2002), in summing up the wide variety of opinions in this area, identified the following characteristics of the information age (or New Economy) worker:

1. abstraction - the ability to discover patterns and meanings - the daily chaos of the post-modern world requires us to use abstraction to make sense of our world (a skill that contradicts traditional school ideals which focus on memorisation of isolated facts),
2. system thinking – the ability to think of most problems in the context of a complete system with interrelated elements – a sort of “big picture” thinking,
3. experimentation – we cannot accurately predict behaviour in complex systems; therefore, the ability to try something, note results, and make modifications until a desired result is obtained is important, and
4. collaboration – many contemporary challenges cut across a wide range of disciplines which can only be managed by teamwork – therefore, by interacting with others, we can often discover new approaches to problems that would stump a lone worker forever. (pp. 33-35)

These characteristics represent a substantially different skill set from the skills and knowledge traditionally valued and developed in schools.

In the ‘old’ [Industrial Age] economy, for example, a designer played a critical role in producing a product, but most of the costs lay in raw materials and labour. In the ‘New Economy’, the typical product is the computer. The physical resources and direct labour required to build a computer are trivial compared to the millions of human hours devoted to designing cumulative generations of hardware and software, and to producing the consultancy and servicing required to enable people to use it. (McNair, 2001, pp. 18-19)

This different skill set has also, to a degree at least, changed the nature and value of the knowledge available to students in school. Consequently, “knowledge is [no longer] a priori – its value is in what it represents – freedom and power” (Thornburg, 2002, p. 30) which has also led, in the post-modern context, to the view that the very nature of knowledge and, therefore, of epistemological assumptions has changed.

The circumstances, conditions, and the very *status* of knowledge, learning, teaching, and researching are currently in a state of profound upheaval under the double impact of rapid and far-reaching technological change and the massive assault on long-standing narratives of foundation and legitimation. (Lankshear et al., 2001, p. 20)

To harvest these skills requires substantial restructuring or “reculturing” (Fullan, 2001) of schools not only in curriculum but also in technology. Kay (1997) acknowledged that technology has crept into current educational delivery. However, he stressed that educators have not gone far enough. “[The current uses of technology] represent a desire on the part of a future-shocked public to see a new technology only as a better version of an old one” (p. 19). Instead, what is needed is “an alternative approach [that] involves using computers as ‘cognitive tools’ that students [and teachers] learn ‘with’ in a cognitive partnership” (Reeves, 1998, p. 50). One approach which has enjoyed significant airplay in recent years and which has potential to provide the foundation necessary for the development of information age skills is the creation of learning communities. “A learning community of practitioners, researchers, and policymakers is essential to expand the use of ‘best practices.’ Beyond distributing descriptions of innovations, this community can foster dialogue about their implementation” (Dede, 2000, p. 173).

While there is a wide spectrum of conceptions of learning communities forwarded in the “traditional school” literature, most of the models suggest that collaboration is a cornerstone of the community. Palloff and Pratt (1999) posited that “collaboration ... is [also] a critical element in the formation of an electronic learning community” (p. 126). Since “the Web’s capacity for collaboration offers new models for learning and meaning making ... never before possible” (Oseas, 2000, p. 5), the virtual school may be in the best position as compared to other educational delivery models to fulfill the promise of learning communities.

Interpersonal Capacity for Organisational Learning

Mitchell and Sackney (2001), offered a number of insights related to the social parameters of traditional learning communities – which they referred to as “interpersonal capacity” which are also relevant in the virtual context. Interpersonal capacity places the focus of the learning community on the group or “society” of the organisation. While it is true that “groups do not learn – people do”, Mitchell and Sackney (2001) pointed out, “Groups [do], however, shape the environment within which the people learn” (pp. 45-46). The group, therefore, has a huge impact on the learning of individuals – it may facilitate or hinder that learning depending on the dynamics that exist within the group.

Some authors suggest that since the societal context for learning has changed, learning itself has also changed. For example, Griffin and Brownhill (2001) posited, “One of the most significant characteristics of the [information age or New Economy] is the way in which learning has ceased to be attributed solely to individuals, and has taken on a range of corporate identities ... increasingly, learning is attributed to communities, organisation, and society itself” (p. 55). Consequently, Mitchell and Sackney (2001), raise a variety of issues essential to the development of interpersonal capacity including: building the affective climate, building the cognitive climate, and building a collaborative ethic within the team under which the following discussion of the interpersonal capacity will be organized.

Building the Affective Climate

Climate, one could argue, is one of the most critical aspects of group dynamics.

The affective climate, according to Mitchell and Sackney (2001), “Entails valuing the contributions of colleagues (affirmation) and inviting them to be participants (invitation)” (p. 46). But, what does it mean to affirm and invite?

Affirmation. Affirmation refers to value the contributions and opinions of others. It is not necessary that the members of the group agree on issues but, they must feel that their opinions and contributions will be heard and valued. Otherwise, “... when teachers’ ideas are not affirmed, they tend not to be active participants in the life of the school” (Mitchell & Sackney, 2001, p. 46). Affirmation, in the virtual context, plays out in an interesting way. “A common view is that the Internet builds on and amplifies the power of existing cultural and social practices ... [therefore] practices in the Internet are mainly about people finding their voice and about speaking for themselves in a public way” (Lankshear, et al., 2001, p. 22). When one finds her voice, there is often a feeling of affirmation or, at least, acknowledgement that her voice matters.

Invitation. In addition to valuing persons’ contributions to the group, they must also be explicitly invited to participate – implicit in this is the assumption that the invitation is to participate in the process of communication. A key ingredient in this invitation is the level of trust that exists within the group (Mitchell & Sackney). In fact, “... it was the level of trust among colleagues that best determined the effectiveness of the school” (p. 49).

Another key aspect of invitation, and one that is particularly critical in the virtual context is the process of communication itself. “In the socially constructed space of cyberspace, where interaction produces culture, information is the only real

medium of exchange an individual has with which to build a presence ... [consequently] information exchange becomes the carrier for expressing one's self concept and for eliciting emotional support" (Riva, 2001, p. 147).

Building the Cognitive Climate

The cognitive climate is influenced by social constructivism. "In a learning community, social constructivism implies that everyone has the opportunity to verify, modify, or discard ideas but that the community ultimately decides which ideas are worth keeping and which ought to be discarded" (Mitchell & Sackney, 2001, p. 52). Typically, this involves negotiation and discussion with the other members of the community. In addition, "the social construction of knowledge is expected to emphasize authentic learning ... this means that educators will be most engaged by learning opportunities and collegial interactions that address the real problems and mysteries that they regularly face in the classroom" (p. 53).

Technology, according to some authors, has a significant and interesting effect on interpersonal communication. Jean Underwood (2000), in her study of the relationship between technology and group interaction found that group interaction was actually enhanced by the introduction of a computer. Her research focussed on measuring the quality and quantity of collaborative talk within groups of students which, at times, had access to a computer and, at other times, did not. "[The study] shows that children are more likely to work cooperatively and often achieve collaboration, when working on computer tasks rather than standard classroom tasks" (Underwood, p. 38). The potential for collaboration via computers is not limited to

students, the type of collaboration described by Underwood may also surface among the teachers in a virtual school project as well.

Building the Collaborative Ethic

“Interpersonal capacity in a learning community implies the presence of a well functioning team of people who work and learn together” (Mitchell & Sackney, p. 59). However, this interpersonal capacity involves more than mere cooperation or congeniality. One needs only to informally observe the operation of a school to ascertain that teachers tend to operate as individuals in separate classrooms. Typically, there is very little interaction among teachers as they go about their day-to-day tasks. “Yet, the more that teachers engage in work-related activities, the less isolated and the more responsive and creative they become” (p. 62).

The virtual environment may be a platform for the creation of an entirely unique collaborative culture – one that sees students and teachers and co-learners.

A teachers’ advantage no longer consists primarily of possessing preordained curricular reserves, but, rather of the competence to channel the constantly growing flows of information in an understandable, pragmatic and co-operative manner, and to transform them, *in cooperation with students*, into situated knowledge that is useful and beneficial to the individuals and to the learning community. (Sandbothe, 2001, p. 74)

Consequently, the teacher and student can be seen as fellow learners – perhaps, master learner and novice – but, still a relationship that is collaborative in nature. Thus, any learning community, virtual or otherwise, must develop structures and attitudes among teachers and students which foster the development of collaborative interaction.

Virtual Communities

The first cog in the wheel of the philosophical potentials and constraints resides in the nature of community and, in particular, the virtual community. According to Putnam (2001), societies and communities are weak and vulnerable to erosion when there are no personal ties or when the ties are weak. Thus, a major challenge for virtual schools is to create structures which encourage those ties to develop. One could examine the role of the telephone in modern society to realise the impact that telecommunications systems have on interpersonal relationships.

When a fire in a switching center unexpectedly cut the telephone service on the lower East Side of Manhattan for three weeks in 1975, two-thirds of the people who lost service reported that being without a telephone made them feel isolated, but one-third reported that they visited other people in person more frequently. (Putnam, 2000, p. 168)

Thus, the telephone (and other mass-communication systems) provides an expression of the paradox confronted by virtual education: “[The telephone] appears to reduce both loneliness and face-to-face socialising” (p. 168). Therefore, the virtual school must address this paradox, perhaps by striving to create virtual learning communities.

Virtual Social Capital

Within a few years of the launch of the Internet, virtual versions of almost every form of social activity and engagement began to appear. Today, it is possible to buy, on-line, virtually anything one needs or wants. Virtual weddings, funerals, concerts, and religious services also exist along with a wide variety of on-line chat and support groups. Since the traditional versions of these activities are prime builders of social

capital, could it be that their virtual counterparts may build virtual social capital? Does it follow that virtual schools can also contribute to social capital?

Potentials of virtual social capital. “Social capital is about networks, and the Net is the network to end all networks” (Putnam, p. 174). The virtual school offers students, teachers, and parents a method of communication that is unparalleled in the traditional school. E-mail alone, with its ubiquitous twenty-four hour presence, provides the opportunity to resolve problems and misunderstandings quickly and, at the same time, permits communication when it suits the individuals. While acknowledging that removing the constraints of time and distance is impossible in the real world, virtual networks, nevertheless, sustain strong, intermediate, and weak ties that provide information and support in all kinds of relationships.

Due to the truncated personal information shared during Internet communication sessions, virtual communities and, therefore, virtual schools may be more egalitarian than the physical schools we are used to. In particular, the possibility to interact with people from widely varied backgrounds and social traditions has the potential to make virtual schools far more heterogeneous than might otherwise be possible. This could lead to a greater tolerance and acceptance of diversity – which will become increasingly important as globalisation becomes a defining feature of world economies. As pointed out by McNair (2001), “If social and political tensions are to be minimised [in the globalised New Economy], some form of learning is needed to enable people (both incomers and hosts) to understand and work with people with unfamiliar backgrounds and value systems, and to establish common notions of citizenship” (p. 17).

Constraints on virtual social capital. Putnam identified four philosophical constraints that virtual schools must address. These include: the digital divide, the lack of non-verbal cues in cyberspace, “cyberbalkanisation”, and the future uses of the Internet.

The digital divide refers to the inequality of access to computers and the Internet among people from various socio-economic (SES) groups. The risk here is that a sort of “cyberapartheid” (Putnam, p. 175) could form that may use the differential of access as a means to reinforce the dominant cultural norms and place poor people at an even greater disadvantage.

Another aspect of the digital divide must also be considered. Even in lower SES schools, it is possible to play the engineering game of counting computers as a measure of reducing the digital divide. However, “The issue of equity now centers not on equality of equipment but on quality of use” (McAdoo, 2001, p. 143). In other words, if the virtual school pays attention only to the economic aspects of the digital divide, it has missed the point.

A key to resolve this constraint is teacher training. If teachers have not had the opportunity to experience effective virtual schooling and view its potential, they may view it as merely a regular class they teach on-line. Thus, the educational environment created by these teachers might be entirely inappropriate given the on-line environment and it may further disadvantage some students.

It is the job of teachers to help children to employ the resources of the World Wide Web in order to become well-informed, and to help them to reflect

intelligently on the structures and processes involved, and on the significance of their learning to wider human concerns. (Bramall, 2001, p. 79)

Given the importance of non-verbal cues in our face to face interactions, the lack of them in the virtual school may contribute to less effective interpersonal relationships. This situation has the potential to lead to a lower level of trust among the students and could ultimately lead to less trust in the public realm. This could develop a sense of “depersonalisation” (Putnam, p. 176). Cheating, reneging, and “verbal abuse” are also more likely in the virtual school because “participants in computer-based setting are less inhibited by social niceties and quicker to resort to extreme language and invective” (p. 176).

Thus, the virtual school must address trust and appropriate interpersonal communications. Again, teacher training may contribute to resolve this problem but students must be held responsible for their actions while in school. As technology advances and bandwidth becomes a smaller problem, virtual schools may be able to add a visual interface which could also mediate this problem somewhat.

The third social constraint facing virtual schools is called “cyberbalkanisation”. Because the Internet permits us to confine our communications to people who share precisely our interests, individuals within a virtual school class could be marginalised.

Teachers must try to avoid this potentiality by carefully designing the on-line learning environment. Group projects and presentations – particularly when groups are randomly generated, seems a possible solution to the problem. Teachers must also

carefully monitor the syntax of discourse in these groups in order to ensure that students are not marginalised.

The future of the Internet could have a significant impact on the virtual school. As it evolves, will the Internet become mainly a source of entertainment or of information? If it becomes an entertainment source, virtual schools may have some credibility problems to address. Students may view on-line learning as play and refuse to take it seriously. While there has been a great deal of research into how to create learning through play and play environments that support learning, the distinction between play and serious learning is being blurred by ICT. Universities and other post-secondary institutions may also discount virtual education as being inferior to traditional education and marginalise the graduates of virtual high schools by denying them entrance. If the Internet becomes a primary source for information, virtual schools could become hot beds of social engagement.

ORGANIZATIONAL ISSUES CONCERNING THE ENGINEERING AND METAPHYSICS OF VIRTUAL SCHOOLS

Innovation as defined by Drucker is “change that creates a new dimension of performance” (as cited in Hesselbein, Goldsmith, & Somerville, 2001, p. 1). Webster’s on-line dictionary defined innovation as “the introduction of something new: a new idea, method or device; a novelty” (www.m-w.com/cgi-bin/dictionary). In today’s fast-paced society, one might expect that innovation would be relatively commonplace. As observed by Fullan (2001), change, at least in schools, is both rare and common at the

same time. This seems to be a contradiction and it is. However, it does hold true for education.

For example, Fullan (2001) posited that people in education may have reached a stage of innovation overload. This stage has been characterized by frequent ill-planned band-wagon jumping. School boards, principals, and teachers regularly implement new ideas in schools without the necessary examination or without appropriate followup (Fullan, 2001). Thus, “in today’s turbulent times, bringing about [well-planned] change is one of the greatest challenges leaders face” (Hesselbein et al., 2001, p. 1). Nevertheless, Moore’s law states, “computing ability doubles roughly every eighteen months - and that rate appears to be increasing” (LeBlanc, 2001). A field, such as virtual schooling, where Moore’s law is operating stimulates the possibility of constant change. This means that virtual schools have to be innovation-oriented on an on-going basis.

The virtual school is an innovation that has potentially far-reaching implications. It radically alters relationships in the educational domain including the student-teacher relationship, the student-student relationship, the teacher-teacher relationship, and even the participant (student or teacher) -knowledge relationship. In addition, the virtual school can potentially alter the nature of education itself as it is currently understood. However, why has this innovation presented itself and how this change should be managed along with key philosophical questions about why (or if) they should exist at all, are key questions that must be answered to ensure that virtual schools do not end up becoming just another novelty on education’s scrap heap.

The Paradox of Success

According to Handy (2002), there is a paradox of success. This paradox expresses itself in the following manner: we need to change before we have to. He illustrates this paradox with Sigmoid Curves (which are lines that are curved in two directions much like the Greek letter Sigma - Σ - see Figure 2.1). He says that the first curve describes the natural life-cycle of almost anything. It begins with a downward curve during which the outputs exceed the inputs followed by steady growth that ultimately peaks and turn downward in decline. “The only variable is the length of the curve [and] the time it takes to reach various points on the curve” (p. 23).



Figure 2.1 – The Sigmoid Curve

The paradox occurs because the only way to extend the life of the curve is to begin a new one. However, “to allow time and resources for the initial period of learning and investment, the second curve has to start before the first one peaks” (Handy, p. 24). Thus, one has to recognize that the peak is coming and be ready to begin the new curve before it arrives. This is not easy, people do not typically like change or cope with it well, let alone really understand the implications of changes – most of which are unpredictable until they happen. However, as Handy pointed out, “the status quo is never the appropriate way forward” (p. 24).

A common theme in contemporary educational literature holds that education is at a crossroads of sorts that has brought education to the brink of significant change. The crossroads image evokes a Frostian “... two roads diverged in the yellow wood ...” situation that not only requires a choice but also suggests that there may be a poor or incorrect choice. The choice may be to make changes or to continue to observe the status quo. Nevertheless, the choice will inevitably have significant consequences for students.

A prominent educational research thrust lies in exploring the nature of change in schools and, particularly, in minimizing the negative aspects of change for educators and students. For example, Fullan (2001) explored a variety of issues worthy of consideration in managing the process of change. He stated, “we have become so accustomed to the presence of change that we rarely stop to think what change really means ... the crux of change is how individuals come to grips with this reality” (p. 29).

Change implies that individuals must give up or, at least, soften their grip on their current views, practices and/or beliefs and accept or integrate new ones in their place. However, this integration of new ideas rarely takes place without difficulty. Marris (as cited in Fullan) observes that “*all* real change involves loss, anxiety and struggle” (p. 30, emphasis in the original). One might say that the feelings of loss, anxiety, and struggle will be particularly evident among teachers during the development and implementation of virtual schools because they radically alter the traditional teacher/student relationship to one in which the students “learn to be constructors of knowledge and to think rationally, creatively, and critically ... [as they]

solve authentic problems [and] retrieve and manage information” (Lowe & Vespestad, 1999, p. 35). This shifts the responsibility for learning to the student and changes the role of the teacher from knowledge dispenser to that of a learning facilitator or coach. This new orientation requires teachers to be responsible for setting up the inquiry units and for creating the organizational structure within which [students] do their work. But once the work begins, teachers no longer have the total control of the direction of instruction that they exercise in conventional classrooms (Means, 1994, p. 8).

In fact, education is ripe for real change in a way that has never existed before. “A new willingness to consider profound changes to the educational system is apparent in the current reform efforts of governors, state legislators, business coalitions, and teachers’ associations” (p. 2). With the spectre of the school reform movement hanging over our educational systems:

in many places, serious school reform is being undertaken without any real consideration of the facilitating role that technology might play. Even more common is the introduction of new instructional technologies without any serious consideration of how these technologies might further school reform goals (p. xi).

In other words, the two movements – school reform and the implementation of educational technology and in particular, virtual schools – should complement each other. “I have come to believe that the causal relationship [between school reform and educational technology] flows at least equally strongly in the other direction – that is, that education reform makes a school ripe for technology” (p. xii). This does not imply that one should advocate blind acceptance of innovation. However, it does suggest that

a critical examination and implementation of technological possibilities which are educationally sound is a reasonable and responsible course of action.

In contemporary education, the forces controlling change are often part of the very fabric of the organisation. Fullan (2001) observed, "The forces reinforcing the status quo are systemic. The current system is held together in many different crosscutting ways" (p. 7). In a similar vein, Papert (1993) stated, "There was a time when I believed, as many people do, that teachers would be the most difficult obstacle in the way of transforming School [sic]. [However] this simplistic belief ... is in reality a far greater obstacle to educational change than the fact that some teachers actually are conservative" (p. 57). He described schools as biological systems "... which act like any living organism in defending itself against a foreign body. [Schools] put into motion an immune reaction whose end result would be to digest and assimilate the intruder" (p. 40). In Papert's illustration, the intruder could be understood to be either the teacher who is an innovator or a new approach to instruction (for example, authentic and appropriate use of technology). Thus, the innovator is repressed and coopted to remain the same by the forces of the institution itself, or teachers become prisoners of their own paradigms and are, therefore, unable to see or realise the true potential of educational technology.

If the forces reinforcing the status quo are systemic; the forces required to effect change must also be systemic. "[Change] requires intensive action sustained over several years to make it possible both physically and attitudinally for teachers ... it

means changing the cultures of the classrooms, the schools, the districts, the universities, and so on” (Fullan, 2001, p. 7).

Yet the fundamentals of education have changed little over time. For example, a modern mathematics teacher teaches concepts that are hundreds or thousands of years old often supplementing his or her lectures by drawing on a piece of paper under a document camera or writing with a piece of chalk on a blackboard. One could argue that, from the student’s point of view, this educational experience differs little from the experience of Pythagoras’s students.

On the one hand, it certainly could be argued that Pythagoras’s students were likely able to understand and apply his mathematical concepts at least, in part, due to his tutelage. Thus, the teaching methods he used were appropriate and successful and, perhaps, require no change for contemporary applications. In other words, the concept has not changed so the approach used to teach it need not change either. On the other hand, it could be argued that since both the context for the application of the mathematical concepts as well as the individuals who are learning and applying the concepts have changed, the method for teaching those concepts must change as well. This sentiment is common in much of the literature regarding educational change. For example, Fernstermacher (1990), observed:

Flying itself has not changed; it is still a matter of moving from one point to another in three-dimensional space. What has changed are the demands that must be met in order to fly well in the air traffic system of today. Neither has teaching changed in fundamental ways; it is still a matter of instructing and assisting students so that they acquire the knowledge, understanding, traits of character, and conduct required for a personally rewarding life, productive employment, and effective citizenship. But teaching under the condition of

modern schooling is vastly more complex than it was thirty or forty years ago (p. 140).

Thus, the educational experiences of many students in today's schools could be said to bear more resemblance to Pythagoras's instructional methods than to modern educational theories.

The virtual school has the potential to change students' educational experiences. Few teachers would argue that every student should be taught in exactly the same ways and, therefore, the virtual school is not for everyone. However, it does provide something new for students and, if organized properly, it could provide students with an experience which mimics the uses of technology in the real world.

Elephants, Fleas, and Skunks

One might wonder what elephants, fleas, and skunks have to do with innovation or, for that matter, with virtual schools. However, these creatures provide metaphors for key aspects of virtual school development and educational change.

Handy (2002) described the nature of innovation as the relationship between elephants and fleas. In this metaphor, the elephants are established organizations such as school systems. These organizations have an established way of doing things characterized by complex and formalized systems and routines. "They deliver efficiency and scale and cultivate predictability, which they see as the key to efficiency" (p. 25). They recognize the life cycle of the Sigmoid Curve and, to extend the length of the growth part of the curve, they ally themselves with other elephants in a variety of ways believing that increasing their size is the safest way to weather the storms of a turbulent world.

The fleas are the creative individuals or groups. They see themselves as being different from other people and are determined to make a difference. They also seem to prefer to live on top of the elephants rather than in their bloodstreams. In other words, they die when they become part of the mainstream of the organization. “Elephants need fleas such as these to keep them innovating, but fleas cannot easily live in elephants. The inevitable bureaucracy and need for conformity suffocates them ... some organizations put their fleas in separate pens” (p. 27).

This is where the skunk enters the metaphor. The pens that the fleas are “kept” in are often referred to as “skunk works” areas. Many virtual schools, to date, have been the result of skunk-works projects which, according to Cuban (2001), are strategies of innovation employed by large corporations to respond quickly to emerging market changes. “The term comes from Lockheed Aircraft Corporation, which in the 1950s put together an elite group of the best talents in aviation, provided them with a mission [to design and build a viable commercial jet aircraft] and complete creative freedom, and equipped them with every tool they needed to accomplish the job” (p. 143).

While the conditions under which educational innovators work is typically quite different from corporate design teams, in that they are working with public money and do not have complete control over such things as space, available time, supervision, and evaluation (Cuban, 2001), what results from educational innovation projects is similar to those of corporations. Particularly in relation to the development of social capital, the projects are similar. “If design engineering in a company, for example, is a social,

political, and organizational process ... [which] depends heavily on relationships between engineers and their managers and among engineers themselves in different parts of the company” (p. 145), in this way, virtual school developers in many school systems are chosen for their special abilities to work as team members, to visualize and develop the potential of this new educational medium, and their demonstrated teaching expertise. Their success, in part, is “dependent on the building of a network of almost causal but energized relationships” (Mintzberg, 2002, p. 149). Consequently, these relationships provide some information for education systems who wish to embark on developing virtual school programs. They must resist the temptation to place bureaucratic chains of command on them and allow them to have the freedom to create learning environments which are appropriate in the on-line environment. De Pree (2002) identified eight key provisions that organizations must provide for creative people – fleas – to be truly innovative. He stated that creative persons need:

1. access to senior leaders – a leader must let it be known that the relationships with the “fleas” are important and that their creativity is critical to the long-term health of the organization,
2. structures that resemble the improvisational structure of jazz – just as in a jazz ensemble, the leader should pick the tune, set the tempo and the key and start the performance and leave it up to the players to work out how to blend their voices,
3. constraints – constraints in this case simply define the parameters within which the innovators work,
4. a license to be contrary – this is not cynicism but more the posture of the healthy skeptic - innovators appreciate being held accountable and assuming part of the risk,
5. knowledge that their innovations will have a reasonable chance of going beyond the design table,
6. a fundamental level of trust,
7. colleagues of equal competence – we improve only when we are challenged and stretched, and

8. gratitude – they need to be identified and told that their contribution matters (pp. 35-37).

Thus, elephants and fleas must learn to co-habitate. Organisations must strive to value diversity not only to avoid driving innovators underground but also to incorporate their ideas to avoid stagnation.

Organizational Capacity for Organisational Learning

In traditional schools, the organizational structures are often a hindrance to the development of a learning community. “Traditional structures have typically been characterized by separation of individual administrators, teachers, and students: by uniform standards, procedures, and expectations; by control of the students’ work by teachers and of the teachers’ work by administrators; and by dominance of decision-making by a few elite individuals” (Mitchell & Sackney, 2001, p. 77). However, a learning community seeks to connect rather than separate, value diversity rather than demand uniformity, and include the multiple voices of the community rather than be dominated by a select few. Thus, two key aspects of the organizational capacity identified by Mitchell and Sackney that are particularly relevant in the virtual context are: socio-cultural and structural arrangements and leadership conditions under which the following discussion of organizational capacity is organized.

Socio-cultural and Structural Arrangements

The metaphor of breaking down walls is an apt one for the development of organizational capacity. Much as the community or interpersonal capacity is structured to encourage isolationist tendencies among teachers and students, the socio-cultural and

structural arrangements that are typically made in schools also perpetuate the solitary and isolated nature of teaching. “Schools are not typically places where the educators collaborate easily or often with one another” (Mitchell & Sackney, 2001, p. 79). So, one of the walls that must be broken down for a learning community to be possible in a school context is this isolationist structure.

Another load-bearing wall that must at least be moved, if not removed entirely, is the current structural arrangement of schools. At the heart of this aspect of a learning community is power and who controls the power buttons. Much like the remote control for a television, the person who holds the power buttons controls what everyone is permitted to watch. “Probably the most important structural arrangement has to do with power relationships in the educational hierarchy” (p. 87). In the local school community, administrators have traditionally been the decision makers and the teachers have been the implementers. When one compounds this structural arrangement with the fact that the administrators also often have responsibility to supervise and evaluate teachers’ work and competency, the teachers often feel that they have little or no voice. This can lead to defensiveness and further isolation as the teacher seeks to create some measure of control over his or her life rather than a collaborative and open learning community in which the members openly admit to having weaknesses and work together to address them.

Leadership Structures

Leadership in a learning community involves both the formal and the informal leaders in the group. The structures and allowances for both must be embedded in the

structural arrangements made in the organization. Fullan observed that “leaders can create a leader-rich culture by confronting resistance; by recognizing and celebrating accomplishments at individual, group and community levels; by fostering collegiality; by emphasizing inquiry and reflection; and by promoting teacher development and continuous improvement” (as cited in Mitchell & Sackney, 2001, p. 97). The development of a leader-rich culture, however, has some inherent risks. For example, if a trio of superheros – Superman, Batman, and the Green Hornet – tried to form a coalition, they would quickly run into some problems. Each, accustomed to his own particular style of leadership and crime fighting, would instinctively go into his own routine that may work at loggerheads to the others’ styles. They would have to find a way to work together in concert with each other to complement each other’s approach. “One of the ways to do so is to create a shared vision and purpose” (p. 98). Working out the shared vision and purpose is, or should be, a collective task in which each member can have input and ownership for the final product.

PERSONAL ISSUES CONCERNING THE ENGINEERING AND METAPHYSICS OF VIRTUAL SCHOOLS

The problem of freedom and its consequences significantly influences the development of virtual schools and, therefore, their philosophical potentials and constraints as well. Virtual schools are so new that their development is, in many ways, a blank slate. Therefore, freedom and its consequences could affect how virtual schools expand and develop.

Freedom

This discussion of the potential and constraints of virtual schools rests on the following quotation: “Each of us, even in a highly controlled workplace, is fundamentally a freedom and, in essence, at every moment we are cause and effect” (Koestenbaum & Block, 2001, p. 22). The quotation seems to be logical and makes eminent sense but, what does it mean to be a cause as well as an effect?

The virtual school environment depends upon a computer-based delivery system. While this fact is not necessarily positive or negative, it provides the first issue in a discussion of the philosophical potentials and constraints of virtual schools. The computer, of course, is simply a tool that humankind has developed to assist us in completing large computational tasks. In order to perform its computations, it depends on a number of programming languages which have very strict formats and structures. Many of these languages fall into the hypothetico-deductive genre in that they employ strict rules to govern the structure and sequence of operations conducted in performing given tasks. The structure, in simple terms, has a very rational basis. The basics of the process have an “if ... then” format in which the computer encounters a piece of binary information, then consults its rules to determine its next course. While there are a variety of artificial intelligence (AI) and smart systems that exhibit aspects of learning and thought, computer operations (including AI systems) are, nevertheless, mechanical. Thus, virtual schools could easily become mechanical also if virtual school focus too much on the technical aspects of providing educational experiences to students.

Human tendency, aside from the mechanical nature of computers, also leans toward focussing on the technical and rational aspects of tasks. Our organizations are full of expressions of our belief in rationality. Koestenbaum and Block (2001) illustrated this tendency in their observation, “we often treat the workplace, which is a human system, as if it were a mechanical system – or, most recently, an information system. We put great organizational effort into constructing a world of control, consistency, and predictability” (p. 24). This statement reveals the first constraint for virtual schools to address. If virtual schools focus too much on the mechanical nature of the enterprise, they risk negating the very features that make virtual schools so interesting.

The Internet, with its almost boundless information and educational possibilities is a likely context to stimulate creativity and innovation in students. However, because it is so new, many school systems want to put extra accountability structures in place to ensure that educational experiences on-line are as challenging as in face-to-face environments. As Koestenbaum and Block pointed out, this sort of measurement is not necessarily bad; but, it is often too pervasive and in this case it may be entirely inappropriate. Fullan (2000) stated that, particularly during times of great change, new tools are often used in terms of the old ones they replace. In other words, a virtual school could be used and evaluated in terms of the traditional school structure such as: the number of exams, the amount of homework assigned, norm-referencing, etc. However, this approach is not appropriate in the virtual environment. We must begin by identifying skills students will need to thrive in today’s workplace. For example,

Lemke (in Thornburg, 2002) suggested that the core skills for the New Economy are:

1. Digital age literacy
 - basic science, math, and technological literacies
 - visual and interpretive literacies
 - cultural literacy and global awareness
2. Inventive thinking
 - adaptability/ability to manage change
 - curiosity, creativity, and risk taking
 - higher-order thinking and sound reasoning
3. Effective communication
 - team-work and collective and interpersonal skills
 - personal and social responsibility
 - interactive communication skills
4. High productivity
 - ability to prioritise, plan, and manage for results
 - effective use of real-world tools
 - ability to create relevant, high-quality products. (pp. 59-60)

If these are accurate, we must modify the curricular and evaluation methods to reflect those skills. It is a new environment and it requires a new system of evaluation.

Organizations tend to assume that “if we want to bring something into existence, it has to be defined in concrete, measurable terms ... [and] that we cannot be ourselves and be successful” (Koestenbaum & Block, p. 24). This is a problem for a virtual school because this sort of structure leaves little or no room for creativity and innovation and eliminates a significant amount of the true potential of virtual schools. “We engage in planning that attempts to predict the future, we believe that structure and rewards drive behaviour, and we trust that for every problem there is a solution” (p. 24). According to Koestenbaum and Block, this is the engineering mind at work. We wish to control everything and assume that if we cannot measure it, it does not exist, or, at least, that it has no value. Thus, “the belief that currently dominates western thinking is

that we are not completely free, but are a product of our culture” (p. 30). This allows us to abdicate responsibility for our freedom. Students can say that they were just following the course’s outlines and teachers can say that they were just following the curriculum. However, at what point does one have to take responsibility for his or her own situation?

In my own experience in developing an on-line course, I have constantly had someone looking over my shoulder to ensure that the educational program that I design is of sufficient quality. I have had various supervisors express concern over the fact that my course does not include a final exam, that I do not point students in a particular way (give them web sites to start with when I ask them to conduct research or gather information) and that I do not include rigid structures for participation and other grades. However, according to Koestenbaum and Block (2001), while they may have their uses “accountability structures with rewards, reinforcement, and punishment [can] increase constraints and reduce creativity” (p. 26).

In the case of the virtual school, one must take advantage of the medium’s nature and allow students to take control of their own learning. If their teacher always tells them where to start and how to complete every task, they do not need to take any responsibility for their own learning and it also stifles their creativity. In the open-ended assignments that I have asked students to complete, they have frequently exceeded the initial expectations that I had for the assignment. I contend that this is due to the fact that I give them the freedom to make their own creative expressions. Consequently, freedom is a critical element of virtual schooling that must be addressed.

How can virtual schools address freedom and accountability? It is essential that educators resist the urge to force virtual schools into the traditional school mould. We must constantly keep our focus on the human side of the educational process.

Traditional schools typically advocate, but do not quite achieve, processes that are student-centred. The virtual school is ideally situated to provide a student-centred program. It can take advantage of the vast capabilities of computers and make education a personal experience which will allow students to take more ownership of their educational experiences and, in the process, make them more meaningful as well.

The basis for how virtual schools should view students is that they do not belong to the school, they just are. "If we stop possessing people, then our organisations can support learning" (Koestenbaum & Block, 2001, p. 107). Just as organisations "do not have to develop their employees" (p. 107) , so a virtual school does not have to develop its students. A virtual school should strive to allow students to choose their own paths and define their own goals. In short, it encouraged students to exercise their freedom.

The "Dark" Side

While freedom can be both emancipatory and liberating, it brings with it responsibility and accountability.

For all the benefits of desktop Web access, there are also significant risks. E-mail and the Web can boost productivity by enhancing communications, collaboration, and research capabilities. However, they can just as surely undermine efficiency, should [students and/or teachers] spend too much time

surfing the Web for personal ends [instead of completing their designated online tasks]. (Cohen, 2001, p. 70)

The use and, potentially, the misuse of the Internet and its resources can be of particular concern for virtual high schools. The temptation may be very strong for students to spend time viewing inappropriate sites (e.g., pornography or hate sites) or sites which draw them away from working on their educational tasks (e.g., music or movie sites). The danger exists that the school could become embroiled in or associated with this kind of behaviour. If a parent, assuming that the child is working on virtual school materials, walks into the child's room to find him/her viewing an inappropriate site, that parent may assume that the school somehow condones this behaviour simply because it exists on the Internet and the student accessed it while he or she was supposed to be doing school work.

What should the virtual school's response be both to the potential of blame and to the stewardship and guidance of students? There are some instances that a certain amount of control may be either desirable or necessary, but there are times when controlling student Internet use would be inappropriately paternalistic. It may also be true that it would be necessary to monitor or restrict some students' Internet freedom while others may not require any controls at all.

In private industry, employers' responses to this problem often seem draconian – they enact Internet use policies then “spy” on their employees to see whether the policies are followed. For example, “between 1997 and 2001, e-mail monitoring has exploded, from 15% in 1997 to 46 % in 2001” (Cohen, 2001, p. 72). In addition, in a

1999 survey sponsored by Vault.com – a New York-based business site, “31% of employers said they restricted or monitored [employee] Internet use. By the next year, that number was up to 42%” (p. 72). Thus, Internet users may have the mistaken perception that they enjoy anonymity when they search the Internet. However, with relatively inexpensive software, it is possible to monitor an Internet user’s every key stroke while on the Internet. “[The monitor] can see where you’ve gone online, when you went there, and how long you stayed. He knows if you hunted for a new job or shopped on eBay on company time” (Cohen, p. 70). Actually, it is rather common for educational institutions to use this sort of software, often called a “snooper”, to monitor Internet use on their networks. What might seem most surprising is that “employers need not worry about their employee’s privacy rights. To put it bluntly, workers don’t [sic] have any” (p. 80). The courts have ruled that since the employer owns the equipment and pays the employee’s wage, it has a right to know what employees do on company time. However, according to Cohen, companies rarely do anything to inform employees regarding Internet use policies; in fact, it is not unusual for the employees to be unaware of the existence of a policy entirely.

But, if virtual schools value freedom for both their employees and their students, they will have to walk a very thin line indeed when it comes to monitoring Internet use. Accusations of hypocrisy are very likely to arise unless virtual schools plan their Internet use rules very carefully and have an open policy to make all users aware of policies and procedures. The guiding principles of policies such as these should be the best interests of the students both from an educational and a protective point of view.

Constraints on Freedom

While this ideal of freedom is positive in theory, there are a number of constraints that must be considered. For example, provincial curricula often define the parameters and expectations of high school courses. This presents a problem for the freedom ascribed to virtual schools here but it is not insurmountable. Provincial curricula, in Saskatchewan at least, tend to be rather open-ended and general. They tend to be descriptive rather than prescriptive. Therefore, a virtual school developer could fulfill the requirements of the curricula and still allow the students freedom and flexibility.

School board policies could be another potential source of philosophical constraint. If school boards continue to manage in ways described earlier (assuming they are engineering mechanical systems), the exercise of free will could also be difficult. As pointed out earlier, my own experience of virtual school development was very similar to Koestenbaum and Block's description of mechanical management. School systems often choose to manage programs in the only way they know how – by treating them like machines. Again, this limits freedom for both student and teacher and school systems must strive to alter their organisational structure to allow for the new medium of virtual schools.

Another constraint is time. "Speed obliterates or blurs the quality of our experience and makes relationships obsolete" (Putnam, 2000, p. 273). If Putnam's observations about the decline of social capital are true, one possible contributing factor

is time. It is common to hear people in our society say that they never have time to do anything anymore. The ever-increasing fascination with increasing the speed that computer CPUs run is a good example of this. The truth is that for most people, a second or third generation computer with a processor running at 386 or a 486 is as fast as they need. For the most part, people use computers to type, surf the Internet, e-mail friends and family, and play a few games. Computer component manufacturers and software companies, however, are continuously reinforcing the message that faster is better. While the processor speed of a computer has nothing to do with the design of the virtual school (in the concrete sense), it is simply an illustration of society's sentiments. A constraint that virtual schools must address is how can the speed of media-rich communications and its resultant lack of attention to relationships and detail be changed or altered in the virtual school? Muirhead (2000), in his study of teachers' perspectives of on-line education in Alberta, found that teachers identified several constraints on their freedom that emerged from their involvement with on-line schools. Among them were (1) evolving professional responsibilities in authoring on-line courses while still teaching full-time resulting in substantially increased workloads, (2) providing technological support to students and parents in an environment that is rapidly changing in "complexity of the content development tools, instructional design philosophies, content development tools, and rapid adoption of integrated on-line delivery methods" (p. v), and (3) continually enhancing their own technological skills. All of these things, according to Muirhead (2000), led to significant time pressures for

teachers. In other words, virtual schools must find a way to make time for human speed.

Another constraint on teachers' freedom often identified by teachers is a sense of loss of their professional autonomy and an increased role for parents in the virtual context – sometimes leading to closer scrutiny of their work and higher levels of accountability. Muirhead (2000) found that “online education in Alberta is characterised by more extensive interaction with parents than in traditional classrooms. [In fact], in some schools, parents assumed responsibility for supervision of students' tests and examinations” (p. v).

Globalization is also a prime constraint of virtual schools. What commitment do virtual schools have toward the community and cultural integrity of the countries and cities in which they do business? While the world may be the virtual school's classroom, the virtual schools themselves are usually based in some local jurisdiction. Whether the jurisdiction is a school system, city, or state/province, the virtual school must address its obligations to its home community first. In this case, the obligations may mean accepting local students first, purchasing computer hardware and software locally, or just fulfilling the criteria of the local educational system's curricula. Nevertheless, these obligations must be considered and addressed.

Potentials of Freedom

Freedom may encourage students to take ownership of their education. This may allow a shift to constructivist learning which sees the student take more responsibility for his or her learning and changes the teacher's role to that of a learning

facilitator or coach. “When participants enter the room of a large event knowing full well that they chose to be there, the social contract of their learning has shifted dramatically. It is no longer up to the instructor to prove their own value and relevance; it is clear from moment one that the learner is responsible for value received” (Dolence & Norris, 1995, pp. 108-109). This shift in focus may lead to education becoming more relevant to the student and allow them to pursue their personal goals more appropriately. It would also demand that the student, as a more active participant in the act of learning, take more initiative for his or her learning. This could lead to the opportunity to engage the student in designing the learning environment and its tasks as well as defining the goals of education. Each student brings to the educational table an array of skills and weaknesses. This structure may allow students to better assess their weaknesses and address them more fully. Thus, in engaging the student, the virtual school may be taking a step toward rebuilding social capital.

When virtual schools structure themselves to address students’ individual and collective freedom, education stops being something done to or for students and becomes something done by and with students. While this structure develops a new relationship between the student and his or her environment, it likely also necessitates special training to help learners learn how to use their increased freedom. In the on-line environment, a fellow student then becomes as valuable a resource as the teacher. The bulletin boards and chat rooms built into many on-line schools have the potential to build social capital by increasing interpersonal communications (as compared to traditional schooling).

Personal Capacity for the Creation of Virtual Learning Communities

Personal capacity is the last of the triumvirate of capacities surfaced by Mitchell and Sackney which are necessary for learning communities. Personal capacity in the school context is defined as “... an amalgam of all the embedded values, assumptions, beliefs, and practical knowledge that teachers carry with them and of the professional networks and knowledge bases with which they connect” (p. 17). This amalgam consists of two distinct ingredients: the search for knowledge and the construction of knowledge and it is under these two headings the discussion of personal capacity are organized.

The Search for Knowledge

The search for knowledge is a complex task which involves examination of both the internal beliefs and assumptions held by the individuals in the community and the external sources of new information and knowledge available to the individual.

Internal Search

The internal search is, in some respects, the most challenging of the precepts involved in the creation of a learning community. Argyris and Schon (as cited in Mitchell & Sackney, 2001) pointed out that “professional action is caught in the crossfire between espoused theory and theory-in-use” (p. 18). Therefore, an internal search requires a careful examination of the internal beliefs and assumptions as well as the publicly professed *raison d'être* held by individuals within the school community.

In some respects, examining espoused theory is not terribly threatening to most teachers. Since espoused theory is “... the set of assumptions, beliefs, and values that

people publicly declare” (Mitchell & Sackney, p. 18), one only needs to visit a school staff room or staff meeting to hear teachers’ publicly espoused theories and beliefs about teaching. However, there is sometimes a dark side to publicly espoused theories in that they tend to be somewhat rhetorical. “[Espoused theory] usually consists of the ‘best practice’ or the standard rhetoric currently in vogue” (p. 18). Thus, while teachers may be willing to express their theories of education, there is no guarantee that those theories actually have any impact on their classroom practice or theory-in-use.

Theory-in-use, as noted above, is related to what “really happens” in the classroom. It is, according to Mitchell and Sackney, “... the set of assumptions, beliefs, and values that people do not necessarily declare but that they follow in practice” (p. 18). Thus, it is what underpins a teacher’s decisions and practices in his or her classroom. An examination of an individual’s theory-in-use can be a very threatening exercise. “It is far easier for some of us to discuss theoretical ideas or to talk about what the world ought to be like than it is ... to look critically at our own ... behaviours” (Jenkins & Jenkins, 1998, p. 25).

Perhaps one explanation for the lack of comfort experienced by teachers as they examine their theories of practice is that there is often little agreement between them. Mitchell and Sackney pointed out, “The problem is not that these two sets of theories operate together but that they are often not aligned” (p. 18). When one’s espoused theory and theory-in-use are incongruent, he or she runs the risk of appearing to be insincere or, even worse, to lack integrity or competence. “The past ... becomes a treasure trove through which to rummage” (Jenkins & Jenkins, 1998, p. 24) as we seek

to understand and reflect on our actions. However, this takes both courage and time which may be in short supply as teachers seek to cope with their ever-increasing workloads. Nevertheless, teachers must take the time because, as theorised by Mitchell and Sackney, “the internal search begins by articulating both sets of theories” (p. 19) as he or she critically reflects on events as they transpire (reflection in action) and after they have transpired (reflection on action).

External Search

The external search can also be a threatening endeavour because one must publicly admit one’s weaknesses. Mitchell and Sackney (2001) described the external search process as including the search for new sources of information and knowledge. The metaphor of a network or web is illustrative of the potential scope of the external search. It involves identifying those things one does not know and examining one’s network of connections for someone who might know the required information or possess the required skills.

Network theory examines the level of homogeneity as well as the strength of the ties among the persons in the network. “Network theory assumes that strong ties and homogeneous networks limit the amount of new information or different ideas to which new members are exposed and consequently restrict their thoughts and actions to a small repertoire of options” (Mitchell & Sackney, p. 23). Similarly, it follows that networks which exhibit the weak ties typical of diverse groups “... provide a rich source of new ideas and new possibilities and a foundation for experiments in practice” (p. 24). In other words, a diverse group feeds off each other and learns from each other in a way

that simply doesn't come to fruition in homogeneous groups. Thus, if an organization wanted to ensure that a new project was truly innovative and that it stretched the boundaries of traditional practice, it would select members for the project team who possessed a wide range of individual skills but who also came from diverse backgrounds. Therefore, the individual learner as well as the entire network benefits from network scholarship because "network scholarship increases the 'bandwidth' of information that can be synthesized by an individual and shortens the time frame [required for learning new material]" (Dolence & Norris, 1995, p. 25).

Process of Knowledge Construction

An aspect of the development of personal capacity which has already been alluded to but not formally articulated here is the process of knowledge construction. This process can be seen as the culmination of the internal and external searches already described above. However, as posited by Mitchell and Sackney (2001), "unless the internal and external searches engender some shift in perception or belief system, then there is likely to be little real change in practice" (p. 31).

At the heart of this knowledge construction process is the concept of constructivist learning. The basic premise of constructivist learning is the acknowledgement of current or existing knowledge and that the learning process begins at that foundation. In other words, "people use current knowledge to construct (or learn) new knowledge ... by 'actively weighing new information against previous learnings'" (Mitchell & Sackney, p. 33). In addition, constructivist learning involves a

shift from traditional or transmittal learning in which “teaching is the process of transferring knowledge from one individual (the teacher) to another (the learner)...” (p. 37) to a transactional approach in which teaching is viewed as a “... process of facilitating the construction of knowledge rather than of dispensing knowledge” (p. 37).

There is considerable support to argue that educational technology and virtual schools, when appropriately organized, provide a constructivist platform for students. For example, Dolence and Norris (1995), in their critical examination of current post-secondary school structures suggested that educational institutions must refocus to become learner-driven. This focus, which they call “just-in-time” learning, could be viewed as constructivist. Just-in-time learning gives the student multiple entry points to content and context based on their needs and interests. It is technology-based, typically in an on-line environment, and is learner-driven in the sense that the learner determines what needs to be learned and begins where ever the gaps are in his or her knowledge base. Williams (2000), in his critique of educational software, observed that “we have multimedia which allows the [learner] to express what they already think, and to create new ideas and present them to the world” (p. 174). Further, O’Neill (2000) posited that constructivism “provides a new paradigm for this new digital age of world wide communication and information” (p. 149) because learners are provided with tools and placed in authentic problem solving situations reflective of real world contexts. Finally, constructivism, particularly in technological contexts, is not limited to students. “Teachers must develop techniques to engage and challenge children as they use these tools” (p. 151).

CONCEPTUAL FRAMEWORK

Virtual schools truly are multifaceted endeavours. They present both engineering and metaphysical problems which cannot be ignored. Virtual schools cannot permit themselves, however, to become bogged down with the engineering problems lest the metaphysical issues surrounding them become lost and forgotten. Consequently, a conceptual framework for a study of the nature of instruction and community in a virtual school must account for both the metaphysical and engineering problems confronted by these schools. Such a study should use the metaphor of a learning community as its conceptual framework because it allows for the incorporation of these problems within the context of the New Economy's digital age.

Mitchell and Sackney (2001) began their book with the following statement: "one of the perplexities of education is whether schools as they are currently structured enhance learning or limit it" (p. 1). Much of the literature suggests that the answer to this question is that current structures limit learning. Dolence and Norris (1995), for example, pointed out that from the point of view of both students and teachers, education is currently organised according to an industrial age paradigm which views learning as an independent and compartmentalised activity characterised by "insufficient flexibility; focussing on processes and outputs, not outcomes; and high cost" (p. 11). Instead, since society has entered an age in which "information has quite suddenly become the world's most important resource" (Cleveland, 1997, p. 143), schools must restructure or radically alter the traditional teacher/student relationship to one in which students "learn to be constructors of knowledge and to think rationally,

creatively, and critically ... [as they] solve authentic problems [and] retrieve and manage information” (Lowe & Vespestad, 1999, p. 35).

This chapter has focussed, for the most part, on the learning community from the point of view of the teacher. However, the learning community has several potential benefits for students as well. For example, if a school learning community is truly receptive to change, the students will benefit not only from the exciting and diverse atmosphere that will inevitably result but also from the innovations (technological and otherwise) that teachers will experiment with. Thus, the metaphors of the learning community and the information age dovetail together to formulate a conceptual framework. Mitchell and Sackney’s heuristic for the structure of a learning community, with its focus on building personal, interpersonal, and organisational capacities was particularly useful in this study.

Personal capacities such as the process of knowledge construction and the internal and external searches support and reinforce both the concept of a learning community and a virtual school. The metaphor of a network, in particular, is illustrative of the appropriateness of the learning community model for virtual schools with its features of strong, interlocking ties and diversity of members within the community. The World Wide Web is, perhaps, the most obvious point of connection between the virtual school and the network metaphor. Students and teachers gain access to the school via the Web and it is immanently flexible which allows learners to access information when and if it is necessary. In addition, the virtual school could potentially involve an incredibly diverse community of learners, perhaps from all over

the world. This could, if handled carefully, result in a wonderful learning community which is rich in variety and texture.

The interpersonal capacity focuses on group and community dynamics. It hinges on activities such as building the affective climate, fostering the cognitive domain, and encouraging a collaborative ethic which are also profound factors affecting the virtual school learning community. The literature surrounding the New Economic climate suggests that workers will require the ability to gather, process, critically evaluate and synthesise vast amounts of information often in short periods of time while working and communicating collaboratively in teams (often via electronic means in diverse geographical regions) in order to accomplish the complex tasks that they will (and do) face. Clearly, the interpersonal capacity will impact significantly on these tasks. For example, the affective climate requires both the invitation to participate as well as acceptance of that participation. In my own experience, a student with cerebral palsy, who is bright and articulate as a typist but must communicate verbally through an interpreter by laboriously pointing at a picture card, found the virtual school experience a wonderfully empowering and liberating experience. He was able to contribute to discussions and interact with his fellow students in a manner that had never before been possible for him. In addition, the Internet can be a force, or at least, a vehicle, for the development of social capital – another aspect of the interpersonal capacity.

Underwood (2000) pointed out that the quality and quantity of truly collaborative face to face talk was significantly increased by the presence of computers in group work. Perhaps that same effect may be realised in the virtual school context as well.

The organisational structures necessary for a learning community reflect the realities of the information age and are enhanced by a virtual school model. Key elements of the organisational capacity is the organisation's ability to cope with change, to break down the walls of the industrial age isolationist structures, and to reframe the hierarchical structures to permit wider and more meaningful leadership opportunities. The Internet and, by extension, the virtual school is an excellent platform from which to build the learning community's organisational capacities. The metaphor fits here because the Internet constitutes a more egalitarian environment in which the hierarchy can be "flattened". In fact, even the teacher's authoritative position becomes reframed as he or she assumes the role of learning facilitator and co-learner with the students. Leadership opportunities are, therefore, enhanced because credibility is based solely upon the quality of one's ideas (and perhaps, the ability to convey them). Consequently, everyone has the capacity to be both a consumer and a constructor of knowledge and everyone can potentially contribute equally. In addition, "integrated performance support systems are essential to the levels of workplace performance required of all workers in organisations that hope to compete in a global economy" (Reeves, 1998, p. 49). The sort of integration suggested here by Reeves can best be realised in the organisational environments created by the virtual school learning community.

Finally, this literature review reveals that the current structural arrangement of schools is designed to develop in students the skills more appropriate for success in the industrial age workplace. However, since society has restructured itself into an

information age environment, schools must also change to permit the development of skills necessary for success in this new environment. As a school implements the precepts of learning communities, particularly in the virtual school context, the new school reality will be a striking resemblance to the modern information age work world in which people are expected to be “knowledge navigators who [have developed] the capacity to [collaboratively] negotiate a pathway through an overwhelming universe of information [using a vast array of technologies] on their way to understanding” (Dolence & Norris, 1995, p. 26).

Many authors appeared to support the premise that contemporary education is out of touch with society’s expectations. It is organized to provide students with skills and knowledge more appropriate for an industrial age context. However, society has transformed into an information age, and as such, students and teachers need a different set of skills to success in this new environment. Thus, the learning community is the appropriate educational structure for the information age because it mimics many of the behaviours and competencies required of information age life and develops those new skills

SUMMARY

The social issues regarding virtual schools relate to community building and interpersonal relationships. In the context of contemporary society, with its prevalence of individuals’ social disengagement and their withdrawal from public life, virtual schools must strive to create effective, democratic, and egalitarian virtual communities which encourage students not only to recognise their roles in society but also to fulfil

them. The virtual school must encourage everyone to participate and provide youth with the knowledge and the will to be able to participate and to know when to participate.

The organisational issues regarding virtual schools focus on the management of these initiatives. School divisions must actively encourage the developers of virtual schools to achieve an innovative and engaging learning environment for students. School divisions must also recognise the need for change and innovation and strive to create an organisational culture which fertilises and incubates innovators.

The personal dimension of virtual schools resides in how the organisation manages its members' freewill and the accountability structures put in place to address the freewill issues. Virtual school developers must resist the temptation to over-engineer their courses and, instead, to allow for maximum creativity and for exercising individuals' freewill.

What are the philosophical constraints and potentials of virtual schools? They have enormous potential in terms of providing quality education for children. Virtual schools have the potential to encourage egalitarian, creative, and free educational environments. However, these potentials can only be realised if the constraints posed by the digital divide, inadequate teacher training, and truncated interpersonal communication are addressed.

Chapter 3

Research Methodology

A common theme in contemporary educational literature is that education is at a crossroads of sorts which has the potential to place it on the brink of significant change. The crossroads image evokes a Frostian “... two roads diverged in the yellow wood ...” predicament that not only requires a choice but also suggests that there may be a poor or incorrect choice. The choice may be to make changes or to simply continue to observe the status quo. Nevertheless, the choice will inevitably have significant consequences for students.

Adhering to the status-quo does not seem to be possible. “The notion that a knowledge-based economy is replacing the industrial economy, in the same way as the latter replaced the agrarian one is now widely accepted among policy makers” (McNair, 2001, p. 18). The key idea in this change is that “most economic value is now generated by trade in knowledge, rather than in manufactured goods” (p. 18). This happens in two ways:

1. through a growth of a highly skilled and individualised service sector (e.g., advice, consultancy, research, publishing, etc.), and
2. by a shift in what makes manufactured goods valuable.

The skills mentioned above represent a vastly different skill set from the skill set that

schools are currently tooled to foster in students. Consequently, change in schools must take place to address not only the needs of the information industry but also to provide students with the skills necessary to be employable.

The traditional school effects research literature suggests that not all schools are equally effective. Reynolds, Teddlie Creemers, Scheerens, and Townsend (2000) stated “... there are observable regularities in [some] schools that ‘add value’” (p. 3) which implies that there are some schools which do not add value. Thus, the many researchers working in the area of school effects have developed heuristics which typically equate the presence of particular school characteristics or attributes with value added. But, it is not clear what it means to add value in the context of the societal reality of the New Economy – not to mention in the virtual school milieu.

The school or, more generally, the educational process, has increasingly become identified as an instrument or a key feature of the New Economy (Tosey & McNair, 2001). Thus, many “traditional” schools as well as many new educational corporate entities are hurrying to establish a presence in the competitive world of virtual schooling spurred on by economic models which hold the promise of new sources of funding (Janigan, 2002), by information age models which require students to develop new technological literacies (Dolence & Norris, 1995) or simply because technology has developed to the point that virtual schools are now not only possible but also relatively accessible for most students. However, some of these efforts are less than satisfactory in terms of either the logical use of the technology or, for that matter, educational effectiveness. In addition, one must wonder what impact, if any, from the

point of view of students, the new educational environment might have on their learning experiences. If the virtual school is, in reality, public education's response to the challenges presented by the Information Age, one must wonder to what extent skills such as:

1. **resources:** ability to identify, organise, plan, and allocate resources;
2. **interpersonal:** ability to work with others in teams, teach others, serve clients, exercise leadership, negotiate and work with diversity;
3. **information:** ability to acquire, organise, interpret, evaluate and communicate information;
4. **systems:** ability to understand complex interrelationships and the ability to distinguish trends, predict impacts, and monitor and correct performance; and,
5. **technology:** ability to work with a range of technologies and choose tools appropriate to particular tasks (Holford & Nicholls, 2000, p. 139)

identified as essential for the Information Age or New Economy worker are fostered and developed in students in the virtual context as a result of the educational environment and tasks provided for them by their teachers.

Kay (1997) pointed out that the current use of computers in today's schools "represents a desire on the part of a future-shocked public to see a new technology only as a better version of an old one" (p. 19). In other words, some educators have adopted new technologies without really implementing them or making the necessary conceptual changes to effectively use them. Fullan (2001), suggesting that a gap exists between the educational potential of a new technology and the realisation of it in practice, posited "a teacher could use new curriculum materials or technologies without altering the teaching approach" (p. 39). Theoretically, one could construct a virtual school in the image of a traditional school without making any cognitive or pragmatic shifts for

instruction in the virtual environment. For example, one could optically scan textbook pages and require students to read, make notes, complete and submit chapter questions much as might be done in a traditional classroom with little or no interaction between students and teacher or among students. Not only does this environment not add value in the virtual environment but also, it likely does not constitute an effective virtual school.

In fact, this sort of environment could be disastrous for students in the new economic environment. Lowe (2002) argued that “information technology (IT) contributes to the increasingly fluid nature of [acquired] skills ... by accelerating the rate of knowledge diffusion, IT affects skills requirements – usually by raising them ... IT obsolescence also affects human capital, raising the bar for skill upgrading” (p. 80). This need for constant learning and upgrading has prompted many authors to posit that schools need to create a flexible, student-centred learning environment which permits students to take ownership of their learning and also has the capacity to respond to their individual needs. While the virtual school certainly has the capacity to provide this environment, there is no guarantee that it will. “The reality [of current educational structures] is considerable stability in what [and how] teachers teach ... flexible learning organisations are not created in such environments (Papert, 1993, p. 143). Thus, if teachers are going to be using the tools available to them on the Internet, they must foster the creation of a learning environment which targets behavioural and cognitive objectives reflective of the skills required in the New Economy or Information Age.

This chapter outlines the fundamentals of the research project described herein.

Research Design

The selection of a research methodology is, or ought to be, determined by the nature of the problem one intends to study. Dolmage (1992) argued that “the correct theory and method for study of educational administration, then, is dependent upon the nature of the questions being asked ... What is important is that the question being asked is not twisted so that it will ‘fit’ a particular research methodology and that the methodology selected is used properly” (p. 6). Thus, in order to determine an appropriate research methodology, one must begin with the problem to be examined.

The two-fold purpose of this study was to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. Consequently, it seemed prudent to conduct the research in a manner that would allow the researcher to describe the actions and perceptions of the reality of faculty and students of the virtual school under study in their natural setting because, “phenomena of study, what ever they may be ... take their meaning as much from their contexts as they do from themselves” (Lincoln & Guba, 1985, p. 189). “Case studies are well suited to developing detailed descriptions ... [because] the researcher can collaborate with subjects in the study and can interview them intensively to learn their phenomenological perspectives” (Borg, Gall, & Gall, 1993, p. 203). Further, “Case studies focus on *contemporary* phenomena” (Borg et al., p. 203, emphasis in the original), “defined by interest in individual cases” (Stake, 2000, p. 435), in their total contexts within a conceptual framework (Borg, et al.). Consequently, a case study

approach was appropriate for this study because it allowed the researcher to “study the meanings that individuals create ... [and] study human actions in a natural setting” (Gall, Borg, & Gall, 1996, p. 30). In other words, this study sought to examine the perceptions and actions of both educators and students participating in a virtual high school in the context of that school.

The Nature of the Case Study Approach

As stated earlier, this study lent itself to an examination of the particular unit or case of a particular phenomenon – one virtual high school. As McNair (2001) pointed out, education will (or already has) become more entrepreneurial; meaning that parents and students will increasingly select educational opportunities and purveyors based upon what the institution has to offer in terms of both content and context rather than simply attend the neighbourhood school. Thus, the onus is put on the school both to provide instructional approaches and focusses that resonate with contemporary societal expectations and to listen carefully to what the students or, to use New Economy terminology, the customers want and need.

In the spirit of New Economic business strategies, this case study was, in a sense, an audit. In much of the literature referring to the New Economy, the need for businesses to listen to their customers is stressed. For example, Hiebeler, Kelly, & Kettelman (1998) posited, “As we approach the 21st Century, hearing – in the sense of listening carefully to what the customers have to say – has never been more crucial ... [and] one over-arching theme ... is that the best way to understand customers’ needs and wants is to ask them directly” (p. 33). After all, “Directly involving the customer in the

design, creation and refinement of products leads to outstanding results” (p. 35).

Hence, the concept of an audit has specific implications in the New Economy’s business climate. “The word ‘audit’ has its roots in the Latin *audire* ‘to hear’, more precisely in the form of *auditus* meaning ‘that which is heard’” (p. 33). Hiebeler et al. suggested that, in the New Economy milieu, there could be dire consequences for the corporate entity that underestimates the value of its customer’s preferences and suggestions with their observation that “companies exclude customers from the design and creation of products and services ... *at their peril*” (p. 85).

The case study has a number of features which adhered well with the above notion of audit. For example, Lincoln and Guba (1985) suggested that “the case study is the primary vehicle for emic inquiry” (p. 359). This implies that the researcher is, or ought to be, concerned with listening carefully to the respondents’ views (including their tacit knowledge) making possible a “reconstruction of the respondents’ constructions” (p. 359). In addition, not only are there a number of potential purposes for case study reports (e.g., to chronicle, to render, to teach, and to test), but also that a given case study may “serve multiple purposes” (p. 361). Similarly, Stenhouse (as cited in Sturman, 1999), alluded to the purposes of case study reports by identifying four types of case study methodology:

1. ethnographic case study – which involves single in-depth study usually by means of participant observation and interview,
2. action research case study – where the focus is on bringing about change in the case under study,
3. evaluative case study – which involves the evaluation of programs and where quite often condensed fieldwork replaces the more lengthy ethnographic approach, and

4. educational case study – which is designed to enhance the understanding of educational action. (p. 107)

Further, Stake (2000), argued that there are only three types of case study including:

1. intrinsic case study ... undertaken because ... the researcher wants better understanding of this particular case (not because the case under study is thought to be representative of other cases),
2. instrumental case study [in which] a particular case is examined mainly to provide insight into an issue or to redraw a generalisation – [in this type of study] the case is of secondary interest, it plays a supportive role and it facilitates our understanding of something else, and
3. collective case study [which sees] a researcher jointly investigating a number of cases in order to investigate a phenomenon, population, or general condition. (p. 437)

While Stake pointed out that studies “often do not fit neatly into such categories” (p. 438), the categories do provide some direction regarding the particular type of case study one may wish to undertake. In fact, “a given case may serve multiple purposes” (Lincoln & Guba, p. 361).

An apt description of this study is that it was an amalgam of the purpose identified by Lincoln and Guba as “to chronicle”, the intrinsic case study identified by Stake, and the educational case study forwarded by Sturman. As such, this study was an attempt to study and understand a particular educational action – the nature and conditions of the virtual schooling experience from the point of view of both faculty and students.

Units of Analysis/Site Selection

Scheerens (1992) pointed out that a researcher must use units of analysis that allow for data analysis with sufficient discriminative power. Typically, the unit of analysis in educational research is the school (Cuttance, 1992). Nevertheless, “the cases

are expected to represent some population of cases. The phenomenon of interest observable in the case represents the phenomenon writ large” (Stake, p. 446).

However, Stake (2000) recognised that while the unit selected in a case study is “one among others ... in any given study, we will concentrate on the one” (p. 436). Further, he urged a pragmatic attitude toward selecting a particular case for study. “In the beginning, phenomena are given; the cases are opportunities to study the phenomena ... my choice would be to examine that case from which we feel we can learn the most. That may mean taking the one most accessible, the one we can spend the most time with” (p. 446).

As stated earlier, this study examined one Canadian-based virtual high school as unit of analysis and collected both survey and semi-structured interview data from the students and faculty associated with the school. At the time of study, the school employed sixteen faculty and offered thirteen high school courses to approximately 300 students. Ultimately, the case was chosen because it was an example of a virtual school, was willing to participate in this study, and was accessible. Nevertheless, a key criterion for selection of this school was that it offered its students a full range of high school educational opportunities entirely on-line.

Data Collection

The case study lends itself to a variety of data collection strategies – particularly in a multi-phase case study. Sturman (1999) argued that in case studies, “the data collection phase ranges from the unstructured to the structured and can include ethnography, structured or unstructured interviews or surveys, and census data” (p.

107). While case study research is usually iterative in nature and is typically characterised by frequent observations and long observatory contact with the case, this study did not evolve in this manner for reasons that will become evident in following sections. Nevertheless, this study made use of a series of semi-structured interviews, an on-line survey, and several focus group interviews in two phases.

Phase I. Phase I of this study focussed on the perceptions of faculty (teachers and administrators) with respect to the nature of instruction and learning in the virtual context as well as the nature of community in their virtual school classes and in the virtual school overall. The researcher invited – in writing – (for an example of the letter of invitation, please see appendix A) each of the sixteen faculty members employed by the virtual school at the time of study to participate in the study. Those who agreed to participate were asked to sign a consent form (see appendix A for an example of the form) and to schedule an interview with the researcher to collect data. Both the respondents and their schools were assigned pseudonyms to ensure confidentiality.

Data collection, in this phase, consisted of semi-structured or open-ended personal interviews with those faculty members who agreed to participate. Silverman (2000) opined, “For the qualitative-minded researcher, the open-ended interview ... offers the opportunity for an authentic gaze into the soul of another, or even for a politically correct dialogue in which the researcher and researched offer mutual understanding and support” (p. 823). “Interviews consist of oral questions by the interviewer and oral responses by the research participants ... [whose] responses are

recorded [in some form] by the interviewer” (Gall et al., 1996, p. 289). The major advantage of interviews for this study was their adaptability and flexibility. The semi-structured interview allowed the researcher to “follow up a respondent’s answers to obtain more information and clarify vague statements” (p. 289) as well as to “probe deeply and to analyse intensively the multifarious phenomena that constitute the life cycle of the unit with a view to establishing generalisations about the wider population to which that unit belongs” (Cohen & Manion, 1989, p. 125). Consequently, the semi-structured interview format was appropriate in this first phase because it allowed the researcher to “probe so that he may go into more depth ... to test the limits of the respondent’s knowledge ... [and] to make a truer assessment of what the respondent really believes” (p. 313). However, Stake (2000) argued that the case study researcher must make a judgement regarding the length of time he or she can remain in the context of the case – particularly when the participants are busy with their own lives. This decision is based, primarily, on the context of the setting and the participants’ willingness to participate. In this case, lengthy observations were not warranted for two reasons: (a) I had been a member of Crestview’s faculty and had become aware – first hand – of many of the contextual issues faced by the faculty in this school and, (b) the faculty was so consumed with their respective tasks that, while they did not specifically indicate a lack of willingness to participate further in the study, I felt uncomfortable asking them to give up more of their time for data collection.

Phase I, then, consisted of a series of semi-structured personal interviews with the faculty associated with the virtual school under study. The interview questions were

developed to address the concepts raised by the literature as well as the researcher's own experiences as a virtual school teacher. In particular, the questions were intended to measure the teachers' perceptions of the principles of both on-line learning and the frameworks necessary to establish learning communities and the extent to which they had addressed them in their course design. Once the questions were developed (see appendix B for a list of the questions), the researcher field tested them in two ways. First, the questions were scrutinised by the researcher's committee. The committee members, with their wealth of research experience, suggested revisions to the interview questions. In addition, a colleague in a similar position in a similar school not under study was asked to assist in the field testing. The person was asked to respond to each question as well as to comment on the questions themselves with respect to their clarity and conciseness. The researcher's transcription and analysis procedures were also field tested with this individual by returning to him both the transcript of the interview and the analysis of the interview to ensure that both procedures were accurate. Once the procedures were deemed to be accurate, the researcher then used the questions to collect data from the teachers in the school under study.

Phase II. Phase II concentrated on gathering data related to students' perceptions of the nature and quality of their virtual school experience. The primary data collection technique for this phase of the study was a structured on-line survey which, according to Birnbaum (2000) makes it "feasible to collect large samples of high-quality data in a short period of time" (p. xv). Teddlie and his colleagues (2000) suggested that in school effects studies, 100 per cent samples are required in order to

truly capture the nuances that exist in a school as well as to eliminate the sampling error inherent in school effects studies. Yet, “the costs associated with 100 per cent samples may ... simply be overwhelming in large studies of school effects” (Teddle et al., p. 59). However, Dillman (2000) argued that return rates, when Web page or e-mail based surveys are used with specific or defined populations (such as schools or military populations), approach 100 per cent under the following conditions:

1. Web questionnaire surveyors should use only a portion of the capacity of the most advanced computers in order to maximize the likelihood that recipients of questionnaires are likely to respond.
2. PIN numbers should also be used so that Web questionnaire access is limited to people who are sampled from defined populations.
3. Multiple contacts by multiple modes, incentives, and other response inducing techniques should also be used to improve the likelihood of a response. (p. 401)

This study employed a survey consisting of a series of statements accompanied by five-point Likert-scale response grids and a small number of open-ended questions which allowed respondents to elaborate somewhat in their answers. PIN numbers were not necessary in this case because the survey did not have a traditional Internet introductory interface (front door). Instead, the survey was hosted on a University server (residing in the Commerce department) and it was only available via link embedded in the students' virtual school welcome page. Students were encouraged several times via the school's welcome page to respond to the survey. While this study had the ambition to attempt to collect data from 100 per cent of the population of the school under study, that ambition proved to be unrealistic.

There is considerable support for the use of internet-based survey data collection. *Psychological Experiments on the Internet*, a book edited by Birnbaum (2000), for example, described a number of disparate research projects which have successfully used both e-mail and Web-based surveys as primary data collection instruments. Birnbaum offered the following summary statement, “the trend emerging from the early research in this problem is that Internet studies yield the same [or similar] conclusions as studies done in the lab ... [and] the advantages of Internet research outweigh the disadvantages” (p. xvii). Dillman (2000) observed that Web surveys provide survey capabilities far beyond those available for any other type of self-administered questionnaire. They offer the following advantages over other survey formats:

- they provide a more dynamic interaction between respondent and questionnaire than can be achieved in e-mail or paper surveys,
- extensive and difficult skip patterns can be designed into Web questionnaires in ways that are mostly invisible to the respondent,
- pop-up instructions can be provided for individual questions, making it easier to provide needed help with questions exactly where that assistance is required and without having to direct the respondent to a separate set of instructions,
- drop-down boxes with long lists of answer choices can be used to provide immediate coding of answers to certain questions that are usually asked in open-ended fashion in paper questionnaires,
- screening questions can be asked which directs respondents to a unique set of questions in ways that would be impractical in paper surveys,
- pictures can be added to Web surveys which may enhance respondent interest or provide alternative ways to pose questions,
- animation, video clips and audio can also be added (p. 354).

These advantages as well as the fact that this study is collecting data from respondents who are not only participating in virtual learning via the Internet and, therefore, have

reasonably unobstructed access to the Internet but also are doing so across widely separated locations (potentially world-wide) makes data collection on the Internet an appropriate and logical strategy.

The questions for this survey were derived primarily from the literature (see appendix C for a list of questions) concerning the parameters of learning communities, social capital development, and the principles of on-line learning and were intended to measure the students' experiences in their on-line high school courses. However, the researcher also allowed questions to emerge from the data collected from phase I – as faculty members stated their opinions and objectives for their on-line courses. The researcher incorporated questions into the survey intended to probe students' perceptions regarding their experiences of those objectives.

In addition, in an attempt to probe the students' perceptions further, the researcher conducted four student focus group interviews. Two groups were composed of students who had not been able to complete the survey – at SSD#1, four students participated and, at SSD#2, six students participated. One group was composed of six students at SSD#2 who had completed the survey and the final group was with eight students from SSD#3 who had dropped out of the cyberschool before the survey was administered. In all cases, the students' home schools organised the groups and invited group members to participate.

Data Analysis Procedures

The nature of qualitative data lends itself to techniques which allow the themes and salient issues to emerge from the data itself rather than according to *a priori*

themes. The interviews during phase I were conducted according to the interview schedule and the teachers' responses were taped, transcribed, and returned to them for verification of accuracy. Once verified, content analysis was used extensively. Content analysis may be defined as "the study of particular aspects of the information contained in a document, film, or other form of communication" (Gall et al., p. 756). The specific analysis technique resembled what Silverman (2000) referred to as developing "intercoder agreement". The procedure involved asking a colleague at the university to code and analyse a transcript while the researcher completed his own analysis of the same transcript. The analyses were compared and checked for congruence. Once the analysis procedures had been checked in this way, the researcher proceeded to analyse the remaining transcripts on his own.

The surveys in phase II, on the other hand, were subject to basic descriptive statistical analysis procedures. Descriptive statistics such as means, ranges, frequencies of response, and others were the primary statistical techniques used. The survey was constructed in such a way that when the respondent clicked "submit survey", the data was sent directly into an appropriate database for analysis making a variety of appropriate statistical analyses possible.

Once the data had been analysed in this way, the researcher used an on-line member check group made up of students from the school under study. A call for volunteers was placed on the school's home page and all students who wished to do so were invited to take part in this member check. The preliminary data analyses were available to the students for one week to allow for their perusal and scrutiny. They

were asked to comment on the veracity of the analysis and they were given the opportunity to suggest revisions or additions to the analysis as they saw fit. The textual data from both the survey and the focus group interviews were subjected to content analysis procedures described earlier.

Establishing Trustworthiness

Trustworthiness is a key consideration for qualitative researchers. It refers to the degree of confidence that can be ascribed to the findings of a particular study. In other words, how can an audience be persuaded “that the findings of an inquiry are worth paying attention to?” (Lincoln & Guba, 1985, p. 290). In conventional or quantitative research, trustworthiness is usually established using criteria such as: internal validity, external validity, reliability and objectivity (Lincoln & Guba, p. 218). However, according to Lincoln and Guba, while the questions underlying these criteria such as:

- how can one establish confidence in the “truth” of the findings of an inquiry for the respondents with which and the context in which the inquiry was carried out;
- how can one determine the degree to which the findings of an inquiry may have applicability in other contexts or with other respondents;
- how can one determine whether the findings of an inquiry would be consistently repeated if the inquiry were replicated with the same (or similar) respondents in the same (or similar) context; and,
- how can one establish the degree to which the findings of an inquiry stem from the characteristics of the respondents and the context and not from the biases, motivations, interests, and perspectives of the inquirer (p. 218),

are appropriate to naturalistic or qualitative inquiry, the criteria are not. Thus, they opined that a parallel list of criteria be established which includes “credibility (in place

of internal validity), transferability (in place of external validity), dependability (in place of reliability), and confirmability (in place of objectivity)” (p. 219). The methods of data collection used in this study, particularly the on-line survey, due to its unconventional nature and the possibility for deception on the part of the respondent, were particularly vulnerable to criticism with respect to both credibility and transferability. However, a variety of approaches were used to limit these trustworthiness concerns.

Transferability

The term transferability usually refers to the extent to which the results of a study can be transferred to or be applied to other situations. Fraenkel and Wallen (1993) suggested that “... [transferability] is usually thought of as a statement or claim of some sort that applies to more than one individual, object, or situation” (p. 402). However, according to Sturman (1999), the case study is concerned with studying, in detail, the particular case in order to discover the nuances and processes which typify the particular case. Since, “the search for particularity competes with the search for [transferability]” (Stake, 2000, p. 439), it is often inappropriate for the case researcher to suggest transferability. After all, “the original inquirer cannot know the sites to which transferability might be sought” (Lincoln & Guba, p. 298). Nevertheless, “transferability is the equivalent of generalisability to the extent that there are similarities between sending and receiving contexts” (Guba & Lincoln, 1999, p. 147). Therefore,

the naturalist can only set out working hypotheses together with a description of the time and context in which they were found to hold. Whether they hold in some other context, or even in the same context at some other time, is an empirical issue, the resolution of which depends upon the degree of similarity between sending and receiving contexts. Thus the naturalist cannot specify the external validity [or transferability] of an inquiry; he or she can provide only the thick description necessary to enable someone interested in making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility. (Lincoln & Guba, 1985, p. 316)

In other words, the researcher must “furnish enough information about a context to provide a vicarious experience of it, and to facilitate judgements about the extent to which working hypotheses from that context might be transferable to a second, similar context” (Guba & Lincoln, 1999, p. 148). In other words, the researcher must provide, as much as possible, this thick description.

There appears to be some ambiguity, however, among authors regarding the exact ingredients necessary to achieve a thick description. However, Lincoln and Guba (1985) provided some direction in this regard with their observation that, at minimum, thick description has two primary facets:

1. a thorough description of the context or setting within which the inquiry took place and with which the inquiry was concerned, and
2. a thorough description of the transactions or processes observed in that context that are relevant to the problem. (p. 362)

This study sought, as much as possible, to provide the above parameters of a thick description in order to provide readers of the final report with the opportunity to establish for themselves the extent of transferability of the findings.

Credibility

Credibility is related to those processes a researcher uses to “make it more likely

that credible findings and interpretations will be produced” (Lincoln & Guba, 1985, p. 301). Credibility, according to Taft (1999), is dependent on the apparent accuracy of the data. Thus, it usually refers to the degree of confidence the researcher has that what he or she has observed and reported is accurate. Merriam (1988) suggested that “[credibility] deals with the question of how one’s findings match reality” (p. 166). However, the term is also used “to indicate that the requirements for making a causal conclusion have been met” (Krantz & Dalal, 2000, p. 37). Consequently, it is “seen as a check on the isomorphism between the enquirer’s data and interpretations and the multiple realities in the minds of informants” (Guba & Lincoln, 1999, p. 147).

Lincoln and Guba (1985, 1999) suggested six techniques that may be used to establish credibility including prolonged engagement and persistent observation, triangulation, peer debriefing, negative case analysis, member checking, and collection of referential adequacy materials. However, not all of these techniques were appropriate or practical for use in this study. The primary techniques that this study used to establish credibility were triangulation and member checking, however, it also made limited use of peer debriefing. These steps are elaborated in the sections that follow. However, in light of Taft’s observation, it also seems prudent, in this case, because of its extensive use of electronic data collection methods, to discuss the credibility of the data itself.

The credibility of data collected via electronic methods. The electronic method used to gather data for this study (on-line survey) has been shown to be at least as reliable as its paper counterpart. However, “one major determinant of the [credibility]

of a finding is the nature of the sample” (Krantz & Dalal, 2000, p. 37). In this study, the case or individual school were sampled at a rate approximating 100 per cent. In other words, all students were invited to participate. Thus, the nature of the sample satisfied the requirements of seeking the natural variations inherent in the population. In fact, according to Krantz and Dalal, “Web-based samples tend to be more diverse than most laboratory samples ... [thus] the greater validity may well lie with the Web-based studies” (p. 37).

In the world of electronic research methods, there are, according to Krantz and Dalal (2000), two typical methods to establish credibility: “(1) compare results from a Web based study to a laboratory based study and (2) examine the research to see if the results follow theoretically predicted trends” (p. 36). The first of these methods did not seem practical or realistic in this case. It would be virtually impossible to replicate this study in the laboratory in order to establish credibility. However, it may not be necessary because in other studies, the validity of Web-based study methods has been established. Birnbaum (2000), for example, studied decision making in a research project that collected data both in the laboratory and on the Internet. His conclusion was that “Internet and lab samples yield similar conclusions ... which demonstrates the feasibility of using the Internet ... with a large, diverse sample” (p. 25).

The second of the above strategies had some usefulness in this study, however. While there is limited literature directly related to the effectiveness of virtual high schools, there is a great deal of literature regarding the appropriate use of technology and the Internet in education as well as the construction of virtual learning

communities. This literature, as well as peer debriefing with persons active in the field of virtual high school education, was useful in establishing credibility in this study.

Member checking. As stated earlier, one method of ensuring credibility is member-checking. In fact, Lincoln and Guba (1985) suggested that “the member check, whereby data, analytic categories, interpretations, and conclusions are tested with members of those stakeholding groups from whom the data were originally collected, is the most crucial technique for establishing credibility” (p. 314). Member checking, as defined by Gall et al. (1996), is “the process of having participants judge the accuracy and completeness of statements made in the researcher’s report” (p. 763). Thus, member checking is essential because “if the investigator is to be able to purport that his or her reconstructions are recognisable to audience members as adequate representations of their own (and multiple) realities, it is essential that they be given the opportunity to react to them” (Lincoln & Guba, 1985, p. 314).

In this study, a number of member checking strategies were used. During phase I, each respondent was asked to verify the accuracy of the transcript of his or her interview. Then, once analysis has been completed, the results were posted for one week on a private bulletin board. The respondents were invited to react to the analysis and offer suggestions for revision. During phase II, the researcher posted (for one week) his analyses of the students’ responses on a private bulletin board. Once analysis had been completed, a message appeared on the school’s home page inviting students to volunteer to be part of a member-check group. All students were invited to visit the bulletin board to react to and comment on the completed analyses.

Triangulation. There are a variety of definitions and types of triangulation. Taft (1999) offered a representative definition: “triangulation [is] a procedure in which multiple sources are used to obtain evidence on the same phenomenon” (p. 117). Guba and Lincoln’s (1999) observation that triangulation is a process “whereby a variety of data sources, different investigators, different perspectives (theories), and different methods are pitted against one another” (p. 147), provides some focus and direction for research. Thus, according to Sturman (1999), triangulation is concerned with providing a research project with “contextual validity”.

The processes of consulting different data sources and using different methods were most applicable for this particular research project. Lincoln and Guba (1985) pointed out that consulting different data sources may imply two things: that one may consult either multiple copies of one type of source or different sources of the same information. Primarily, this research project made use of multiple copies of one type of source. For example, it invited all of the faculty associated with the school under study to take part as a respondent and it also invited all of the students attending the school to be respondents as well. In addition, it made limited use (where possible) of multiple copies of one type of source. For example, phase I elicited responses from all faculty (including teachers and administrators) associated with the school. Some of the questions they were asked (such as asking administrators what supports have been provided for teachers and asking teachers what supports have been available to them) served to triangulate in this way. There was also inter-phase triangulation in some ways. For example, teachers were asked questions about their instructional practices

and intentions and students were asked to describe their experiences of those practices and intentions. This project made use of different methods as well. Phase I used both personal interviews and an on-line focus-group (primarily for member checking but also for data collection) and phase II used an on-line survey, an on-line focus group, and several face-to-face focus groups in much the same way. Thus, triangulation was achieved.

Ethical Considerations

Research with people requires that the ethical guidelines of the University and of the community at large be observed. This study adhered to the policies established by the University of Saskatchewan's behavioural research ethics board (see appendix D for a copy of the REB approval). Permission to conduct this study was sought from both the school system and in-school administration. Next, each participant in phase I was invited to participate and was informed that his or her participation was voluntary and would not harm them in any known way. Those faculty who agreed to participate were asked to sign a letter of consent and to schedule and attend an interview session with the researcher. Each respondent was asked to verify the accuracy of the transcript of the interview. Once analysis of phase I data had been completed, the respondents were invited to visit a private bulletin board containing the analysis and to comment on the analysis (as outlined earlier). In phase II, the process was similar. However, the students were invited to participate via a message placed on the school's web site. This message provided general information about the project and also provided him or her with directions regarding accessing the survey. The front door of the survey contained

an informed consent form which outlined the ethical issues appropriate for this study (purpose of the study, protection of anonymity, freedom to withdraw from the study with impunity at any time, etc.) and they were required to click “I accept” or “I do not accept” after reviewing the consent form with their parents in much the same way that software companies require acceptance of licencing parameters. Clicking on “I do not accept” led to an exit page which thanked them for their involvement to that point and no data were collected from them. Clicking on “I accept” led them to the survey instrument for data collection. A button on the tool bar gave each participant the option of ending his or her participation in the study at any time and also permitted pausing the session to come back to it later. Again, once the data were analysed, all students enrolled in the school under study were invited to act as an on-line member check to comment on and verify the analyses.

Anonymity and confidentiality have been and will continue to be protected with the use of pseudonyms for the school system and the school itself. Phase I participants were assigned pseudonyms that were used to refer to them in this report and that they used to access and comment on the data analyses during the on-line member check period. Phase II participants were assigned a code that was used to refer to their comments from the open-ended survey questions. In addition, those who participated in the on-line member check were assigned codes so that they would not be able to identify each other’s participation and comments. Data will be stored by Dr. Larry Sackney, the researcher’s advisor, as per University of Saskatchewan ethical guidelines.

Summary

This case study consisted of two phases designed to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. The first phase examined faculty perceptions regarding virtual schooling. The second phase examined student perceptions. The research questions, the sources of data, and the data analysis procedures are summarised as a matrix in table 3.1. In some cases, research questions span both phases of the study

Table 3.1 - Research question matrix

Research Question	Source of data	Analysis methods
1. What is the nature of instruction in a virtual high school?	Semi-structured interviews with faculty members	Content analysis On-line member check
2. What is the nature of community in a virtual high school?	Semi-structured interviews with faculty members On-line survey with students Focus groups with students	Content analysis On-line member check Descriptive statistics Content analysis On-line member check Content analysis of open-ended questions and focus group data
3. What school system-level structures and supports facilitate the development of a learning community in a virtual high school?	Semi-structured interviews with faculty members On-line survey with students Focus groups with students	Content analysis On-line member check Descriptive statistics Content analysis of open-ended questions and focus group data On-line member-check group

4. What do students perceive to be the strengths and drawbacks of learning in a virtual high school?	On-line survey with students Focus groups with students	Descriptive statistics Content analysis of open-ended questions and focus group data On-line member-check group
5. What structures and supports do students believe are necessary for effective learning in the virtual school?	On-line survey with students Focus groups with students	Descriptive statistics Content analysis of open-ended questions and focus group data On-line member-check group
6. From the New Economy point of view of seeing students as users or consumers of education, what prompts students to pursue virtual high schooling?	On-line survey with students Focus groups with students	Descriptive statistics Content analysis of open-ended questions and focus group data On-line member-check group

as both faculty and students provided salient information regarding these questions. At the same time, there were questions (e.g., questions 4 and 5) which were addressed entirely within either phase I or phase II. In many cases, particular survey questions spoke to more than one research question. This multiplicity was intended because it provided the opportunity to examine multiple facets of particular research questions and led to a more comprehensive final report.

Chapter 4

Presentation and Discussion of Phase I Data

The two-fold purpose of this study was to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. Phase I focussed on the perceptions of the faculty associated with a Canadian-based virtual high school. Data were collected through a series of semi-structured personal interviews with members of the faculty as described in Chapter 3.

The intent of this chapter is to present and discuss phase I data. However, to provide context for this data, this chapter opens with a description of Crestview Virtual School, the virtual high school (called cyberschool by its staff) under study, Crestview's host school system, and phase I respondents as well as the researcher's coding system. Next, data from this phase are presented in three sections: administrators' perceptions, teacher/developer perceptions, and developer perceptions. A summary follows each section and the chapter ends with a synthesis of the perceptions from the three respondent groups.

The Respondents and Their Contexts

The purpose of this section is to outline and describe the respondents and their contexts: specifically, the school system, the virtual school under study, and the

characteristics of the respondent groups. In addition, the coding process is also outlined to clarify and streamline the data reporting process (see table 4.1 for the coding contexts).

The System

The school system, referred to as Surfside School Division (SSD), is a large urban Canadian-based Catholic school system serving students from Kindergarten (K) to Grade 12. There are approximately forty-five schools in the system ranging in focus according to: grade level (elementary – K to Grade 8, middle schools – Grade 5 to Grade 8, and high schools – Grades 9 to 12), student population and demographics (alternate and associate schools), and program (language immersion, fine arts, and practical and applied arts). At the time of study, SSD employed approximately 1000 teachers (940 full-time equivalents) and approximately 900 support staff (clerical, custodial, and teacher aides) and was divided into five geographical areas with a superintendent assigned to each area and charged with responsibility for the program and personnel in his or her area.

The School

Crestview Cyber School (CCS) was formed in 1998. It began with a staff of four: three course developers and their project leader (who was also a course developer). The original group of developers were chosen by senior administration from one high school in the school system. Each developer was provided with a computer work station at his “traditional” school (all were males) and was allowed fifty percent release time for one semester to develop his course. Three new developers were

Table 4.1

Phase I Respondent Coding Contexts and Demographic Table

Respondent	Coding reference	Experience with on-line school
Administrator	A1	Since inception, 4 years
Administrator	A2	Since inception, 4 years
Administrator	A3	3 years
Administrator	A4	Was project leader/course developer at inception, 4 years
Teacher/Developer	TD1	An original member of faculty, 4 years
Teacher/Developer	TD2	An original member of faculty, 4 years
Teacher/Developer	TD3	An original member of faculty, 4 years
Teacher/Developer	TD4	Part of the first wave of staff additions, 3 years
Teacher/Developer	TD5	Part of second wave of staff additions, 2 years
Teacher/Developer	TD6	Part of second wave of staff additions, 2 years
Teacher/Developer	TD7	Part of second wave of staff additions, 2 years
Developer	D1	Recent addition, first year
Developer	D2	Recent addition, first year
Developer	D3	Recent addition, first year
Developer	D4	Recent addition, first year

added during the next semester – two of whom were provided with the same basic set of circumstances described above and one of the new developers was given substantially more release time (100 %) for the whole year to complete his course. Following that, new people were added each semester. At the time of study, Crestview had a staff of fourteen part-time developer/instructors, a full-time in-house

administrator, and a full-time secretary/receptionist. In addition, the principal at the “host” school had assumed responsibilities for the on-line school and a superintendent at the school system head office assumed responsibility for it as well.

Crestview offered a wide range of high school level courses to students. At the time of the study, these courses included: (a) Grade 9 Mathematics; (b) Grade 10 Information Processing and Christian Ethics; (c) Grade 11 Chemistry, Physics, Mathematics, and Christian Ethics; and (d) 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.

The Faculty

For the purposes of this study, all certified staff associated with Crestview were considered faculty. Therefore, faculty consisted of four administrators, nine instructor/developers, and five individuals engaged in the development process of courses to be delivered one or two semesters hence. With the exception of A1, A2, and A3, the entire faculty was housed, along with their computers and associated technologies, in a large room in a building separate from but attached to one of the traditional high schools in SSD. Since all of the teacher/developers were on-line part-time, each of them also had a teaching assignment in a regular classroom in one of the traditional high schools in SSD.

While faculty members were not specifically asked about their experience level (e.g., the number of years as an educator, facility with computers, etc.), some details relating to this information emerged from the interviews. For example, A4 pointed out that, with a few exceptions, there had been an intentional decision to select staff for Crestview who had experienced a high level of success in the classroom and who were veteran teachers; not necessarily those who were considered “experts” with computers or technology. He observed, “most of the teachers we have taught around 20 years – the youngest teacher we have has taught 6 years – I think that [we chose] teachers because they were good teachers not because of their ability with technology and that has translated into making these courses as good as they are”.

Faculty Perceptions

While the faculty saw themselves as working together for the common goal of creating an exemplary on-line school, an examination of the data revealed that there were three distinct groups among the faculty. Perhaps not surprisingly, these groups were divided according to the responsibilities or duties they had assumed within the “cyberschool”. Thus, to facilitate presentation and analysis, the data are discussed below in three sections:

- a) administrators’ perceptions,
- b) instructors’ perceptions (including the views of those faculty who were engaged in delivering or teaching the course(s) they had developed), and
- c) developers’ perceptions (including the views of those faculty who were engaged in the development of a course but who had not yet taught one).

Administrators' Perceptions

Administrators' perceptions tended to focus on the broader issues confronting the cyberschool. They had particularly important insights into the reasons for the development of the virtual school, the organisational conditions necessary for successful virtual development, the challenges to sustaining a virtual school project, and the impact of the virtual school on SSD.

Why Create a Virtual School?

With respect to the impetus for creating a cyberschool or, more abstractly, why one should exist in the first place, five key themes emerged from the administrators' perceptions. These themes were: the desire to address individual student needs, the effect that they believed the virtual school would have on SSD, desire to respond to changing societal conditions, and the necessity to address the commodification of education.

Individual student needs. The most prevalent comment among the administrators regarding the impetus for having developed the cyberschool was that it had been developed to serve the needs of the students of SSD school division regardless of the potential world-wide audience that the school may attract. While all four of the administrators shared similar observations in this regard, A4's comments are illustrative of the general thrust of opinions in this area. He emphatically stated that "the cyberschool is important because, *first and foremost*, it gives flexibility to the students within *our* school system [regardless of the potential world-wide market]".

That being said, all four administrators illustrated various perceptions of the needs that they believed existed among the students of SSD. For example, A2 raised the issue of student learning styles with his comment that “people have different learning styles, they learn differently ... we thought this [cyberschool] would meet the needs of some people”. A1 commented, “We are called, as educators, to provide as many different forms of delivery of education for students [as we can]. Recognising the fact that students do learn differently, we must respond to changes in their personal circumstances and their scheduling needs” indicating that he also saw learning styles as a primary concern. However, he added that, since contemporary students’ lives are more complex than they were in the past, school systems have a responsibility to respond by providing the flexibility for them to be able to pursue their education amid the other activities and personal circumstances in their lives.

Each of the administrators also added a cautionary note that, while on-line education is a new and exciting method of course delivery – particularly for students who have had difficulty in the regular classroom for various reasons – it does not appear to be appropriate for all students. A4 stated it in this way:

I think that [online education] is a very valid method of educating students. [However], I don’t think that it is for everyone. I think that there is a select group of students that blossom in this area. The thing I find really exciting about it is the fact that it allows the shy student or the student who is not totally comfortable with the regurgitation of information [i.e., one who is a more independent learner] to have an alternative means of learning.

Organisational effects. The administrators believed that the existence of a cyberschool was important due to the benefits accrued by the school system overall.

However, they also indicated that while Crestview had fulfilled the intended effects on SSD, there had also been several unintended effects.

The most obvious intended benefit was to provide the students of SSD with an alternative to the current instructional models already available to them in their “regular” schools. In addition, A1 pointed out that another intended outcome of the cyberschool initiative was to create an opportunity not only to provide Catholic educational opportunities for students who live in rural areas with little or no access to Catholic education but also to develop new partnerships with these smaller school systems to develop enhanced Catholic educational opportunities for all students. In other words, the partnerships that were made possible were, in a sense, a marriage of convenience among the large urban system (SSD) and three smaller rural systems. In fact, in the case of one of the systems, the partnership to create the cyberschool was an attempt on behalf of that school system to remain a viable and independent school system. “It [the partnership] was an opportunity to look at the viability of a very small school division [which had only one school] and whether or not the creation of a cyberschool would assist with that viability. [It has].”

Another intended benefit was that the development of the cyberschool would provide a new challenge to both the school system and the individual teachers involved in the project. In a way, it was seen as an attempt to keep up with the times. A3, for example, stated that he felt that the project was important “as a trial”. A2 stated, “We took this on as a professional challenge – to see if we could make it work.”

An unintended outcome to emerge from the cyberschool project was that it appeared to have spurred organisational efforts concerning teachers' use of technology in the regular classrooms. Professional development throughout the division had focussed on what was going on in the cyberschool as well as how technology could be integrated into the regular classrooms. A4 observed,

For our developers and teachers as well, I think that it forces them to become part of the technology age which is important because most of our students are coming from the basis of spending a lot of time in front of the computer rather than in front of the TV. There are skills that we [on-line teachers] transfer over to our face-to-face classrooms.

In a similar vein, A3 pointed out that the quality and nature of instruction in the “cyber- courses” had made an impact on the regular classroom in at least two ways. First, “it’s [the cyberschool] using the students’ learning abilities in different ways ... and it has already had an impact on learning and the way learning is packaged, delivered, and processed ... and how existing programs are also delivered.” In other words, students had come to appreciate the flexibility afforded them as a result of being associated with the cyberschool and were beginning to demand a more flexible and personalised learning environment in their face-to-face classrooms. Second, the cyberschool had “raised the bar” for all courses and all teachers in all subject areas.

I’m hearing from students that they enjoy the way things are set up within cyberschool courses. They appreciate the sequential learning. They want to move quickly and at their own pace. But it has also impacted what students expect from their other classes. Students are going to other classes and saying, ‘I would like something similar in these other classes. I realise that its not going to be a cyber education, but I know I can get it structured in this way and I wonder if you [the teacher] could structure it [the course] in the way that I learn best’.

A response to changing social conditions. Each of the administrators alluded to the belief that he felt there was a professional and moral responsibility on behalf of school systems to experiment with new educational delivery models and to provide learning opportunities which were timely and relevant. For example, A4 stated that cyberschool was important because it used technology in authentic ways that mimic technology use in society and that addressed both media and information literacy. He said, “There’s so much content [information] in the world and on the Internet that to try to teach them everything that is there doesn’t make sense. To teach them how to find it, I think, is a valuable skill that every single person needs in life.” Further, he opined,

... our educational system isn’t designed to handle the world economy and the way the world interacts and I think that its really good that cyberschool has the ability to do that and if we use the Internet properly and use the communication tools appropriately then we can teach them some of the skills they’ll be using when they go into the business world.

A2, on the other hand, was somewhat more pragmatic. He felt that education in general and in SSD specifically, had fallen behind the times both in terms of addressing the technological changes in society and in meeting the challenges presented by technology.

I think that education in SSD looks strikingly similar to what it did probably 50 years ago. There really hadn’t been very much done, as it were, outside of the box, outside of the typical school day and outside of the typical school year. I think that there have been changes in society, and we know that there are so many different needs that can’t always be met within the context of 10 months a year, 8 ‘til 3 – bricks and mortar, seated in the classroom. Really when you look inside our schools, while there certainly have been changes in individual classrooms, we essentially go about the whole business of education the same way with grade 5s as we do with grade 8s and grades 9, 10, 11, and 12 and there really aren’t a lot of differences. This is sort of the first, or, at least the most

dramatic, systematic departure from the typical learning delivery model that we use.

A2 also stated that he felt that society's expectations of graduates had changed and that schools had a responsibility to address those changed expectations. He believed that the cyberschool allowed for the fostering of independent, life-long learning in a way that was not possible in the "traditional" schools.

Commodification of education. The commodification theme emerged primarily as a response to parental pressure to provide alternative educational opportunities for students. A1 stated that he had noticed that parents were beginning to "shop around" both for alternatives to existing programs and for on-line schools operated by other school jurisdictions. One reason the school system chose to develop the on-line school was in response to this pressure and to "hold on to those students." He observed,

In the back of our minds, as we were discussing this [the creation of a cyberschool], we were looking for new ways to deliver Catholic education, recognising the fact that parents want what's best for their children. [This means] that if it is not available at the local neighbourhood schools, they will make the decision to go elsewhere. That's a reality that did not exist years ago.

A2 had similar opinions. He felt that parents will and do "shop around" and that, in some cases, school systems have the responsibility to cater to or, at least, address the public's demands for innovation.

Obviously, there is an increased interest by parents and students in what's out there – and we've seen in our brick and mortar schools where people shop around and are looking for programs and for different opportunities for their children. I think that cyberschool was a response to that.

At the same time, he saw the cyberschool as, "A response to staff members' needs for professional development and technological innovation."

Conditions Necessary for Successful Cyberschool Development

A number of themes emerged from the data about the conditions necessary for successful cyberschool development. These themes, however, seemed to relate to two primary areas of concern: faculty issues and bureaucratic/organisational issues. Thus, the discussion related to these conditions is organised according to these two headings.

Faculty issues. The key faculty issues identified by the administrators revolved around recruiting and selection of staff. A1 stated that a school system may not be able to provide all of the financial and technical support necessary for a fledgling virtual school project to get off the ground so, particularly in the early stages of a cyberschool project, staff who will take on the project as “a professional challenge and want to make it work” must be chosen. This quality is necessary, according to A4, because “the cyberschool consumes every single second you have. [We have been successful because] we chose teachers who would grab a task and wouldn’t let it go until it was done”. However, as A1 observed, it may not be reasonable to expect the teacher/developers to sustain that level of personal commitment (often as unpaid overtime) over the long term. To that end, he said that working in the cyberschool context “shouldn’t be a life sentence – people should have a mechanism to opt out at some point”.

A4 also acknowledged that teachers should have the freedom to be able to opt out. However, he favoured a course development process that saw on-line instructors being given the time to develop their own courses rather than being recruited to teach pre-existing courses. While he recognised that this practice would make it difficult to

sustain existing courses over time, he argued,

It is really important that they [new developers] become immersed in it – you [should] give them lots of release time before hand so that they can develop their own course ... to take a teacher and throw them into an on-line teaching scenario [would be unfair] and you'd have to spend a lot more time training them. I think that they [developers] learn a lot of skills and what they've experienced on-line they can then transfer over to their students when the students get on-line. I think that this is a good process that we have in place.

With regard to recruiting potential staff, A1 suggested that school systems that intend to pursue an on-line school initiative should develop and use a profile of success for potential staff. A2 pointed out that a particular individual's ability or facility with technology should not be the determining factor as to whether he or she is selected as a cyberschool teacher. Instead, he felt that the key quality that should be part of such a profile was that potential staff members should be willing to be part of the team (for mutual support). A4 echoed this by stating his belief that a "pod concept" in which the staff (or a subset of the staff) of a cyberschool was housed in a central location for the development phase and, ideally, the early delivery phases of a new course was essential.

You will never get to work with another group of teachers like we have in the pod. When you get a group of teachers together with a common goal, that is such a powerful group of people. The teaching profession has changed so much that we never get a chance to see a group of teachers together, working in a room without a lot of distractions, toward a common goal. I don't think we give teachers [enough] release time in order to do that so we don't get to see some of the special things that they can do and the type of person that becomes a teacher. [So we] just put them into that room [the cyberschool computer pod] and said, 'Here's your task'. Then, we let them go. That has been a very exciting [and productive] environment to be in.

Bureaucratic/organisational issues. Many of the bureaucratic issues related to funding in some way. For example, each of the administrators recognised that, while

the amount of funding for new programs is never enough, the current practice of allowing 25% release time for one year for course development was inadequate. In fact, A3 suggested that the amount of time allotted for course development should be at least doubled.

The other key funding issue, related to the provision of computers and other technologies for cyberschool staff. It was also identified by all of the administrators. SSD provided a complete work station for each course developer/instructor at the school site but did not provide any computer hardware for use at developers' homes (it did, however, provide high speed Internet access at developers' homes). All administrators suggested that this practice should be changed but expressed some reservations in addressing this situation. The superintendents, in particular, appeared to be concerned about the potential development of animosity among staff not involved in the cyberschool project as a result of giving too much "status" to the cyberschool project relative to other programs in the school division. However, A3 stated that effective communication should be able to clear up misunderstandings and alleviate, or at least, reduce this potential animosity.

A4 suggested that SSD had provided a key organisational support for teachers by making decisions about hardware and software to be used by the cyberschool staff. He stressed that while staff were free to use any software they wished (except the school's operational platform was WebCT and was non-negotiable), the cyberschool had chosen software that at least one person in the group either already knew how to use or were willing to learn how to use in order to provide mutual support and

streamline the induction process of new staff. Beyond making some software selections, A4 argued, “Freedoms are more important than supports.” He went on to explain that each developer must be given the freedom to create a course that reflects his or her values and personality. However, “they [developers] have to learn about learning styles, methods and style of stuff (pedagogy) that should be put on-line.”

Finally, since all of the teachers with Crestview cyberschool also had responsibilities in “regular” classrooms in addition to their on-line duties, their “home” schools also played a role in making the virtual school possible. A3 stated that each local school saw it as a priority to accommodate the scheduling needs and desires of the cyberschool teachers. He stated,

There needs to be an acceptance, an awareness of those special circumstances and schools need to be flexible to make the time-table work if they’re going to have part-time teachers. It’s been absolutely the best thing we could have done from a professional development point of view [for those teachers] ... so I’m willing to put up with [the difficulties in scheduling] because I think that our students here in this school are better served.

Challenges to Sustaining an On-line School Project

The general thrust of perceptions regarding the challenges associated with an on-line school can be summed up by A1’s observation that “cyber education challenges all of the rules and regulations that would be common to bricks and mortar operations. Virtual education knows no boundaries.” This comment alludes to all three of the general themes that emerged from the administrators’ comments which related to vision and purpose, organisational structures, and equity of access and resources. These themes also provide the structure for the following discussion.

Vision and purpose. There appeared to be some tension among the administrators with regard to the vision and purpose of SSD cyberschool both in terms of what the school's vision and purpose should be and how that vision should be determined. This tension was illustrated by A3 in the following manner:

We [the administrators] each have different areas of concern: different subject areas [to be addressed by the cyberschool], what is being taught, who is teaching, how we go about teaching those subjects, how we get staff involved. There's a myriad of things, and each of us has a responsibility in different areas. A4, the project leader has the vision of let's just go and do these things. But, there are so many other things that have to be done before that happens ... or maybe it'll never happen, I don't know. However, these are examples of things that AP wouldn't be terribly concerned about but they are issues I'm concerned about and that the Superintendents are concerned about.

Nevertheless, each of the administrators stated that the primary purpose of SSD cyberschool was to provide educational opportunities to the students currently enrolled in SSD schools (as opposed to serving the needs of students from outside the school division) and that the on-line school should have a definite Catholic flavour and focus.

A3 saw the cyberschool experience as one that every student should experience at least once in his or her high school career and he believed that the school's mission should include building the capacity to provide that opportunity for all students in SSD. A1, however, believed that cyberschool was not for everyone and that this fact presented a challenge to SSD to develop an effective screening process to accurately assess students' likelihood of success and to counsel them to select other learning opportunities if they are unlikely to be successful.

According to A2, SSD had recently formed a steering committee to address the continued growth and development of the cyberschool project. The steering committee

was made up of school division administrators already involved in the project and two school division technology consultants. However, A2 acknowledged that “a more broad-based steering committee with representatives from teaching staff, administration, and various SSD schools [was needed] to determine deliverance, development, and administration [of the cyberschool].” He felt that “failure to include teachers, administrators, and parents from all of our schools has contributed to some misunderstandings about where we were going.”

Organisational structure. According to the administrators, the organisational structure within the school system must provide mechanisms for effective communication. A2 stated that there had been some reluctance among the staff and parents of the “traditional” schools in SSD school division “to fully ascribe to this particular style of educational program delivery because we haven’t been as good in communicating to teachers and to administrators and all of SSD schools about this.” A3 stated that he would like to see more sharing between the cyberschool program teachers and the teachers in the “traditional” schools in order to dispel myths and misunderstandings as well as to develop links between the cyberschool and the traditional classroom.

A2 raised the issue of whether traditional methods of administration were appropriate in the on-line school context. He pointed out that the existence of the cyberschool had raised issues related to year-round schooling and flexible staff assignments and schedules and, at the same time “cut across many jurisdictions and boundaries - making it important to consider the impact of and input of people

throughout the organisation.” He stressed that the problems were not insurmountable but would necessitate the development of an administrative structure that was quite different from current practice although he was not sure what that alternative structure might look like.

Equity. The equity issues with respect to cyberschools appeared to fall into two main categories: issues around funding and issues around student access to cyberschool programs. The key funding issue was the challenge to balance the organisational desire to create a first-class on-line school with the other important initiatives supported within the school division. For example, A3 stated that he would like to see the school system provide technology (computers) to students (perhaps even all students) to allow all students to have the opportunity to participate in cyberschool courses. In a related observation, A2 wanted to see cyberschool “broaden its audience and go beyond those students for whom cyberschool is an immediate fit”. Yet, according to A1, “Cyberschool is just one program among all of the programs in SSD” therefore, it should not be funded too heavily in relation to the many other important programs in the school division.

Impact of the On-line School on SSD

The administrators expressed a wide variety of perceptions regarding the effects that the existence of the cyberschool has had on SSD school division. These perceptions have been organised for discussion under the following headings: impacts on the learner, impacts on instruction, and impacts on the organisation.

Impacts on the learner. SSD Cyberschool administrators believed that the nature of instruction in Crestview Virtual School had a significant impact on the learners enrolled in on-line classes. A1 said that “students are very comfortable with the virtual learning mode” because “they have been raised in a generation where the use of technology is at a level like no other previous generation”. Therefore, at least theoretically, students can learn more effectively because the on-line school can “respond to changes in their personal circumstances ... [and] can address particular learning needs and styles” more easily. A1 stated that the virtual school also puts “more of the responsibility on the learners. [He or she] has to be a self-motivated, more independent learner, and have the personal initiative to get going”. A4 stated that from his experience of teaching cyberschool courses that students tend to be more independent in an on-line environment and typically take more ownership for their learning than do students in “regular” classrooms. However, while A2 expressed the hope that the cyberschool encouraged students to become more independent, life-long learners, he was not sure that cyberschool was actually doing that. He cautioned,

Something that we’re grappling with right now is that I’m not sure if we’re creating independent learners or if we’re just catering to independent learners. We would like to get to the point that we were creating them but, I think right now that we’re just catering to those students who learn independently and are able to function no matter what we do.

Thus, cyberschool may simply be an attractive option for those students who are already independent learners rather than a platform for creating or fostering independent learning.

Impact on instruction. Essentially, the administrators shared the perception that instruction was actually better in the on-line school than it was in the “regular” school. A4 saw the teacher’s role in the on-line school as a facilitator who assists and guides students’ independent learning pursuits. He felt that this role was possible in the on-line context because,

In a face-to-face classroom, you [the teacher] spend about 80% of your time in front of the class presenting material [and disciplining] whereas in this type of [on-line] scenario we can spend most of our time actually teaching, looking at the problems students are having and analysing what the issues are for individuals.

Therefore, “instruction is more individualised and we have the ability, because of our communication and student tracking tools, to get to know our students better and to assist them more effectively in the learning process.” A2 believed that on-line “classrooms” were much more interactive than regular classrooms in the sense that teachers have a better understanding of where their students are and what their learning difficulties are. In fact, his experience of virtual schools has “dispelled the myths about virtual learning – where it is seen by many as exactly not that [interactive]. It seems as though it’s exactly the opposite of what people perceive it to be.”

While professing his strong support for on-line instruction, A3 stated that the electronic platform used by cyberschools has had at least one significant negative impact on instruction. Since the interface between students and teachers in the cyberschool is electronic, students are less tolerant of the natural variations among teachers’ instructional and grading procedures. Students have begun to depersonalise teachers in a sense and expect them to be as rigid and consistent as computers are.

“They [students] are more willing to accept these variations in a typical high school and are less willing to accept them in a cyberschool situation”. Students have also begun to compare their cyberschool courses and grades with their traditional school colleagues’ regular classroom courses. A3 believed that this comparison may have an impact on instruction in both milieus over the long term.

Impact on the organisation. Perhaps due to their roles in SSD school division, the administrators identified a large number of impacts, both positive and negative, that the cyberschool had on the school system overall. P, for example, believed that the cyberschool had challenged administrative and organisational practices throughout the school system. He pointed out that due to the newness of cyberschool with its broad and indistinct boundaries, it has become difficult to determine where bureaucratic, hierarchical lines should be drawn. He raised the question of whether traditional administrative structures work in new environments with the following illustration:

The relationship [between A4 and myself] is different because it is almost an off-site situation. It isn’t but its close to that. The day-to-day relationships are not the same. His role has become to look after the day-to-day stuff. So he’s basically been given the responsibility of making it work under the ‘supervision’ of myself, which is not really true either, because he’s serving the many different masters not the least of which would be A2 who has responsibility for cyberschool. So in some cases, he has to go to him, in some cases he has to go through me. Sometimes he goes through me and A2 gets upset about it because he should have gone through him [and vice versa].

According to A3, cyberschool courses have also become, in a sense, self-propagating. He suggested that as students become familiar with the flexibility afforded them by the existence of the cyberschool courses, they demand more and more courses. At the same time, the local schools have also become dependent on cyberschool courses

to alleviate problems associated with scheduling, student timetables, and over-crowded classrooms. For example, a student who is enrolled in French immersion, band, and drama and still wishes to take all of her academic courses finds that this is possible when she can take a course or two (e.g., physics and English) via the cyberschool.

Both A2 and A3 stated that the school system has experienced some negative consequences in relation to the existence of Crestview. A2 pointed out that there had been a mixed response among teachers and administrators in the “regular” schools toward the cyberschool. While he acknowledged that much of the negative response was due to poor communication throughout SSD regarding the purpose and intent of Crestview, he believed that some of the concerns were valid. For example, some teachers were concerned about the potential of losing their jobs in the regular classroom as more students chose to enroll in on-line courses. In addition, schools were concerned that “their best students were being raided by cyberschool” and that they were no longer present in the regular classrooms as catalysts for discussion and instruction. A3 also noted the perception that Crestview presented a threat to some teachers. However, he pointed out that much of the opposition had come from what he called “non-academic” classes. In particular, Christian Ethics seemed to be a touchstone of opposition. He explained that a number of teachers felt that Crestview should not be offering courses in Christian Ethics because the local schools integrated the delivery of these courses into other programs such as graduation, social justice activities, and grade 12 retreats. He mused,

If we have a whole bunch of students that are no longer in those grade 12 Christian Ethics classes, what does that do to the graduation status of the school, that you say all students must have grade 12 Christian Ethics from this school in order to graduate from this school? Does this mean that we are backing away from our Catholic commitment to students? Along with that, we say that all students must attend the grade 12 retreat which is, again, organised through the Christian Ethics class. If the student is no longer registered in that Christian Ethics class, and does not have a retreat from our school, does that student lose his or her right to graduate from our school? Each of our schools has a similar policy. Are there other ways that we can achieve those things, not necessarily through Christian Ethics class? These are the issues that we still have to deal with.

A2 suggested that the parents and students were most definitely the biggest supporters of the cyberschool program and that SSD had some work to do in effectively communicating with staff about the cyberschool project. One strategy that he intended to pursue as a possible solution to the tension was to station pods of cyberschool workers in each of the “traditional” high schools in SSD. He felt that creating a visible cyberschool presence in these schools might raise the profile of the cyberschool overall and could potentially eliminate misunderstandings at the local level. Nevertheless, “there is a critical mass that are somewhat wary and we will have to address that at some point.”

Summary of Administrator's Perceptions

In sum, the administrators' perceptions about Crestview Cyberschool fell into four broad categories related to the reasons that SSD had chosen to develop Crestview, the organisational conditions that were necessary to create Crestview, the challenges presented by the existence of Crestview, and the impact that Crestview had on SSD.

The administrators stated that the primary purpose for having created Crestview was to serve the diverse needs of the students of SSD. In particular, they recognised that the lifestyles of contemporary students often require a learning environment that is more flexible than is presently possible in traditional schools and that current research suggests that there is no one “best” way to promote better student learning. Therefore, a prudent school system must provide a variety of learning models for students and an on-line school is just one of those options. Nevertheless, they also identified other reasons or purposes for having supported the creation of the cyberschool. For example, they believed that it was important to foster the creation of a cyberschool due to the impact one would have on the school system overall. They pointed out that the intended effects had more or less been realised. These effects were that Crestview would provide both a challenge to the school system to create the school as well as an alternative for staff and students in terms of providing professional development opportunities for staff and new, flexible educational delivery models for students. In addition, they wished to explore the partnership opportunities afforded by the creation of the cyberschool. The unintended effects had also been interesting. The existence of the cyberschool had sparked a new interest in educational technology throughout the school system and students were now demanding more flexible and individualised learning environments in their “regular” classrooms. In addition, cyberschool was seen as a response to the changing social conditions within the community. They recognised that little change had thus far taken place in SSD in terms of instructional methods and program delivery and that there was a need to “keep up with the times” to address both

media and information literacy. They pointed out that parents had recently become aware of the on-line education opportunities available to their children from other jurisdictions and that Crestview was a response to their demands for this service.

They believed that it was essential to choose dedicated staff who would rise to the challenge and create first class on-line courses. They felt that it was necessary to provide teachers with the opportunity to develop their own courses rather than simply having them step in to teach already existing courses. They agreed that the primary criterion for cyberschool staff selection should be teaching excellence rather than technological proficiency and there was agreement that the “pod” concept was important. However, they differed with regard to their visions of what that pod concept might look like. They recognised that the funding for course development was inadequate and that it should reflect the *real* amount of time required to create an on-line course; however, they also stated that the funding of a cyberschool should not be over-generous in comparison to other programs within the system. Up-to-date computer hardware and software at the “pod” were seen as essential as a support to on-line teachers and the home schools were seen as being supportive of the special nature of cyber-teachers’ schedules.

Vision and purpose were seen as problematic. While all agreed with respect to the importance of having a Catholic focus in Crestview’s courses, there was significant tension with respect to the vision and purpose of Crestview. Communication problems were identified especially in regard to informing the faculties of the “regular” schools about the intentions and directions of cyberschool. In addition, there were strained

relationships among the administrators as they struggled to cope with creating an appropriate administrative structure to manage Crestview.

Finally, they pointed out that Crestview had effected a significant impact on SSD overall. Learners now had a flexible, individualised course delivery option that recognised their different learning styles and that encouraged them to become more independent learners. Instruction was seen as being better on-line because teachers were spending less time on administrative issues such as discipline and information transfer and were spending more time actually interacting with students. However, students had become less tolerant of the natural variations among teachers' approaches and grading procedures. The administrators recognised that the traditional hierarchical administrative structures that had been thus far applied to Crestview were not working. They also recognised that the cyberschool courses had become, in a sense, self-propagating and that students and parents were increasingly demanding more access to cyberschool and a greater variety of available cyberschool classes.

Teacher/Developer Perceptions

As stated earlier, Crestview employed nine teacher/developers. From among this group, one person chose not to take part in this study and another was the researcher himself. Therefore, the researcher conducted semi-structured personal interviews with the seven remaining participants and the transcripts of their interviews form the majority of the data presented below. However, since the researcher was also employed as a teacher/developer at Crestview, his perceptions have also been included where appropriate. In addition, A4 had only recently become a full-time administrator

and had been the original developer and instructor of the Information Processing 10 course, giving him extensive experience as an on-line teacher. Therefore, his perceptions with respect to instructional issues were also included.

The perceptions of the teacher/developers revealed that there was a wide variety of interests and concerns among them with respect to on-line education. However, there were four key emergent themes: the nature of instruction in Crestview cyberschool, organisational conditions necessary for a cyberschool to exist, organisational response to Crestview cyberschool, and the nature of community within Crestview cyberschool. These themes also provide the organisational heuristic around which the data are presented.

Nature of Instruction in Crestview Cyberschool

The perceptions of Crestview's teacher/developers regarding the nature of instruction in their on-line courses raised a wide range of issues. These issues are organised here according to the following typology:

- a) the role of the teacher in the on-line school context,
- b) the role of the student in the on-line school context,
- c) instructional strategies necessary/used on-line,
- d) the impact of those strategies on students' learning,
- e) the impact of those strategies on teachers, and
- f) the strategies necessary for the development of trust in the on-line school context.

The role of the teacher in the on-line school context. Each one of the teachers stated that they saw themselves in a slightly different way in their on-line classes as opposed to their face-to-face classrooms. While the role was given a number of different names (e.g., coach, guide, and facilitator), the general thrust of the views was that the teachers saw themselves as mediators between their students and the content within the particular courses. TD1, for example, stated that he saw himself as a facilitator who must “provide students with quite a bit of guidance [particularly at the early stages of a course] and structure and who will ensure that they get things done”. Similarly, TD2 believed that his role as an on-line teacher was not really different from his role in his “regular” classroom. In both milieux, he saw himself as a motivator whose responsibility was, at least in part, to encourage students and help them to resist the temptation to procrastinate. TD4 expressed similar objectives but also identified some frustration with this new role with his observation:

I see my role as a teacher to be a guide more than anything else. Deep, deep in my heart of hearts, I want the kids to find the stuff they need to find, whether its chemistry or whether its anything else, I suppose. [I want them] to do it because they can, do it because its fun, do it because its good to do, rather than, ‘What do I need to know for this test?’ How I get there is still a little fuzzy to me at this stage.

TD3 identified the traditional teacher roles of evaluation and setting the pace as being critical in the on-line context. He pointed out,

The teacher is still the one who guides it, who gives it some direction. We’re still in that role of evaluating students and I don’t think there’s anything wrong with that. You could conceivably take the course on your own, but without that feedback, without that interaction, it obviously wouldn’t be the same.

Finally, TD5 stated that his role in an on-line context had two key dimensions in comparison to his role in the face-to-face classroom. The first role was to create or develop the course and, in doing so, to anticipate all of the needs of the students before they even enroll in the class. In the face-to-face classroom, this role is fulfilled to a large extent by the Department of Education in its curriculum guides and the teacher would make modifications to address particular student needs as the course progressed. However, in the on-line context, the whole course must be created in advance and “you try to analyse their behaviour and needs in order to predict what the roadblocks might be and to get rid of the roadblocks before they [the students] get there” (A4). The other key role was as a fellow-learner – perhaps as a master learner. “[On-line] you can go through the ‘room’ and provide help one-on-one, to be able to work with them, almost as an equal, to complete a task. Its much less like an instructor-student relationship on-line than it is in a regular physical classroom” (TD5).

The role of the student in the on-line school context. Each of the teacher/developers stated that the student’s role is obvious – to learn. However, many of the teachers put some caveats on that observation. TD7, for example, stated that because it is initially more difficult for the teacher to assess students’ abilities and problems in an on-line situation, the student must take the initiative to ask for help and to ensure that he or she gets the necessary assistance.

In order to be successful, the student must also log on and take part in the class activities. In fact, in contrast to a regular physical classroom in which it is possible for some students to sit back and pick up enough information to get by without actually

taking part, due to the tracking tools and the individualised nature of the on-line classroom, *each* student must accept his or her responsibility to take part. TD3 stated this student responsibility in the following manner, “There’s no escaping it, there’s no hiding in the back row, there’s no pulling off an exam. You either do it or you don’t.” Thus, every student necessarily has a role in his or her educational pursuits on-line.

In my own experience as a cyberschool teacher, the student’s role becomes much more active on-line than it is in the physical classroom. First of all, the students are required to accept the responsibility to read directions carefully – perhaps, much more carefully than they do in their physical classes. While the onus is on them to complete their tasks or to come forward and ask for assistance, there exists a dichotomy in what the student is expected to do in the event that she or he does have a question. On one hand, the student, in choosing to take a course via the Internet, is also attached to the largest single source of information in the world. On-line teachers often become frustrated with situations in which students ask “questions that don’t need to be asked” (TD1) or questions about things that have already been meticulously explained. On the other hand, teachers are still teachers and wish students to be successful and hope that they will ask the questions that are necessary for them to be successful. In fact, I have a favourite statement that I make in my on-line classes – “there’s no such thing as a stupid question”. In addition, the teacher in the physical classroom has clues available to judge students’ understanding of concepts that the on-line instructor does not such as body language. Some teachers (e.g. TD5) referred to this sense as a teacher’s intuition. However, since these clues are not available to the on-line teacher, at least in the same

way, the student must accept the role of making sure that the teacher is aware of misunderstandings and gaps in knowledge and must ask for assistance when necessary.

Instructional strategies. TD4 pointed out that Crestview had been struggling to establish credibility and to justify its existence. He alluded to the situation concerning Christian Ethics (also mentioned by A3) and stated that he, and the other members of the teaching faculty at Crestview had “grown tired of continually justifying our existence”. Perhaps due to this struggle, many of the teachers seemed somewhat defensive when asked about their on-line teaching strategies. Most of them stated emphatically that, in developing their courses, they had tried to recreate the environment of their regular classrooms on-line. TD6, for example, stated,

I’ve tried to create online the same type of thing that I would do in the classroom in the sense that there are some parts where I’m just talking to the kids about how to do things or opinions or whatever and sometimes where it’s official [Church] information that they are taking in. I think its similar to my classroom.

TD3 stated that in developing his on-line course, he tried to recreate in text what he would have said in his classroom. A4 echoed this observation by stating,

What I tried to do as a teacher is I tried to recreate the same environment and the same approach to teaching that I used in the classroom. I just took what I did on my first day of class and said to myself, ‘that is what I’d normally do’. Then I would just think about what I’d present and I tried to recreate that for the cyberschool. But, basically, I tried to do something that was almost identical to the stuff I did in class.

Nevertheless, as the interviews progressed, the respondents identified a number of other teaching strategies that they had begun to use.

Many of the respondents had indicated that, while they had initially approached their courses from a traditional point of view, they had begun to see the need for change to make their courses “make more sense” in light of the technological environment inherent in the cyberschool milieu. TD4, for example, stated that he had initially developed his course around an on-line textbook but, had recognised the need for change. He observed,

... because of my own traditional views and time constraints, I have a textbook on-line and the more I look at it the more I realise it needs to change to require different things of the students. I suppose the flip side of that is that the kids feel, at least initially, more comfortable with having a textbook on-line. So I've got to find some happy medium. I want to get to a situation where the kids are doing more discovery learning.

One drawback I found with chemistry is that in terms of resources, there are lots and lots of periodic tables on-line, but little else. So, things that I've had to make for my class I've had to construct on my own. So, I'm kind of in a period of flux in my course. My textbooks are there, the assignments are there, the courses will run. But now, I have to make them more interactive. Make them different.

TD2 stated that his approach to teaching was exactly the same in both the regular classroom and the on-line classroom. However, he described his approach in the following manner:

It is in the presentation, which is obviously different. I like to think that I plan the lessons the same way. I throw the notes out there for the students *but* I try to put as much animation into it and thought into it as possible, so that its like I'm virtually there with them.

TD7 stated that, since she was teaching English as a second language, her approach on-line was very different from her approach in her regular classroom. In her physical classroom, she tended to focus on students' abilities with oral English whereas

in her on-line course, while she had experimented with using audio files, she tended to use far more pictures to help her students to understand.

Both TD5 and A4 stated that they tried to use more open-ended assignments in their on-line courses. However, TD5 observed,

My focus in the cyberschool is to use a variety of approaches. I've made a conscious effort not to have two lessons or two assignments that go along the same structure in a row. I try to mix them up so that its different each time. I also try to provide the students with a choice of how they want to go through the material in this course. They get to choose what works best for them. In addition, I try to provide a variety of presentation formats. It could be the exact same lesson but, I might include a text-based explanation, a Flash movie and an audio file [of me speaking the information] to help students understand. Finally, my focus is on communication and feedback with the kids. I get them to keep an on-line journal and invite them to participate in on-line discussion groups and insist that they email me. Because if they're not talking to you, you really have no idea whether they're getting the material or not.

My own on-line course would best be described as a sort of hybrid class. With the exception of two novels (one required and one the student chooses), all required literature is directly within the on-line course. Students are required to read and respond to the literature but, the literature is used primarily as a springboard to the nine open-ended projects that make up a majority of the students' graded work. Each project requires the student to critically examine and reflect on information, often gathered by him or herself, and to present those reflections in a way that seems appropriate for the particular assignment (usually the student chooses the mode of presentation).

Impact of these strategies on teachers. Teaching in the on-line school has had a significant impact on the teachers at Crestview. On one hand, they report being energised and see their cyberschool development and instructional experiences as one

of the most rewarding of their careers and, at the same time, they reported a discomfort or uneasiness with the way in which teaching on-line has affected their pedagogical approaches as well as how it had affected their relationships with their students.

However, all teachers reported that one of the most positive aspects of the cyberschool model was that they no longer had to spend a majority of their time addressing discipline concerns. Instead, they reported that they appreciated the opportunity to finally spend most of their time providing feedback and support for students.

TD3 observed that, in teaching on-line, he had lost what he felt was his most important asset as a teacher – his voice. “My greatest teaching strength, in the classroom, is my voice. I can use that effectively – and I can’t use that in cyberschool. I’ve messed around somewhat with recording readings and poems and stuff like that, but not to any great success”. Yet, this loss actually had improved him as a teacher in both the regular classroom and the on-line classroom. He opined,

I think that it [teaching and developing a course on-line] makes you pay attention to details, to how you present things. You have to stop and, rather than speak them, you have to write them, and you have to pay careful attention. I think its made me a better and smarter teacher having to prepare a course on-line.

TD6 expressed distress in having “lost control”. She stated that while the flexibility afforded students by the on-line school was important and desirable, students did not always do things in the order that she had intended or, for that matter, they may not do them at all. Thus, in any on-line course, some key pieces of content may well be missed as the students pick and choose the tasks they complete and the order in which

they complete those tasks. In addition, she pointed out that students' expectations of teachers were substantially different on-line as opposed to in the physical classroom.

There is so much more of a 24 hour a day availability in the cyber world that you don't have in the classroom. I find in the cyber world, if they've e-mailed you and you haven't answered in ten minutes, they're e-mailing you again wanting to know where you are. There's a sense that you're more available more of the time in the cyberschool. They're so used to things like 'Ask Jeeves' that they just kind of start thinking of us in the same way and they don't realise that we have other teaching commitments and we sleep sometimes.

TD1 also expressed some trepidation over loss of control. In fact, he described his approach as having to "remove [him]self to a certain extent". He explained that the expectation that students take more responsibility for their own learning had resulted in a situation in which students are no longer responsible to the teacher in the same way they are in the classroom. Therefore, he has had "to re-think the way in which [he] presented the material, realising that [he] would no longer be there to explain things to the student". However, he also relished the opportunity to be involved in the cyberschool. He observed,

... it allowed me to learn things I would never have learned otherwise. Having taught for 25 years, I felt comfortable in what I was doing and then all of a sudden, this huge challenge was thrown at me and I kind of enjoy it. Its also made me a better teacher because I have had to re-think certain concepts and the way I would present them or develop them and that has impacted the way I do them in the classroom. I transfer some of that into my regular teaching.

TD5 stated that he had initially found teaching in the cyberschool context to be very awkward. On-line, he tended to rely less on his personality and social skills and focussed, instead, on relationship building and on clear, concise communication. He noted that he was much more concerned about accuracy and preciseness on-line –

probably because much of his course was in print – lending a permanency not present with oral presentations in the regular classroom.

Finally, TD2 pointed out that he found the cyberschool environment to be more relaxed – an opinion shared by most other teachers, particularly TD4. However, this relaxed atmosphere sometimes led in different directions. TD2 stated that the atmosphere in cyberschool allowed for more personal and direct contact with students – a byproduct that he felt was a significant plus. TD4 stated that not only was the atmosphere more relaxed but also, he tended to be “more patient with the kids on-line than [he] was in the classroom [particularly when the same kid asks the same question for the fourth time]”. He pointed out that since he had been required to go through the ordeal of learning all of the technology in order to “get the course up and running”, he found it “easier to put himself in the kid’s spot”.

Student response to on-line instructional strategies. Teachers stated that, in contrast to the regular classroom, cyberschool students tended to achieve either very well or very poorly. TD3 illustrated this with his observation that “for the students who do the necessary work, they’ll probably do better than they’ve ever done. And if they don’t, they’ll probably do worse than they’ve ever done”. TD1 echoed this observation and attributed the phenomenon to the fact that an on-line course made it easy for students to procrastinate because there was no physically present teacher to “nag” them to complete their work.

TD5 stated that students seemed to feel empowered by the opportunity to have direct, one-on-one contact with their teachers and fellow students without the stress of

meeting face-to-face. He observed,

Students feel comfortable enough to contribute because some of the most intimidating factors of it [communication] have been removed. You know that when you're creating your message or your discussion post, other people will see it or respond to it, which lends some seriousness, but you have the luxury of taking as much time as you need to gather your thoughts.

TD4 cited the following example of a particular student:

I have one student in my chemistry class right now. She must e-mail me 2 or 3 times a day. Right now, she's really dependent on me. And that's okay. But, I've met this student here at Notre Dame and she doesn't strike me as the kind of kid who would have her hand up that often in class. So for her, I think the cyberschool is a bit of a life line. It allows her to get the information she needs without having to worry about time constraints in class or whether people are going to think she's foolish, or all the other things that go on in the adolescent mind.

Many teachers also reported that the quality of student work was at least as good and the quality of discussion had actually been better online than was usually the case in a face-to-face classroom. TD5 reported that, because students have time to read and consider their responses to comments and questions, "the discussion we do get tends to be of a higher quality ... you don't get the students who will just blurt out things [like you do in a regular classroom]". TD3 also reported that the quality of interaction between himself and the students was also of higher quality. "I have a much more intelligent interaction with the students because they've done their reading and have actually thought about it themselves rather than waiting for the teacher to tell them what to think."

Trust in the cyberschool. The fact that cyberschool is delivered to students via the Internet was cause for some concern on behalf of the teachers. In particular, the

issue of trust was raised in connection with academic honesty. Each teacher was relatively confident that the students were submitting their own work but, each also recognised that it was relatively easy for students to find papers on the Internet and that it would be difficult for teachers to detect the fraudulent papers since students were never required to write anything in person to provide a comparison.

In my own experience, I have received very few papers that were questionable with regard to their authenticity. A larger concern in my courses has been that students frequently forget what audience they are writing for in their on-line work. For example, students frequently do not follow the conventions of formal essay writing (e.g., they use slang, first person pronouns, etc.) perhaps because they associate writing on-line with their leisure pursuits such as ICQ and MSN. Students are also reluctant to cite references and works consulted in their essays submitted on-line. Again, they seem to associate a certain level of informality with writing on-line, however, it is also possible that they simply may not have been taught these skills in previous courses.

The Nature of Community in Crestview Cyberschool

The teacher/developers identified two primary arenas of community in Crestview Cyberschool. They identified community issues within the individual classrooms and among the staff. The following discussion of community in Crestview is divided according to these two categories.

Community within the classrooms. The teacher/developers stated that developing a sense of community in their classes, particularly at the high school level, was essential to students' success. A4 stated,

I think that it [a sense of community] is necessary for a high school – I think you increase the level of learning when there is a stronger sense of community in the classroom. When there is a strong sense of community in the classroom, the students feel like they are a part of something and they feel that they have the ability to ask questions of the teacher and of their fellow students.

He stated that it may actually be easier to create community in the cyberschool context because students cannot just sit back and watch, at least, without being noticed.

I think we automatically assume that the face-to-face classrooms have community in them and I know that I've sat in class and never felt like I was part of the class. I was there every single day and I was there with the same 24 students and if you asked me what was happening in that classroom, I would be able to give them an answer 9 times out of 10 but, I couldn't tell you anything about the other students in the class.

In my own classes, I have seen students get to know each other much more quickly and, in some cases, much better than they do in their face-to-face classes. Students are more willing to share aspects of their personal lives on-line perhaps because they have established means of communication in the on-line school and because they do not have to contend with sharing those things face-to-face.

The teachers of Crestview had established a wide variety of strategies that they used to create community in their courses. Many of the teachers had devised a number of activities and assignments which required students to interact with one another. For example, the initial activity for the students in my class requires them to find a partner they do not already know and communicate with each other sufficiently to allow them to introduce their partner to the rest of the class via a bulletin board posting. TD5 used a similar activity which he then used as a personal growth opportunity for students to reflect on what they actually want people to know about them. Many of the teachers

also employed various structured discussion groups to stimulate interaction and build community. In my class, once the groups have been formed, the students are given the task of naming their groups. This task usually generates a wealth of discussion around the meanings of particular words and whether they would want to be known by those names; providing, in many cases, a great deal of insight into their personalities.

Crestview had also begun offering an on-line chapel to the whole student body as a place to meet and interact with each other. According to both A4 and TD6, the response to the chapel had been overwhelming. Virtually every student had logged on to the chapel at least once and a majority had participated in discussions about a wide variety of topics. TD6, perhaps due to her teaching responsibilities in Christian Ethics, had spent a great deal of time monitoring the student interactions in the chapel. She opined, “A lot of the kids are going in there to do their prayer intentions and so on. That set of kids is developing a real sense of community in there”.

All of the teachers identified the communication tools available to them in WebCT as having been extremely useful in building community in their courses. There were three primary communication tools including e-mail, bulletin boards and chat rooms. E-mail, according to the teachers, was used primarily as a private means of communication, most often between student and teacher but, occasionally between students. The bulletin boards were used in a number of ways. Each course had a “public” bulletin board which everyone enrolled in a particular course could access. Some teachers also used the bulletin board for other purposes. In my class, for example, each student has a private bulletin board area which was accessible only by

him or her and myself. We call it a journal/response log and use it as a receptacle for ongoing work as well as a place to keep their personal thoughts. In addition, the class is divided into discussion groups of five or six students and each discussion group also has its own bulletin board accessible only to the group's members. Groups conducted literary discussions as well as group projects from the discussion area. The chat rooms, according to the teachers, were rarely used. Some teachers explained that they had experimented with synchronous on-line chat parties with varying degrees of success. They reported that the quality of these parties had been dependent on the size of the group (a smaller group worked best) and whether the group was living in the same or similar time zone. However, most of the teachers reported that, as a community building tool, the chat room had not been particularly useful.

Community among the staff. A4 stated that part of his vision for Crestview was to create a community of learners that could work collectively, in a sense, to learn the technological skills necessary to facilitate the creation and delivery of their on-line courses. In addition, he pointed out that the model that had been chosen to incorporate new staff members into the fabric of the cyberschool was that each new staff member should "become immersed in it" and spend time developing the course that he or she would ultimately teach. He said that, so far, this approach had spawned at least two positive outcomes. First, the developers, by the time they finish developing their course, have become very familiar with the technological aspects of on-line course delivery, making it possible for any staff member to assist any student, at least in the basics of navigating the WebCT platform. Second, the developmental phase of the

courses gave the developers a certain empathy for the students, since each developer had to endure a relatively steep learning curve as he or she put together their courses. He said, "I think they [developers] learn a lot of skills and what they've experienced on-line they can then transfer over to their students when the students get on-line. I think that is a good process we have in place".

One teacher/developer, TD5, indicated that he saw his role as both a teacher/developer and a technology mentor. "I think that part of my role here was to provide some computer assistance. I was one of the first ones brought in to do some team development on a specific subject and, at the same time, help someone else learn the computer side of it".

Nevertheless, each teacher/developer, without exception, stated emphatically that one of the best aspects of the cyberschool experience for them had been the feeling of community that had developed among them. For example, TD1 stated "I can't say enough good things about the people we work with [in the cyberschool pod]. A4, for example, has a great deal of expertise and he was able to share it with us ... within the group there was a lot of support". TD7 opined, "Having other peoples' expertise is certainly helping me, I enjoy sharing that." TD6 argued, "Support comes from within our cyberschool staff and that's virtually everyone. Anyone who can help you does and they've been very good and very patient and very supportive." Whereas, TD4 observed,

From a teacher's perspective, the ideal cyberschool is very much the one we have now. I couldn't imagine trying to develop a course without that core group of people around me. Even though there were no [technology] specialists, we were all learners. The dynamics that develop when you have this number of bodies in a room is just amazing. A sense of community does a lot when you

feel like you're together in a little cubicle working together on a common project.

Organisational Response to Crestview

The teacher/developer perceptions regarding the organisational responses to the presence of Crestview fell along two lines: administrators' responses and "traditional" or home school responses. The following discussion of the organisational responses to Crestview, then, are organised according to these two categories.

Administrators' responses. Many of the teacher/developers expressed frustration with the lack of a common vision of what Crestview should be and where it should go. TD5's comments were reflective of the general flavour of the observations. He said that he felt like Crestview had,

... more than one master to serve – from the board level down, there has been support for the overall initiative of virtual schooling and the cyberschool. However, *actual* support – beyond what exists in the cyber pod, is somewhat more removed. I think the board is generally positive about what we do. Although, I still get a very real sense that they don't know what to do with us. We see potentials that don't even occur to the downtown people. They're still trying to fit us into a traditional model of education, which it can't.

A4's perspective was similar. He felt that the school system's senior administration (e.g., A1, A2, and A3) intentionally placed barriers in the way of the cyberschool in order to control its growth and direction. Many of these "organisational barriers" were present because "cyberschool is new, things have never been done this way – it doesn't fit into the normal mould".

Traditional school responses. The cyberschool teachers seemed to fall into two categories with respect to their perceptions about their home schools' response to

cyberschool. This split, oddly enough, seemed to be aligned with whether or not their home school was SSD#1. Those teachers whose home school was not SSD#1 felt that, for the most part, their schools had been very supportive of their role in cyberschool and had been very accommodating. On the other hand, the cyberschool teachers from SSD#1 felt that there had been very little support from their school.

TD3's comments were indicative of the views of SSD#1's cyberschool teachers. He stated that "my teaching schedule [in the regular classroom] has not reflected an overwhelming support". He explained that SSD#1 scheduled him in such a way that required him to,

... race between his home school and the cyberschool – we're in the same building and I think that makes it worse sometimes. If you're part of a special project where you're in one building for part of the day and in another building for the rest of the day, then its silly that you're going back and forth between those buildings within the same day. Surely it can't be that difficult to give you your home-school classes in the morning and your cyberschool classes in the afternoon.

He also indicated that the other Crestview teachers from SSD#1 had experienced similar situations.

The teachers from the other four home schools indicated that they felt that their schools had been generally supportive of their cyberschool involvement. However, they also identified one common problem as well. They indicated that there were times when they felt that cyberschool activities and responsibilities "were not valued" (TD5). The problem was that their home school expected them to "drop" their cyberschool duties whenever there was a staff meeting or some other function that the "regular" staff of the home school were expected to attend. It seemed to them as if the home schools

thought that since cyberschool work could be done anytime and anywhere that it *should* be done anytime and anywhere.

Organisational Conditions Necessary for Cyberschool Development

This section relates to teachers' perceptions of the organisational supports and conditions which existed when they were developing their courses and those conditions and supports which they felt were necessary. Teachers' perceptions are organised here according to the three main themes which emerged from their responses. These themes related to the time, technical support and training necessary to develop a cyberschool course.

Time. Time was the most prevalent issue among the teachers in Crestview.

Without exception, they stated that the time commitment necessary to develop a cyberschool course was enormous. The teachers indicated that they had been provided with the equivalent of one quarter release time to work on their courses. The regular work load for teachers in this school division required them to teach four classes out of five periods each day per semester and that the fifth class period per day was for preparation time. Thus, during the development phase of each course, teachers typically taught three classes per semester in a regular classroom and were expected to use that fourth class (approximately one hour per day) for cyberschool course development. Thus, over the course of one year, a course would be developed. In some cases, however, the developers had been given half-time release for one semester (an arrangement which amounted to the same amount of release time but meant that the course was developed in one semester instead of over an entire year).

Every teacher/developer indicated that the formula described above for the amount of time allowed for cyberschool course development was wholly inadequate. TD7's observation was indicative of the view of all of the teacher/developers. She said, "We need way, way more time. 25% to do a course is not enough time. I realise now that we probably actually need a year [four times as much]. One of the most difficult things is that when you only have an hour or two on the computer, you just get something started [and you have to quit]."

This shortage of time had exacted a heavy toll on the teachers. Most of them indicated that they had allowed cyberschool course development to take time away from their other duties as teachers, from time with their families, and from down time and holiday time. TD3, for example, stated,

Its probably been 3 years since I sat in the staff room during my break [preparation period] and just visited with someone. So in terms of the impact its [cyberschool] had, the time has shifted. In my day, theoretically, 80% is scheduled for the home school and 20% for the cyberschool. But, I bet you right now that its 50-50 of how my day is actually spent. My time at school is divided equally. I still have to do the work for my regular school, and its now done at home because the work I do for cyberschool I have to do here [at the cyberschool pod].

TD1 pointed out, "I have had to utilise quite a bit of my own time. Long evenings, weekends, summer holidays, things like that, in order for me to create what I felt was a course on-line. Even though I wasn't given enough release time, I still managed to get it done".

When asked if cyberschool activities had made any impact on their duties as a "regular" teacher, each of the teacher/developers interviewed indicated that they had not

allowed their cyberschool duties to interfere with their activities within their home schools. Instead, they had allowed their personal time to be eroded in order to allow enough time to conduct their cyberschool duties. “It hasn’t had an effect on my commitments at my regular school in terms of my teaching commitments or my involvement in either extra-curricular activities or staff activities. It has affected my personal time” (TD1). Perhaps, TD6’s observations were the most telling:

Its all-consuming. I was here last night from 8:30 until midnight. I’m here most nights from 9:00 until midnight. I’m here on weekends. It is just so time-consuming. If I was in a different space in my life – if I were single or if my children were all grown up or whatever, it might be different – but I have very small children and it’s a hard balance. Because I don’t like to come back until they’re in bed, we’re now sitting at 9:00 when I get back here. Then I still have to be up the next morning. So, when you’re here until midnight or 1:00 and then you’re back here the next morning for school, its hard.

Technical support. All of the teacher/developers indicated that they felt adequately supported in the “pod” in terms of the computer hardware and software available to them. Comments such as, “we’ve got a great setup here in the pod” (TD3) were common. However, at issue was the lack of technology support available for them at their homes. They indicated appreciation that the school division had provided each teacher/developer with high speed Internet access at home. However, many of them indicated frustration that the school division had not provided them with computers at home. TD3 opined,

To me it’s the principle of the thing. We’re asked to do this and yes, we are willing to do this but, its like so many other things in our profession that in order to do it, it comes down on the backs of each individual teacher again, but this time financially. You wouldn’t [be expected to] buy a blackboard to teach in a classroom and I don’t think you shouldn’t need to foot the bill to do what’s required to teach this course. When I was asked to do this, A2 told me that I

could do my course in my bathrobe and slippers. But, that would only be possible if I buy the computer at home. Its not fair.

A majority of the teacher/developers indicated that they favoured the current model which required them to do both content and technical development over a model which would have seen someone else to develop the technical aspects of the course. All of them believed that developers should have at least a basic functional understanding of the technology required for operating a cyberschool. They felt that their own struggles with the technological aspects of their courses had given them a great deal of empathy for their students leading to better and more effective directions and explanations in their courses.

However, they did indicate that there was a need for a resident “techie” who could be on hand throughout the day to troubleshoot and repair technological problems. Many of them also indicated that they would like to have the opportunity to receive software support and training in an on-going basis – in a sort of “just-in-time” fashion. They felt that it would be too overwhelming for new people to have all of the necessary technical training up front as they join cyberschool. Instead, a system that allowed each individual to receive technical training as he or she needed it appeared to be the favoured approach.

Training. Aside from the above-mentioned technical training, no teacher/developer indicated that he or she felt a need for or had received any training regarding the pedagogy of on-line teaching. Many of them indicated that there had been a cyberschool staff tradition of the whole group attending an annual on-line education

conference. These conferences, they stated, had been helpful and informative. Some of them also made observations such as: “once the course is up and running, then time can be devoted to looking at things that are out there and to make changes to improve the learning environment for the students” (TD1).

Summary of Teacher/Developer Perceptions

With regard to their roles as on-line teachers, several of Crestview’s teacher/developers saw themselves as facilitators or motivators. In addition, some believed that the nature of the relationship between student and teacher in an on-line context ought to be one of fellow-learners – with the teacher, perhaps, a master learner. Students, it was felt, must take more initiative and become more responsible for their own education; particularly, in making sure that they ask for the help they need.

Regular student participation was seen as essential and that each student must participate in order to be successful. Many of the teacher/developers at Crestview were rather defensive with respect to describing their on-line instructional strategies. They stated that they had tried to recreate the environment of their regular classrooms for the on-line context. Some teachers had chosen to develop on-line textbooks but most were beginning to realise that they needed to make some changes. Many had plans to experiment with discovery learning and open-ended projects and some teachers stated that they had experimented with the use of more visual stimuli in their on-line courses.

Teaching in an on-line school had impacted on teachers in a significant way. Several of the teachers at Crestview indicated that they were excited and energised to be involved in the project but, due to the time constraints around course development, they

also felt very stressed. In particular, they stated that they enjoyed the expanded role of supplying feedback and support to students without the necessity of managing the discipline necessary in a regular classroom. However, many felt a loss of identity in the on-line context. In particular, they felt a loss of personal traits such as their voice or their physical presence which they believed made them good classroom teachers but which did not exist in their on-line classrooms. In addition, some lamented the lack of control associated with teaching in an on-line situation.

Student response, from the point of view of the teachers, had been generally positive. While students were expected to take more responsibility for their own learning in Crestview, they seemed to achieve either very well or very poorly. However, many of the teachers observed that students seemed to be more willing to ask questions in the on-line classroom. In addition, teachers noted that the interactions between themselves and their students seemed to be of higher quality because students were more prepared and had often spent time reflecting upon the relevant material before initiating dialogue. Teachers indicated a concern regarding academic honesty but had experienced few incidents of plagiarism.

Without exception, Crestview's staff indicated that they had found the community in the "pod" to be the most energising and enjoyable of their careers. In fact, most of them stated that they found the community to be the best part of their cyberschool experience. The community of the classroom was also very important to the teacher/developers. While student participation in the community of the on-line classroom was, by no means, universally high, faculty noted that several students

seemed willing to share and take part in the community of the classroom. In particular, the chapel as well as the bulletin boards in the individual classes had proven effective as means to garner student participation.

The administrators were perceived by most of the teachers to lack vision with regard to the mission and purpose for the cyberschool. Consequently, administrators were seen almost as enemies – creating a more distinct separation between administration and teaching staff than is typical in bricks and mortar schools. In addition, in the absence of direction from administration, many of the teacher/developers were frustrated with the administrators' apparent refusal to ascribe to the teacher/developers' visions. The teacher/developers felt that the administrators were trying to fit Crestview into a traditional school organisational mould. This attempt was most evident at SSD#1 as the cyber-teachers, from their points of view, were scheduled into their regular classroom responsibilities according to what was easy for the school rather than to what made sense for them.

The organisational conditions were largely negative. Several of the teacher/developers believed that they were, in a sense, victims of willful neglect because, even though the school division administrators knew that the developmental time allotted for courses was insufficient, there had been no changes. This lack of paid development time had a negative impact on these teachers because each of them had allowed their cyberschool activities to erode their personal and family time and had become somewhat bitter toward the administrators.

The possibility of an alternative developmental model which would see these teachers as content developers and have someone else develop the technical aspects of their courses was not viewed as an attractive option. However, the need for a resident computer technician who could trouble-shoot and repair technical glitches was raised. In addition, the teacher/developers had received little training, particularly with respect to the pedagogy of on-line instruction and the methods of facilitating on-line discussions, beyond what they had provided for each other.

Developer Perceptions

Faculty members who were developing a course but had not yet taught on-line were included in this respondent group. At the time of study, Crestview employed five faculty who were engaged in course development. One developer declined to participate therefore, this respondent group included four developers (see table 4.1 for the coding contexts). Since the interviews took place in mid-October, these respondents had been working with the cyberschool for approximately six weeks when they were interviewed. Consequently, many of the questions regarding the nature of instruction and the day-to-day operations of a cyberschool course were either answered from the point of view of what the respondents *thought* might happen or were not answered at all due to lack of experience with the particular phenomenon being explored. Nevertheless, to facilitate comparison, the following account of the developers' perceptions follows a format similar to the account of the teacher/developers' perceptions that appeared earlier in this chapter.

The Nature of Instruction

The developers' responses were particularly limited with respect to their understanding of the nature of instruction required in a cyberschool context. Nevertheless, they did express some interesting perceptions regarding what they thought should take place in a cyberschool. Their views related to the role of the teacher and the student in an on-line course as well as to the instructional strategies necessary in a cyberschool are used as organisational heuristics for the following section.

The role of the teacher. The developers, perhaps due to the differences in their backgrounds, had rather diverse conceptions of what their roles as teachers in a cyberschool course would be. D2 and D4, for example, believed that they should try to construct their courses to allow them the role of facilitator or guide. Both indicated that they had discovered, much to their surprise, that their regular classrooms were rather teacher-directed but, they felt that an on-line course should be different. D2 observed,

Its totally thrown me for a loop. I wouldn't have believed that I was as teacher-directed in the classroom, but I am. So, on-line, I would like to be more of a facilitator – to show the way to go and to show how to find things out [rather than just telling students the answers]. I wouldn't have believed that I was like that [teacher-directed] in the classroom until you take that all away from me and say, 'Okay, go'.

D1 also believed that his role as an on-line instructor would be as a facilitator or mediator. However, in contrast to D2 and D4, D1 stated that his regular courses were already constructed around a teacher-as-facilitator model. He observed,

I don't think my role [on-line] will change that much. I already teach my students how to use e-mail and discussion boards in my classes – [however]

there's certainly more independent learning in the on-line course. You're still answering questions, you're still providing feedback. You're still not losing everything you would do as a teacher. You're just doing more of it because it's a format in which you provide feedback.

He also stated that he intended to use the technology available to him in the cyberschool milieu to create an interactive environment similar, in some ways, to the environment of the regular classroom. He pointed out that he was,

... trying to make it somewhat interactive – so as soon as I give information, the student will have to respond to that information in some fashion, whether it be on a message board or in a short quiz, its so that they have to recognise and prove to me that they've read the material and then respond to it. In this way, I'm trying to take advantage of using the computer.

D3 had a unique role within the cyberschool. She had been recruited to translate an existing course (Math 90) into French. Perhaps due to the nature of the already-existing course or because of the nature of teaching math, she saw the cyberschool class as being fairly teacher-directed. She revealed this inclination with her observation that the cyberschool afforded her the opportunity to “communicate the information clearly and in a way that is easy to read and understand, breaking it down into understandable steps so the kids don't have to.”

The role of the student. The developers believed that the student in a cyberschool course is an independent but, connected member of a learning community. Each of them stated that he or she would like to see students evolve into independent learners who take ownership for their own learning activities and who “learn how to learn” (D2). However, three of the developers – D1, D2, and D4 – saw students as

independent learners within the broader context of the community of the classroom. In fact, D1 stated,

When you talk about community, the neat thing I like about message boards, in particular, is that you can *require* discussions and there shouldn't be as much of a problem with a quieter student who might not be comfortable with discussion in a classroom but will hopefully feel more comfortable behind their computer because there is a certain amount of [anonymity] on-line.

Instructional strategies. The developers were not too sure yet exactly what strategies would be successful on-line. D1 stated that he intended to focus on developing interactivity while using a wide variety of images, icons and audio and video files. D2 stated that, in a way, she intended to recreate what she did in her classroom for the on-line class. She opined,

I realised that I use my whole space, I tend to have a lot of things on my walls, and use my entire workspace. I [also] use my own enthusiasm and my own excitement about the learning – I am a motivator. However, on-line, you have to appear in another way to be motivated or to be excited about things. So I want to learn how to use the classroom on-line. I want to learn about all the tools that will enable me to use that space [the cyberschool space] as effectively as in a classroom – but, I think its going to be different.

D4 stated that, in contrast to the regular classroom, cyberschool provided him with the opportunity to give students an overview of an entire concept without being interrupted by questions that disrupt the flow of ideas. In addition, he observed that cyberschool puts the onus on students to control the pacing of their own learning and to make sure that they move on to a new concept only after they thoroughly understand present concepts.

The Nature of Community in Crestview Cyberschool

The developers indicated that they were not sure yet what community might look like in an on-line course and, therefore, could not comment on that. However, they did have experience of the community within the cyberschool staff and their comments about that community are included here.

Community among the staff. Each of the developers stated emphatically that the practice of gathering the cyberschool teachers together in a particular location to develop and deliver their courses was not only a strength but also an essential component of the cyberschool structure. D1 argued, “I think that having A4 as a full-time release person to assist us was a good idea. I think having us in the same room right now so that we can assist each other when we’re learning new things is a good idea. The main support system we have is the people”. D2 echoed this sentiment with the following observation:

... I think what has already helped me more than anything is that I’m able to muddle through the technological aspects simply because of the community that I’m involved in right now. Their encouragement and willingness to allow me to learn from them has been critical. They’ve allowed me to see some of what they do and, seeing theirs, it has helped me to visualise what I can do.

D4 suggested that, while he appreciated the current pod concept, he thought that the slight alteration of forming formal mentoring arrangements between experienced and new staff might make the transition to teaching and developing an on-line course less traumatic. “I think that there should be a sort of internship type of thing where you have the master cyber-teacher who kind of knows what is going on and shows you what you need to look at learning.”

D3 stated that she had expected herself to become “sort of addicted” to working on her course at all hours of the day and night. However, the sense of community in the cyberschool pod had been so empowering that “I don’t feel pressured to have to do it [course development] at home or to take time from my personal and family life to deal with things that are happening here. The community of cyberschool has made the transition easier.”

Organisational Response to Crestview

The developers stated that they perceived both SSD and their individual home schools to be generally supportive of their involvement in Crestview. For example, D3 stated, “They [my home school] view it as a positive thing. They see it as a new experience for me. I like change and my home school knows that. Nobody has said anything where I’ve had to defend myself. I don’t feel like I’m doing something that is taking away from my own school. They’ve been behind me 100%.” Nevertheless, key themes related to their home school and fellow teachers’ responses to cyberschool emerged and form the basis for the following discussion.

Home school response. As stated earlier, all of the developers stated that they perceived their home schools to be generally supportive. However, a key theme emerged that suggested that some of the home schools, while supportive in principle, did not always take seriously developers’ scheduled time for cyberschool duties. For example, when staff meetings or other school events took place, cyberschool developers were expected to give up their allotted cyberschool time to attend those events. There was also concern regarding the structures that would be in place in case of sickness.

D1, for example, wondered whether the system would be looking at hiring “cyber-subs”.

In addition, D1 found that he appreciated the opportunity to work on his cyberschool project somewhere other than in his home school due to the demands placed on him at his home school. As a computer teacher, he was often seen as an in-house computer support technician and he accepted that role. However, “there was a lot more demand on me when I was in the building to [provide computer support - because I had an extra hour a day off]. So, in that respect, its good to be somewhere else, to be away.”

Fellow teachers' responses. While the developers identified the school system's attitude toward Crestview to be generally positive, “there certainly seems to be a difficulty in the attitude [of teachers] outside of cyberschool” (D1). There was some controversy within SSD regarding whether Crestview should be offering particular courses. “Its just adapting to change. The other teachers might not be ready to accept it. Maybe they just don't know what its about yet. They're all individuals with backgrounds and dealings based on where they're coming from. This [affects] how they see cyberschool” (D1).

Organisational Conditions Necessary for Cyberschool Development

The developers, due to their lack of experience with cyberschool activities, tended to defer to the more experienced cyberschool teachers with regard to the conditions necessary for cyberschool development. For example, they stated that they did not really know how much time would be necessary to develop a cyberschool

course but, they “had heard” or “had been told” that the amount of time they had been given would not be enough. Each of them noted, as did D1, that there had been “an understanding going in that it would take more time than we were being allotted to create this class.” However, none of them had any real sense about just how much extra time would be required. Nevertheless, D2 stated, “I feel that with the time allotment that [we are being] set up for failure.”

With respect to training, the developers stated that they saw a definite need for software and technological training. However, each of them stated that they saw no value in a lot of training “up front” before they began their cyberschool work. D3's comments were representative of the general attitude regarding training. She stated that she preferred to “learn as I go”. She suggested that having a workshop where they would learn of the software used in cyberschool would not be useful because the information would not be relevant at the time. Instead, she preferred the idea of having access to training when she needed it. She stated, “Start me and I’ll go as far as I can and then turn around again [for more help].”

Summary of Developers’ Perceptions

The developers saw their roles as facilitators. They hoped to encourage students to become independent learners by using a wide variety of instructional materials such as video, audio, and visual stimuli. They felt that they could provide students with a broader picture of concepts because the concepts were presented in their entirety without interruptions.

The community of the staff was seen as both positive and essential for successful course development. They suggested that formal mentorships between experienced and inexperienced staff might reduce anxiety for new staff, particularly in the early stages of course development, as new staff try to learn all of the new software necessary.

Home schools were seen as being generally supportive (none of the developers were from SSD#1) but, were inflexible with respect to developers' time as cyberschool when there were other activities taking place at the home schools. Cyberschool was rather controversial among the teachers in the home schools, particularly with regard to the specific courses offered at Crestview. Finally, some developers felt that they were "set up for failure" because of the poor support from SSD over the amount of time allowed for course development.

A Synthesis of the Data

A synthesis of the data from this phase reveals some interesting issues for discussion. The perceptions of the respondent groups, while congruent on some issues, were frequently incongruent – providing some significant stress points in the fabric of Crestview cyberschool. It seemed that many of the difficulties stemmed from the clash between traditional school system administrative and instructional practices and the practices necessary to effectively govern an innovative project like a cyberschool. In general, while the administrators were aware of most of the stress points, they had been reluctant both to address them and to communicate openly about their decisions. This administrative inaction had led to an erosion of trust between administrative and

instructional staff and had fuelled a great deal of frustration among the instructional staff.

For example, the administrators appeared almost Machiavellian in their approach to recruiting and scheduling instructional staff. It was quite freely acknowledged that the allotted course development time is grossly insufficient and, at the same time, the administrators admitted to deliberately choosing staff they knew would complete the job of course development. The instructional staff admitted that they had been told about this problem but, it was clear that none of them had any real sense of just how large the discrepancy would be at the outset of their cyberschool tenures. At the same time, administrators and teacher/developers expressed concern over the development of an appropriate vision and mission for the cyberschool. While a steering committee had been formed to address these concerns, the committee was admittedly “too narrow” and did not include teacher/developers. Consequently, teacher/developers felt a high level of frustration and betrayal. Teachers felt that not only were they capable of making a significant contribution to Crestview’s vision and mission but also, they had a right to make that contribution since they were doing much of the work on their own time.

Communication, of lack thereof, within the broader context of SSD had also had an impact on the cyberschool faculty. Both administrators and teacher/developers indicated that there was a significant level of animosity between the faculties of the traditional schools and the cyberschool. Again, this animosity appeared to stem from the clash of tradition and innovation and was hastened by ineffective communication or

no communication at all. According to the perceptions of the respondents, the principals of some of the traditional schools were concerned about cyberschool “raiding their best teachers”, the teachers in the traditional schools were concerned about cyberschool “raiding their best students”, and nearly everyone was concerned about whether it was appropriate to deliver some courses – notably, Christian Ethics – via the cyberschool format.

All faculty stated that Crestview had been created to serve the needs of the students of SSD and many of them also believed that its existence had positively impacted on SSD overall. Crestview provided a flexibility which seemed to be beneficial to both students and the school system. In addition, administrators perceived that the students benefitted from better instruction in the on-line context. However, teachers revealed a situation which amounted to a pedagogical crisis. They felt disempowered as instructors due to the loss of voice and identity and were concerned about their lack of control over students’ interactions with course materials. They were quite defensive when describing their on-line instructional strategies and often stated that they had set out to recreate the environment of their traditional classroom for the on-line context. Consequently, while they appreciated being removed somewhat from their traditional roles as disciplinarians, teachers expressed concern at having been removed from their traditional instructional roles. Yet, none of the faculty believed that training or inservice related to the pedagogy of on-line instruction would be of significant use to them.

All faculty also appeared to believe that the on-line environment required a different role for students. Instructors believed that students felt empowered by the opportunities afforded them in the on-line environment. It seemed that students made more contributions to the class and that these contributions were of higher quality. In addition, on-line students appeared to be more willing to accept a greater responsibility for their own learning. However, students had also begun to depersonalise their teachers and appeared to expect computer-like precision and uniformity from them and, at the same time, 24-hour personal access to their teacher whenever they did have a problem or wanted to ask a question.

Community, particularly in the cyberschool “pod” is likely to become a hotly-contested issue in the future. On one hand, the administrators expressed the intention to disband the group of teacher/developers and to disperse them to smaller “pods” housed in each of the traditional schools. On the other hand, the teacher/developers emphatically averred that the key to successful course development – particularly given the lack of school system support for the program – is the support of the community of cyberschool course developers.

Chapter 5

Presentation and Discussion of Phase II Data

The two-fold purpose of this study was to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. The data from phase I (perceptions of faculty associated with the virtual school under study) were presented in Chapter four. This chapter focusses on phase II, the perceptions of students enrolled in Crestview Cyberschool – the virtual school under study. The researcher collected data for this phase in two ways (as described in Chapter three): first, a survey (see Appendix C for the survey text) was prepared and administered on-line via Crestview's website then, a series of focus group interviews (see Appendix C for the interview schedules used) was conducted with students selected at random from the virtual school enrollment lists in three of the four main schools serving as home schools for the students. This chapter begins by presenting relevant respondent demographic information. Then, student perceptions of the nature of instruction in their virtual school, their response to that instruction and the nature and patterns of communication in their virtual school are presented. Finally, student perceptions of the nature and processes of community in Crestview Cyberschool are presented.

The Respondents and Their Contexts

At the time of study, Crestview Cyberschool boasted a student enrollment of 244. However, as the study progressed, it became evident that a considerable number of students, while officially enrolled in the school, were not actively participating in their courses. In fact, there were 83 inactive students leaving a total of 161 students who were regularly participating in individual courses in Crestview – a number that is also somewhat deceiving. Since 10 students were taking two courses, the actual number of discrete students enrolled in Crestview was 151.

The on-line survey became available to students on November 12, 2002 and remained available until December 18, 2002. During that time, 71 students (47 % of discrete students) completed the survey. The demographics (see table 5.1 for a summary) of this respondent group were as follows:

1. there were twenty-six males and forty-five females;
2. two students were in grade 8, two were in grade 9, sixteen were in grade 10, twenty-one were in grade 11, twenty-six were in grade 12, two were upgraders (already graduated but repeating a course to improve the original grade), one was taking grade 12 over a two-year period and one student indicated that he had trouble focussing in regular school (although both were grade 12 students - making the number of Grade 12 students twenty-eight);
3. fifty-nine students were enrolled in one course and eight students were enrolled in two courses; and

4. sixty-one students indicated that they were taking cyberschool courses for the first time and eight students were “veteran” on-line students, having taken at least one on-line class earlier.

Table 5.1

Demographics of Survey Respondents

Gender	Grade	Number of classes	First class?
Males - 26	Grade 8 - 2	One class -	Yes -
Females - 45	Grade 9 - 2	59	61
	Grade 10 - 16	Two classes - 8	No - 8
	Grade 11 - 21	Did not respond - 4	Did not respond - 2
	Grade 12 - 28		
	Upgraders - 2		

As mentioned earlier, the researcher also conducted four focus group interviews with students in three of the schools – SSD#1, SSD#2, and SSD#3 – associated with Crestview Cyberschool. At SSD#1, all students from the cyberschool enrollment list who had not completed the on-line survey were invited to participate in the focus group. Four students chose to participate. At SSD#2, all 35 students enrolled in Crestview were asked to attend a meeting at the Student Guidance Office. Of those eligible, 12 students chose to attend the meeting. These students were separated into two groups: those who had completed the survey and those who had not done so and the researcher conducted an interview with each group separately. At SSD#3, the in-school administration contacted students who had been inactive, unsuccessful, or who had

chosen to drop out of their cyberschool courses sometime during the semester and invited them to take part in a focus group interview. The researcher met with the eight students who chose to take part.

Student Responses and Perceptions

Students' responses and perceptions covered a wide range of issues. The data related to these issues is separated into three sections suggested by the research questions related to phase II. Students' perceptions of the nature of instruction and their responses to that instruction forms one section. Students' perceptions of the nature of community within their cyberschool courses as well as within the cyberschool overall form another section. The third section relates to the patterns and nature of communication in the cyberschool. Since communication is related to both of the other two categories, it is presented first. Please note that the survey made extensive use of a five-point Likert-type scale and that, unless otherwise stated, all statistics are reported assuming that scale (see appendix E for a statistics table indicating means and standard deviations). In addition, data analysis included several crosstabulations in an effort to examine whether there were gender differences with respect to students' perceptions of particular aspects of virtual high schooling. These statistical analyses revealed that, in general, there were few gender differences. However, in those cases where there were gender differences, those differences are reported.

Communication Patterns

Student perceptions of the communication patterns in Crestview are reported here in two sections. First, the students' reports about how the various communication

tools were used during the day-to-day operation of the school and the individual classes are discussed. Then, a discussion of the level and nature of communication reported by the students is presented.

Use of Communication Tools

The communication patterns in Crestview Cyberschool revolved around the uses of three primary communication tools available in WebCT: the bulletin or message board, the chat room and the school's internal email system. Students were asked questions about the frequency of use of each tool, the specific uses of those tools, as well as the overall importance or usefulness of each tool in their course(s). Thus, the following discussion is separated according to headings suggested by these three tools.

Bulletin board. The bulletin board (sometimes called message board) in WebCT allows it to be used for a wide variety of functions. All of the courses used the course-wide message function (accessible by all students and teacher of a particular course) permitting messages to be posted and read by everyone in the course. Many of the courses also partitioned the message board to create private spaces for students to use as a reflective journal (accessible only by a particular student and his or her teacher) and group discussion spaces (accessible by a particular group of students and the teacher).

When asked the frequency of bulletin board communications with their teachers, 56% of the respondents indicated that they either never or rarely communicated with their teachers via the bulletin board while another 19% were neutral (the mean was 2.53

with a standard deviation of 1.5). This indicates that bulletin board communication between students and teachers was a relatively infrequent occurrence.

The frequency of student to student communication via the bulletin board had a similar mean (2.93) but, opinions were decidedly split (standard deviation 1.53). While 21% of the students indicated that they never used the bulletin board to communicate with each other, 31% indicated that they frequently did so. Nevertheless, when asked about the overall importance of the bulletin board to their on-line school experience, 41% of the students indicated that the bulletin board was either important or very important resulting in a mean of 3.57 (standard deviation 1.43). Finally, when asked whether they would use the bulletin board even if they were not forced to do so, 47 students (66%) indicated that they would use it.

Student comments regarding the bulletin board suggested that they saw it primarily as a means of student-to-student communication as well as for personal reflection; however, they also indicated that it was occasionally used by their instructor to communicate with the whole class at once. Some students saw their private bulletin board journals as a bridge between the community of the face-to-face classroom and the isolation of the cyberschool environment; particularly, as an aid to the development of a more personal relationship between individual students and their teacher. One student stated, "I like having an on-line journal – it helps me get to know the teacher and the teacher gets to know me through it too."

A common student perception was that communication in the bulletin board area was frequently of high quality and that, when composing a posting, they often felt

an obligation to produce their best work. As noted by one student, “The postings there [on the bulletin board] are very good – they are well thought-out.” Another student noted that the bulletin board provided almost a comfort zone that aided them in the transition from their regular face-to-face classrooms to their virtual classes. She stated, “Discussion postings make it feel more like a [regular] classroom. [When I post something] I’m thinking, ‘someone’s going to read this, I’d better put some effort into this.’ I also like to read others’ [students] postings.”

Finally, students indicated that the bulletin board provided a forum for them to collaborate and assist each other in their learning tasks by fostering a sense of independence. In addition, the bulletin board seemed to be valued as a conduit of community. In an illustration of this point, a student pointed out, “The bulletin board is really good. Especially for doing group projects and to ask other students questions [sic] about assignments.”

Chat room. Crestview had a total of six different chat rooms available in each course. There was one general chat room available to the whole class, four separate rooms accessible to all course participants but intended for smaller group chats, and one room (called “The Commons”) which was accessible to all students and staff of Crestview cyberschool. In general, the phrase “unrealised potential” was indicative of students’ observations about the chat rooms. This generalisation is illustrated with the student statement, “The chat room has a lot of good potential but nobody’s ever in there”. In fact, 58 students (82%) indicated that they had never used the chat room to

communicate with their teachers or with their fellow students. Further, 63% (45 students) stated that they would not use the chat room unless forced to do so.

While the students recognised the challenge presented by effectively using a synchronous communication tool like a chat room in a context which provided asynchronous educational services to students in various time zones, they seemed to believe that the obstacles should be faced and overcome. Many students suggested that, in order to create a sense of community in Crestview, all students “should be required to log on at a particular time” to facilitate chat room sessions. In addition, some students saw a need for a variety of synchronous cyberschool services. For example, one student opined, “It would be awesome to have on-line masses, retreats, lectures, etc. It would also be awesome to have set times when people will go to the chat rooms – no one ever goes there.”

E-mail. Each course in Crestview used an internal e-mail system permitting class participants to send e-mails to each other without using external servers or e-mail addresses. When one wished to send an e-mail to another within his or her course, he or she would simply click “compose message”, type the message or attach the required file, then browse for the intended recipients.

E-mail appeared to be very highly valued among the students in Crestview, particularly as a means of private communication between them and their teachers. A large number of students (85% – mean of 3.69) indicated that they frequently used e-mail to communicate with their teachers. However, 80% (57 students) indicated that they rarely or never used e-mail to communicate with fellow students. Yet, 67 students

(94%) stated that they would use e-mail even if not forced to do so and 62% saw e-mail as vital to their success as on-line students.

Level and Nature of Communication

Students were asked a series of questions regarding the frequency and nature of communication they experienced as members of Crestview cyberschool. In addition, they were asked to estimate the importance of various types of communication to their successful completion of the particular courses they were enrolled in at the time of study. Therefore, the following discussion of the level and nature of communication in Crestview is separated into these two sections.

Frequency and nature of communication. Students were asked to compare their experiences in “traditional” schools to their experience in Crestview and estimate the amount of communication they had with both their teacher and their fellow students. A majority of students (51 students or 71.8%) indicated that they had experienced either a little less or much less communication with their on-line teachers as compared to their face-to-face teachers. In fact, one student stated, “Teachers should communicate with their students more.” However, several students indicated that there was less communication with their teachers because more communication was unnecessary. In fact, some students observed that less frequent communication with their teachers had enhanced both their self-confidence and their feelings of accomplishment. For example, one student wrote, “I know that there are people around [classmates and teachers] to talk to if I need them ... but its nice to have the freedom to work alone.”

During the focus group meetings, many of the students indicated that the volume of communication between students and teachers was significantly lower but, the quality of communication was often better. One student observed, "... more of the communication is giving us feedback instead of nagging us to get our work done." Actually, many students indicated that they appreciated the nature of feedback provided in their cyberschool classes. In particular, they appreciated that they could check on their progress any time they wanted to since each course provided a real-time listing of student grades. In addition, some students noted that the "turn-around time" for assignments was very quick in cyberschool as compared to their face-to-face classes. In illustration of these points, one student noted, "I like that we can see our grades any time we want and the fact that we get our assignments back so quickly – usually the next day – this is really good!"

The nature of communication in the on-line school also appeared to provide some students with an avenue of interaction not usually available to them in their face-to-face schools. For example, one student argued that for shy or quiet students, the amount of communication with their on-line teacher was significantly higher than it would likely be in a face-to-face classroom. She stated, "In a classroom, I do everything on my own – I don't ask questions [but, on-line, I feel comfortable to ask things anytime I want]." Another student echoed this sentiment but added that communication with the teacher on-line was easier in a way because the relationship between teacher and student was different. "[On-line] the teacher is a lot more like a co-worker and there is a lot more room for personal interaction with the teacher." Some

students also remarked that, while “there is not as much communication as in a face-to-face class ... students get as much as they ask for.” One student offered the following example:

For most assignments, I just send them in and I get a mark with a few comments back. One time, I wrote about how hard it was for me to do the assignment and how proud I was of it and I got a lot of really helpful comments back. I think that teachers judge how much feedback to give each student according to how much they think the student wants.

Nevertheless, 50 students (70.5%) indicated that regular communication with their teachers was either very important or vital to their successful completion of their on-line courses.

With respect to the amount of communication among students, 62 students (87.3% with a mean of 1.52 and a standard deviation of .89) indicated that they had either a little less or much less communication with their fellow students in their on-line courses as compared to “regular” face-to-face courses. Many of the students indicated that, indeed, there was less interaction among students but, that was exactly how they wanted it. One student noted, “One of the main reasons I went into cyberschool was to get away from group projects – I don’t like having to depend on other students to get their work done for mine to be complete!” Another said, “I’m tired of so many students fooling around in class when I want to work.”

When asked to estimate the importance of regular communication with their fellow students, the responses were a bit surprising. Given the frequency of student observations about being frustrated with current face-to-face classroom communications with their peers, one might expect students to observe that

communication with their peers was unimportant. However, only 28 students (40%, mean 2.77) indicated that regular communication with other students was unimportant while 22 students (31%) were neutral about the importance of communications with other students.

Students were also asked to identify the initiator of a majority of class discussions. The responses in this regard were also surprising. According to 27 students (39%), the teacher was the most frequent initiator of discussions while 10 students (15%) indicated that there were no discussions at all. This suggested that 46% of the discussions were begun by students themselves yet, as stated earlier, a majority of students were either indifferent toward this type of communication, felt that it was unnecessary, or stated that it did not take place at all.

Summary: The Nature and Quality of Communication

The participants in Crestview Cyberschool tended to use two main communication tools: bulletin boards and e-mails. Bulletin boards were used primarily as a means of student-to-student communication as well as for private and small-group interaction. E-mail, on the other hand, was used primarily as a means of student-to-teacher communication.

While pointing out that communications among cyberschool participants were not as frequent as they would likely be in a traditional classroom, several students indicated that they were generally satisfied with the nature of communication. In particular, they believed that the deficit between the amount of communication they would have in their “regular” classes and that which they received in their on-line

classes was due primarily to the lack of superfluous communication in the cyberschool context. In fact, they tended to believe that they received more feedback from their teachers because the teachers were less occupied in “disciplining” or “nagging” them to get their work done. They also believed that the feedback they did receive was both more timely and more informative and that their teachers were willing to communicate more frequently with them if they wished.

The Nature of Instruction and Student Response to That Instruction

When one considers the students’ perceptions of the operation of Crestview cyberschool, the nature of instruction encompasses a wide variety of issues. However, these issues seemed to fall into two main categories: issues related to technology and those factors that affected student learning. Consequently, the data are also reported in two sections. The first section relates to student perceptions of both the impact and the role of technology in the cyberschool experience. The second section includes factors that students believe either facilitated or impeded their learning.

The Impact and Role of Technology

Technology, as one might expect, plays a significant role in the context of a cyberschool. In order to address the impact of technology on learning, students were asked questions about where they did their cyberschool tasks, the quality of the technology supporting the courses, the role played by technology in their courses, and the nature and amount of preparation that a student would need in order to successfully manage the technology inherent in a cyberschool course – particularly one that uses the

WebCT platform. The presentation of the data related to technology in Crestview follows headings derived from these questions.

Where do students work on cyberschool tasks? All students indicated that they appreciated the freedom and flexibility afforded them by the fact that they could access their courses from anywhere and at any time they wished. Consequently, many also stated that they accessed their courses and worked on educational tasks from a wide variety of locations.

Nearly all students (97%) indicated that they worked on cyberschool tasks at home. In fact, one student observed that it would be nearly impossible to take part in a cyberschool class without access to the course while at home. He lamented, "Because I don't have Internet at home, I had lots of trouble keeping up with the class and probably won't pass the course."

Many students also reported that their home schools had facilitated their involvement in cyberschool by allowing them to use the computers in both the school libraries and computer labs. Consequently, 55% of the students reported that they worked in their school libraries and 32% stated that they had used the school computer labs to gain access to their cyberschool work.

Several students (15 or 21 %) also reported that they had accessed their courses from a number of other places. These students indicated that they had used computers at the public library, family members' homes, Internet cafes, parents' and relatives' offices, local business colleges, and the learning assistance rooms in their home schools. In addition, two students – one a nationally ranked high-performance athlete

and the other a competitive dancer, reported that they had accessed their courses from hotel rooms using their lap-top computers.

Actually, many student stated that the flexibility of being able to access their course from anywhere coupled with the absence of time constraints as to when they could “log on” was, perhaps, the best thing about being in a cyberschool. One student put it this way, “I get to do as much as I want when I want where I want.”

Quality of technology. Students were asked to rate the overall quality of a number of the technological aspects of their cyberschool experiences. In each case, they were asked to rate these technologies.

A majority of the students (84%) rated the quality of the technology supporting the courses (i.e., the server, etc.) as being poor (the mean of the responses was 2.53, standard deviation 1.05). One student wrote, “I think that if I had not been on the computer every time it crashed (slight exaggeration) [sic] it would have been good.” Many students reported a high degree of frustration with the server and with accessing their courses; yet, the school reported that there had been infrequent and short-lived server problems during the semester.

Many of the students (91%) reported a similar dissatisfaction with the WebCT platform. In fact, the mean was 2.20 (standard deviation 0.99). It appeared that the students found it difficult to navigate through the WebCT platform and to determine how to complete their tasks. Many students expressed a desire for a site map. They felt that much of the confusion they had experienced would have been ameliorated if there had been a simple and clear way to learn “how to get around” their courses. Another

oft-cited WebCT problem was that when students re-sized dialogue boxes while writing bulletin board postings, e-mails, and exam questions, their partially written responses were lost and they had to start all over again. This quirk contributed significantly to student frustration, particularly in connection to writing exams.

Students were also asked to rate the ease of writing exams on the WebCT platform. Again, many students (83%) expressed dissatisfaction (with a mean of 2.53 and a standard deviation of 1.24) with the exam writing process. During the focus group interviews, students reported that, in addition to the window resizing problem mentioned above, the structure of the exams often made it very difficult to complete them within the time limit allotted – particularly if they were accessing the course using a dial-up modem. It seemed that many of the teachers chose to deliver exams one question at a time and “with a dial-up modem, this takes forever!” Students observed that if the whole exam were sent at once, they would be able to complete their exams with much less frustration.

Students’ rating of the technology used in their courses (i.e., web pages, animations, graphics, etc.) was also quite low (mean of 2.27). Students indicated that most of the pages in their courses were just static text and, therefore, somewhat boring. One student put it this way, “If I were making a cyberschool course, I would hire some super-hackers to jazz up the site.” He went on to observe that students are used to seeing “flashy” sites because they spend a lot of time on the Internet therefore, “... cyberschool should suit the youth using it.” Some students indicated that a few animations using Macromedia’s Flash or other animation software had been used by the

course designers. However, they observed that while the animations were interesting, they were not very useful. “[We need] more practical tutorials ... it would have been better if it was a practical walkthrough [sic] of the tasks I had to perform rather than Flash movies showing me.”

Finally, students were asked to indicate the frequency of technical difficulties that they experienced during their cyberschool experience. Given the students’ views about the various technologies in Crestview, one might reasonably expect students to indicate that they had experienced a large number of technical difficulties. However, that was not the case. In fact, a majority of students (82%) indicated that they had experienced very few technical difficulties (mean of 2.5, standard deviation of 1.24). Thus, while the students had reported a high level of dissatisfaction with the technological aspects of their courses, they had actually experienced few technological difficulties.

The importance of technology to cyberschool. Students were asked to discern whether technology was integral to the educational activities that they were required to complete in cyberschool or just the means of accessing their courses. Student responses were fairly evenly split between the two choices. In fact, a number of students stated that the role of technology was actually either context or course dependent.

Those students who saw technology as being integral to cyberschool stated that teachers had made a strong link between their courses and the information available on the Internet. One student stated, “Technology plays a key role in literature courses because the Internet has so much information. I enjoy my course because I can look

information up and also do assignments in the same place.” Another student indicated, “You have to be able to find things outside of the course in order to complete assignments.” In some cases, students reported that cyberschool experiences had enhanced their facility with the Internet. For example, a student pointed out, “Technology is a key resource to the course. It allows you to learn in a new way but also opens up the cyber world to you even more. You discover things about the Internet and your computer you never knew and may not have even found out.” Finally, one student also pointed out that, because of the nature of the tasks in cyberschool, one had to use already-existing technological abilities as well as to develop new ones quickly in order to be entirely successful. He observed, “It [technology] is very key because you need to be able to use technology to complete the course to your own full potential. If you do not know how to use the technology you are probably not performing to your full potential.”

For those students who saw technology as a means to access their courses, the dominant opinion was that their on-line teachers had just used technology to present their lectures (usually as static text) and that most of their educational tasks could just as easily have been done off-line. For example, one student stated, “For me, technology is simply the way that I get access to this course. Although I have much experience with computers, I find that there is not much technological aspects [sic] to the cyberschool courses.”

Those students who indicated that the role of technology was either context or course-dependent opined that the nature of some courses made technology either

integral or ancillary to the educational tasks required of students. The following statement is indicative of the general thrust of students' opinions: "It [technology] is how you gain access to the course but also allows you to access many resources depending on your course." A particularly poignant comment was offered with the following observation:

I would have to say that it depends on what course it is, if its mathematics for example, the computer is just the device I use to figure out equations. However, if I am doing Information Processing, then the computer plays a much more active part. I have the opportunity to learn the course and then try it out for myself on the computer.

The importance of an on-line learning preparation course. With respect to the importance of a training course or session which would introduce students to the idiosyncrasies of navigating a WebCT course, students opined that such a course was necessary. A majority of the students (75% with a mean of 3.28 and a standard deviation of 1.28) supported the notion of a preparation course of some kind. However, when asked about the quality or usefulness of the preparation course currently used by Crestview, 49% indicated that Crestview's course had not been useful and another 20% had been neutral about its usefulness (mean 2.78 and standard deviation 1.41). Student comments such as, "It is important to have one (a preparation course) if it is a good one" and, "A good WebCT orientation would have been useful" were typical of student opinions in this regard. Thus, one may glean from these observations that students saw value in a preparation course but, not necessarily in the one they completed.

Information necessary in a preparation course. As a follow-up question, students were asked to identify what information they thought should be incorporated

into an on-line school preparation course. Many students suggested that all that was necessary was a brief overview of practical issues about taking a WebCT course. For example, one student observed, “It [a preparation course] should explain what kind of assignments the course involves ... and how to operate all the learning tools [in WebCT].” This perspective was echoed by another student who opined, “I think that an introductory course should show the students ways to navigate the course ... and show them how to use all the on-line equipment (e.g., the e-mail system and the drop box, calendars for assignment [due] dates, etc.) and anything else that the standard course contains.”

In addition, some students indicated that since the on-line course structure puts more onus on students to complete assignments in a timely fashion “instead of the teacher constantly nagging you to do them”, a introductory course should include some activities designed to develop time management skills. One student offered the following illustration:

[While I think that an introductory course should include] how to write an exam (how the java script works, saving your answers, etc.) and how to use the communication tools effectively, the introductory course should also include time management skills. A small quiz should be given on the information that was read, and even a small discussion with others in the cyberschool before they start their course.

Students also identified other practical issues that they would have found useful. They suggested that a student needs to know “how to use a computer for cyberschool – [for example] what to do if the computer crashes, typing instructions, an overview of Netscape and WebCT, a description of on-line chatting, and Internet etiquette.”

Instructional Issues

Students were asked questions about the nature of instruction, the specific instructional techniques used in their courses, what their preferences were, and the impact these instructional techniques had on them as learners. In addition, students were asked to compare their expectations about being involved in an on-line course to their actual experiences of being in that course, what prospective students needed to know about on-line education, what additional information was necessary once a student had begun a cyberschool course, did they enjoy their cyberschool experience, and whether they would recommend a cyberschool course to their friends. Finally, they were asked to list and explain the services they felt were necessary for students to be successful in an on-line school setting and why they chose to pursue an on-line course as well as the ways in which their cyberschool experiences had made them better learners. The following discussion of student perceptions of instructional issues is organised according to headings suggested by the above questions.

Nature of instruction and instructional techniques. Most of the students indicated that, for the most part, instruction consisted of a series of static text-based pages that appeared to them to replace the lectures that they were familiar with in their face-to-face classrooms. In these pages, information was presented and they were usually expected to complete particular “homework” tasks in response to that information. In addition, many students reported that they were required to complete projects of various types – usually alone but occasionally as part of a group. Many students also indicated that they had been encouraged or, in some cases, required to take

part in discussions both in their individual courses and in Crestview's chapel (which was accessible to all students).

Other instructional techniques were also identified. Many students indicated that their teachers had created audio files as an alternative or sometimes as a companion to text-based presentation. In fact, one student appeared to be aware of audio files in one of his friends's classes and wished for them in his own class. He humourously lamented, "... They should have an animation on the screen reading the notes to me :) pleeeeeeease [sic]." Some English Language Arts students indicated that they had been required to listen to and work with a series of audio files that, together, made up a play (rather than read the play). Several students also made comments such as, "I like the animated pix [sic] ... Keep up the good work!" expressing appreciation for the animations that their teachers had incorporated into the course materials. In fact, it seems that a few teachers had made use of animated presentations (either as Flash movies or as viewlets) to present or explain particular concepts and often as a companion to explanations in static text.

While some students indicated that they had been required to work on group projects, the majority of students indicated that they felt more like an individual scholar rather than as part of a class or group. The following statement from a student is indicative of the comments in this regard, "I feel like I'm learning on my own, although its not any different than if I were sitting in the classroom, there's just not really any interaction with the other students – although there is opportunities to [sic]."

Students indicated that they wanted to have input into the kinds of tasks they are asked to complete in their cyberschool courses. A majority of students (86%, mean 3.7 and standard deviation 1.12) indicated that, particularly in the new milieu of cyberschool, students should have input into their educational environment and tasks. However, 65% of the students indicated that they had little or no opportunity to have input into their current courses.

Student preferences. Students were nearly universal in their appreciation of the independent and flexible nature of cyberschool courses. The following comments from one student encompasses much of the diversity of views in this regard:

The number one thing that works for me is the flexibility:

- there are no deadlines (or flexible ones)
- you can work whenever you want for how ever long you want
- cyberschool helps to solve regular school scheduling problems
- you can use or create spares in the regular school for homework or going to work.

Students also tended to prefer the independent nature of most of the cyberschool courses. They appeared to appreciate the opportunity to “work things out” on their own but also appreciated the feeling that they were encouraged to contact their teachers if and when they had problems. During one of the focus group interviews, three female students simultaneously stated, “What doesn’t work for us is group projects! We went in cyberschool because we don’t like group projects. We think that there are too many group projects in our regular classes.” Another oft-cited preference was that students liked to be able to work whenever they wanted and for as long as they wanted. Student

observations such as, “It was a great experience to learn at your own pace and within your own time frame [sic]” were common.

Finally, students stated that they preferred teachers to be available but to remain unobtrusive in the sense of allowing them to complete the assigned tasks in their own time and in their own way. In fact, they saw the cyberschool experience as being empowering both from the point of view of developing responsible attitudes toward their studies as well as giving them a new voice in their own learning. One student stated that 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 the students, leads to “assignments being more honest because we know that we won’t have to read them aloud or be singled out in class.” At the same time, students felt empowered to seek assistance from both their peers and their teacher in a way that does not exist in the traditional classroom. A student observed, “I am not afraid to e-mail my teacher and ask for help.”

However, students also expressed difficulties in getting the kind of help that they needed at a given time. Often they found it difficult to explain exactly what their problems were or their requests were misinterpreted by their teacher. One student expressed the problem this way, “E-mailing your teacher and waiting for a reply can sometimes be frustrating. Its sometimes hard to explain your problem or the location [in the course] of your problem in writing.”

What services do student want from a cyberschool? Students were asked to indicate their opinions of the importance of a variety of potential on-line school services. A large majority (91%) of the students (with a mean of 4.17) indicated that they wished to have access to a wider range of cyberschool courses. The other services with a relatively high mean related to the desire for a course content help desk (mean 4.02, standard deviation 1.02) and a technical help desk (mean of 3.89, standard deviation 1.10).

Interest in other services was also present but not quite as strong. For example, 40% (mean of 3.14, standard deviation of 1.26) of the students indicated that they would welcome the availability of an on-line career counsellor. Several students (50%) were also somewhat interested in the potential of real-time on-line lectures from their teachers (mean of 3.09, standard deviation 1.36). However, some services such as an on-line chaplain (mean of 2.78, standard deviation 1.40), an on-line personal counsellor (mean of 2.83, standard deviation 1.31), and access to video conferencing (mean of 2.69, standard deviation 1.35) were not deemed particularly important.

What were students learning? Students were asked to indicate the extent to which they thought that they had learned or were learning a wide range of skills and competences. These skills and competencies included:

1. learning more about computers,
2. learning how to work with and manage tasks which require large amounts of information from a wide variety of sources,
3. learning more about the students' cultures,

4. learning to collaborate more effectively – particularly from diverse backgrounds,
5. learning to analyse and synthesise,
6. learning to become a more active learner,
7. learning to communicate with large numbers of people,
8. learning to prioritise, plan, and manage for results,
9. learning to create relevant, high-quality products, and
10. learning to work with and choose appropriate technologies for particular tasks.

In general, many students believed that they were either learning or enhancing many of these skills and competencies. In particular, 78% of the students felt that they were learning the ability to work with large amounts of information (mean of 3.17, standard deviation 1.12), 76% felt that they were gaining the ability to effectively analyse and synthesise information (mean of 3.27, standard deviation 1.24), 77% believed that they had become a more active learner (mean of 3.45, standard deviation 1.26), 75% opined that they had developed new time- management skills (mean of 3.28, standard deviation 1.20), and 79% stated that they had developed the ability to choose appropriate technologies for particular applications (mean of 3.24, standard deviation 1.15).

What did students expect from their cyberschool experiences? The vast majority of students expected that the main advantage that cyberschool would hold for them would be that they would be able to work independently and at their own pace. Many

of the students also pointed out that cyberschool provided them with the opportunity to take particular classes they either wanted or needed to take but could not take in their conventional schools due to scheduling difficulties. One student noted, "The ability to do the class when and where I needed to [was important to me]. For the most part, I could do some of the course at home, which really helped when I had other things I [needed] to get done during [regular school hours]." Another student pointed out that cyberschool "freed up my schedule so that I could take the classes that I wanted to ... and it gave me a spare [period] in the next semester which I can use to complete work."

A surprisingly common student perception was that it would be advantageous for them to take cyberschool courses because the cyber-courses would be easier and have a reduced work load as compared to regular face-to-face courses. Student observations such as, "I thought it would be easier material and there would be fewer assignments and studying" and, "[I thought] that the courses and assignments wouldn't be so hard or different" were common. In fact, one student wryly pointed out, "When I first started, I expected to do next to no work and get credit for it."

Nevertheless, many students observed that the workload in their cyberschool courses had been at least as heavy, if not more so, than their regular courses and that the time commitment required for a cyberschool class was also similar to that of a regular course. Actually, 80% of the survey respondents indicated that the time required of them for a cyberschool course was either the same or less than for a face-to-face course.

When asked about the disadvantages that they expected from a cyberschool experience, the most common student response was that the nature of on-line education

made it very easy for them to procrastinate with respect to completing their school work. Many of the students also pointed out that they expected to have difficulty motivating themselves to complete their work. One student pointed out that, at the beginning, he was afraid that he "... would get behind because I can always find other things to do." Similarly, another student pointed out, "I knew that I would have a problem working on cyberschool since it got put 'on the back burner'."

Students also seemed to be concerned about the impact that cyberschool might have on the nature of their relationships with their teachers. For example, some students were wondering about whether they would have access to their teachers and what that access would look like. In particular, many of them expressed concern that they would not be able to get the help they might need. In addition, students pointed out that they valued the personal relationship that often develops between student and teacher and feared that this type of relationship might not develop on-line. This point is illustrated by a student in the following manner, "I miss the interaction between classmates and even my teachers during projects and even just throughout the work. We can communicate in e-mail, but it seems rather impersonal, making the course focus only on work [instead of] growth between students and teachers."

Finally, some students expressed concern about the impact that learning via the Internet might have on them. A few students indicated that they feared that they would face a heavier workload in their on-line courses which would lead to lower grades. However, one student stated, "I expected to get lower grade but, the advantages

outweigh the disadvantages – and, my grades are only a couple marks lower than they would have been otherwise.”

Most students indicated that their experiences with cyberschool had essentially matched their expectations. For example, one student pointed out:

I have learned that the effort in cyberschool is relatively close to the effort needed in a regular school course. I love being able to put off working on cyberschool if something like an essay or project comes up in regular class, but feel that it is too easy to just forget about cyberschool or procrastinate about it since it can so easily be put aside.

Many students indicated that they had been pleasantly surprised to discover that, in contrast to a regular class, there was much less “wasted time” in cyberschool. For example, a student argued that this was the best thing about cyberschool. She stated, “[I appreciate] that I don’t have to put up with all the crap you have to deal with in a regular classroom situation.”

Not all students were pleased with their experiences, however. Some students expressed the opinion that their cyberschool courses had taken more time than a regular course would have required. Other students stated that they had found the course materials “boring” or “too challenging”. One student stated that her cyberschool experience was not only disappointing but also completely different from what she expected. She stated that cyberschool was “... the total opposite [of what I expected], I expected a challenge and maybe some new skills now, all I have is a class that if I don’t pass or finish I owe the school \$500.00. So, yes, I am extremely disappointed.” In addition, several students indicated that they had chosen to drop out of their courses because they had been added to their classes as much as three weeks later than their

fellow classmates and they had felt intimidated by the amount of work and their perception that they had little time to catch up. When asked to explain why they had been added late, some students stated that they had decided to take the on-line course after the semester started but, others indicated that they were told that they were added late because of a back-log of paperwork at the cyberschool office and it just took that long to process their application.

What does a prospective on-line student need to know? Many students suggested that, in order to be successful, students must be very honest with themselves with respect to their personal characteristics – particularly in relation to their abilities to motivate themselves to complete tasks and abilities to effectively manage time. Comments such as, “A student should have good work habbits [sic] ...” were common. It seems that students felt that if students had problems motivating themselves to complete tasks, that they should simply not register in a cyberschool course because, in contrast to face-to-face classes, “... there is no teacher egging you on to get your work done” in a cyberschool class. In fact, one student argued that the best thing about on-line education – its flexibility – was also its biggest potential danger.

The students need to be given more strict commands when using cyberschool. The work needs a lot of motivation and most of the time it is really lacking. Most people I know will most likely learn self-motivation after high school ... this could be a problem for many students.

Students frequently mentioned that a prospective on-line student needs basic computer skills before enrolling in a cyberschool course. An initial skill set that

includes, “information retrieving, word processing [and] basic computer skills” were deemed essential for cyberschool success.

In addition, many students pointed out various issues regarding work load that prospective students should be made aware of. For example, some students opined that cyberschool work required a time commitment that may exceed their expectations. In explaining what he thought prospective cyberschool students needed to know before registering, one student observed, “Students will need to have at least a solid two hours of working time for cyberschool for every two days. Without this, it is easy to fall behind since cyberschool courses are very independent.” Other students indicated that cyberschool classes differed from face-to-face classes because, “You actually have to do the assignments and regular work.”

Further, students must be able to read and follow directions and be willing to ask for help in order to be a successful on-line student. In fact, one student pointed out, “You have to read everything even if it doesn’t seem important” while another mused, “Basically, [a student needs to know] how to look around and not be afraid to check things out.” Many students also stressed that students must take the responsibility “to keep in touch with the teacher and try to build on-line relationships with their fellow students” on a regular basis.

Student satisfaction with cyberschool experience. In an attempt to gauge student satisfaction with their cyberschool experience, students were asked a series of questions related to whether they would take another on-line class, if they would recommend an on-line class to their friends, why they chose to take cyberschool

courses, and what they liked about their on-line class. A majority of the students (62%) indicated that they would take another cyberschool class while 72% stated that they would recommend a cyberschool class to their friends.

A large number of students indicated that they liked the cyberschool environment because they were frustrated with the amount of time “wasted” in their regular face-to-face classes. One student’s comments were illustrative of the general theme of responses in this regard, “In class, we waste so much time. Teachers don’t actually teach much in the classroom. We spend a lot of our time in the classroom waiting to work [e.g., get directions, waiting for student to settle down, etc.]. I am tired of other students fooling around when I want to work.” Another student cited boredom with regular school as a reason for taking cyberschool courses. She said, “A face-to-face class can only move as fast as the slowest person – I’m often bored.”

Some students also indicated that they had chosen to pursue an on-line course due their dislike of some of the common instructional techniques used in their regular face-to-face courses. For example, a contingent of students indicated that they did not agree with the amount of time spent in face-to-face classes “reading aloud”. They expressed frustration with the length of time it often takes to read something relatively short. One student observed, “It often takes a whole class to read something I could have read in a few minutes.”

Several students from the focus groups indicated that they thought that there was too much group work in their face-to-face classes which had led them to explore the on-line school environment. Actually, this disdain for group work was one area that there

was a gender difference; however, the nature of the gender difference was somewhat surprising. An examination of the survey results revealed that 20 of the 44 female respondents (45%) preferred to work entirely alone on their on-line courses while only 7 of the 26 males (27%) preferred individual work over group work. In fact one female student stated, "I went into cyberschool because I hate group projects. We do too many group projects in our regular classes. Somebody always gets stuck doing all the work and everybody gets the same mark."

These comments lead to a discussion of the reasons that students had chosen to enroll in a cyberschool course. Flexibility and convenience were the most popular comments. The survey results seemed to agree with this perception. When asked about their main reason for taking a cyberschool class, 25 students (35%) indicated that the convenience afforded them by the on-line school platform was the main reason. Additionally, 17 students (26%) indicated that they wanted to take an extra credit and the cyberschool allowed them that opportunity. In addition, 8 students (12%) indicated that they were interested in taking a cyberschool class because they just liked computers.

A fairly significant indication of student satisfaction is held in the comment, "It's a refreshing change!" Many students believed that the cyberschool had not publicised its existence widely enough and that too much misinformation about cyberschool existed among the students in their schools. The following student comment is illustrative of this point:

It [cyberschool] needs to be more 'hyped up'. Students don't have good information about the cyberschool. My friends think that its way harder and I heard that the smartest student in the school had trouble with cyberschool – which made me scared to take a class but, now that I'm in it, its great! I think everybody needs to know how great it is!

Another student observed, "Cyberschool is the best thing ever made! Even if there were no changes and it stayed just the way it is, it would still be great!"

In what way does cyberschool help students to be better learners? Students observed that on-line learning had impacted on them in a number of ways. A common response was that they felt a higher level of responsibility for their own learning. For example, a student stated that, "[Cyberschool] requires me to pay careful attention to what I am reading and try to comprehend what I am reading". According to the students, with this increased responsibility also comes increased independence and freedom yet, students have to develop the ability to "stay on task" and to "become a self-motivator and learn to work and learn in a different way." In fact, some of the students stated that cyberschool had helped them to "be self-motivated for the first time!" One student stated, "The onus is on us. Students are required to work things out on their own. This makes us learn better."

Many students indicated that when they worked on-line, they took more time to think through things and to compose their work. For example, one student observed, "It [cyberschool] allows me to take the time that is needed to complete an assignment instead of just rushing to get it done for the due date." Another student said, "I make sure that I take the time to double check and triple check now!" A third student wrote:

You have time to sit, and think about what you just read, or wrote. Rather than have it go in one ear and out the other, [sometimes] you have to read something quick in class and [have to] move on [before you have understood it] in a uniform pace – [In cyberschool] you are in the comfort of your own home and you can concentrate better and reflect on the material without distractions.

Students were quick, however, to point out that this extra time did not necessarily translate into higher marks. However, it did provide the opportunity to add more depth to their learning helping them to “better understand the materials and have time to really learn everything”.

Students also reported that their cyberschool courses had helped them to become more active learners which, in some cases, had actually spilled out into their lives outside school. One student observed that cyberschool “forces you to take your own time and responsibly and maturely make decisions involving your education. Instead of listening to a teacher all day.” Another student stated,

It [on-line education] is completely independent learning, and the skills flow into other areas of independence of your life. There is a confidence and sense of importance that comes along with it. It also opens up new areas, like searching the Web, and I believe it also prepares us for what will be a computer-dominated world.

A third student observed that not only did cyberschool encourage active learning but also it encouraged students to become empowered learners who learned how to learn. “Cyberschool helps you to be a better learner by forcing a student to read and interpret information on their own. In this respect, they become more independent workers since they have no one to rely on.”

Finally, many students indicated that they felt that they learned more or better on-line because their teachers had provided them better information or clearer

directions in their on-line courses. The following comments from a student are illustrative of the general thrust of opinions in this regard. She stated that cyberschool is “a refreshing change ... because we read more modern and more up-to-date materials and teachers give us much better directions on-line – we know exactly what to do.”

Despite the glowing praises of many of the students, a small number of students indicated that cyberschool did not make them better learners. One student observed, “It [cyberschool] doesn’t [make me a better learner], because my teacher still always explains things in a rude manner.” Another student believed that cyberschool made it too easy for students to cheat on their exams. He stated, “It [cyberschool] doesn’t [make me a better learner], it gives you the answers pretty much and you really don’t have to know anything about computers other than just how to open the page with the answers and copy them to the test without reading all the garbage [course materials].”

Summary

In sum, students observed that, while technology certainly plays a role in providing them with access to their cyberschool courses, it does not, itself, play a particularly significant role in those courses. Many students expressed frustration with the much of the technical aspects of Crestview Cyberschool. In particular, they found the server to be troublesome and finicky and WebCT to be confusing and quirky at times. They also found the quality of the web-pages in their cyberschool courses to be inferior to the quality of the web-pages that they were familiar with on the Internet.

Nevertheless, students appreciated the flexibility and freedom afforded them by their cyberschool courses. Many of them felt empowered by the independence and

autonomy as they strove to figure things out for themselves. While they believed that prospective cyberschool students should be made aware of the time commitment necessary for success in the virtual school context, they did not see the time commitment necessary for success in the cyberschool context as being significantly different from that of a face-to-face course. They also believed that students should know that they have to take more responsibility for their own learning which includes getting their work done on their own, managing their time responsibly, and being more willing to contact their teacher when there is a problem.

Students felt that they should have input into the types of tasks they were asked to complete. However, some of them preferred a more directive model in which they would simply be told what to do. Nevertheless, many students also pointed out that the directions for completing tasks were better and more complete than they were used to in their face-to-face classes. In addition, they tended to prefer independent learning activities over group projects. Yet, they were intrigued by the possibility of synchronous interaction with their peers in the chat rooms and felt that each person associated with the cyberschool should be required to prepare a personal web-page to facilitate interaction and to establish a personal identity.

In general, students believed that their experience with cyberschool made them better learners. They felt that their cyberschool experiences had fostered in them a sense of independence and that they had also learned how to learn on their own by working things out for themselves.

Students' Perceptions of Community

Discussions regarding community in cyberschool elicited very strong opinions among students. In fact, during the focus groups, issues of community were the most hotly debated topics. Opinions ranged from whether community in an on-line high school class was relevant or, even, necessary to the view that a feeling of community was essential to successful learning. Nevertheless, this section is separated according to the following typology: students' experiences of community and students' perceptions of the potential of community in their on-line schools.

Students' Experiences of Community

In response to questions regarding their experiences of community, students tended either to identify particular communication patterns as community or to describe particular instances that they felt denoted the existence of community in their classes. This section is organised according to headings suggested by these two primary headings.

Communication as community. Students tended to identify the bulletin or discussion board as the primary vehicle for the creation of community among themselves in Crestview Cyberschool. A student observed, "Discussion postings make it [the on-line class] feel more like a [face-to-face] classroom – we read each others' comments and, as we are making our own, we think, 'Someone is going to read this, I'd better get it right.'" Another student echoed this observation with her comment, "I really enjoy reading other students' postings. I find the stuff really interesting." In fact, one student pointed out that he had "made quite a few new friends in the cyberschool."

Thus, through bulletin board postings, students believed that they were building community. However, according to one of the students, “You don’t really get to *know* each other very well” (emphasis in the original), in the cyberschool.

The notion of getting to know each other was particularly important to the students in the context of their teacher getting to know more about who they really were. Actually, the establishment of a personal identity that would be revealed primarily to their teachers appeared to be of paramount importance. Students, in general, had concerns about their perception that the only information that teachers get about their personalities comes from their assignments. For example, a student pointed out that her “assignments don’t show her sense of humour or what she’s really like – they’re just academic and serious.” An interesting illustration of the importance that students place on establishing their personal identities came from up during a focus group interview. A pair of students revealed that they were members of my class and they argued that community was not all that important to them. But, as the meeting was concluding, one of them stated that she was happy that I had met them and that I was able to see “what they were really like”. In some cases, students also indicated that they had sought out their on-line teachers during their day in their home school both as a way of getting “instant” assistance and as a method of establishing a personal relationship.

Many students suggested that they would like to see additional vehicles provided by the cyberschool to facilitate student-teacher relationship building. One student pointed out, “The personal homepage tool could help – I’ve done some [work]

on mine and I think I got across more about me.” Other students suggested that, as a matter of course, everyone associated with Crestview (both students and teachers) should be required to create personal web-pages or profiles to facilitate this transfer of personal information and, thereby, help to build community. For example, one student stated, “I’d have a mandatory student [and teacher] profile – with a picture, a little background maybe, and some personal information as well ... just to get an idea of what fellow classmates are like.”

When asked what they would do to encourage the development of community in their cyberschool classes, many students responded with suggestions related to enhanced interactions and communication patterns. For example, 12 students suggested that on-line school classes should require regular mandatory synchronous chat-room sessions. Comments such as, “I would make it required to use the chat-rooms at a certain time” were common. In addition, students also suggested that teachers could play a significant role in facilitating the development of community via the communication tools by framing and initiating engaging debates that would attract student attention and reveal their “true identities” through their opinions about the topics. One student suggested, “I would make sure that there were always interesting discussions going, and that there were assignments that included having to post things mandatorially [sic] to encourage interaction.”

Some students favoured a system that would build community by being given the opportunity to work on group projects that would combine on-line work with occasional face-to-face meetings. A student opined:

To encourage a feeling of community and belonging for class participants, I would set up projects for the students to physically come together and work on. In turn, for example, a Christian Ethics class could gain their community service hours and still be able to build a somewhat personal relationship with their classmates. To me, this is an important aspect that cyberschool lacks.

Another student suggested that, while community would be built through group projects, it would be further enhanced if students had the opportunity to just get together to interact:

I would make sure that students communicated with each other by giving group projects or other things like that. Also, I would let the students know that at the end of the course, they would all get to meet in real life (if they wanted) and have a little party with pizza and pop ... something like that.

Some students indicated that their involvement in cyberschool had impacted upon community in their face-to-face schools. They revealed that they often tried to find fellow regular school students who were taking the same cyberschool courses to collaborate with on their cyberschool tasks. For example, one student noted, "Me and several friends [sic] are taking the same course, and we end up doing all our labs together."

Instances that denoted community. A frequent observation was that teachers had created activities which had successfully contributed to a feeling of community. In general, these activities tended to involve group projects in some way. In some instances, students had been required to introduce each other or themselves. In the case of peer introductions, students explained that they had been required to find a partner in their class and introduce him or her to the rest of the class. These introductions, according to many students, had "helped us to get to know each other ... but, it would

have been better if the information had been put into some kind of grid [or table] so that it was easier to keep track of it [the information].”

Many students indicated that they felt that cyberschool could be just as interactive as their face-to-face classes were. A student observed, “On-line, it can be just as social. Its just different ... [for example] we had a lot of good discussion about the name of our group. I thought it was really good!”

Some students indicated that, while they could not cite specific examples, Crestview had done a good job of creating community among the students and staff. One student wrote, “I don’t know [what else could be done to encourage community]. So much that I can think of has already been done” while another student observed, “I would do just what is being done in my course right now.”

While many student appeared to appreciate the efforts made by Crestview with respect to community-building, a significant segment of the respondent group stated emphatically that they were “not interested in community – I just want to get the work done.” One student wrote, “I would not do anything [to create community]. A feeling of belonging is not important, completing the course and doing your work is. Feeling community is irrelevant.”

On a similar note, some students indicated that they had been attracted to cyberschool because they were independent workers and liked to work alone. One student noted, “You asked ‘What doesn’t work?’ Group projects don’t work! I went in cyberschool because I don’t like group projects.” Similarly, another student added:

[I would not do] as much as the current one (Crestview) is doing [to create community]. Most students take cyberschool as a means to get ahead and to try something different. You sign on independently but you are asked to participate in group surveys and message board replies. I would leave most of it optional and make it more of an individual course rather than as a whole [class].

Summary

While they seemed to be indifferent toward the value of interpersonal relationships with their peers, students were very concerned that they be permitted to develop a personal relationship with their teachers and that their teachers get to know their “real” personal identities. Nevertheless, they tended to identify the bulletin board as the primary venue for peer-related community building. In particular, they felt that they were able to get to know each other through the bulletin board postings during their on-line discussions. Their relationship with their teachers, however, appeared to be very important to them. While I suspect that their primary motivation for developing a personal relationship with their teachers was driven by their hope that such a relationship might translate into higher grades; students did, nevertheless, stress that they wanted their teachers to know what they were really like.

Students were intrigued by the possibilities afforded by the creation of personal web-pages or, perhaps, other means of establishing a personal identity. However, they felt that these means were under-utilised.

In general, while students recognised 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."

Chapter 6

Summary, Analysis, and Discussion of Findings

It [the Internet] will alter our conceptions of student independence, the nature of teachers and teaching, raise questions about authority, issues in the distribution of educational opportunities and their accreditation, [and raise] questions about the content and structure of curricula under changed patterns of participation. (Blake & Standish, 2001, p. 8)

Blake and Standish, in their comments above, suggest that the Internet will have a radical impact on education by transforming virtually every process, action, and attitude associated with educational endeavours. In a sense, they envision a best-case scenario or ideal structure for the virtual school by encapsulating, in a concise statement, the aspects of the educational enterprise that must change in order for the virtual school to achieve its full potential. In a way, this study was an attempt to determine the extent to which the potential described in the literature had been realised in a Canadian-based virtual school. Therefore, the two-fold purpose of this study was: to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. The following research questions were developed to address the following purposes:

1. What is the nature of instruction in a virtual high school?
2. What is the nature of community in a virtual high school?

3. What school system-level structures and supports facilitate the development of a learning community in a virtual high school?
4. What do students and faculty perceive to be the strengths and drawbacks of learning in a virtual high school?
5. What structures and supports do students believe to be necessary for them to be able to learn effectively in the virtual context?
6. From the New Economy point of view of seeing students as users or consumers of education, what prompts students to pursue virtual high schooling?

This chapter summarises, analyses, and discusses the findings in light of the literature reviewed earlier by answering each of the above research questions. Finally, it closes with a section that explores a question that, while not formally a research question for this study, informs the practice of virtual high schooling.

What Is the Nature of Instruction in a Virtual High School?

The nature of instruction required in a virtual high school was addressed in this study in both phases since both faculty and students had important perceptions about the nature of instruction in the virtual high school under study. Thus, the following is a composite of comments from both of the respondent groups. This section is organised according to the following headings:

1. The role of the teacher
2. The role of the student
3. Instructional strategies

4. The impact of those strategies on students
5. The impact of those strategies on faculty

The Role of the Teacher

In general, teachers stated that they saw their roles as learning facilitators or guides – and that this role was in some way *different* from their roles in a face-to-face classroom. This finding appears to agree with much of the literature in the field. For example, Dolence and Norris (1995) implied that the teacher's role in the on-line or virtual context is different from that of the traditional classroom in that students in a virtual school ought to be able to pursue knowledge precisely when that knowledge is relevant rather than as an a priori condition. In this structure, "a teacher is no longer seen as an authority but as a resource to be used" (Griffin & Brownhill, 2001, p. 64). In other words, the teacher must shift his or her focus from transferring knowledge (the traditional instructional posture) to facilitating the creation of knowledge by guiding and stimulating the student's search for knowledge.

While the terminology used by teachers in this study was essentially uniform, a closer examination of their perceptions actually reveals that many of them did not see facilitation of learning in the same way. In some cases, teachers stated that they 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 Gardiner (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, teachers revealed a more teacher-led transmissional perception of facilitation with statements like “I tell them where they need to be”.

Student statements indicated that they favoured the mediator role of their on-line teachers. They tended to prefer to solve problems for themselves but appreciated the freedom to contact teachers when they deemed it to be necessary. However, students did state that they sometimes found it difficult to get the help they needed because it was difficult for them to explain, in precise terms, the nature of their problems.

The Role of the Student

Administrators and teachers alike believed that the virtual school environment encouraged students to take a more active role in their own learning by becoming independent scholars who have “learned how to learn”. This perception resonates well with the literature on the subject. For example, Thornburg (2002) observed that students must learn how to take responsibility for their own learning if they wish to be successful in the New Economy. Further, Dolence and Norris (1995) argued, “... the learner is [now] responsible for value received (p. 109).”

Students appeared to be comfortable with this new role – in fact, they viewed the responsibility as being empowering. The students in this study agreed, in large part, with those in Barker and Wendel’s study (2001) in that the most successful students in the virtual school context were self-directed learners with clear expectations and goals and who chose the virtual school as a “first resort” (p. vx). In general, however, the students in Crestview 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. In contrast to Barker and Wendel’s findings, even those students who had been unsuccessful indicated that they were also cognizant of both the allure and the effects of procrastination, and they appeared to accept the responsibility to choose as well as to accept the consequences of their choice. Yet, they suggested that the online school could do more to assist them in their transition to autonomous learning. In particular, they suggested that the school ought to provide time-management instruction or, at least, suggestions and that, while the teachers had provided just the sort of open-ended environment they had expected, they wished to have slightly more defined parameters with respect to deadlines and time-management issues.

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. The literature suggests that, 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 Crestview Cyberschool 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 Crestview. Several teachers, myself included,

described group activities which were intended to address the need for collaboration among students. In addition, several students also indicated that they had been required to participate in various types of group projects. However, students preferred to work individually. In fact, for some students, one of the main reasons for having enrolled in a cyberschool course was to avoid the collaborative or group assignments prevalent in contemporary classrooms – an observation that concurs with Barker and Wendel's (2001) findings that most students choose on-line schooling because of their (or their parents') dissatisfaction with conventional schooling.

While some of the teachers indicated that they either had incorporated some inquiry learning projects into their courses or had intended to do so, other teachers stated that they had designed their courses around text books (either on-line or in traditional formats) intending to ensure that the students covered the required course content. Since most teachers stated that they had tried to re-create the tasks and information from their regular classroom for the on-line environment, one could assume that those who used inquiry-based instruction methods in their regular classrooms also did so in their on-line classes.

Several students stated that they had been asked to complete various open-ended assignments that would fall into the category of inquiry-based instruction. This finding might suggest that inquiry-based instruction was common in Crestview. However, an examination of the respondent demographics revealed that the students who identified this type of learning activity were not spread evenly over the classes and were, in fact,

enrolled in only three of the classes. Thus, inquiry-based instruction was not common among Crestview's faculty.

The administrators indicated that staffing decisions for Crestview had been based on teachers' face-to-face instructional abilities rather than on their facility with technology. In addition, according to the teachers, little if any effort or resources had gone into providing the cyberschool staff with training in either computer use or the pedagogy of on-line instruction. Thus, one can infer that the way technology was used was not ranked high in importance – at least to those who conceived of the cyberschool in SSD school division. If this inference is accurate, it must be questioned according to both the literature on the subject and students' comments about technology use in Crestview.

Fullan (2001) opined that for lasting change to occur there must be a reculturing of the organisation, otherwise people tend to use new technologies in the same manner they used old ones. Further, according to Thornburg (2002), teachers who work in fields outside of their expertise tend to rely on more traditional methods of instruction. In view of the fact that few of the teachers involved with the cyberschool had much computer use experience let alone any formal training in the pedagogy of on-line instruction or web-site design, it is not surprising that students rated the quality of technology used in their courses as poor. Many students stated that their courses consisted of a series of "... static text-based web pages" that were boring. The student comment that the cyberschool should "... suit the youth using it" agreed with Kolb's (2001) observation that cyberschool designers must remember that the young people

taking cyberschool courses spend a great deal of time surfing the Internet and, therefore, have developed a keen sense of the ingredients necessary for a quality web site.

Consequently, 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 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 the cyberschool courses were largely teacher-directed, a common student observation was that they did experience considerable flexibility over when, where, and, in some cases, how they worked on their cyberschool courses. They stated that this flexibility forced them to develop better time-management skills, and to foster a new independence that did not exist in the traditional school environment.

According to the students, this new independence led to better and more authentic assignments for at least three reasons:

1. Students had nowhere to hide and teachers could track what had been done,
2. Students felt more freedom to experiment with new activities, and
3. Students knew that they would not be “put on the spot” to read their work in front of the class.

In addition, students believed that they were learning many of the key skills and competencies identified in the literature (e.g., Holford & Nicholls, 2000; McNair, 2001; Thornburg, 2002) as being essential New Economy skills such as: the ability to work

with large amounts of information, the ability to analyse and synthesise, and the ability to choose appropriate technologies for particular applications.

A2 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 face-to-face courses as well as the lack of open-ended inquiry learning tasks in many of the on-line courses, suggest that Crestview appeared to be catering to independent learners rather than creating them. This finding parallels Barker and Wendel’s (2001) findings. They found that there were typically two types of students who choose virtual schooling. The first, who, incidentally, is typically the most successful, is the self-directed learner. The second, who typically is not successful, is the under-achiever. In Crestview, students who were active and self-starters had been very successful and were generally positive about their on-line school experiences.

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 even done before. Students felt that they did better work on-line because they could take their time to compose their answers and comments. Researchers such as Reyna et al. (2001) suggest that it is possible that students may, indeed, perform better in an on-line

context. They theorised that this higher achievement may be the result of students spending more time interacting with the subject matter than they might otherwise have done. The findings of this study agree with Reyna et al. Many students indicated that they spent more time on their cyberschool work than they would on a regular face-to-face course.

Wolfe (2001), on the other hand, theorised that students perform better because the Internet provides a learning environment that is so different from the traditional learning environment that it promotes greater cognitive engagement and, therefore, leads to better quality work. This may also be a factor in Crestview. Many students stated that they found cyberschool to be more difficult than “regular” school – most often because they were forced to “work things out for themselves”. 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 internalised more of the materials and processes contained in their courses.

It is also possible that, as suggested by McNair (2001), students produce better work in the on-line environment because it is more egalitarian and leads to greater freedom. Barker and Wendel (2001) found that students were 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. The students – girls in particular – stated that they liked the opportunity to get to know others in their courses without the

awkwardness of face-to-face meetings. Perhaps, this greater personal freedom also leads to greater engagement and, ultimately, to higher achievement.

The Impact of Instructional Strategies on Teachers

Both administrators and teachers stated that instruction was better in the cyberschool. Teachers were required to spend very little time on discipline and were free to spend more time providing feedback and encouragement to students – a finding that coheres with much of the research in this field. For example, Muirhead (2000), in his study of on-line teachers in Alberta, found that teachers were generally positive about their on-line teaching experiences. Among Barker and Wendel's (2001) findings was that teachers indicated a high level of satisfaction with their on-line experiences, in part, because of the absence of conventional school behavioural problems. In Crestview, teachers indicated that they felt their increased instructional time led to a more personalised instructional environment and enhanced the quality of interactions between students and teachers. In addition, the increased instructional time seemed to lead to better self-actualisation among teachers in that they felt satisfied with their performance. Despite the high level of frustration among teachers at the lack of time provided by the school division for their cyberschool duties, the teachers appeared to be happy to be involved and tended to feel positive about their roles as on-line teachers. Rourke (2000) found that students found the on-line school environment to be "trusting, warm, friendly, disinhibiting, and personal" (p. v). This perception appeared to be supported by Crestview's students' perceptions. While a majority of students stated that they actually had less communication with their on-line teachers, in contrast to their

face-to-face teachers, they indicated that the quality of communication was better because it was in the form of more timely, frequent, and helpful feedback.

These observations cohere well with much of the research in the field. For example, Gardiner (2000) predicted that computers could provide teachers with an opportunity to offer personalised instruction in a degree not possible in a traditional classroom. Van Horn (1997) also predicted the creation of an individualised, student-centred approach to instruction in the on-line environment. However, he suggested that, in order for the student-centredness to reach its full potential, instructors would have to allow students more freedom to choose their own educational paths and to give them input into the kinds of tasks they are asked to complete.

Students, for the most part, stated that, while they sometimes had choices such as which essay topic to do, they had not had the opportunity to have input into their courses in any significant way. Most teachers also stated that they had not structured their courses to allow for student input. In fact, one teacher asked, “How would they [students] know what they need and what they don’t? That’s my job.”

Interactions with parents also seemed to have an impact on teachers in Crestview. Muirhead (2000) found that “online education in Alberta is characterised by more extensive interaction with parents than in traditional classrooms” (p. v). The teachers in Crestview did not specifically indicate concerns over their interactions with parents but, A4 indicated that he had initiated a policy requiring teachers to communicate with parents via a weekly parent email – which had been met with some resistance by the faculty. In addition, he indicated that parents were encouraged to log

on the their children's courses to both monitor their progress and find out 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.

What is the Nature of Community in a Virtual High School?

There were two distinct types of community in Crestview cyberschool: the community among faculty and the community of the virtual classroom. Consequently, the following discussion of community is separated into two corresponding sections.

The Faculty Community

Because the nature of the community that developed among the faculty of Crestview was described extensively in Chapter 4, I present a synopsis and analysis of that material through the lens provided by the literature reviewed in Chapter 2. In addition, it became clear during the data collection process that the existence of the cyberschool had a significant impact on the community of SSD school division overall and several examples of that impact were also included in this section.

With the exception of the senior administration (principal and superintendent), the staff of Crestview Cyberschool was housed together in a large room in a building connected to SSD#1. 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 staffs of several of the existing high schools in SSD and nearly all of them also had duties at their home schools. According

to A4, these dual roles had made an impact on the cyberschool community in at least two ways:

1. First, 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.
2. Second, these dual roles also 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 time.

The lack of a common schedule for cyberschool staff created a need for an innovative way to communicate. Consequently, A4 had begun using e-mail and paper memos "From the Big Red Chair" 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 Crestview.

The interpersonal capacity. A4 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 as well as all of the software necessary for the 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 theorised 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 Crestview's faculty group played an important role in mediating the considerable learning curve inherent in beginning 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, the Crestview group 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. A4, who was the project leader at the time, 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 to both participate and contribute. According to Mitchell and Sackney's model, then, the affective climate was built because people in the group felt that their contributions were welcomed and valued (affirmation) and their participation was explicitly sought (invitation).

Nevertheless, a threat emerged with respect to the long-term stability of the interpersonal capacity. This threat developed because of the lack of effective communication between the senior administration and the teacher/developers over their visions of the future of the cyberschool community. A comparison between the

statements of the senior administrators and the statements of the rest of Crestview's faculty revealed a significant lack of congruence between their respective visions of the future of cyberschool community development. While superintendents indicated that they intended to split up the instructional faculty and house them in smaller "pods" at the various home schools, A4 and the entire instructional staff indicated that the common work area and the community that had developed within that work space was essential to successful cyberschool course development. This disagreement, arising from a lack of communication, could potentially become a serious rift within the community.

Poor communication about Crestview also had a negative impact on the larger community of SSD. The existence of the cyberschool, according to many of the phase I respondents, had been questioned by several "regular" school faculty from the beginning of the project. Questions over the appropriateness of delivering certain courses via the Internet had raised questions about the cyberschool's impact on the school community. A1, A2, and A3 indicated that they had not done a good enough job of communicating the vision and mission of the cyberschool project to the faculty of the school division.

The foundations for a cognitive climate, another facet of Mitchell and Sackney's interpersonal capacity, had been laid within the cyberschool as well. According to many of the teachers, there had been a great deal of discussion among the staff at Crestview over the years about what an effective on-line course should look like and how one should be delivered. Everyone appeared to feel free to contribute to the

discussion. However, the discussions had not led to consensus and each person ultimately had his or her own perspective of it.

The organisational capacity. Mitchell and Sackney (2001) suggested that, in order to develop the organisational capacity for a learning community, special attention must be paid to the socio-cultural arrangements and the leadership structures within the group. With respect to the socio-cultural arrangements, a learning community must address the isolationist structures typical of most contemporary organisations and encourage collaboration and shared decision making. With respect to the important decisions, the structural arrangements within Crestview were not different from the traditional school structures in place in the rest of SSD. In fact, many of the respondents raised questions about whether the traditional model of school governance would work in the cyberschool environment – which appeared to be drastically different in its operation. A4, among others, expressed frustration over the process of decision-making that was currently in place. He felt that it was 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 in the cyberschool organisation indicated that the primary purpose of the cyberschool was to serve the needs of the students of SSD. However, beyond that agreement, there seemed to be a definite rift between the view of the senior 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 [senior 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 organisations must have a special relationship permitting growth and, at the same time, organisational stability. In an attempt to provide for that stability, both A3 and A2 saw their roles as gate-keepers. They believed that it was up to them to "put the brakes on" and keep Crestview's growth and evolution under control and to ensure that it continued to fit within the organisational confines of SSD. In other words, the administration wanted to ensure that, while the cyberschool was different, it did not become *too* different.

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 to the theoretical underpinnings of those positions. In the case of Crestview cyberschool, 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. TD4, for example, pointed out that he had recently noticed the need for change in his course delivery model. Through both the dialogue with other Crestview staff and the biennial course self-evaluations, he had realised that his course was organised around an on-line text book that encouraged the basic information transmission approach to instruction common in face-to-face classrooms. While he

believed that on-line learning should be different, he was not sure how to achieve that difference. He expressed desire to explore what would best be described as an inquiry method of instruction, but had not yet conceptualised a way that would ensure that the students would learn the required content. In short, he realised 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 Crestview's developers, it is not surprising that many of them have resorted to teaching on-line in much the same way as they teach in a face-to-face 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) theorised that a learning community which "fosters dialogue" about the implementation of innovations could ameliorate implementation difficulties and, perhaps, could enhance the internal search. TD4's reflections support this theory. The internal searches had begun but had not, as yet, achieved completion.

The external search, as described by Mitchell and Sackney, had only begun to take place at Crestview. The veteran teachers had begun to look at each other's courses as well as at courses offered by other institutions as they reviewed their own offerings. Some (e.g., TD4 & TD5) found their approach wanting and had begun the process of change while others (e.g., TD1 & TD2) realised that their courses followed a more traditional approach but had decided that they were comfortable with that fact.

The Community of the Classroom

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.

An examination of the students' comments regarding the formation of community revealed that they were not disinterested in building community but rather, due to their busy and complex lives, they did not have the time to devote to building community. Thus, many of them simply identified the common pragmatic interest to complete their courses and move on.

According to Mitchell and Sackney (2001), a key facet of a learning community is collaboration. Many of the students stated that they had no interest in collaborative activities. However, others acknowledged that they saw their fellow students as potential sources of information, and they occasionally posed questions on their course's bulletin board and answered others' questions.

Nevertheless, while students seemed somewhat disinterested in building community with their peers, there was interest in building a strong student-teacher relationship. In particular, the students seemed to be concerned that their true identities were not entirely revealed via the assignments they completed, and that there should be a forum for further explication of their true identities. In fact, their interest in establishing a personal identity sparked interest in the provision of means by which

their personal identities could be shared. For example, some students suggested that the development of personal homepages or, at least, personal profile pages could be promoted as a means of building community. In addition, some students stated that occasional face-to-face meetings should be organised – at least for those students who lived in the school's home community – to facilitate collaboration and to allow community to be established.

While community had not been particularly strong within the individual courses, a community of interest had developed in Crestview's chapel. The chapel was accessible by all students enrolled in at least one course and both A4 and TD6 observed that a number of students had gathered there to interact and discuss a wide variety of topics.

What School System-level Structures and Supports Facilitate the Development of a Learning Community in a Virtual High School?

An answer to this question is not immediately evident in data collected from Crestview Cyberschool. Administrators and instructors alike indicated that, aside from some release time and the provision of high-speed Internet access at their homes, SSD school division had provided very little support. Nevertheless, an examination of the accounts of the creation of Crestview as well as the teacher/developer comments and the literature on the topic – particularly, Fullan's conception of the three phases of the change process (initiation, implementation, and institutionalisation) – yields some useful information.

Initiation

Mehlinger (1997) suggested that, at the initiation stage, an organisation should form a broad-based committee to lead the planning process and to define the mission of the new entity. He warned, “A small group ... should not decide key issues without the consultation of others” (p. A23). The administrators stated that a steering committee had been recently formed to sustain and define Crestview’s continued growth. However, according to S2, that steering committee – composed entirely of administrators and computer consultants – was, “probably too narrow”.

A second major issue related to initiation identified in the literature was the need for professional development to create an informed faculty and to encourage faculty to question and change what and how they think (Bull et al., 1997; Fullan, 2001). As stated earlier in this chapter, faculty had very little access to professional development related to on-line education. While the school division had provided generous support for the faculty to attend an annual conference sponsored by a provincial on-line consortium in a neighbouring city, Crestview’s faculty was left largely to their own devices to determine the program’s pedagogy and course construction.

A factor that was not specifically identified by the literature as necessary for initiation but which seems to fit in this category, is the entity of time. Byun et al. (1998) observed that, in comparison to traditional courses, it takes approximately 2.5 to 3 times longer to develop an on-line course. Muirhead (2000) found that, in the on-line school context, teachers’ workloads were substantially increased due to the “complexity

of the content development process, instructional design philosophies, content development tools, and rapid adoption of integrated on-line delivery tools” (p. v). In the case of Crestview, the teachers had been provided with the equivalent of one hour per day to work on course development – an amount that the teachers had found to be inadequate. In fact, when asked what supports were necessary, the first thing that every one of the teachers said was “more time”. The administrators acknowledged that they were aware that the amount of paid development time was inadequate, but they had chosen not to make adjustments. The reason for this decision was that it would reduce the total number of courses that could be developed, and they appeared to be more concerned about how those who had come first would react to others getting more time.

Implementation

There are two primary factors identified in the literature that affect implementation: adequate technical support and ongoing instructional support. I would add a third – a clearly-articulated vision. The development of an appropriate vision for a cyberschool, one might argue, would be a time-consuming process. However, for illustration purposes, one might say that the vision might be to create an educational environment that is different from the traditional school structure, that uses technology in authentic and interesting ways, and that challenges students and faculty alike to revisit their preconceptions of knowledge and information in light of the Information Age and the New Economy. The vision for Crestview was, at best, fuzzy. When asked what the vision was, most faculty said that it was to serve the needs of the students of SSD and to create the best cyberschool possible. These are fine goals and a good vision

but, what specific student needs was Crestview serving? Further, what, exactly, constitutes best practice in the context of cyberschools?

In terms of providing adequate technical support, SSD was lacking. A4 stated that he had been requesting funding for technical support staff for the cyberschool since the beginning (he had yet to receive funding for it). However, it must be mentioned that the school system had provided sound server support from its downtown offices and the school system had provided first-class computer hardware and software for the cyberschool faculty to use while at the pod. Nevertheless, the cyberschool staff were frequently left to themselves to provide technical support for each other.

According to Becker (as cited in Bull et al., 1997), relevant and on-going technical and moral support is the most important determining factor to successful implementation of educational technology. Yet, Crestview's teachers seemed to have done well considering the lack of this kind of support they had received. In fact, when asked about this kind of support, most of the faculty had not even considered the possibility. Actually, they tended to assume that instruction on-line was essentially the same as face-to-face instruction and, since they were experienced teachers, they tended to believe that they did not need any instructional support.

Institutionalisation

Sabatier and Mazmanian (1979) suggested that institutionalisation could be enhanced by paying attention to five key strategies: a sound theoretical base, an unambiguous policy directive, well-trained leaders, active support from the school board, and an on-going indication that the innovation was of high priority. The

theoretical base in Crestview was meagre. Little work had been done regarding pedagogical structure. There was a degree of active support from the school board in the sense that some course development time had been allotted for each course and the members of the cyberschool had enjoyed more generous in-service funding in the form of annual all-expenses paid attendance at a nearby on-line consortium conference as compared to other teachers in the system. However, the administrators indicated that, while the cyberschool was a priority, they were careful to avoid over-supporting it relative to other programs in the school system. A1 stated that cyberschool was just another program and the funding and support given to it could not show favouritism.

What do students and faculty perceive to be the strengths and drawbacks of learning in a virtual high school?

The following discussion of the strengths and drawbacks of a virtual high school is separated into two sections. First, a composite of the views of both faculty and students regarding the strengths of the virtual school is presented; then, a composite of the views of both faculty and students regarding the drawbacks of the virtual school is presented.

Strengths of the Virtual School

Chief among the strengths of virtual schools, according to many of the authors (e.g., Barker & Wendel, 2001; Blake & Standish, 2000; Cortada, 2000; Dolence & Norris, 1995; Joinson & Buchanan, 2001; Rutkowski, 1999; Sandbothe, 2001; Thornburg, 2002; Van Horn, 1997) is the flexibility afforded both educators and students by the ubiquitous availability of the medium of the Internet and the removal of

the temporal and geographical restrictions associated with the traditional structures of schooling. These observations were borne out by the respondents in this study. The faculty felt that one of the key reasons for having developed the cyberschool was to provide a more flexible and user-friendly learning environment for the students of SSD. Administrators, in particular, stated that they recognised that students' lives are currently more complex and busier than was previously the case; and they felt that the cyberschool presented a viable option for students who, for whatever reasons, were unable to pursue their desired educational programs. In-school administrators (e.g., A3 & A4) pointed out that the existence of the cyberschool alleviated several students' class scheduling problems and provided them with the opportunity to individualise their class timetables. This arrangement permitted them to take precisely the course they wanted, regardless of when and/or if such courses were offered in their home schools. Students concurred with these observations and, particularly in the focus group interviews, they identified flexibility as the major strength of the cyberschool platform. However, while the flexibility identified by the faculty did get some attention from the students, the latter gave it a more subtle alternative meaning. According to the students, the cyberschool provided them with a flexible learning environment that allowed them to work when, where, and for how long they wanted. In particular, they appeared to appreciate the flexibility to put off cyberschool work from time to time when they became too busy, and then to return to the cyberschool tasks in the middle of the night or during a weekend marathon-session if they chose. In fact, according to TD4, the

occasional student chose to do very little during the regular term but to complete the entire course during the two weeks of the Christmas break.

Faculty also identified another key strength of the cyberschool – its overall positive impact on SSD. According to Fullan (2001), changes can have both intended and unintended effects on organisations. In the case of Crestview, many of the intended changes came to fruition: students did have a flexible learning environment; the virtual school had, indeed, been created (according to A1, the project was embarked upon partially to see if it could be done); and, partnerships with smaller rural school divisions had begun to develop. However, it was the unintended effects that were the most interesting. For example, the existence of the cyberschool had positively affected the instructional practices of many of the teachers in SSD because the students who had taken cyberschool courses demanded certain changes in their face-to-face classes. As a result, new teaching strategies such as inquiry-based instruction, technology-focussed resource-based instruction, and more flexible assignment structures were gradually being adopted by teachers who were not directly involved with the cyberschool project. In addition, technology use in the classroom became a focus of teacher in-service and training in the school division, as a result of the presentations given to various teacher groups by the cyberschool's staff members.

In addition to flexibility, students identified a number of other strengths associated with taking a cyberschool course. Thornburg (2002) argued that, in the on-line school, students would become more self-actualised learners. Based on student comments, this principle seemed to be supported. Many students stated that the

flexibility inherent in their cyberschool experience had prompted them to develop a new independence empowering them to perform more effectively and to take more responsibility for the work they did. Another identified strength was that when students were ready to work, they *could* work. To them, it meant that they would not have to wait for the teacher to tell them what to do, or for the class to settle down for work to begin. In short, in the words of one of the students, “[In a regular class] we spend a lot of time waiting to work”; however, in the virtual school, students could simply log on and begin work immediately.

Drawbacks of the Virtual School

In general, neither faculty nor students identified major weaknesses in the virtual program. However, faculty did state that the cyberschool work tended to have an obsessive quality associated with it. This obsession had led them to work on their cyberschool courses during their holidays, breaks, and weekends – a finding that coheres well with Barker and Wendel’s study. Potentially, this behaviour, if left unchecked, could lead to faculty burnout and/or sickness. Teacher/developers also pointed out that their home schools, particularly SSD#1, had not yet accepted the challenge presented by the new environment of the cyberschool. Fullan (2001) suggested that, during times of change, organisations tend to force-fit innovations into pre-existing organisational constructs. At SSD#1, in particular, the teachers stated that their participation in the virtual school project was not valued and that they felt that they were being taken advantage of through unreasonable teaching schedules and

expectations that they attend all face-to-face meetings and events at their home school even when they took place during their scheduled cyberschool time.

Putnam (2000) argued that the advent of computer and Internet technology might lead to an erosion of personal social capital. This observation may have some truth for this study, in light of student perceptions about their cyberschool experience. Many students stated that one of the reasons they had chosen to enroll in a cyberschool course was to get away from the group projects and collaborative activities that they felt were too pervasive in their face-to-face classrooms. This preference suggests that Putnam may be correct about his social capital predictions and that a drawback of the virtual school is that it allows students to isolate themselves from their peers. However, the student respondents also pointed out that they had been given assignments requiring them to go out into their communities and to engage in such activities as to attend and review concerts and art shows, to conduct mock research projects, and to perform community service – all of which which appears to temper the social capital concerns somewhat.

What structures and supports do students believe to be necessary for them to be able to learn effectively in the virtual context?

Many of the supports that students identified as being necessary for their success as on-line learners appeared to be related to technical aspects of on-line learning. For example, students were concerned that they learned how to submit assignments and navigate the WebCT platform. At the same time, they were also concerned about several issues that related to developing interpersonal relationships with their teachers

and with each other. Thus, the following section is divided into two parts: technical supports and structures and interpersonal supports and structures.

Technical Supports and Structures

Because a majority of the students were first-time on-line students, they stated that they valued the potential of an effective preparation program to introduce them to the practical procedures surrounding on-line scholarship. As indicated by Joinson and Buchanan (2001), the inclusion of time management skills was very high on students' list for a preparation class. Many students reported that they had learned some hard lessons with respect to time management, and they believed that a preparation program should include some strategies for effective time management during the course.

Just as teachers seemed to have difficulty in their new roles as on-line instructors, students also had difficulties managing the change. While they relished the freedom to work according to their own schedules, they still wanted someone available at a help desk to assist them with both technical and course content issues.

Interpersonal Structures and Supports

Students saw regular communications from their teachers as one of the most important supports in the cyberschool. For the students, regular communication represented what Putnam (2000) referred to as the building of social capital. In general, students were concerned with building a relationship with their teachers, and they worried that their teachers might not get to know what they were "really like". They valued the personal relationships with the teachers in their face-to-face classrooms and were reluctant to relinquish those relationships. In fact, some students suggested that an

occasional face-to-face class meeting might facilitate relationship building and, as a result, could possibly lead to a stronger social capital foundation.

Students were also specific in delineating the kinds of communication they thought would be most valuable. In particular, they appreciated regular, positive, constructive feedback on their course work and progress. Both Papert (1995) and Van Horn (1997) postulated that students of the future would willingly accept responsibility for their own learning. Based upon the student comments, this belief seemed to be supported. Students were willing to accept responsibility for their own learning, but they wanted someone to tell them that they were on the right track and were doing a good job.

Another interpersonal support students saw as important was freedom. In contrast to Griffin and Brownhill's (2001) observation that students in the on-line context would no longer see the teacher as an authority figure, students stated that, although they valued the freedom (e.g., deadlines, work schedules, etc.) inherent in the virtual school, they still wanted their teacher to exert some authority by providing suggested deadlines in order to encourage them to complete their work successfully.

What prompts students to pursue virtual high schooling?

According to the literature, one might expect students to make the choice to pursue virtual high schooling for a variety of reasons. Barker and Wendel (2001) stated, "Enrollment and demand for virtual schooling is growing. For example, the 2-year cumulative growth rate for Alberta school in the study was 125% ... where permitted, enrollment will continue to rise because distributed learning enhances

student choices and learning opportunities” (p. viii). McLean (1998), in her description of St. Gabriel’s Cyberschool, suggests that children may wish to pursue virtual educational opportunities because the virtual school presents a more egalitarian environment in which cliques, bullying, and peer pressure become less prevalent. Johnston’s (2000) observations about the Florida Virtual High School suggest that students might choose to take virtual courses due to their flexible natures – particularly that students can access them from anywhere at any time. Mittleman (2000), among others including Reyna et al. (2001) and Salomon (1998), suggest that students may simply wish to find a more interesting or, at least, different learning environment. Finally, several authors (Alvarez, 1997; Holford & Nicholls, 2001; Muirhead, 2000; Van Horn, 1997) theorised that students may choose to pursue courses delivered via the Internet because they recognise the potential impact that computers may have on society and wish to learn about them and, at the same time, learn other skills typically deemed necessary for success in today’s business world.

The majority of students in this study indicated that flexibility was a key determinant factor in their choice to pursue an on-line course. However, that flexibility played itself out in a number of different ways. For example, some students indicated that the cyberschool had presented them with a means to personalise their class timetables. In other words, they had been able to avoid scheduling problems in their home schools by taking a cyberschool class to free up a period during the regular school day to take a class that was not offered on-line (such as French immersion or Fine Arts) – allowing them to take precisely what they wished. Flexibility also played out in the

form of convenience. For example, for some students, cyberschool courses allowed them to take some face-to-face courses and supplement them with on-line courses – freeing up part of their day to work more hours at their part-time jobs, to pursue their active athletic careers, or, in a few cases, to raise their families.

While flexibility was the most common reason cited, it was not the only reason. Several students indicated that they preferred to work independently and cyberschool provided a platform from which they could do that comfortably. Students also indicated that they chose to take cyberschool courses because they just liked computers or because they wanted to try something new. Finally, a surprising number of students indicated that they had chosen to take a cyberschool course because they thought it would be easier than were their face-to-face courses.

What impact has the societal environment of the New Economy had on the development, instruction, and participation in a virtual high school?

Recently, the literature (e.g., Clarke & Nichols, 2002; Fingar & Aronica, 2001) has begun to question the existence of the New Economy phenomenon. The main thrust of the opinions being surfaced suggests that, contrary to much of the current business literature touting the development of a new economy which trades in information rather than in goods, there is only one economy. Asserting the existence of a new economy “... implies that somehow both [economies] exist and a business competes in either one or the other” (Clarke & Nichols, p. xv). However, according to Fingar and Aronica, “There is no ‘new’ economy, but there is something very new in the real economy” (p. 21). In other words, the basic rules of business: building capital,

being innovative, and delivering value to customers, have not changed. Instead, the changes currently taking place in the business world are just part of the normal evolutionary forces of the economy. Nevertheless, according to Clarke and Nichols, a business that wishes to be successful in the current evolutionary economy must also be streetwise, innovative, fast and fun. This section, therefore, is organised according to the four headings suggested by Clarke and Nichols's typology.

Streetwise

A streetwise organisation recognises who its customers are, the customers' contexts (which streets they live on), and the value of strategic partnerships for mutual benefit (Clarke & Nichols). One could argue that the decision to create the cyberschool in the first place was, in part, a response to what Cortada (2000) referred to as the consumer's personal market share as they tried to address the needs of the students. S1 and S2 indicated that part of the motivation for the development of Crestview was to address parental requests for the service and the fact that some neighbouring school divisions had begun to offer on-line courses. In addition, the school division recognised that there was a segment of its student population that wished to pursue something new and, at the same time, home schools needed something to alleviate class scheduling problems. S1 also pointed out that SSD had been in partnership negotiations with several other smaller school divisions and that the cyberschool initiative was something that had facilitated those partnerships. Thus, it appears that SSD had been streetwise in the new economy sense as it chose to develop the cyberschool.

However, in terms of program delivery and instruction, that sense of being streetwise had not yet fully matured at the time of study. Several teachers were following very traditional instructional methods that focussed on content rather than process and had not yet made the cognitive jumps to instructional techniques more appropriate for the on-line environment (e.g., inquiry learning). Students entered the on-line school expecting highly interactive and individualised learning environments but many found what could be referred to as on-line correspondence classes in which they read directions on static text-based web pages, did their “homework”, and submitted it for review much as they did in their regular classrooms. Thus, Crestview could not be seen to be streetwise in this context.

Innovative

Innovation, according to Clarke and Nichols, requires an organisation to facilitate risk taking and creativity in an atmosphere that has a clear sense of vision and is appropriately well-resourced. This raises the question of the type of institutional control and management necessary to foster the innovative atmosphere and implies that the vision must be communicated in such a way to provide guidance for people within the organisation but not be too restrictive “... enabling them to innovate at a local level within the guiding framework of the vision” (Clark & Nichols, p. 29).

Beyond the very basic notion that the cyberschool was created to serve the needs of the students of SSD school division, the cyberschool suffered from a lack of common vision. Teaching staff and one administrator (A4) expressed frustration at the lack of progress that had been made in developing a broader vision that incorporated elements

what they saw as obvious but which “... didn’t even occur to [senior administrators]” (TD6). At the same time, the other administrators (A1, A2, and A3) revealed that they had been thinking about the vision and that many of the issues identified by teachers were being considered but, they were concerned about moving too fast and about the “optics” inherent in over-resourcing the cyberschool relative to other programs in the school division. Thus, while vision was part of the problem, communication was also a definite issue within Crestview.

Faculty, both administrative and instructional, at Crestview had also been wondering about whether a traditional style of management would be effective in the cyberschool context. Handy (2002) opined that the answer would be no. He said, “The inevitable bureaucracy and need for conformity suffocates [innovation and innovators]” (p. 27). The teacher/developers indicated that the school division had not played a significant role in the development of the cyberschool courses and could not, therefore, be accused of attempting to force conformity in instructional and pedagogical design. In fact, the lack of any controls whatsoever in this regard had actually allowed some teachers to maintain the status quo and develop courses which mimic their traditional face-to-face courses rather than till new ground as distinct on-line courses. Kay (1997) observed that this tendency was common when organisations had not provided adequate support and training. He said that in these situations, the resultant product “... represents a desire on the part of a future-shocked public to see a new technology only as a better version of an old one” (p. 19). Consequently, some of the courses, at least, could not be seen as truly innovative.

While conformity was not forced in term of course design, it was demanded in term of operational directives. The teachers expressed frustration that their home schools, particularly SSD#1 – the cyberschool’s host school – did not recognise their “special status” and frequently required conformity in attending events and completing tasks at the physical school even when they conflicted with the time set aside for their cyberschool duties. This, in effect, ensured that the cyberschool teachers often fulfilled the physical school’s expectations during their paid in-school time and fulfilled their cyberschool duties in the evenings and on weekends. The superintendents and the principal were also adamant that the cyberschool not be seen as being “special” relative to other programs in the school system. While they recognised it as being different, they were not willing to manage it differently.

Fast

Clarke and Nichols suggest that organisations have always needed to be streetwise and innovative. However, “It’s actually the *pace* at which these crucial competencies must manifest themselves that is different today” (p. 30, emphasis in the original). Not only do new products need to get to market quickly but also, they must be constantly updated. Crestview’s on-line classes had been developed relatively quickly but, according to TD5, teachers were not only provided with insufficient paid time to develop their courses but also they were given absolutely no paid time to update them.

Fun

The atmosphere in Crestview – both in terms of the attitudes among the teacher/developers and many of the students – was that cyberschool was fun. One student remarked that, even if there were never any changes made to improve Crestview's on-line classes, she would still take the courses because they were fun. When asked why they continued to work in the cyberschool in the face of all of their frustrations, faculty stated that they enjoyed both the work and the comraderie that had developed in the "pod" and that they felt that they had become better teachers as a result of having had the opportunity to be involved in the cyberschool project.

Whether real or not, the New Economy had a limited impact on Crestview Cyberschool. It had, in part, provided the impetus for creating the cyberschool and had also, to an extent, driven its expansion. However, several issues regarding administration and control as well as organisational culture had not yet been addressed. The school did have a sense of its customers, or at least of its primary customer base, but had not been able to develop an effective vision that incorporated the views of all faculty. It certainly appeared to be fun but, it was not particularly innovative.

Chapter 7

Summary, Conclusions, and Recommendations

This chapter presents a summary of the study including a review of the problem, the research questions, the methodology and the purpose of the study. In addition, this chapter presents findings and conclusions drawn from this study including a reconceptualisation of the theoretical framework and a series of implications for theory, practice, and future research. The chapter concludes with some comments and reflections on the study and the process used.

Summary of the Study

The impetus for this study arose partially from the researcher's personal journey in developing and delivering an on-line high school course. As he and his colleagues worked through the trials and tribulations of putting together their courses, he came to the realisation that, since none of us had any training or background in the pedagogy of on-line instruction or, for that matter, in distance education, we were just "muddling through" as we made assumptions not only about what instructional approaches and activities would make sense in an on-line high school course but also about the kinds of educational experiences and the level and nature of interaction and community that students desired from their on-line school experiences. Consequently, he began to question his own assumptions and embarked on a relatively fruitless search for research literature that would provide him with some direction – which brought him to the other

major impetus for the study. The researcher found a large body of “How To” literature as well as a good deal of conjecture and speculation extolling the virtues of on-line education as well as about what the future might hold for on-line education but, much to his surprise, he found very little actual research into the processes and structures of an on-line school; particularly in the high school context. Thus, he set out to design a study which would examine what was actually taking place in an on-line high school by asking the key players involved – faculty and students – about their experiences and preferences. Therefore, the two-fold purposes of this study were: to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context. The following research questions were developed to address these purposes:

1. What is the nature of instruction in a virtual high school?
2. What is the nature of community in a virtual high school?
3. What school system-level structures and supports facilitate the development of a learning community in a virtual high school?
4. What do students and faculty perceive to be the strengths and drawbacks of learning in a virtual high school?
5. What structures and supports do students believe to be necessary for them to be able to learn effectively in the virtual context?

6. From the New Economy point of view of seeing students as users or consumers of education, what prompts students to pursue virtual high schooling?

Methodology

In the spirit advocated by Dolmage (1992), that the nature of the research questions ought to determine the research methodology used in any given study, this study was conceived of as a case study. A multi-phase case study method seemed to be an appropriate method of inquiry because it permits the researcher to “study the meanings that individuals create ... [and] to study human actions in a natural setting” (Gall, Borg, & Gall, 1996, p. 30). In this study, it allowed the researcher to gather and probe the perceptions of two distinct respondent groups: the students and the faculty of a particular on-line high school.

Unit of analysis/site selection. The site selection criteria for this study consisted of pragmatic issues such as willingness to take part in the study, the school’s proximity to the researcher’s residence – it should be close enough to his place of residence that he could spend enough time with the faculty to capture their stories accurately (Stake, 2000), the size of school (it should offer a relatively complete academic program of high school courses to a substantial student body), and that it offer its educational programs to students entirely on-line. Once the site was selected (Crestview Catholic Cyberschool – a Canadian-based on-line high school), the researcher contacted the school’s host division to request permission to conduct the

study and at the same time, prepared a proposal for the University's research ethics board. Approval was granted from both agencies and data collection began.

Data collection. Data were collected in two phases. First, the researcher extended an invitation to all faculty associated with Crestview Cyberschool and conducted a semi-structured personal interview with each of the fifteen faculty member who were willing to take part in the study. The interviews were transcribed and each faculty member was asked to authenticate the transcription of his or her interview.

The second phase focussed on the students enrolled in Crestview Cyberschool. The researcher prepared a questionnaire that was administered to the students on-line. The students were invited to complete the survey via a message that appeared on their WebCT personal homepages. Those students who were interested in participating were asked to review an on-line consent form with their parents. Once parental consent had been given in this manner, 71 of the 151 students (47%) in Crestview cyberschool completed the questionnaire. In addition, the researcher conducted several focus group interviews with students at their home schools. Group interviews were undertaken for one of three purposes:

1. in order to add richness and depth to the questionnaire data,
2. in order to reach a respondent group who had not had the opportunity to complete the questionnaire, or
3. to conduct a member-check of data analysis.

The composition of these groups varied. Three groups were selected from among students in a particular home school who had either completed the on-line questionnaire

or had not done so, and one group was determined by random selection from among the students in any given home school who were also enrolled in the cyberschool. At SSD#1, one focus group interview was held with four participants; two focus group interviews were held at SSD#2 with five and four participants respectively. Finally, one focus group interview with eight participants was held at SSD#3.

Data analysis. Once the accuracy of the phase I interview transcripts had been verified, they were subjected to content analysis. The coding procedures were checked in two ways: one transcript was simultaneously coded by the researcher and one of his university colleagues; in another case, a respondent was asked to review the researcher's coding of his transcript. The researcher then proceeded to code and analyse the remaining transcripts on his own.

The phase II questionnaire data were subjected to basic descriptive statistical analysis procedures such as means, standard deviations, and frequencies of response. The open-ended questions from the questionnaires as well as the transcripts from the focus group interviews were subjected to content analysis. The researcher conducted an on-line member-check by posting a link to his analyses on Crestview's home page along with an invitation for students to read and to comment on these analyses. In addition, the researcher conducted one focus group interview with the expressed purpose of checking the accuracy of his analysis procedures.

Conclusions

Given that this study used the conceptual framework of the learning community, it is appropriate that the conclusions be organised according to this framework as well.

Consequently, the following discussion of the conclusions is organised according to three headings: conclusions regarding the personal capacity, conclusions regarding the interpersonal capacity, and conclusions regarding the organisational capacity.

Personal capacity. There were several conclusions about personal capacity that became evident in this study. The first, and most obvious, is that 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, organisations must place a great deal of emphasis on the preferences of their customers. In this case, the customers of cyberschools 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 indicated that taking classes from cyberschool allowed them to pursue their other interests or responsibilities such as athletics, jobs, dance, and caring for their own children.

Dolence and Norris (1995) predicted that the advent of the on-line school medium would lead to a child-centred learning environment that would permit 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 appeared that the cyberschool may have the potential to provide this type of learning environment, it was not doing so at this time – at least in Crestview Cyberschool. 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 (Dolence & Norris). In addition, constructivist methodology is a very individualised approach that takes into account the student’s pre-existing knowledge and focusses on building on that knowledge (Winner, 1998). Crestview’s courses, for the most part, had been conceived as teacher-led, content-driven courses. As pointed out by the teachers, 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 Crestview’s classes, the school, overall, had not yet reached its potential as a truly new and innovative educational environment.

Finally, there was a strong undercurrent of academic dishonesty among students. Putnam (2000), indicated that the on-line school environment may facilitate cheating and plagiarism among students. Several students in this study indicated that the high achievement rates common among successful students were not entirely honest. They stated that it was easy to cheat – particularly on exams – in the on-line environment and that they frequently did so.

Interpersonal capacity. Several conclusions related to the interpersonal capacity also emerged from this study. Mitchell and Sackney (2001) observed that the focus for the interpersonal capacity is placed on the community or the group. Inherent in this capacity is the nature of the climate, relationships, and communications within the group. 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. Schwier (2001) noted that learning communities, especially virtual learning communities, often form spontaneously as a result of the group members' common interests. In the case of Crestview Cyberschool, the teacher/developers had formed a learning community around their common challenge to create on-line courses without any 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 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 Crestview. The administrators' actions and, in some cases, lack of actions frequently left the teaching faculty without the 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 their cyberschool project 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.

In addition, according to Putnam (2000), a key consideration of the interpersonal capacity 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 had not taken place in Crestview. The model of on-line course delivery in SSD school division would best be described in Mittleman's (2001) parlance as a hybrid cyberschool in which students were taking both on-line and face-to-face 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. In fact, considering students' comments that they had been required to do things in their communities that they would never have done otherwise,

the cyberschool environment actually enhanced the development of social capital for students.

Another aspect of the interpersonal capacity is the nature of communication (Lankshear et al., 2001). Van Horn (1997) predicted that the on-line environment allows for better and more instruction because the lack of a physical presence removes the constant demands for classroom discipline giving teachers more time to provide feedback and positive reinforcement to students; while Barker and Wendel (2001) found that teachers did, indeed, find that they had more time to interact directly with students regarding their progress in the absence of the behavioural problems usually associated with conventional schools. This study supported these observations. Students indicated that, while they did not have the same volume of communication with their teachers as they were accustomed to in their regular classrooms, the nature of the communication was significantly better. In particular, they said that their teachers tended to give more lengthy comments about their work and those comments were more helpful and provided clearer direction than those they received in face-to-face classes.

Organisational capacity. This study presented the opportunity to draw several conclusions regarding the organisational capacity for a learning community. Mitchell and Sackney suggested that the socio-cultural and structural arrangements in the organisation were critical elements of the learning community. One aspect of these arrangements was the nature and condition of leadership in the organisation. The cyberschool platform provided a leadership structure that was truly unique. On one

hand, much of the instruction in Crestview 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 theorised by Blake and Standish (2001), the traditional hierarchical relationship between students and teacher had become partially reframed in Crestview. 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.

Many of the proponents of on-line education suggest that the milieu might provide a more egalitarian and pluralistic learning atmosphere (e.g., Cuban, 2001; Sandbothe, 2001; Van Horn, 1997). Barker and Wendel (2001), in their study of Canada's on-line schools, found this to be true. They found that students felt empowered and their sense of efficacy was enhanced by the type of social interaction typical in the on-line school characterised by the removal of both physical and temporal constraints. Crestview also appeared to have a more egalitarian and pluralistic atmosphere. Several students (primarily female) indicated that they felt more comfortable trying their best and doing well because they knew that they would not be "put on the spot" to read their work in class or to publically display their achievements. In addition, several students were very appreciative of the opportunity to have a measure of control over their own learning environments – at least, when, where, and

for how long they worked. Many of Crestview's teachers, however, expressed apprehension over the loss of control associated with this enhanced student freedom – a finding that resonates with Haythornthwite's (2002) study examining the conditions necessary to create and sustain distributed learning communities.

While this study did not specifically examine pedagogy, the issue of appropriate on-line instructional pedagogy emerged as a glaring issue in Crestview. 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, SSD school system had chosen faculty for Crestview 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. Fullan argued that a reculturing of teachers' beliefs and habits was necessary to make full use of technological (or other) innovation. Bull and his colleagues (1997) observed that this reculturing only takes place 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.

Several of the senior administrators wondered aloud during their interviews whether traditional methods of administration would work in the on-line environment. Mintzberg (2002) argued that, if organisations wish to foster innovation, they must resist the temptations to use traditional bureaucratic controls. The tension between the senior administrators and the teaching staff stemmed from the dichotomy between the developers' attempts to innovate and the administrators' attempts to control. Clearly, the traditional administrative structure did not work in the cyberschool context and a new one must take its place.

Reconceptualisation

This study used the metaphor of the learning community as its conceptual framework. In particular, it used Mitchell and Sackney's model of the learning community to examine several aspects of a single Canadian-based virtual or on-line high school. This model, with its three key capacities, was an effective and useful framework through which to conduct this study.

In my explanation of the conceptual framework in Chapter 2, I referred to the following quotation to raise some questions about the organisation of contemporary education: "One of the perplexities of education is whether schools as they are currently structured enhance learning or limit it" (Mitchell & Sackney, 2001, p. 1). I expected to discover that an on-line school, while probably not a perfect example of school

restructuring, would have at least “pushed the boat out” a little more and was, perhaps, closer to a true learning community than most traditional schools are. To an extent, my expectations were fulfilled but not in the way I expected.

The personal capacity, with its dense and diverse network of fellow learners, had come to fruition – at least in part – in Crestview. The network metaphor, with its strong interlocking ties, is useful in describing the relationships among the teacher/developers in Crestview. The group, as predicted by Mitchell and Sackney, certainly did feed off each other’s experience and expertise and the on-line courses were of better quality as a result. However, Argyris and Shon (as cited in Mitchell & Sackney) pointed out that individuals in an organisation are often caught in the neutral zone between their espoused theories and their theories in action – requiring an internal search to resolve the conflict. “Unless the internal ... and external searches engender some shift in perception or belief system, then there is likely to be little real change in practice” (Mitchell & Sackney, p. 31). Crestview had done some things right. It gathered a diverse group but, it had not provided them with the time or the resources to conduct the necessary searches to change their perceptions and belief systems and, as a result, the on-line courses, while providing good educational opportunities, did not yet resemble the espoused theory of highly interactive, multimedia-rich programs.

The interpersonal capacity was also useful in analysing an on-line school. Mitchell and Sackney cautioned that, in order to become a learning community, an organisation needed to break down the walls of insulation that currently separate individual teachers and classroom practice. The faculty of Crestview indicated that they

had found their cyberschool development and course delivery experiences to be among the best of their professional lives due primarily to the cohesiveness of the development group and the ties that had developed among them.

The organisational capacity was similarly useful as an ideal to strive for in developing an on-line school. Crestview exhibited several weaknesses in this regard. Communication, for example, was regularly inconsistent and incomplete and decisions were frequently slow in coming. In addition, frequent mention was made of the difficulty that the traditional structure of SSD school system had in coming to terms with the potentially radically new structure of Crestview Cyberschool.

So, while the model of the learning community was useful for this study, it did not go quite far enough to allow for the input and preferences of a key constituent in the new economic order: the customer. Fingar and Aronica (2001), among others, cautioned that to be successful in the contemporary business environment, organisations must place a significant new focus on the customer – in this case, the student. Mitchell and Sackney's learning community model, while making mention of the importance of the students in schools, does not specifically include them in the key capacities. Nevertheless, I expected the learning community of an on-line school to be able to include students in more of the decision making and capacity building than would be possible in a traditional school. The students did see themselves as fellow learners with their teachers in some cases and some teachers concurred with that perception. But, Crestview's faculty really did not see their relationships with the students as being particularly different. Several authors (Johnston, 2000; McLean, 1998; Mittleman,

2001; Rutkowski, 1999, Van Horn, 1997) argued that the on-line school presented a new opportunity for students to be more directly involved in making decisions about their own education. Many of these authors theorised that students' new roles in the on-line school would lead them to become more independent, life-long learners. This may take place over time but, in Crestview's current structure, it did not seem particularly likely. The students in this school did not have a significantly new role and the school attracted students who were already independent learners. This presents a huge obstacle for on-line schools. They will have to reculture themselves and conduct the searches advocated by Mitchell and Sackney in order to reach their potential.

Further, the notion of community in schools may have to be reframed to allow for the experiences of the participants in this school. Typically, community refers to the social bonds that develop among individuals who are associated for some reason. According to Chayko (2002), we typically assume that there is a primacy in face-to-face associations over other types of community interactions. However, "The assumption that social connections must satisfy certain narrowly determined criteria (such as "containing" a face-to-face component) in order to be truly authentic greatly oversimplifies the phenomenon of social bonding" (p. 3). Just as the debates regarding the relative merits of on-line education over face-to-face instruction continue to take place, the question of whether the on-line school context can or should provide the social interaction necessary for students to become productive citizens will also continue.

While the debates will not likely be silenced for some time, this study sheds some light on the issues. Just as we often feel a close association with people we have never met such as movie stars or sports figures, it is possible that we can also form bonds with fellow students via the Internet even though we may have never met them face-to-face. Chako (2002) characterises these bonds as being “sociomental”. She suggests that they are:

The manifestation of an absolutely genuine and often deeply felt sense that despite physical separation, a closeness among people, a nearness, exists; that while the physical distance separating people may be great, the social distance between them may be very small indeed.(p. 1)

Consequently, the on-line school may be helping students to develop social bonds – or community – that are just as valid and, perhaps, just as important in the current information age. If one accepts the possibilities that are raised by many of the authors cited in Chapter 2 – that future workers will have to develop new ways of interacting and collaborating with each other, often over long distances; then, the notion of community will have to change as well. It is true that:

We need face-to-face interaction. It is crucial to our intellectual and social development, it allows for the development of richer contexts [i.e., social capital] between people in which more intricate details and meanings can be shared, and it provides certain satisfactions that are impossible to technologically replicate. (Chayko, 2002, p. 6)

However, in a sense, on-line schools – at least hybrid cyberschools such as Crestview – appear to provide students with the best of both worlds. They get the opportunity to meet face-to-face with their fellow students for some of their classes and, they get the

opportunity to meet on-line with fellow students to develop their on-line networking skills.

In other words, it appears that both types of social interaction are important and that a new definition of community to accommodate both face-to-face and on-line interactions is necessary. According to Renninger and Shumar (2002), “‘community’ can be thought of as a reference group with whom one shares information and interests that extend beyond the kind of physical connection one might hope for in a neighbourhood” (p. 62). Thus, the neighbourhood inhabited by students may well have extended beyond the physical nature of the current definition of community.

“Participants’ connections to community are both cognitive and affective, rather than simply spatial and temporal” (Shumar & Renninger, p. 6). Consequently, the lines between the traditional community and the on-line community will continue to blur as the Internet becomes more fully integrated into the way we live our lives. “The Internet has altered our sense of boundaries, participation, and identity ... allow[ing] for a recasting of both self and community” (Shumar & Renninger, p. 14). Therefore, just as the debates regarding the New Economy has questioned whether there actually is a new economy or just a new facet of the traditional one, perhaps the on-line school will provide us with a new facet of community rather than a new community itself. Horn, Pytlikzillig, Bruning, and Kauffman (2003) observed that, since, “a sense of community is an important component of student success [particularly for at-risk students]” (p. 144), perhaps it will be useful, if not essential, for educators to include both face-to-face interaction and on-line interaction in their courses “to enhance students’ sense of

community and relationship” (p. 145). Thus, maybe people will be able to stop asking whether or not on-line communities will fulfill all of our students’ needs and, instead, focus on the broader context of students’ experience of community in relation to school throughout their lives.

Implications

Several implications have emerged from this study. These implications are organised in the following sections under three headings: implications for theory, implications for practice, and implications for further research.

Implications for Theory

This study showed that, at least in the initial stages, if adequate time, pedagogical and technological training, and support for teachers are not provided, an on-line course will look much like a typical face-to-face course apart from the fact that the course resides on the Internet and is accessed with the use of computers. Beyond providing the opportunity for the cyberschool teachers to attend an annual conference, SSD school division had made no provisions for training its cyberschool teachers to operate properly in the on-line context and it was widely accepted among both teachers and administrators that the amount of time provided for course development was inadequate. It might be possible for a school division to mediate these effects by choosing cyberschool teachers who are not only good teachers (as was the case in this school) but also who were already proficient with technology and/or on-line instructional pedagogy. However, few of the teachers chosen for this project at its inception or in successive waves had any special proficiency with technology beyond

basic abilities to use a word processor or to surf the Internet and none of them had any proficiency with on-line instructional pedagogy. In fact, some of them had never even sent an email when they began to work on their courses. Consequently, this lack of facility compounded with the paucity of training opportunities led the teachers to remain in their comfort zone and create on-line courses in the likeness of their existing courses.

This study also showed that a traditional bureaucratic management style does not fit well with an innovative project such as a cyberschool. The Crestview Cyberschool development procedures resembled the skunk-works projects described by Cuban (2001). The developers had been placed in a separate building by themselves to work on their courses. This physical separation had become a metaphor for their ideological separation from the school division's management structure. Neither the principal nor the superintendents had made any real effort to develop a functional knowledge of the on-line courses or, for that matter, of technology in general. In fact, at the time of his interview, A2 pointed out that he had recently sent his first email! One may suggest that he would not need a thorough knowledge of HTML code and the WebCT platform but, a general understanding and appreciation for these issues might be valuable. In the traditional school management structure, there is an assumption that administrators have some personal, first-hand experience with schools and teaching (which, of course, they typically do). However, one cannot make this assumption in a virtual school. Most people in administrative positions have not had the opportunity to take or teach on-line courses (since they are relatively new). In addition, Clarke and

Nicholls (2002) suggested that, for the wired workplace, the people at the “sharp end” of an enterprise must have adequate power to make the necessary decisions and that there must be a clear vision to enable people to determine the right thing to do. In short, staff must be empowered to make decisions and they must feel that they will be supported in those decisions. In Crestview, the principal and superintendents had retained much of the decision making power and had not communicated nor negotiated a clear vision for the on-line school creating a great deal of frustration among both the teaching faculty and the students because decisions frequently took a long time to make.

Further, this study showed that the roles of both the teacher and the student in the learning process are somewhat different in a cyberschool. In the traditional classroom, the teacher usually has certain a level of authority associated with his or her position as well as with his or her greater facility with the course content and its delivery. However, in the cyberschool, the authority structure of the classroom appeared to have been flattened. The teacher was still responsible for both evaluating and guiding students. However, the students had a more active role in the on-line classroom. Actually, some students assumed a role similar to a teaching assistant. They helped each other by working collaboratively to solve problems and answer questions and, at the same time, occasionally provided teachers with sage technical advice and assistance.

Building community in an on-line high school was a challenging process, perhaps, because the faculty assumed that community was the same in an on-line school as it was in a traditional school. However, this study showed that, in several ways,

community in an on-line school was different. For example, there was a highly committed but over-worked faculty who had toiled diligently on their courses and who were trying their best to provide educational opportunities for students. Yet, one must wonder how long these men and women can keep up their pace before they choose to opt out of the program – leaving a whole new generation of first-time on-line teachers to muddle through on their own. In addition, a particular kind of student also appeared to be attracted to the on-line school environment – at least among those who were successful. He or she tended to be highly self-motivated and preferred to learn independently. This also presented some challenges to the on-line school with respect to building community. On the other hand, we may be making too big an issue of community in the on-line school since all of the students in Crestview were part-time students, maybe they are developing the social capital that they need in their traditional school venue and the on-line school does not need to concern itself with this issue.

Several researchers have theorised that the cyberschool might have a positive impact on student learning. For example, Reyna et al. (2001) suggested that students might be more successful in the on-line environment because the environment itself is more engaging and students might spend more time interacting with the learning materials and, therefore, internalise the material more effectively. Similarly, Papert (1993) theorised that students might view their learning activities on-line as play. Consequently, students might “forget” they were learning and actually learn more because they spend more time with the instructional materials. Finally, both Wolfe (2001) and Salomon (1998) theorised that the on-line environment puts greater

demands on students' cognitive processes which leads to the engagement of a broader range of a student's cognitive abilities resulting in better learning. This study supported and extended these theories. Teachers indicated that students frequently submitted material that was far superior to the material submitted in face-to-face courses. Most students reported that they tended to spend as much or more time working on their on-line courses as they do in their regular courses and their "discussions" were of higher quality because they had more time to ponder the questions and statements and to compose their own responses. In addition, those students who had been successful indicated that they were more engaged and did tend to work harder due primarily to the fact that they had to work things out for themselves. Individual participation rates (the amount of work completed by any one student) were also higher than in face-to-face classes. Due, in part, to students' awareness of the tracking and course management tools that the on-line environment provided for teachers, students completed a larger proportion of the instructional tasks provided for them than was typical for them in their face-to-face courses. Students also felt more empowered to experiment and try new things because they had a greater sense of control over their own learning.

However, these positive results were not universal. Teachers indicated that students tended to achieve either extremely well or extremely poorly in the on-line environment. One of the superintendents wondered whether the cyberschool catered to or created independent learners. The results from this study suggested that it caters to independent learners. Many of those students who had been unsuccessful in their on-line courses indicated that they had been uncomfortable with having to work things out

for themselves and preferred to have regular face-to-face access to their teachers to ask for help or just to remain motivated to complete their tasks. In addition, there was a very high drop out rate in Crestview Cyberschool at this time as well as a large population of unengaged or inactive students indicating, at the very least, that on-line learning was not for everyone. Those students who had been unsuccessful indicated that cyberschool assumed too much about their abilities to work with computers. In addition, they indicated that, unless they had already developed or been taught time-management skills, students were largely unprepared to accept responsibility to manage the flexible due dates typical of cyberschool courses.

Implications for Practice

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, organisations – 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 organisational 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 organisations must provide effective and poignant in-service in order for an innovation to be properly implemented and developed. SSD 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 Crestview, 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, Crestview is challenged to develop student placement procedures that permit all students to begin at the same time and to have the same chances to succeed.

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 familiarise themselves about these techniques as well as to experiment with them in an attempt to increase student to student communication.

Implications for Further Research

The results of this study opened up a Pandora's box of issues that must be explored further. 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 the input of this important stakeholder group because they may be able to more clearly define the students' difficulties and challenges.
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.

Concluding Comments

This study was conceived as an attempt delve into the practice of on-line high schooling. It has shown that, even in the face of incredible potential for change, there has been little evidence of real change. Means (1994) stated that the school reform movement has largely overlooked the role that technology might play in restructuring schools. It seems that, even in the highly technological world of the virtual school, this oversight has been made.

Electronic data collection seemed like a good idea at the time and was appropriate for this study but, I would make some changes in approach if I were to repeat this study. I chose to use a passive invitation to students for their participation in

this study. The invitation appeared on their homepages and those who were interested or who had the time, checked into the study further. I think that, in order to gather a broader cross-section of information, I would choose a more active invitation method – perhaps as a personal email. This might, at least, encourage more students to inform themselves about the study and choose to take part. I would also include a cross-section of staff and students not directly involved in the cyberschool to determine their perceptions and concerns about this new educational platform.

The methodological choice of the case study was also appropriate in this study. However, it presented several problems that, once the study began, made it difficult to adhere to. For example, the case study is an iterative and evolutionary study that is characterised by several observations and frequent interactions with the case. However, Stake (2000) pointed out that, “The case study researcher faces a strategic decision in regard to how much and how long the complexities of the case should be studied” (p. 439). In other words, while the researcher usually spends a great deal of time immersed in the context of the phenomenon, he or she must make a decision about the amount of time to spend in the setting based, in part, upon the context of the setting and participants’ willingness to participate. As this case study evolved, it became evident that frequent interviews and long-term participant observations would be difficult, in not impossible. During my initial interviews with the faculty, I became acutely aware of their very high stress levels and their perceived lack of discretionary time. Whether or not they intended to convey the impression that they did not wish to participate further is still not clear at this time. However, the impression was certainly conveyed. I

did not feel comfortable to ask these already very busy and extremely stressed men and women to give up additional time for further data collection. While I had several informal conversations with many of the faculty during the course of my data collection phase, I did not feel comfortable to include these conversations in the data for the study because the conversations were not expressly for data collection (we did not establish that the conversations might be included in this study). In addition, if one were to conduct a case study of a conventional school, one would probably spend considerable time visiting the classrooms to get a sense of what was transpiring in them. However, this case study did not include on-line classroom observations for several reasons. Among them, I got the sense that teachers were not comfortable with this kind of intrusion in their lives. In addition, because I was a member of their faculty and because I was also a fellow member of their teacher union, I did not want this study to be perceived by the teachers or, by anyone else, as an evaluation of teacher competency or practice. Consequently, the data collection methods and frequencies were chosen based upon what seemed reasonable in this context.

With respect to the phenomenon of the on-line school, I predict that it will continue to prosper in several forms. Several provincial governments and departments of education have chosen to invest substantially in on-line learning by facilitating the construction of wider networks of broadband Internet service for schools and by supporting the development of on-line learning resources. However, in several provinces – particularly in Saskatchewan, departments of education have chosen to support the development of on-line learning objects rather than entire on-line courses.

Due, in part, to increasing pressure on teachers from the public to incorporate Information Technology into their instructional strategies, I suspect that these learning objects will begin to gain a wide penetration in teachers' classrooms as their availability and the ways in which they may be used becomes more widely disseminated.

The focus on on-line learning objects has, however, impeded the development of complete on-line courses at the provincial level. Provincial correspondence schools have been experimenting with on-line course delivery but, many of their offerings so far have looked even more traditional than the Crestview courses. In fact, a few of the students who attended focus group meetings for this study indicated that they had previously taken on-line correspondence courses and they had been dreadful. According to the students, the courses were entirely static text and students were not able to interact with each other at all and had only limited access to their teacher. In light of this observation, Crestview might be viewed as a second-generation on-line school in a way. Its courses had been designed to make some concessions to interaction and interactivity – albeit tentative ones.

The hybrid model of on-line school will likely become the most effective and wide-spread form of formal on-line learning next to the learning objects mentioned above. Crestview was an example of such a hybrid that focussed on providing on-line education as an alternative for its students. While there are a few on-line schools in existence now that permit students to complete educational programs entirely on-line, I think that parents' and teachers' perceptions about the value of face-to-face interaction

in the classroom will probably limit the development of purely on-line schools – at least in Canada.

The on-line school may also have a significant long-term effect on educational delivery for both rural and First Nations schools. In both contexts, it has been somewhat difficult to recruit and retain qualified teachers – particularly in specialty areas such as science and math. This has led to a myriad of problems. In some cases, schools choose to offer these courses to students using faculty who are not specifically trained to teach these specialty courses. In other cases, schools choose not to offer the courses at all and require students either to leave their communities to gain access to the courses or to take the courses via correspondence. While correspondence is a reasonable option in these cases, in light of the students' comments in this study, on-line education may become an interesting option. The on-line school may make it possible for students to remain in their home communities and still receive effective instruction from a qualified teacher. In addition, courses which may have “small markets” or subscription rates – such as creative writing or calculus – may become viable if students from several schools were able to subscribe to them.

In the global economy, Canadian on-line schools will begin to experience exponential growth as the international educational market becomes more aware of their offerings and more familiar with their curricula. The international school projects recently launched by many Canadian school systems have illustrated that there is wide demand for Canadian English-language education. The on-line school may have an

interesting role in developing those markets as students and their parents can get a taste of the type of instruction that is available without leaving their homes.

Research currently being conducted in Artificial Intelligence and data-based decision making may impact the on-line school and, ultimately, traditional schools as well. The on-line school passively collects a great deal of data in its server logs that may provide insights into a variety of issues around student learning. Perhaps this information could be used to tailor the on-line learning environment to suit each student and may lead to truly individualised instruction. This may also lead to the development of “smart” on-line school platforms which are able to use the data to respond to student behaviours instantly to ensure effective student learning in an interactive environment. Traditional schools may be able to learn from this process as well to impact positively on student learning as well. In the hybrid school structure, students take classes in both traditional and on-line classrooms. The data collected in the on-line school may inform the instructional decisions made on behalf of the student in the traditional school making both milieus more responsive to student needs.

Finally, the New Economy may begin to exert some pressure on the school division to alter the structure of the school learning environment. This pressure had already begun to percolate through SSD in several ways. The existence of the cyberschool had raised the profile of information technology throughout the school system and teacher groups had begun to focus on technology as means of effecting change in schools. In addition, as more students enrolled in and finished on-line courses, they were increasingly demanding changes to their face-to-face classes. While

there had been little change at the time of study, I suspect that change will begin to take place and the pace of change will increase as the critical mass of students in the school system who have experienced on-line education becomes larger. Ultimately, questions such as, "Should Christian Ethics be available to students on-line" will become moot as teachers' fears are assuaged through more effective communication within school divisions. It seemed that many of their concerns were related more to the logistics of managing a hybrid school with its meshing of the traditional and on-line threads than to philosophical questions of the appropriateness of the on-line school itself. I suspect that effective communication regarding the intentions and procedures of the on-line school coupled with the knowledge that will develop as the on-line school comes of age will address those fears in large part.

References

- Alberta Learning (2001). Student participation and achievement by type of delivery system, 1996-2000. Last accessed May 24, 2003, http://learning.gov.ab.ca/k_12/testing.
- Alvarez, M. (1997). Thinking and learning with technology: Helping students construct meaning, *NASSP Bulletin*, 81 (597), 66-72.
- Asimov, I. (1958). *The feeling of power*. New York, NY: Quinn Publishing Co.
- Arai, A.B. (1999). Homeschooling and the redefinition of citizenship. *Educational Policy Analysis Archives*, 7(27). Last retrieved May 23, 2003 at <http://www.epaa.asu.edu/epaa/v7n27.html>.
- 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.
- Becker, H. (1998). Running to catch a moving train: Schools and information technology, *Theory into Practice*, 37 (1), 20-30.
- Birnbaum, M. (2000). Introduction to psychological experiments on the Internet. In M. Birnbaum (Ed.), *Psychological experiments on the Internet* (pp. xv-xx). San Diego, CA: Academic Press.
- Birnbaum, M. (2000). Decision making in the lab and on the Web. In M. Birnbaum (Ed.), *Psychological experiments on the Internet* (pp. 3-34). San Diego, CA: Academic Press.

- 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.
- Borg, W., Gall, J., & Gall, M. (1993). *Applying educational research: A practical guide* (3rd Ed.). White Plains, NY: Longman.
- Bramall, S. (2000). The educational significance of the interface. In N. Blake & P. Standish (Eds.). *Enquiries at the interface: Philosophical problems of online education*. (pp. 79-94). 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.
- Chayko, M. (2002). *Connecting: How we form social bonds and communities in the internet age*. Albany, NY: State University of New York Press.
- Clarke, J. & Nichols, L. (2002). *Wired working: Thriving in a connected world*. London, GB: Spiro Press.
- Cleveland, H. (1997). Information is the critical resource of the future, *The Futurist*, 31 (1), 13.

- Cohen, A. (2001, Summer Special Issue). Worker watchers, *Fortune*, 70-84.
- Cohen, L., & Manion, L. (1989). *Research methods in education* (3rd Ed.). London: Routledge.
- Cortada, J. (2001). *21st Century business: Managing and working in the new digital economy*. Upper Saddle River, NJ: Prentice Hall.
- Coulter, B., Konold, C., & Feldman, A. (2000). Promoting reflective discussions, *Learning and Leading with Technology*, 28 (2), 44-61.
- Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.
- Cuttance, P. (1992). Evaluating the effectiveness of schools. In D. Reynolds, & P. Cuttance (Eds.), *School Effectiveness: Research, Policy and Practice* (pp. 71-95). New York: Cassals.
- Dede, C. (2000). A new century demands new ways of learning. In D. Gordon (Ed). *The digital classroom: How technology is changing the way we teach and learn*. (pp. 171-174). Cambridge, MA: Harvard Education Letter.
- DeLong, B. (2002). What's new about the "New Economy"?, *Canadian Journal of Policy Research*, 3 (1), 11-16.
- 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.
- Dillman, D. (2000). *Mail and Internet surveys: The tailored design method* (2nd Ed.). Toronto, ON: John Wiley & Sons.

- 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.
- Dolmage, R. (1992). The quest for understanding in educational administration: A Habermasian perspective on the "Griffiths-Greenfield debate", *The Journal of Educational Thought*, 26 (2), 89-113.
- Fernstermacher, G. (1990). Some moral considerations on teaching as a profession. In J. Goodlad, R. Soder, & K. Sirotnik (Eds.), *The moral dimensions of teaching*. (pp. 130-154). San Francisco: Jossey-Bass.
- 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.
- Fontana, A., & Frey, J. (2000). The interview: from structured questions to negotiated text. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd Ed.) (pp. 645-672). Thousand Oaks, CA: Sage.
- Fraenkel, J., & Wallen, N. (1993). *How to design and evaluate a research project* (2nd Ed.). New York: McGraw-Hill.
- Fullan, M. (2001). *The new meaning of educational change* (3rd Ed.). New York: Teachers College Press.
- Gall, M., Borg, W., & Gall, J. (1996). *Educational research: An introduction* (6th Ed.). New York: Longan.

- Gardner, H. (2000). Can technology exploit our 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.
- Gardner, H. (2000). Technology *remakes* the schools, *The Futurist*, 34 (2). 30-32.
- Griffin, C. (2001). From educational policy to life-long learning strategies. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 41-54). London, UK: Kogan Page.
- 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.
- Guba, E., & Lincoln, Y. (1999). Naturalistic and rationalistic enquiry. In J. Keeves, & G. Lakomski (Eds.), *Issues in educational research* (pp. 141-149). New York: Pergamon.
- 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.
- Haughey, M. (1990). Distance education in schools. *The Canadian Administrator*, 29(8), 1-8.
- Haughey, M. (2002). Canadian research on information and communications technologies: A state of the field. Key note policy paper for PCERA symposium, April, Montreal. Last retrieved May 22, 2003, at http://www.cmec.ca/stats/pcera/RSEvents02/Mhaughey_OEN.pdf.

- Haughey, M., & Anderson, T. (1998). *Networked learning: The pedagogy of the Internet*. Montreal, PQ: Cheneliere/McGraw-Hill.
- Haughey, M., & Roberts, J. (1996). Canadian policy and practice in distance schooling. In T. Evans & D. Nation, (Eds.), *Opening education: Policies and practices from open and distance education*, (pp. 63-76). London, UK: Routledge.
- Hesselbein, F., Goldsmith, M., & Somerville, I. (2001). Introduction. In F. Hesselbein, M. Goldsmith, & I. Somerville (Eds.). *Leading for innovation and organizing for results*. (pp. 1-10). San Francisco, CA: Jossey-Bass.
- Hiebeler, R., Kelly, T., & Kettelman, C. (1988). *Best practices: Building your business with customer – focussed solutions*. New York, NY: Simon & Schuster.
- Hobbes, T. (1997). On the state of men without civil society. In C. Sommers & F. Sommers (Eds.). *Vice and Virtue in everyday life: Introductory readings in ethics* (4th Ed.). (pp. 464- 471). Orlando, FL: Harcourt Brace.
- 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.
- Horn, C.A., Pytlikzillig, L.M., Bruning, R., & Kauffman, D.F. (2003). At risk in cyberspace: Responding to at-risk students in on-line courses. In R. Bruning, C.A. Horn, & L.M. Pytlikzillig (Eds.). *Web-based learning: What do we know? Where do we go?*. (pp. 129-152). Greenwich, CT: Information Age Publishing.
- Howe, E. (1998). Integrating information technology into and across the curriculum: a short course for secondary students, *Knowledge Quest*, 26 (2), 32-40.

- Husain, D. (1998). Integrating information technology into and across the curriculum: A short course for secondary students, *Knowledge Quest*, 26, (2), 32-40.
- Janigan, M. (2002). The buzz on e-biz. *Macleans*, 115,(13), (28-30).
- Jefferson, A. & Edwards, S. (2000). Technology implies LTD and FTE, [monograph]. *A Pan-Canadian education research agenda*. Ottawa, On: Canadian Society for Studies in Education.
- Jenkins, M., & Jenkins, D. (1998). *The character of leadership: Political realism and public virtue in nonprofit organisations*. San Francisco, CA: Jossey-Bass.
- Johnston, S., & Mitchell, M. (2000). Teaching the FHS way, *Multimedia Schools*, 7 (4), 52-55.
- 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.
- Kearns, D., & Anderson, J. (1996). Sharing the vision: Creating new American schools. In S. Stringfield, S. M. Ross, & L. Smith (Eds), *Bold plans for school restructuring: The new American schools designs*. (pp. 75-108). Mahwah, NJ: Erlbaum.
- Kellner, D. (1995). Preface. In P. McLaren, R. Hammer, D. Sholle, & S. Reilly (Eds.), *Rethinking media literacy: A critical pedagogy of representation*. (pp. xiii - xvii). New York, NY: Peter Lang Publishing.

- Koestenbaum, P., & Block, P. (2001). *Freedom and accountability at work: Applying philosophic insight to the real world*. San Fransico, CA: Jossey-Bass/Pfeiffer.
- Kolb, D. (2000). Learning places: Building dwelling thinking online. In N. Blake & P. Standish (Eds.). *Enquiries at the interface: Philosophical problems of online education*. (pp. 135-148). Malden, MA: Blackwell.
- Koons, A., & Novak, K. (1992). The ethnography of a computer workplace in Cameroon. In M. Boone, & J. Wood (Eds.), *Computer applications for anthropologists*. (pp. 27-39). Belmont, CA: Wadsworth Publishing.
- Krantz, J., Dalal, R. (2000). Validity or Web-based psychological research. In M. Birnbaum (Ed.), *Psychological experiments on the Internet*. (pp. 35-60). San Diego, CA: Academic Press.
- Lankshear, C., Peters, M., & Knobel, M. (2000). Information, knowledge, and learning: Some issues facing epistemology and education in a digital age. In N. Blake & P. Standish (Eds.). *Enquiries at the interface: Philosophical problems of online education*. (pp. 19 - 44). Malden, MA: Blackwell.
- LeBlanc, A. (2001). The new economy: Editorial, *Canadian Journal of Policy Research*, 3 (1), 6-7.
- Lelliott, A., Pendlebury, S., & Enslin, P. (2000). Promises of access and inclusion: Online education in Africa. In N. Blake & P. Standish (Eds.). *Enquiries at the interface: Philosophical problems of online education*. (pp. 45-58). Malden, MA: Blackwell.
- Lincoln, Y., & Guba, E. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.

- Lincoln, Y., & Guba, E. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd Ed.) (pp. 163-188). Thousand Oaks, CA: Sage.
- Lowe, G. (2002). Leveraging the skills of knowledge workers, *Canadian Journal of Policy Research*, 3(1), 79-86.
- Lowe, M., & Vespestad, K. (1999). Using technology as a tool to enhance teaching and learning. *NASSP Bulletin*, 83 (607), 30-37.
- MacInnes, J. (1996). Technology in the classroom, *FWTAO/FAEO Newsletter*, 15 (2), 14-19.
- McAdoo, M. (2000). The real digital divide: Quality not quantity. In D. Gordon (Ed.), *The digital classroom: How technology is changing the way we teach and learn*. (pp. 143-150). Cambridge, MA: Harvard Education Letter.
- McCalla, G. (2000). The fragmentation of culture, learning, teaching and technology: Implications for the artificial intelligence in education research agenda in 2010, *International Journal of Artificial Intelligence in Education*, 11 (2), 177-196.
- 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.
- Means, B. (1994). Introduction: Using technology to advance educational goals. In B. Means (Ed.). *Technology and education reform: The reality behind the promise*. (pp. 1-23). San Francisco: Jossey-Bass.

- Mehlinger, H. (1997). The next step, *American School Board Journal*, 184 (6), A22-A24.
- 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.
- Merriam, S. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.
- Mintzberg, H. (2001). Managing to innovate. In F. Hesselbein, M. Goldsmith, & I. Somerville (Eds.). *Leading for innovation and organizing for results*. (pp. 141-152). San Francisco, CA: Jossey-Bass.
- Mitchell, C., & Sackney, L. (2001). *Profound improvement: Building capacity for a learning community*. Lisse, The Netherlands: Swets & Zeitlinger.
- Mittelman, T. (2001). The establishment of a virtual high school in Israel, *Educational Technology Research and Development*, 49 (1), 84-93.
- Moulavi, A. (2001). Letter in support of learning the FLVS way. Retrieved January 5, 2002 from <http://www.flvs.net>.
- 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.
- Noble, D. (1998). Digital diploma mills: The automation of higher education. Available at http://firstmonday.org/issues/issue3_1/noble/index.html.

- O'Neill, B. (2000). New ways of telling: Multimedia authoring in the classroom. In M. Monteith (Ed.). *IT for learning enhancement*. (revised edition). (pp. 147-158). Portland, OR: Intellect Books.
- Oseas, A. (2000). Introduction: an invitation to ask "What if ...?". In D. Gordon (Ed.). *The digital classroom: How technology is changing the way we teach and learn*. (pp. 3-6). Cambridge, MA: Harvard Education Letter.
- 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: Basic Books.
- Postman, N. (1995). *The end of education: Redefining the value of school*. New York, NY: Alfred Knopf.
- Putnam, R., Leonardi, R., & Nanetti, R. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton, NJ: Princeton University Press.
- Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Simon & Schuster.
- Reeves, T. (1998). 'Future schlock,' 'The computer delusion,' and 'The end of education': Responding to critics of educational technology, *Educational Technology*, 38 (5), 49-53.
- Renninger, K.A., & Shumar, W. (2002). Community building with and for teachers at The Math Forum. In K.A. Renninger & W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace*, (pp. 60-95). Cambridge, UK: Cambridge University Press.

- 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.
- Reynolds, D., Teddlie, C., Creemers, B., Scheerens, J., & Townsend, T. (2000). An introduction to school effectiveness research. In C. Teddlie, & D. Reynolds (Eds.), *The international handbook of school effectiveness research* (pp. 3-25). New York: Falmer Press.
- Ridley, D., & Sammour, H. (1996). Viable alternative means of instructional delivery: Online courses an alternative teaching method, *College Student Journal*, 30, 337-339.
- Riva, G. (2001). From real to virtual communities: Cognition, knowledge, and interaction in the World Wide Web. In C. Wolfe (Ed.), *Learning and teaching on the World Wide Web*. (pp. 131-152). San Diego, CA: Academic Press.
- Robyler, M., & Elbaum, B. (2000). Virtual learning?, *Learning & Leading with Technology*, 27, (4), 58-61.
- Rourke, L. (2000). Exploring social communication in computer conferencing. Unpublished Master's Thesis, University of Alberta, Edmonton, Alberta.
- Rutkowski, K. (1999). Virtual schools: charting new frontiers, *Multimedia Schools*, 6 (1), 74-79.
- 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.
- Sandbothe, M. (2000). Media philosophy and media education in the age of the Internet. In N. Blake & P. Standish (Eds.). *Enquiries at the interface: Philosophical problems of online education*. (pp. 59 - 78). Malden, MA: Blackwell.
- Scheerens, J. (1992). *Effective Schooling: Research, Theory and Practice*. New York: Cassals.
- Schwier, R. (2001). Catalysts, emphases, and elements of virtual learning communities, *The Quarterly Review of Distance Education*, 2 (1), 5-18.
- Shaffer, 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.
- Shumar, W., & Renninger, K.A. (2001). Introduction: On conceptualising community. In K.A. Renninger & W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace*, (pp. 1-20). Cambridge, UK: Cambridge University Press.
- Silverman, D. (2000). Analysing talk and text. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd Ed.). (pp. 821-834). Thousand Oaks, CA: Sage.
- Stake, R. (2000). Case studies. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd Ed.) (pp. 435-454). Thousand Oaks, CA: Sage.

- Sturman, A. (1999). Case study methods. In J. Keeves, & G. Lakomski (Eds.), *Issues in educational research* (pp. 103-112). New York: Pergamon.
- Taft, R. (1999). Ethnographic research methods. In J. Keeves, & G. Lakomski (Eds.), *Issues in educational research* (pp. 113-120). New York: Pergamon.
- Teddlie, C., Reynolds, D., & Sammons, P. (2000). The methodology and scientific properties of school effectiveness research. In C. Teddlie, & D. Reynolds (Eds.), *The international handbook of school effectiveness research*. (pp. 55-133). New York: Falmer Press.
- Tedlock, B. (2000). Ethnography and ethnographic representation. In N. Denzin, & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd Ed.) (pp. 455-486). Thousand Oaks, CA: Sage.
- 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.
- Tosey, P., & McNair, S. (2001). Work-related learning. In P. Jarvis (Ed.). *The age of learning: Education and the knowledge society*. (pp. 95-108). London, UK: Kogan Page.
- Tuttle, H. (1998). What is a virtual school? *Multimedia Schools*, 5(3), 46-48.
- Tyner, K. (1998). *Literacy in a digital world: Teaching and learning in the age of information*. Mahwah, NJ: Erlbaum.

- Underwood, J. (2000). Making groups work. In M. Monteith (Ed.). *IT for learning enhancement*. (revised edition). (pp. 35-47). Portland, OR: Intellect Books.
- Van Horn, R. (1997). The virtual school, *Phi Delta Kappan*, 78, 481-482.
- Websters on-line dictionary. www.m-w.com/cgi-bin/dictionary. Accessed May 6, 2002.
- Williams, J. (2000). World wide wonder, *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.
- Zak, K. (2000). Some it thrills, others it chills: Is teaching online for you?, *Teach*, March/April. 27-29.
- Zirkle, C., & Guan, S. (2000). The journey into distance education, *Techniques*, 75 (5), 18-21.

Appendix A

Letter of invitation (Phase I)

Invitation (Phase II)

Interview consent form

Survey consent form

Transcript verification form

University of Saskatchewan
INVITATION TO PARTICIPATE

Project Title

The digital tornado: A study of the nature and conditions of learning in a virtual high school

Purpose of the Study

The two-fold purpose of this study is to determine the nature of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context.

Rationale

You are invited to take part in an exciting and interesting study being undertaken in your school. While virtual schools have become relatively common on the educational landscape, they have been subject – particularly in the case of secondary schools – to little study. In the context of the New Economy, students are expected to develop a wide variety of skills and competencies which are very different from the competencies that traditional schools have been designed to address. Virtual schools have been developed, in part, as a response to these new expectations. However, in light of Fullan's (2001) observations that it is possible, in fact, probable, that the pace of change in schools is so great that teachers may have difficulty making effective use of new technologies and instructional strategies amid all of the other demands placed upon them. Therefore, in the virtual school context, what are teachers' perceptions of the current state of technology use and what supports would be necessary to facilitate future enhancements of technology in their virtual courses. In addition, the virtual school typically involves little or no face-to-face contact among teachers and students; yet, cooperation and learning to work with others is a facet of contemporary education identified by many authors as being an essential New Economy skill. While cooperation usually implies the existence of community, the community that exists in a virtual school may be very different from the community in a traditional school. This study is an attempt to gather and disseminate base-line data regarding the nature and conditions of instruction and the nature and conditions of community in a virtual high school context by collecting the perceptions of both faculty and students as they participate in virtual learning.

Procedure

If you are willing to take part in this study (as indicated by returning the slip of paper at the end of this document), you will be approached by the researcher, Scott Tunison, and asked to schedule a suitable interview time (approximately 45 minutes) for data collection. The interview process will be semi-structured and will begin with a set of questions but, will also include a more informal opportunity for you to express ideas, concerns, and perceptions that may not be addressed by the interview questions. The procedure for the interview will be more fully explained at the interview itself.

(tear off here)

I _____ wish / do not wish (please circle one) to take part in the study entitled *The digital tornado: A study of the nature and conditions of learning in a virtual high school*.

Please return to Scott's mailbox by September 30, 2002

University of Saskatchewan
INVITATION TO PARTICIPATE (Phase II)

Project Title

The digital tornado: A study of the nature and conditions of learning in a virtual high school

Purpose of the Study

This study has two purposes: to determine the nature of instruction required in a virtual school (cyberschool) and student responses to that instruction; and, to determine the nature of community that develops in a virtual school.

Rationale

You are invited to take part in an exciting and interesting study being undertaken in your school. While virtual schools have become relatively common on the educational landscape, they have been subject – particularly in the case of secondary schools – to little study. In today's society, students are expected to develop a wide variety of skills and competencies which appear to be very different from the competencies that traditional schools have been designed to address. Virtual schools have been developed, in part, as a response to these new expectations. Students, according to the literature, have a significant role to play in the design of their educational environments and in the direction of their own education. In addition, the virtual school typically involves little or no face-to-face contact among teachers and students; yet, cooperation and learning to work with others is a facet of contemporary education identified by many authors as being an essential skill in today's world. While cooperation usually implies the existence of community, the community that exists in a virtual school may be very different from the community in a traditional school. This study is an attempt to gather and report basic data regarding the nature and conditions of instruction and the nature and conditions of community in a virtual high school context by collecting the perceptions of both faculty and students as they participate in virtual learning.

Procedure

If you are willing to take part in this study, you may click "**Continue**" below and you will be taken to another page explaining further your participation in this study. However, to give you some idea what participation involves, I will give you some information here. Student participation will consist of responding to an on-line survey. Most of the questions will look a bit like a multiple-choice test. These questions will ask things like "To what extent do you agree with" and will ask you to pick a number from 1 to 5 that indicates how much you agree with the statement made. There will be some questions that will allow you to elaborate and type a paragraph or two to explain yourself or your opinions. The whole process should take about 30 minutes. If you are interested in finding out more about this study, click on "**Continue**" below and you will find out more.

Continue

University of Saskatchewan
INTERVIEW CONSENT FORM

Project Title

The digital tornado: A study of the nature and conditions of learning in a virtual high school

Purpose of the Study

The two-fold purpose of this study is to determine the nature (conditions and types) of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context.

Rationale

This interview is a vital component of a case study being undertaken in your school. While virtual schools have become relatively common on the educational landscape, they have been subject – particularly in the case of secondary schools – to little study. In the context of the New Economy, students are expected to develop a wide variety of skills and competencies which are very different from the competencies that traditional schools have been designed to address. Virtual schools have been developed, in part, as a response to these new expectations. However, in light of Fullan's (2001) observations that it is possible, in fact, probable, that the pace of change in schools is so great that teachers may use new technologies and instructional strategies without really implementing them or making the cognitive shifts necessary to use them effectively, one must wonder to what extent teachers have been able to make the shifts necessary to effectively use the instructional tools available to them in the virtual school context. This study is an attempt to gather and disseminate base-line data in this regard by collecting the perceptions of both faculty and students as they participate in virtual learning.

Procedure

The interview will take the form of a semi-structured interview format. This means that the researcher has prepared a list of questions in advance which will provide the basis for the interview. However, the interview will not be limited to those questions. In some instances, the researcher will ask additional questions. You will also have a more informal opportunity to share your perceptions and insights. The interview will last approximately 45 minutes. It will be tape recorded for the purposes of accuracy; however, only the researcher and his committee will have access to the data on the recordings and the subsequent transcriptions that will be produced. The final report will protect confidentiality and anonymity via the use of pseudonyms for the school and for all participants.

This study adheres to the University of Saskatchewan's behavioural research ethics board guidelines as follows. Your participation in this project is voluntary and you may withdraw from it at any time. If you should choose to withdraw, you may select either to have all of your comments removed from the study or to allow the comments you have made to the point of withdrawal to remain as part of the study. If you do not wish to be recorded, please inform the researcher and no recording will be made. You will have the opportunity to review the transcript of your interview to confirm its accuracy. You will also have the opportunity to review the researcher's analysis of the data via a posting on a private bulletin board which will be available for one week. Any data collected in this study will be stored by the researcher's advisor as per university ethical guidelines and will be used for academic purposes only. An executive summary of the final report will be available to all participants electronically via the school's home page.

I consent to be a participant in the study described above under the specified conditions.
I understand that

10. the information gathered may be used for publications or presentations related to this study (however, anonymity and confidentiality will be protected in all cases), and
11. that I am free to withdraw at any time from this study.

Participant's signature: _____ Date: _____

Researcher's signature: _____

University of Saskatchewan
SURVEY CONSENT FORM

Project Title

The digital tornado: A study of the nature and conditions of learning in a virtual high school

Purpose of the Study

The two-fold purpose of this study is to determine the nature (conditions and types) of instruction required in the virtual school context and student responses to that instruction; and, to determine the nature and parameters of community that develop in the virtual school context.

Rationale

This survey is a vital component of a case study being undertaken in your school. While virtual schools have become relatively common on the educational landscape, they have been subject – particularly in the case of secondary schools – to little study. In the context of the New Economy, students are expected to develop a wide variety of skills and competencies which are very different from the competencies that traditional schools have been designed to address. Virtual schools have been developed, in part, as a response to these new expectations. However, in light of Fullan's (2001) observations that it is possible, in fact, probable, that the pace of change in schools is so great that new technologies and instructional strategies can be used without really implementing them or making the cognitive shifts necessary to use them effectively, one must wonder to what extent virtual schools have been designed to effectively use the instructional tools available to them. This study is an attempt to gather and disseminate base-line data in this regard by collecting the perceptions of both faculty and students as they participate in virtual learning.

Procedure

The survey will take the form of a structured survey. This means that the researcher has prepared a list of questions in advance that will form the majority of the survey. Most of the questions will be in a multiple-choice format which will give you a series of possible responses to the questions. In some cases, the questions will allow you to make multiple responses and, in other cases, you will be able to make only one response. You will also have a more informal opportunity to share your perceptions and insights with a small number of open-ended questions that will give you the opportunity to elaborate in a paragraph or two your opinions and perceptions. The survey will take approximately 30 minutes. Only the researcher and his committee will have access to your survey responses. The final report will protect confidentiality and anonymity via the use of pseudonyms for the school and for all participants.

Your participation in this project is voluntary and you may withdraw from it at any time. A group of students from your school will have the opportunity to access a

private bulletin board to review the analyses of the data. Any data collected in this study will be used for academic purposes only.

Research with students usually requires written parental consent. However, in this case, because the students in this school are potentially a world-wide group, parental consent will take the following format. If you choose to participate in this study, you must ask your parents to review this consent form with you before, you click "I accept". Parents are to be reassured that no harm will come to your children as a result of participation in this study. No personal information (e.g., name) will be collected in this study. The students' responses will be gathered in a central data base which will not record the source of the data (e.g., student name or email address). Thus, the research report cannot possibly identify any individual student's responses from among the data base of student responses.

Clicking on "I accept" below, will take the student to the survey instrument. Clicking on "I do not accept" or closing this browser window will end any student's participation in this project.

I consent to be a participant in the study described above under the specified conditions. I understand that

1. the information gathered may be used for publications or presentations related to this study (however, anonymity and confidentiality will be protected in all cases), and
2. that I am free to withdraw at any time from this study.

In any case, I thank you for your consideration of this project.

I accept

I do not accept

University of Saskatchewan

TRANSCRIPT VERIFICATION FORM

I have reviewed this transcript of my interview with Scott Tunison and found it to be:
(please check one)

_____ accurate to the best of my recollection; or,

_____ in need of revision as indicated in the text.

I understand that any information contained in this transcript may be quoted or paraphrased in the final research document and/or other publications which may result from this study. If and when specific references to this transcript do take place, my identity as well as any information which may indirectly identify me will be protected with the use of a pseudonym.

Respondent's signature: _____ Date: _____

Appendix B

Phase I interview schedule

University of Saskatchewan
The digital tornado: A study of the nature and conditions of learning in a virtual high
school

Phase I interview schedule

I wish to thank you for agreeing to participate in this study. If at any time you wish to terminate your participation, please let me know. Before we begin the questions that I have prepared, I would like to clarify the focus for our discussion today. I will be asking you to respond to my questions with respect to your views on a variety of issues which surround virtual or cyber schools.

1. What is your role in this virtual school? How long have you been in this role?
2. Tell me why you think that the existence of a cyber school is important.
3. Describe your approach to teaching in the cyber school.
4. To what extent is instruction different from or the same as instruction in a traditional classroom? To what extent have you had to change your instructional methods and strategies for use in the virtual school?
5. Comment on your opinion of the validity of virtual learning.
6. What do you see as the teacher's role in the learning process in a virtual school? Is this role different from the role you assume as a regular classroom teacher? Why or why not?
7. What impact, if any, for the fact that there is no face-to-face contact between you and the students as well as among the students themselves have on instruction and learning and instruction in the virtual school?
8. Do you think that a sense of community enhances learning and instruction? Why or why not? What do you do in your on-line class to create a sense of community?

9. Do you think that a sense of trust enhances learning and instruction? Why or why not? What do you do in your on-line class to create a sense of trust?
10. Do you think that students should have some input into their educational environments and experiences? Why or why not? To what extent have students had input into the structure and processes of your on-line course?
11. To what extent did you have freedom to create the course you thought should be created? What was the school system's role in determining the parameters of your course? What role has the Department of Education played in the development of your course?
12. The literature speaks about student freedom as a by-product of an on-line course. To what extent to students taking your course have the freedom to exercise choice over the tasks and experiences they encounter in your course? To what extent do you think that this sort of freedom is important?
13. What school system supports have you had access to as you made the transition to teaching on-line? Were the supports adequate? Explain.
14. What supports are necessary for teachers to make an effective transition to teaching on-line?
15. What skills and competencies do you think students need to be successful in today's world?
16. What tasks or structures have you incorporated into your on-line course to help students develop those skills? What supports do you think would be helpful as you try to identify and incorporate these into your course?

17. Is it possible, in your opinion, that using the Internet and reflecting their engagement with it could provide an opportunity for students to learn something new and significant? If so, what is it and what is the teacher's role in that learning?
18. What would the ideal virtual school look like? What would the ideal virtual class look like?
19. Are you a full-time on-line teacher?
20. What impact does your employment status with the cyberschool have on the other aspects of your duties as a teacher?
21. What might be the ideal with respect to teachers' duties with an on-line school? (Full-time on-line or part-time on-line) Should on-line teachers have some association with traditional schools? Why or why not?
22. That was my last question. However, I invite you to express any thoughts you may have regarding virtual schools that were not addressed by my questions. I also invite you to close with a summary statement.

Appendix C

Phase II - Data Collection Instruments

Student Perception Survey

Focus Group Interview Schedule

University of Saskatchewan

The digital tornado: A study of the nature and conditions of learning in a virtual high school

Student perception survey

I wish to thank you for agreeing to participate in this study. Particularly in light of the skills and abilities that society expects students to develop, it is critical that student have input into the structure and style of their own education. This is an opportunity for you to have significant input into one kind of education – the virtual school.

I want to remind you that if at any time you wish to terminate your participation in this study, you may do so by closing your browser. You may also pause your survey session by clicking the pause button in the tool bar at the top of the screen. Remember, you are under no obligation to participate - your grades will not be affected (actually, your teacher will not know one way or the other whether you have completed this survey) and you will experience no negative consequences whatsoever if you choose not to participate. However, if you do choose to participate, it will take you approximately 45 minutes to complete this survey. Thank you very much for your assistance.

1. I am: a) female b) male.
2. I am in grade: a) 8 b) 9 c) 10 d) 11 e) 12 f) other — explain
3. This is my first on-line course. a) yes b) no
4. I am currently taking ____ courses from this cyberschool.
a) 1 b) 2 c) 3 or more
5. I have completed the school's preparation course. a) yes b) no
6. Rate your own comfort level or experience with computers

Beginner				Expert
1	2	3	4	5
7. Estimate the number of hours you spend each day on-line doing cyberschool work.

1	2	3	4	5	more than 5
---	---	---	---	---	-------------

8. How often do you use the following communication tools to communicate with your **teacher**?

		Never			Frequently	
1.	the chat room	1	2	3	4	5
2.	the bulletin board	1	2	3	4	5
3.	email	1	2	3	4	5

9. How often do you use the following communication tools to communicate with the other students in your class?

		Never			Frequently	
1.	the chat room	1	2	3	4	5
2.	the bulletin board	1	2	3	4	5
3.	email	1	2	3	4	5

10. Rate the overall importance of the following communications tools to your cyberschool experience.

		Unimportant			Vital	
1.	the chat room	1	2	3	4	5
2.	the bulletin board	1	2	3	4	5
3.	email	1	2	3	4	5

11. Would you use the following communication tools if you were not forced to by the tasks in your class?

a) email	yes	no
b) chat room	yes	no
c) bulletin board	yes	no

12. In comparison to a similar class in your regular school, how much communication do you have with your cyberschool teacher?

- a) much less in this course
- b) a little less in this course
- c) about the same
- d) a little more in this course
- e) a lot more in this course

13. In comparison to a similar class in your regular school, how much communication do you have with your fellow cyberschool classmates?

- a) much less in this course
- b) a little less in this course
- c) about the same
- d) a little more in this course
- e) a lot more in this course

14. Which of the following began a majority of the class discussions that have taken place in your online course?
1. the teacher
 2. your classmates
 3. yourself
 4. there were no class discussions
15. Estimate the importance of the following: (using a scale from 1-5; with 1 = unimportant and 5 = vital)
- a) regular communications from your teacher
 - b) regular communications with your fellow on-line students
 - c) opportunities to have off-computer tasks during your on-line course work
 - d) group projects which encourage you to interact with your fellow students on-line
 - e) a course which allows you to work entirely alone and with no interpersonal contact with other students
16. Describe your experiences in this class (or classes). What is it like to be a member of this class (for example, do you feel more like you are learning on your own or like you are a part of a group or class)? Explain.
17. How important would it be for you as a student to have input into the kinds of tasks you are asked to complete in your cyberschool course?
- | | | | | |
|-------------|---|---|---|-------|
| Unimportant | | | | Vital |
| 1 | 2 | 3 | 4 | 5 |
18. Should students have input into the kinds of tasks they are asked to complete in cyberschool courses? Yes No
19. How much input did you have into the kinds of tasks and assignments in your course(s)?
- | | | | | |
|--------|---|---|---|-------|
| Little | | | | A lot |
| 1 | 2 | 3 | 4 | 5 |
20. Rate the overall quality of the following technologies: Very poor Excellent
- | | | | | | |
|---|---|---|---|---|---|
| 1. the technology supporting the course (server, etc.) | 1 | 2 | 3 | 4 | 5 |
| 2. the course platform (WebCT) | 1 | 2 | 3 | 4 | 5 |
| 3. the technology used in the course
(pages, animations, graphics, etc.) | 1 | 2 | 3 | 4 | 5 |
| 4. ease of writing exams | 1 | 2 | 3 | 4 | 5 |

21. Rate the amount of technical difficulty you experienced during this course.
- | | | | | |
|--------|---|---|---|-------|
| Little | | | | A lot |
| 1 | 2 | 3 | 4 | 5 |
22. If you were designing a cyberschool course, what would you do to encourage a feeling of community and belonging for the class participants? Explain.
23. Where did you work on this course? (Check all that apply)
- | | | |
|-----------------------------|-----|----|
| At home? | Yes | No |
| At the school library? | Yes | No |
| In the school computer lab? | Yes | No |
| Other places? | Yes | |
- If you said that you worked on this course in other places, please explain.
24. Is technology just the way you get access to the course or is it a key resource or feature of the course? Explain.
25. Keeping in mind that a regular face to face course takes about 5 hours per week instruction time and approximately 2 hours per week homework time, how does the amount of time you spend working on this course's materials compare to a regular course?
- a) much less time for this course
 - b) a little less for this course
 - c) about the same
 - d) a little more for this course
 - e) a lot more for this course
26. In comparison to a regular classroom course, how interesting are this cyber course's materials and tasks.
- a) much less for this course
 - b) a little less for this course
 - c) about the same
 - d) a little more for this course
 - e) a lot more for this course
27. To what extent do you agree that you have experienced the following as you have taken your cyberschool course(s)?
- | | Strongly disagree | | Strongly agree |
|---|-------------------|-----|----------------|
| a) I have learned more about computers. | 1 | 2 3 | 4 5 |
| b) I have learned how to effectively manage large amounts of information (as exists on the Internet). | 1 | 2 3 | 4 5 |
| c) I have learned skills that I think are | 1 | 2 3 | 4 5 |

- | | | | | | | |
|----|--|---|---|---|---|---|
| | important for success in today's world. | | | | | |
| d) | I have had a personalised learning environment. | 1 | 2 | 3 | 4 | 5 |
| e) | I have learned more about my culture | 1 | 2 | 3 | 4 | 5 |
| f) | The cyberschool was a more exciting learning environment (as compared to regular school). | 1 | 2 | 3 | 4 | 5 |
| g) | The cyberschool allowed more focussed learning (I was less distracted). | 1 | 2 | 3 | 4 | 5 |
| h) | I have experienced "real world" tasks (learning activities that are similar to what people do in the workplace). | 1 | 2 | 3 | 4 | 5 |
| I) | I frequently experienced project-based learning activities. | 1 | 2 | 3 | 4 | 5 |
| j) | I collaborated or worked with others as a main source of my learning. | 1 | 2 | 3 | 4 | 5 |
| k) | I found the cyberschool to be a more flexible learning environment. | 1 | 2 | 3 | 4 | 5 |
| m) | I was able to pursue my own educational goals. | 1 | 2 | 3 | 4 | 5 |
| n) | I had more freedom but, at the same time, more responsibility to complete tasks | 1 | 2 | 3 | 4 | 5 |

28. If we believe that schools prepare us, at least in part, for our roles as adults in our communities, it would be important that a cyberschool does so as well. To what extent do you agree that your cyberschool experiences helped you build the following skills:

- | | | | | | | |
|----|---|-------------------|---|---|---|----------------|
| | | Strongly disagree | | | | Strongly agree |
| 1. | the ability to work with and manage tasks which require large amounts of information from a wide variety of sources | 1 | 2 | 3 | 4 | 5 |
| 2. | the ability to analyse and synthesise (pull together large amounts of information from a wide variety of sources to make something new) | 1 | 2 | 3 | 4 | 5 |
| 3. | the ability to be a more active learner (learn by doing not by reading or being lectured to) | 1 | 2 | 3 | 4 | 5 |
| 4. | the ability to work with people from different backgrounds in a spirit of mutual cooperation and respect | 1 | 2 | 3 | 4 | 5 |
| 5. | the ability to communicate with large numbers of other people | 1 | 2 | 3 | 4 | 5 |
| 6. | the ability to prioritise, plan, and manage for results | 1 | 2 | 3 | 4 | 5 |

7. the ability to create relevant, high-quality products 1 2 3 4 5
8. the ability to work with and choose appropriate technologies for particular tasks 1 2 3 4 5

29. To what extent do you agree that the following potential drawbacks were present for you as you took your cyberschool courses(s)?

- | | | Strongly disagree | | | Strongly agree |
|----|---|-------------------|---|---|----------------|
| a) | tasks at the computer tend to be geared toward computer speeds rather than human speeds | 1 | 2 | 3 | 4 5 |
| b) | cyberschools tend to encourage students to be less involved in their local communities (because students work at home on their own) | 1 | 2 | 3 | 4 5 |
| c) | cyberschools are too impersonal | 1 | 2 | 3 | 4 5 |

30. What did you expect to be the advantages of taking a cyberschool class (before you started)?

31. What did you expect to be the drawbacks of taking a cyberschool class (before you started)?

32. Having been taking this class for some time, how well has your experience of cyberschool matched your expectations? (In other words, now that you have been taking a cyberschool course for some time, what are the strengths and drawbacks of being in a cyberschool?) Explain.

33. Would you take another cyberschool class (considering what you know now)?
a) yes b) no

Why or why not?

34. Would you recommend a cyberschool class to your friends?
a) yes b) no

Why or why not?

35. What is the importance of a course which introduces students to the procedures of on-line learning.

Very unimportant				Vital	
1	2	3	4	5	

36. How useful was the "Preparation course" in this on-line school in helping you to manage your involvement in this course?

Not useful		Very useful		
1	2	3	4	5

37. What does a student need to know when she/he begins an on-line course? (technology, work habits, etc.)
38. Once the course has begun, what additional things does a student need to know?
39. What do you wish you had known before you chose to enroll in this class?
40. What sorts of information or activities should an introductory course contain? Please explain fully.
41. Estimate the potential importance of the following virtual school services in helping you to successfully complete an online course.

	Very unimportant					Vital
a) on-line personal counsellor	1	2	3	4	5	
b) on-line career counsellor	1	2	3	4	5	
c) on-line chaplain	1	2	3	4	5	
d) help desk (technical)	1	2	3	4	5	
e) help desk (course content)	1	2	3	4	5	
f) video conferencing with teacher	1	2	3	4	5	
g) occasional real-time on-line lectures	1	2	3	4	5	
h) wider range of available courses	1	2	3	4	5	

42. Why did you choose to take this cyberschool course?
- a) convenience/for the flexible schedule
 - b) to get an extra class (in addition to a full load of courses at your home school)
 - c) to boost my mark for post-secondary school (upgrade)
 - d) the course was not available at my home school
 - e) I like working with computers
 - f) I had conflicts with the teacher at my home school
 - g) I just wanted to try something new
 - h) other (explain)
43. In what ways does the cyberschool help you to be a better learner? Explain.
44. You are invited to make any comments about cyberschool that you may wish to make. Perhaps there is something that this survey has missed about your experiences of cyberschool, please include them.

Thank you very much for your participation. This study would not be possible without your assistance.

Appendix D

Research Ethics Board Approval

**UNIVERSITY OF SASKATCHEWAN
BEHAVIOURAL RESEARCH ETHICS BOARD**

<http://www.usask.ca/research/ethics.shtml>

NAME: Larry Sackney (Scott Tunison)
Department of Educational Administration

BSC#: 02- 640

DATE: September 17, 2002

The University Advisory Committee on Ethics in Behavioural Science Research has reviewed the Application for Ethics Approval for your study "The Digital Tornado: A Study of the Nature and Conditions of Learning in a Virtual High School" (02-640).

Your study has been APPROVED subject to the following minor modifications:

. Please modify your consent forms as follows:

1. We were concerned that the language of the student's consent form is too advanced. Please simplify the language.
2. On the students' consent form, please make it clear that no-one from the school will know who has participated and who has not, and that there is no penalty for not participating, or for deciding to withdraw.
3. The student's consent form should make clear that a student may not participate without their parents' consent.
4. We were concerned that 45 minutes may not be sufficient time to discuss 22 questions; please reconsider and revise your estimate.
5. Please provide more detail on the dissemination of your findings. Will you report direct quotations? Will the data be published? Etc.
6. The participant's signature (or mouse click) should indicate that they have read and understood the consent form, and have received (or printed) a copy of the form for their records.
7. Provide the institutional affiliations and phone numbers of the researchers.
8. Add a line to the effect that the research was approved by the University of Saskatchewan's Behavioural Research Ethics Board on (insert date), and that

any questions regarding one's rights as a participant may be addressed to that committee through the Office of Research Services (306-966-2084).

2. Please send one copy of your revisions to the Office of Research Services for our records. Please highlight or underline any changes made when resubmitting.
3. The term of this approval is for 5 years.
4. This letter serves as your certificate of approval, effective as of the time that you have completed the requested modifications. If you require a letter of unconditional approval, please so indicate on your reply, and one will be issued to you.
5. Any significant changes to your proposed study should be reported to the Chair for Committee consideration in advance of its implementation.
5. This approval is valid for five years on the condition that a status report form is submitted annually to the Chair of the Committee. This certificate will automatically be invalidated if a status report form is not received within one month of the anniversary date. Please refer to the website for further instructions: <http://www.usask.ca/research/ethics.shtml>

wish you a successful and informative study.

Dr. Valerie Thompson, Chair
Behavioural Research Ethics Board

/T/ck

Appendix E
Statistics Table

Descriptive Statistics - Phase II

	N	Mean	Std. Deviation
Question 7	71	1.54	1.040
Question 8a	70	1.29	.783
Question 8b	70	2.53	1.472
Question 8c	71	3.69	1.116
Question 9a	71	1.32	.841
Question 9b	71	2.93	1.534
Question 9c	71	2.45	1.193
Question 10a	70	1.81	1.107
Question 10b	70	3.57	1.430
Question 10c	71	4.31	1.036
Question 12	71	1.94	1.068
Question 13	71	1.52	.892
Question 15a	71	3.99	1.102
Question 15b	70	2.77	1.079
Question 15c	70	2.81	1.195
Question 15d	70	2.44	1.199
Question 15e	70	2.84	1.247
Question 17	70	3.66	1.115
Question 19	68	2.16	1.154
Question 20a	70	2.53	1.046
Question 20b	70	2.20	.987
Question 20c	70	2.27	1.141
Question 20d	70	2.27	1.239
Question 21	71	2.46	1.240
Question 25	69	2.39	1.364
Question 26	70	2.80	1.162
Question 27a	69	2.96	1.322
Question 27b	69	2.94	1.187
Question 27c	68	3.07	1.396
Question 27d	68	3.56	1.274
Question 27e	68	2.07	1.213
Question 27f	67	2.36	1.356
Question 27g	68	3.19	1.489
Question 27h	68	2.44	1.164
Question 27i	66	2.80	1.140
Question 27j	67	2.00	1.231
Question 27k	67	3.96	1.173
Question 27l	67	3.33	1.440
Question 27m	68	4.25	1.028

Question 28a	66	3.17	1.117
Question 28b	67	3.27	1.238
Question 28c	67	3.45	1.259
Question 28d	67	2.49	1.272
Question 28e	67	2.54	1.306
Question 28f	67	3.28	1.204
Question 28g	67	3.06	1.301
Question 28h	66	3.24	1.151
Question 29a	65	3.00	1.173
Question 29b	65	2.57	1.274
Question 29c	65	2.74	1.450
Question 35	65	3.28	1.281
Question 36	65	2.78	1.409
Question 41a	65	2.83	1.306
Question 41b	65	3.14	1.261
Question 41c	64	2.78	1.397
Question 41d	65	3.89	1.091
Question 41e	64	4.02	1.016
Question 41f	65	2.69	1.345
Question 41g	65	3.09	1.355
Question 41h	65	4.17	1.039
Valid (listwise)	55		