Teaching With The Internet:

The Online University as Media Hype?

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Abstract

The purpose of this study was to examine the teaching process at the post-secondary level when Internet-related technologies were used in the delivery of teaching materials. More specifically, the purpose was also to ask the question: how and why do a group of university instructors choose to use the Internet as a teaching tool? As well as trying to discover details about the use of these technologies in the classroom, it was also the aim of this study to try and determine the impetus behind that usage. The study was conducted by means of in-depth or "long" interviews (after McCracken, 1988), with four technology-using university faculty members from various disciplines who were asked to share their thoughts about a number of basic questions. The questions were concerned with utilization issues (i.e.what components of Internet technologies do post-secondary faculty use as teaching tools?), justification questions, (what are the primary reasons for faculty use of this technology in teaching?), learning theory questions, (do post-secondary faculty consciously apply learning theories to their Internet-based instruction and if so, how?), and issues questions, (how significant are the mass media and other outside influences as driving forces behind Internet-mediated education?). The study determined that most of the interviewed professors used the expected Internet utilities in their teaching (the World Wide Web, email and newsgroups), and avoided such peripheral utilities like videoconferencing, whiteboards, FTP, IRC and chat rooms. Their reasons for using Internet technologies were varied but most agreed that personal convenience and a desire to add another effective tool to the traditional modes of instruction were high on their lists. The professors did not consciously use specific learning theories when preparing teaching materials for Internet usage but all of them exhibited an intuitive grasp of how learning occurred and all showed a concern for their students' learning situations that mirrored that grasp. None of the professors felt that they, personally, were overtly influenced by the mass media when making the decision to teach with these technologies, but most were concerned that the next generation of educators probably would be.

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me·di·um (mē'dē-əm) *noun*
plural **me·di·a (-dē-ə) or me·di·ums**

1. Something, such as an intermediate course of action, that occupies a position or represents a condition midway between extremes.
2. An intervening substance through which something else is transmitted or carried on.
3. An agency by which something is accomplished, conveyed, or transferred: *The train was the usual medium of transportation in those days.*
4. *plural* **media**. *Usage Problem.* **a.** A means of mass communication, such as newspapers, magazines, radio, or television. **b. media** *(used with a sing. or pl. verb).* The group of journalists and others who constitute the communications industry and profession.

Chapter 1 Introduction

> A threshold event will take place early in the 21st century: the emergence of machines more intelligent than their creators. By 2019, a $1,000 computer will match the processing power of the human brain—about 20-million-billion calculations per second. Organizing these resources—the "software" of intelligence will take us to 2029, by which time your average personal computer will be equivalent to 1,000 human brains.
>
> Once a computer achieves a level of intelligence comparable to human intelligence, it will necessarily soar past it. For one thing, computers can easily share their knowledge. If I learn French, or read War and Peace, I can't readily download that learning to you.. You have to acquire that scholarship the same painstaking way that I did. But if one computer learns a skill or gains an insight, it can immediately share that wisdom with billions of other computers. So every computer can be a master of all human and machine—acquired knowledge. (Kurzweil, 1999, p. 54)

The mass media have certainly been providing us with some interesting predictions lately. In the final years of the millennium, and in the midst of a massive proliferation of technology and technology-based motivators for most aspects of human endeavour, the media, in all of its forms, has been there to show us the way: informing us, clarifying the issues, and helping us to make sense of the sometimes baffling phenomena that technology's vector leaves in its wake. Or, you could look at it another way. The various media, in their haste to scoop the competition and garner the big numbers and accompanying advertising revenues, have been feeding us a sensational cocktail of hype, speculation, and projection; shaping our thoughts, influencing our decisions and providing us with a yardstick with which to measure just how far we appear to have fallen behind.

This latter scenario wouldn't be such a problem (given that this is indeed is how things really are) if the stakes weren't so high. However, as this study is being prepared, there are massive amounts of currency being accrued on the strength of media-fuelled reports that one high-tech company or another is now a hot stock buy and carries a promised payoff at some point down the line. (For example, Amazon.Com, "Yahoo" and others whose stock value has been huge yet who continue to make no discernable profit). The success or failure of large and emerging technology conglomerates is being determined by reports from media technology commentators seeking to enlighten their audiences with information about the companies in which they should be interested and those they should avoid. (For instance, Apple Computer's reported demise of several years ago contrasted with their new-found status as a market success). Governments and school boards are allocating billions of dollars across the continent to computerize classrooms because the buzz tells them that to not do so will be to deprive their students of meaningful futures. (The Heller Report estimated that post-secondary educational technology spending in the U.S. would be $2.6 billion in 1998). And that buzz is originating primarily with the media. Innovative universities and colleges are expending precious resources to get their courses delivered online, and while they reap the financial benefits, their contemporaries look on with the fear and envy of those watching the departure of an increasingly inaccessible bandwagon. The exact nature of that bandwagon is being made abundantly clear by endless articles and television reports that rush to inform us as to who is "wired" and who remains unplugged. All of which necessarily leads back to the problem referred to above and to other questions that arise from considering it: are the things we are being told by the mass media really the case at this time or are we watching the concept of the self-fulfilling prophesy in action? Why are we intent upon believing the messages the media has been delivering on this subject and how can we determine if what we are being told is not just whole-cloth fabrication? Is it a fact that the media can tell us something about technology

and we will automatically accept that statement as the truth? And if so, are they really reporting the facts - or are their efforts actually rooted in the magnification of those facts with the intent to have us to alter our perceptions of what becomes our everyday reality?

A number of years ago, the managing editor of a large newspaper in my city taught a night class entitled, "A Semester With The Editor: Media Relations" to a group of marketing professionals. When asked by a class member as to his opinion about the power of the media to shape public thought, he answered by insisting that the news media really didn't have any direct influence upon the way people thought, acted or formulated their opinions; that people didn't fully believe the newspapers and newscasts they read and watched anyway. This is still a fairly common response to the charge that the media is somehow manipulating our attitudes with the information they choose to print and the ways in which they choose to present it. " We don't make the news, we only report the facts" is the line most media people fall back on when pressed about this issue. However, in a society that is being deluged with information from so many sources, and with increasingly fewer resources with which to determine the veracity of that information, the public is often likely to take what is proffered as verbatim and proceed with their lives based on that information. Furthermore, we are currently experiencing a shift in the way that we, as a society, deal with the messages of the media. As Douglas Coupland of *Generation X* fame stated recently while discussing the media-influenced messages most people carry in their heads:

"I think the unspoken agreement between us as a culture is that we're not supposed to consider the commercialized memories in our head as real, that real life consists of time spent away from TV's, magazines and theaters. But soon the planet will be entirely populated by people who have only known a world with TV's and computers. When this point arrives, will we still continue with pre-TV notions of identity? Probably not." (Coupland, 1996, p. 112).

We instinctively believe what the media tells us - or at least, it is our first reaction not to question their efforts too closely. Their messages have been a major part of our mass consciousness for so long that few of us ever critically analyze their offerings anymore. However, when one considers the biases and prejudices hardwired into all living beings and the fact that the nature of any message can be coloured or otherwise influenced by what the messenger decides is important enough to include or leave out, it becomes clear that a force as pervasive and persuasive as the modern media machine cannot be downplayed.

On the other hand, this study was not meant to be an in-depth analysis of the media and what it ends up doing with the information it delivers. Many other excellent analyses on this subject have been undertaken and it would be out of the range of this study to delve too deeply into this area of inquiry. As a friend and professor in the faculty of education with which I am associated often says with regards to the masters and doctoral theses he encounters: "Where's the education?". Furthermore, such an analysis could easily lead into the sort of (arguably) paranoid conclusions arrived at by such thinkers as Jacques Ellul who, when commenting upon the media's effect on the common person, described media's messages as propaganda and declared that the "manipulators of the mass subconscious" shaped a person's every action: "he acts in a dream: he seeks other ends (those the incantational magic of propaganda proposes for him) than those he will really attain. . . . He will not be aware of it because the essence of propaganda is to act upon the human subconscious but to leave men the illusion of complete freedom". (Ellul, 1964, p. 372). As has been stated above, the purpose here was not to uncover some vast plot on the part of media agencies or the government to control the minds of the citizenry.

Rather, this study seeks only to document some of the edges of this phenomenon; to note some of the issues and to apply some of the insights gained to a particular facet of the educational spectrum that has been receiving a good deal of media attention lately: the Internet—and, more specifically, to the teaching and delivering of course materials using the Internet. The goal of this study is to determine how and why educators are teaching with this important and powerful medium in the face of a flood of information on the subject, and at a time when hyperbole seems to be the dominant form that information takes.

Problem Statement

The research problem upon which this study was based addresses the how and why of post-secondary faculty usage of the Internet as a teaching tool in an educational landscape that has been, like most areas of human endeavour, under heavy siege from rapid technological development and from the commentators on that development who make the issues public. Because of the amount and kinds of information in existence today, it has become increasingly difficult for educators or anyone else to make informed decisions as to the most effective ways of utilizing such technology. As Jerry Mander (1978) stated a number of years ago when referring to the messages of television: "Much of the nervousness in the world today in both individual and national life may be attributable to the density and power of the experiences that are prearranged for our consumption. Too much happens too fast to be absorbed and integrated into an overall pattern of experience." (p.313-14).

Upon recognizing this trend, it was felt that perhaps what was needed was a stripping away of the media hype so as to be able to look carefully at this emerging teaching tool from a more pedagogically sound point of view and to determine how to harness its power in a more effective manner. This is

not to suggest, however, that a "best" way of using the technology actually exists. Depending on when and where it is being used, by whom and for what purpose, there are many possible "best" uses for the Internet as a teaching tool. This study investigated a number of those uses in relation to instruction delivered to adults in post-secondary learning situations; determining how and why faculty were utilizing this technology while at the same time trying to separate the usage from the hype and speculation that has accompanied it whenever it has appeared.

Need For The Study

At any point in time, when confusion begins to take precedence over understanding in the field of education, the need for such studies as this becomes critical. The whole idea behind any academic research is, and should be, the search for both facts and the truth. However, when information based upon other factors begins to cloud an educational issue, and when motivations other than those based on proven educational principles become possible determinants in the use of a particular tool or method of instruction, a clarification becomes necessary. As has been detailed above, the influence of the media has lately become much more prevalent in matters such as these. Provincial funding bodies and faculty or department heads base policy decisions and prepare budgets on the basis of the information that comes to them largely through television newscasts or from newspapers and magazines. Instructors base course materials on those policies and inspire their peers to do the same when it becomes obvious that budgetary spending has been aimed at the technological innovators. It is not only a matter of a few courses appearing on the web any more, now entire programs and even entire universities have become part of the world of online education. The classroom environment is definitely changing but those changes may not necessarily be based on what we have traditionally assumed should be the case. Clarification of the issues is now required so as to restore some measure of equilibrium.

Let it be stated clearly at this point that the media is necessary. Without their activities, governments and the police could (and probably would) abuse their powers under the guise of political expediency. A strong media is needed to keep things such as these in balance, and in most of their reporting, media representatives attempt to be diligent, unbiased and fair. As mentioned above, informing us, clarifying the issues, and helping us to make sense of the complicated phenomena that surround us are still the main goals of the media. Indeed, when it comes to clarifying the major events occurring throughout the world, the mass media is almost our only source for helping us to get facts, to find out what is happening and to make considered decisions based on that information. Civilization in its present form could not survive without an active media. However, when it comes to an area like technology—which is so huge, unknowable, and so rapidly changing, it seems as though nobody can quite get a handle on things. So they speculate.

It is part of the nature of modern technology to be in a constant state of flux and confusion. People make claims as to the next big product that may or may not arrive while salesmen and consultants try to convince us that their product or their superior technical knowledge will be just what we need in order to solve our particular problems (the Modernist's dream come true—a solution, provided by science, that will give us that one right answer we've been searching for).

In actuality, there is no one person or group or media agency that can know much at all about technology's future or even its current direction. Technology is moving so quickly that it is virtually untrackable. The media's answer to this, however, seems to be to do what everyone else does: they speculate. Or they publish/broadcast that which they feel is, or will soon be, the closest thing to the truth that they can ascertain at this time. The problem for educators remains in the fact that it

becomes difficult to develop and deliver materials based on educational principles and learning theories when so much of our shared knowledge comes from one media source or another. When it is the media that provides our direction, these indispensible factors can often become the least important in the mix.

Conspiracy theories notwithstanding, it is also a fact that more and more of the world's media conglomerates are coming to be owned by fewer and fewer people. Although it doesn't guarantee it, this could make for a media that reflects only one point of view, one political leaning, one way of thinking. That there seems to be only one person at the head of many of these conglomerates doesn't help the situation either. When one considers the holdings of individuals like I.H. Asper, Conrad Black, Rupert Murdoch and Ted Rogers, or the vast power of media giants such as the recently-merged AOL/Time-Warner/ Turner group, one cannot help but ask if there is perhaps a hidden agenda where the personal points of view of a small number of individuals are reflected broadly by the types of stories their employees choose for publication or broadcast, the types of imagery their media outlets will or will not allow, or what political slant their messages will take. All of which is acceptable in an arena characterized by healthy competition from a variety of voices, but when those voices become limited to only a few, and those few become our only sources of information, then that information runs the risk of being filtered through some interesting devices before it reaches us. As a syndicated Knight-Ridder columnist recently pointed out, "the commercially viable journalism and entertainment in the digital future is going to be controlled by just a few massive media giants . . . a handful of media executives will be setting your information diet." (McChesney, 2000, p. B2). And that is not the sort of information educators need now. What *is* needed now are solid ideas that have been rigorously tested and subjected to scrutiny by forward-thinking professionals from the field of education who are not only comfortable with their subject matter and theoretical foundations, but who know their technology as well.

Research Question

Although there were a number of questions asked earlier in this text that had to do with the effects of media's messages on our general understanding and utilization of technology, a more specific focus for this research would be to ask the question, how and why do a group of post-secondary instructors choose to use the Internet as a teaching tool? This question would necessarily generate several other related questions that have been subdivided into four broad categories:

1. **Utilization:** What components of Internet technologies do post-secondary faculty use as teaching tools? (The World Wide Web, Email, Newsgroups, Videoconferencing, Whiteboards, FTP, IRC, Chat rooms).
2. **Justification:** What are the primary reasons for faculty use of this technology in teaching, ie. why are they using it?
3. **Learning Theory:** Do post-secondary faculty consciously apply learning theories to their Internet-based instruction? If so, how?
4. **Issues:** How significant are the mass media and other outside influences as driving forces behind Internet-mediated education?

To answer these questions, contact was made with a number of post-secondary instructors and professors currently involved in teaching with some component of the Internet. Out of necessity and convenience, a relatively small group was drawn from individuals who were employed at one of the educational institutions I am associated with. The methods employed involved a series of in-depth or "long interviews" with participants in order to create "snapshot" profiles of several advanced users of this technology. Through a careful, "close reading" analysis of the resulting data, it was expected that a clearer picture of the current utilization of this newest of teaching tools would emerge— in the

midst of, and hopefully in spite of—an atmosphere of confusion as regards the actual motivators behind it.

The interviews followed the steps detailed by McCracken (1988) in his book, The long interview and consisted of a number of questions based on the four broad categories detailed above. (see appendix "B" for a list of interview questions). Responses were tape recorded for later collation, perusal and analysis.

Limitations to the Study

Limitations to this study include the fact that a relatively small number of professors were contacted to participate. Furthermore, in order to focus the study more specifically on active users, an initial screening process determined, in advance, that the participants were already involved, to a fairly high degree, in teaching with some facet of Internet technology. To compensate for the small number of participants, the close reading method of analyzing results was employed so as to provide a more complete look at what actual practitioners were doing and why they were doing it. In addition, interviews were conducted in the in-depth or long interview style in order to achieve a deep understanding of a few modes of practice as opposed to a shallow look at many. (see "methodology section for clarification of these last items).

Some might also protest that the very qualitative nature of the in-depth observation/interview/analysis process suggested here would also constitute a limitation in itself, and that a rigorous, comparative, control group-situation with a standardized instrument and measurably valid results was what was really needed to arrive at the truth in a situation such as this. Cited drawbacks to the more qualitative methods have usually focused on the fact that "results are difficult to analyze, conclusions are highly

tentative, and generalizations are minimal or nonexistent" (Gay, 1996, p. 230). However, because of the nature of what was being studied, it was felt that the truth of the matter could not be arrived at by attempting to control all the variables in an experiment resulting in generalized conclusions based on mathematical formulae.

On the contrary, the truth of this situation is more complicated than that. It was concluded that a more accurate picture could only be arrived at by questioning professional educators as to how and why they were using this new technology in their classrooms and finding out whether they had been asking themselves similar questions of their own:

Is this the best way to use this technology? Is there something else I could be doing to make this work more effectively? Are my students benefitting from these additions to the traditional methods? Are the best interests of educational practice being served here or am I just doing this because it's the innovative thing to do? And if the latter is the case, just who (or what) is it that is determining the nature of that innovation?

Today's educators must attempt to answer these questions as they proceed with the use of the Internet in the classroom. It will no longer be enough to institute this kind of technology in a random and unexamined fashion or in ways that have possibly been dictated by a third party. Educators must learn to make the correct choices and implement the use of this technology in the most effective manner possible, insuring, in the crush to stay current, that the desirable outcomes of the learning process are not being obscured by the tools used for delivery.

Chapter 2 Literature Review

> As the Information Age shifts into overdrive, the breakneck pace of change is creating legions of lifelong learners. Who is fuelling the online revolution? Forty percent of those pursuing degrees in the United States are now over the age of 40. But their children are part of a parallel shift that is transforming the way teaching takes place in elementary and secondary schools. If Canada fails to capitalize on the trend, experts warn that it risks losing the advantage to a host of foreign rivals. (Schofield,1999. p. 23)

Popular Perceptions of Internet Use in the Classroom

In a recent issue of Canada's Maclean's Magazine, an article entitled *Back To School Online* included, among other things, an exhaustive account of schools and other agencies involved in "the race" to get learning "online". Breathless statements such as the one above littered the article, no doubt creating (unwittingly or not) an equally breathless reaction on the part of teachers across the country—but not for quite the same reasons. It is important to recognize the subtextual connotations in such phrases as *risks losing the advantage* and *foreign rivals.* How better to strike fear into already overloaded teaching professionals than to remind them that they are falling behind and that others (possibly foreigners!) will soon be taking their places. "It's important that we move with some sense of urgency", says University of Waterloo President David Johnston later in the same article. "This is a race that will go to the swift and the wise - and it's borderless." (Johnson in Schofield, 1999, p. 23). The author then proceeded, over the space of five pages, to compile a list of who was doing what, in which schools, to what degree and at what cost—in the field of online education.

It was not until the final paragraph of the article that any sense of critical awareness regarding the actual teaching part of this phenomenon was displayed. "In the end, Waterloo's Johnston cautions that the tools of online education must be seen primarily as a means to extend learning, of presenting knowledge in a wider variety of forms. 'The role of critical thinking, which face-to-face teaching tends to teach best—has never been more important . . . The human search engine is the best search engine of all.' " In his closing statement, the author conceded, "As Canadians adjust to the brave new world of online learning, that message may be the most important one of all." (Schofield,/Johnston 1999, p.26).

All too often, however, when scenarios such as the above have appeared in magazines, newspapers and television newscasts, the effect upon readers has been less a matter of information dissemination and more one of sensationalism—and pedagogical concerns have usually taken a back seat to the big story. As they have brushed aside any considerations of the ultimate effects upon students of a wholesale and unexamined move to technologically-mediated education, the authors of such articles usually remain unchallenged in these instances. Once in a while, however, someone takes them on. In a letter to the editor in the next issue of Maclean's Magazine, Watson Scott Swail, Associate Director for Policy Analysis of the College Board in Washington DC stated:

"The unbridled optimism and sense of urgency reported in the article on online education only fuels speculation and makes the case for dramatic investment into this phenomenon, often at the cost of other important programs designed to increase access and opportunity for our neediest students." The letter describes how access to this type of education appears to be limited to higher-income individuals and makes the point that what was forgotten in the original article was the fact that in terms of learning theory and preference, "research clearly shows that our neediest students require individual,

hands-on instruction." Swail concludes by stating: "Undoubtedly, technology has its merit. However, we must keep it in perspective, and continue to focus our effort on issues of equal opportunity and educational excellence. Until technology takes another leap in progression, the current power of Internet-based instruction will remain mostly fictional." (Swail, 1999. p.p.7-8).

While it was noteworthy that this letter originated from one of the very "foreigners" whose countrymen seemed to be on the verge of taking over Canada's online educational system, it was far more interesting that Swail reminded us of the need for such foundations as learning theories and educational excellence to be considered when looking at the implementation of these new technologies. More interesting still was the fact that such information was being published by the popular media. Learning theories do not often make for good press, and usually, this sort of information has been found only in scholarly literature.

However, a review of some of the literature surrounding the issue of teaching with the Internet reveals a large number of conflicting opinions on the subject. And, the same sort of technological cheerleading that characterizes the popular media can and does appear with a great deal of regularity in many of the officially sanctioned professional publications as well. Consider the following quotation taken from an article in the Fall 1997 issue of New England's Journal of Higher Education & Economic Development:

> The classroom of tomorrow enables students to work as collaborative learners, navigating an environment where meaning is derived by assembling fragments of information from a wide network of information providers and media. This classroom reflects much better the Information Age economy in which we find ourselves.

> For example, increasing numbers of students have used Web-based search tools, e-mail, real-time chat software and conferencing to work with others in remote locations on collaboratively researched and written reports. These students are developing skills that will serve them well in an information-based job market that puts a premium on creative use of on-line technologies. (LeBlanc, 1997. p.41).

One of the major issues in the delivery of online education has been the idea that the amount of information a student can gather from the Internet will somehow, magically, make them smarter and will give them the knowledge they need for their future endeavours. In any cursory perusal of academic literature in this area, one will find pointed out many times that information, in and of itself, is not knowledge—but the fallacy, for some, seems to endure. Fortunately, in most professional journals, a more rational approach that attempts to analyze the issue from a more informed point of view has usually been the case. For instance, concerning the quote from the article cited above, an excellent argument from the British Journal of Sociology of Education places these observations into a more interesting and accurate context:

> The idea that the knowledge embodied in scientific-technological texts can be reduced to quantities of information embodies a naive empiricism that ignores the concrete experiences, socialization practices and implicit background knowledge that are essential to the collection of data than can be interpreted as information bearing on the resolution of theoretical or practical issues. These experiences are constituted by different pedagogical practices, through which professional knowledge is transmitted and cultural capital is formed. (Newman and Johnson, 1999. par.23).

Or, in much simpler terms and from a less academically rigorous source, similar observations can be found. Clifford Stoll, in the book Silicon Snake Oil, put it this way: "Minds think with ideas, not information. No amount of data, bandwidth, or processing power can substitute for inspired thought" (Stoll, 1995, p. 194)

Indeed, for almost every ill-considered statement found in the literature, there appears to be many others that will counter the poorly constructed argument with well-reasoned discourse. Again with reference to the "information-based job market" referred to above by LeBlanc: in the introduction to the book, Education/Technology/Power: Educational Computing as a Social Practice, Hank Bromley addressed some of the same "hot-button", technology-training-for-the-needs-of-industry topics, but did so with a far more acuity. He described the current rhetoric that ties the "adaptable, opportunistic, quick to respond" modern business and its dependence on information technologies to a need for a new kind of education that will produce a new kind of worker. With tongue in cheek, he repeated the familiar refrain:"To thrive in a work environment involving continual shifting to new tasks, students will need to become self-motivated learners who are prepared to keep acquiring new skills their whole lives and are adept at "critical thinking" (which has come to mean simply applying their skills to whatever unfamiliar situations may be presented to them, rather than questioning and challenging the premises of those situations). Most of all they'll need proficiency with the high-tech equipment that will typify their work environment."

Bromley then proceeded to let the air out of this stance by pointing out that:

. . .although the occupations with the greatest rate of growth are in prime, high-tech fields, the actual number of such jobs being created is quite modest . . . The vast majority of new jobs being created are in relatively menial service occupations. The Bureau of Labor Statistics projects that the occupation in which the most new jobs will be created over the next decade is salesclerk, followed by nurse, cashier, general office clerk, truck driver, waiter/waitress, nursing aide, janitor, and food-preparation worker. . . Clearly, what the post-Fordist labor market presents is not a ravenous demand for as many self-motivated, multiply skilled, critically thinking young people as can be supplied, but a split demand for a few such fortunates and a much larger population shunted into marginal and temporary work, at best.
(Bromley, 1998, p.p 9-10).

Other popular perceptions regarding Internet use in the classroom also take on some of the same polemics as represented in the examples above. In a pair of recent textbooks that were prepared for the purposes of learning about the Internet, the following introductory statements were presented:

> The Internet is, by far, the greatest and most significant achievement in the history of mankind. What? Am I saying that the Internet is more impressive than the pyramids? More beautiful than Michelangelo's David? More important to mankind than the wondrous inventions of the industrial revolution? Yes, yes and yes. (Hahn and Stout, 1996, p.xix).

> Now, we are blessed with the emergence of the World Wide Web, commonly known as the Web, as one of the most important economic and democratic mediums of learning and teaching at a distance. As the Internet is rapidly emerging, the Web has become an increasingly powerful, global, interactive, and dynamic medium for sharing information. (Kahn, 1997, p. 5.).

It is fairly certain that this kind of hyperbole has always greeted the emergence of a new technology. However, the speed with which information now travels, coupled with the sheer amount of information currently available for our consumption both make it increasingly difficult to come to any conclusions as to whether it is either accurate or wrongheaded. In 1922, Thomas Edison stated: "I believe that the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks." (Edison in Stoll, 1995, p. 117). In 1997, in a recent issue of Saturday Night Magazine, Peter S. Taylor quoted Don Tapscott, the author of "Growing Up Digital", saying: "On the education front, Tapscott predicts that teachers will eventually bow out of the knowledge business altogether. In the future the corporate sector will provide the educational content and computers will deliver it. Old-style teaching, he argues, is hierarchical and broadcast-based, and cannot withstand the assault of the inter-networked computer." (Taylor, 1997, p.33). Rear-view vision has proven Edison's predictions to be incorrect; will Tapscott's be any more accurate? One way to determine this might be to look at a few examples from the literature that describe how individual educators are currently using the new online technologies in the classroom. By looking at some of the current practices, perhaps a window into the future might be opened so as to give us a more practical and experience-based view of where this technology might be taking the field of education.

How Educators Are Using the Web (and how they perceive they are using it)

Recently, there has been an abundance of studies, articles newscasts and online analyses devoted to the topic of teaching with the Internet. As has been indicated many times in the preceding pages, this trend is undoubtedly part of the reason for all of the current interest in the new technologies. However, instead of relying solely upon the mass media to shed light on current practice in this area, it is also necessary to consult scholarly literature as well. In this section, a combination of sources will be investigated so as to ascertain the ways in which educators are using the Internet as a teaching tool, and to examine their perceptions as to how this new technology is re-shaping the educational landscape they inhabit.

One of the primary and most often referred-to changes in practice likely to occur when online technology is introduced into the classroom revolves around the idea of a move away from the instructor-centered, lecture-based method of delivery. Collins (1991), observed that the "uses of computers tend to subvert the prevailing, didactic view of education that holds sway in our society. Using computers entails active learning, and this change in practice will eventually foster a shift in society's beliefs toward a more constructivist view of education." (p. 36). As an educational goal, the concept of a greater component of student-centered learning is highly desirable. However, it is not enough to simply recognize that computer-mediated educational practices have the *potential* to engender a more constructivist-based teaching environment, it is also necessary that the resulting experiences are planned in such a way so as to ensure that true learning is taking place. Again, from Clifford Stoll (1995):

> The Internet can probably deliver all the information taught in a university, as can a good encyclopedia. So why go to college?

> Because isolated facts don't make an education. Meaning doesn't come from data alone. Creative problem solving depends on context, interrelationships and experience. The surrounding matrix may be more important than the individual lumps of information. And only human beings can teach the connections between things. (p. 135)

Indeed, the idea that it requires active planning by an experienced and knowledgeable practitioner in order to make any educational experience complete has often been left out of the equation when the constructivist nature of online education is discussed. Simply turning students loose with computers or an Internet connection in front of them does not necessarily constitute a constructivist learning situation. A considered plan prepared by a trained expert must also become part of the picture. This idea was also made clear in the Newman and Johnson (1999) article referred to earlier. The authors described the "invisible pedagogy" that results from the accumulated wealth of knowledge and experience found in traditional institutions: "Traditional agents of knowledge combined attributes of both expertise and authority (in other words, they were seen to have both technical and social legitimacy). They were formed professionally in the hospitals, universities, libraries and courts. These were 'sites' in the literal sense of physical place." (par. 18). The authors point out that the even the physical location and the fact that students spend time within that location with trained educators, are factors that are just as important in the true learning experience as the subject matter. " The knowledge that emanated from these sites was knowledge of a discipline, because these sites were associated with power structures that implemented formal and informal processes of quality control." (par.19).

With Web-based teaching, however, these authors feel that much of the influence of the sort of pedagogy referred to above is lost:

> The superficial features of WWW-based knowledge conform to the rhetoric of invisible pedagogy but the WWW lacks the resources whereby tacit competencies were developed in traditional sites of professional formation. The competencies, necessary for the creation and synthesis of knowledge, are formed through a long and rigorous process of apprenticeship. It is through this apprenticeship process that the learner acquires 'recognition rules' that enable the speciality of context to be recognized and 'realization rules' that allow a legitimate text to be produced. (par. 25).

In short, it was felt by these authors that it is more than just putting the information out there for consumption that is important in the learning process.

It is interesting to note at this point that not all critiques of Internet-based education come to these same negative or cautionary conclusions. George P. Landow, (1996), in an online essay entitled *Newman and The Idea of an Electronic University* also began by discussing the fact that the university as a place has been, until recently, a central and necessary part of the learning and knowledge dissemination activities of the educational process:

> I began this essay by pointing out that Newman's assumption that the university had to be a place served as an important, if unexamined, premise in his conception of higher education. Such an assumption is entirely appropriate given the role that long-traditional conceptions of education granted to the idea of presence—to the assumption that student and teacher communicated, however one-sided that relationship might be, in the presence of each other. (par. 3)

Landow continued, however, by explaining that this was not necessarily the case today:

> From the Renaissance onward, however, learners both within and without educational institutions have used information technologies to educate themselves outside the presence of individual instructors. Printed books, newspaper and periodical literature, phonograph records, tapes, videodisks, and CD-ROMs form an unbroken continuum that begins with Renaissance self-help manuals that people of comparatively low social status used to acquire knowledge and skills that formerly required the services of private tutor or educational institution. Like the manuscript or printed book, digital information technology creates what we may term the virtual presence of an absent teacher that students consult at their need and convenience and not those of the instructor. . . . Computer networks, which enable students to read materials stored thousands of miles away, promise to redefine the place of learning as radically as did the inventions of writing and printing—in part because networks like the World Wide Web enable hundreds and even thousands of people to consult the same texts at the same time, and in part because networks disperse the instructor's virtual presence even farther from the location of the stored text. Placing digital information on giant networks completely changes the learner's experience, conception, and assumptions about the place of learning. (par. 4)

It would appear, from the perspective of this argument and the attitudes of its author, that a type of constructivist learning can indeed be engendered through the use of online networks. Students who are able to avail themselves of computer-based, networked learning are depicted here as learners who are, in fact, able to create their own learning situations—proceeding at their own pace with the instructor acting only as a guide—not commanding the traditional, didactic, broadcaster's role.

Depending upon the source, then, the idea of whether or not online instruction contributes to the successful employment of a particular learning theory remains, to some degree, a matter of opinion. All of the above commentators are educators of one sort or another and all of them are respected as experts within their professions. The fact that their attitudes on the subject vary considerably only points to the need for further investigation into the field and to the necessity for a more determined attempt to analyze those investigations carefully.

With this in mind, it is interesting to see what other educators feel about the use of the current Internet technologies as they relate to the educational process. The Newman and Johnson paper (1999) quoted earlier contains, as part of the text, the results of a qualitative study that was conducted to investigate "the views and experiences of a university staff who have been engaged in the pedagogical applications of the World Wide Web" (from the abstract to the study). Some of those views were listed as follows:

> The web provides an ocean of information, but sometimes it is difficult to find the way to the right pond. Knowledge requires interpretation building on experience.

> Again, most of it is done in user-friendly fashion. It can make what is complex appear simple. However, even if technical mastery is gained over the mechanics of navigation and information retrieval, the virtual world of cyberspace does not afford the resources whereby the student can accumulate the necessary cultural capital for evaluation of the material accessed.

Gathering information becomes an end in itself. To what use it is going to be put? We now have cleverer ways in which we can search for information, but it still needs to be filtered, sifted.

The WWW facilitates communication, but the downside is that there will be a decline in the influence of personality and motivation. Many students need the personal interaction. Where, without it, is the civilizing process? The personal charisma is taken out of the teaching process.

The WWW can be used as a research or learning resource. This will depend on the status of the material, i.e. whether the article on the web has already been published in an acknowledged academic journal. But publishers are reluctant to make already-published material available on the web for economic reasons.

One needs to ask, is it serving any interest group? Who is the audience targeted? The WWW does not have segmentation in its current form. There is no profile of user, no clear signs of who and what they are . . . [On the other hand] the bulk of the interest is from the highly educated.

A great deal of dodgy stuff comes out of many sites, even what are considered important institutional sites. In theory universities have guidelines, but dodgy stuff still gets through. In the end there is no real means of discrimination—because of the freedom of the WWW—one has to use common sense. (Par. 30-43)

It is again interesting to note at this point that most of these statements are tempered with a fair bit of caution and that none of the study respondents really came out completely in favour of teaching with the World Wide Web—but then university professors have always been a cautious lot. The ages-old habit of requiring empirical proof before any claims regarding an idea can be trusted or believed is as entrenched in academia today as it ever was and a quick look at several other studies conducted in this field will testify to that. In a study entitled *Students' Frustrations With A Web-based Distance Education Course: A Taboo Topic in the Discourse*, Hara and Kling (1999) commented upon a graduate course at Indiana University taught with Internet-based technology in a manner quite similar to that of most Internet courses in their present incarnation. After noting that the students enrolled in this course felt frustrated and overwhelmed with the proceedings due to equipment problems, lack of instructor feedback, and ambiguous online instructions, they concluded that:

> It is acceptable to fantasize about the future when a field is young, because these discussions can propel the field forward. Distance education has great potential for providing rich environments for students; however, as history has taught us, new technology is not a panacea. It has trade-offs. . . .Unfortunately, a large fraction of the articles about computer-mediated distance education emphasize the potentials of new technology, and understate the extent to which instructors may need to develop new pedagogies as well as different approaches to managing their online courses. High quality on-line education is neither cheap nor easy. (conclusion, par. 1,5).

Similar frustrations were discussed by Fristensky (1999) in a class he taught in Macroeconomics at Bentley College, where students with access to email, the Internet and other information-gathering resources were required to provide him with weekly short e-mail papers dealing with real-world

examples of economic concepts. Apart from his own problems with time and tedium while trying to grade these assignments, he observed that: "Some students were overwhelmed by the amount of information available. Others became frustrated by endless searches or addresses that no longer worked. Some saw the assignments as busy-work. Some search engines got the students going in the wrong direction, and they never recovered. I definitely overestimated the typical student's Web navigating skills." After examining his own motives for using this technology, his methods of designing the teaching materials and upon considering the relative lack of success he had in delivering them, the author concluded: "When properly constructed, e-assignments and information technology can complement and improve classroom instruction. When poorly crafted, they can foster frustration and take time away from active instruction. . . . I had fallen into the trap of using technology for its own sake rather than as an instructional aid." (pp. 2-3).

As mentioned above, however, negative experiences are not always the case with technology-mediated teaching practices. Gillette (1999), discussed a relatively successful experience in designing and delivering a Web-based course entitled "Digital Rhetorics and the Modern Dialectic" and used an architectural metaphor to describe the resulting virtual environment. Detailing the hardware, software and methodology he used to create his course, he compared the parts of his website to the rooms of a school and included such things as a front lobby (orientation), lecture halls (his direct address area), workshop areas, (discussion areas using Web CT Forum's password protection), student lounges (where students can communicate electronically with one another), and a research room (for course-related materials). Important in the design of the site was the necessity for the instructor to use language that "speaks directly to the student. . . . A distant, scholarly, or overly authoritative tone in your text will be counter-productive and exacerbate the sense of distance that students may already be experiencing. Always assume you are only talking to one person, which, in many ways, you are." (par. 37).

Although Gillette was diligent in the design and construction process and stressed the need to pre-plan this sort of course very thoroughly, the process was not without problems:

> From the day I started planning my course to the first day of class, I spent four months working many hours each day, writing my course material, building the Web site, writing HTML pages, testing pages, and revising my work. I already knew a fair amount about creating Web pages and Web sites before I started building my first online course. By no stretch of the imagination am I an expert in online design, but I do know what I'm doing, and I feel at ease rising graphics, database, and word processing software; yet I still often felt overwhelmed by all the technical work required to create a successful online course. (par. 4)

As well, at the end of the semester, Gillette was feeling "completely exhausted from continually building, tearing down, and rebuilding my online course" and felt that he had neglected his duties as an instructor by not being present in class and teaching in the traditional manner. It wasn't until he corresponded at length with one of his students on the subject that he began to realize what he had actually succeeded in doing:

> . . . she told me that my online course was the first course she had ever taken at the university where she felt free to talk about "the big things," without getting a groan from other students in the room. She loved the fact that I seemed to be the "ghost in the machine," present on every page of the course, a gently critical presence in the Web boards, a friendly voice in her e-mail, and a technical reference source always

> happy to help with problems both large and small. But she also appreciated the fact that I never lectured or imposed my ideas upon the class, mainly because that type of control (she called it indoctrination) is impossible in an online course (a point also made by Tiffin and Rajasingham). She said that once a good online course is set up and running properly, the students should take over and create much of the content. The course's content therefore arises through the students' interactions with each other through thoughtful, if sometimes heated, responses to the course readings, and through sharing advice about each other's online creations. She felt the true job of an online instructor is to stand in the background and keep things running smoothly. I had to agree with her. (par. 43)

Again, an experience such as this points not only to the need for solid planning in the creation of online learning situations but, more importantly, to the idea that much of the relative success or failure of such endeavours can sometimes be a matter of perception. Even though he felt that he was not being entirely diligent in carrying out his duties as a professor, Gillette nonetheless incorporated the idea of "place" into his course and attempted to re-create the classroom situation in a virtual format. In doing so he partly addressed some of the concerns that Newman and Johnson had indicated as being problematic with the electronic delivery format. His course also engendered a component of constructivist learning—even though he wasn't quite aware of the fact until his student pointed it out to him. As is often the case, many factors can and will influence attitudes and opinions on this subject. As mentioned above, this only points to the fact that there is a definite need for further investigation into the field and a necessity for a more determined attempt to analyze and evaluate those investigations carefully. The next section of this study will investigate how some educators are currently going about performing those functions

How Academic Internet Use is Being Evaluated

Of the many current trends in academia, none seems to be as dominant or far-reaching as the almost single-minded preoccupation with all things related to the Internet. Whether this is due to the influence of the media or to other factors, it cannot be denied that a great many scholars are now turning their attention to the potential of this exciting new medium. That being said, because of the emerging status of Internet technologies, investigations into the field are still at a relatively early stage, and when compared to those in more established areas, the number of studies that deal with analyzing and evaluating electronically delivered teaching materials is comparatively small. Examples of a few of those studies will comprise the third section of this chapter.

According to Reeves (2000),

> Systematic evaluation of computer-based education (CBE) in all its various forms (including integrated learning systems, interactive multimedia, interactive learning environments, and microworlds) often lags behind development efforts (Flagg, 1990). There are several reasons for this lack of evaluation. First, consumers of technological innovations for education seem to assume that because these innovations are advertised as effective, they are effective. . . . Second, evaluation of CBE has often been reduced to a numbers game wherein the value of CBE is represented by 1) the amount of money spent on hardware and software, 2) the ratio of students to computers, or 3) the amount of time students have access to CBE within a school day, week, month, or year (Becker, 1992). The utility of such indicators in evaluating the ultimate effectiveness and worth of CBE is extremely limited, but their pervasiveness is obvious in the reports produced by national, state, and local education agencies around the world

> (National Center for Educational Statistics, 1993). . . . A third reason for the lack of the evaluation of CBE is the inadequate utility of the evaluations that have been previously conducted. Evaluation reports are usually presented in the format of social science research reports, a format that "is almost useless for most clients and audiences" (Scriven, 1993, p. 77). Further, evaluations of CBE are rarely carried out in a manner timely enough to have sufficient impact on the decisions that must be made in the midst of significant development or implementation efforts. . . . A fourth factor in the paucity of useful evaluations of CBE may be that evaluators often rely upon traditional empirical evaluation methods that compare an instructional innovation with another approach. Frequently the results of these studies have been disappointing (Clark, 1992). A major weakness in traditional empirical approaches to evaluation is that the treatments being compared (e.g., interactive multimedia versus classroom instruction) are often assumed to be cohesive, holistic entities with meaningful differences. Berman and McLaughlin (1978) and other implementation researchers (Cooley and Lohnes, 1976) have illustrated the fallacy of assuming that meaningful differences exist between two programs just because they have different names.(par. 1-4).

Reeves' paper then proceeded to list 14 "Pedagogical Dimensions" by which any computer-based education package might be evaluated. A scale was constructed and the level to which any CBE package registers evidence of such desirables as Epistemology (from Objectivism to Constructivism), Pedagogical Philosophy (from Instructivist to Constructivist), underlying philosophy (from Behavioural to Cognitive) etc. was plotted on this 14 point chart. Evaluations could then be made as to how close to a desired outcome for these dimensions an instructor would prefer to see the CBE

package achieve. It seems a complicated strategy, but as Reeves concluded: "In education today, we need "deep change," and therefore improving evaluation of CBE has never been more important." (par. 59).

However, as *effective* as Reeves felt this method might be for evaluating pre-packaged CBE teaching units, it may not always be the most *efficient* way of evaluating electronically-mediated teaching that is being developed and delivered by the practicing educators themselves. As Reeves stated in another section of his paper: "The fourteen pedagogical dimensions described above are by no means the final answer to improving evaluations of CBE in education. A comprehensive approach to evaluating CBE requires multiple levels of design, data collection and interpretation. We must explore many alternatives." (par. 58).

Individuals who have recently been involved in those explorations include Campbell and Ben Zvi (1998) who evaluated a junior undergraduate class in religion that was offered to students at The University of Alberta and utilized both Computer-mediated conferencing and The World Wide Web. Computers were introduced into a re-design of an existing class taught by Ben Zvi in order to compensate for perceived problems due to class size and "the emotional volatility of the content", and to allow for the conscious introduction of elements of "caring regard and constructivist learning" as well. (p.170).

Asynchronous conferencing was used to post course materials and readings and provided a forum for learners to anonymously comment on the progress of the course, while also allowing them function as part of an online discussion group. The World Wide Web was integrated into the course design to pro-

vide "the links to the content information about the world's religions that was later discussed in class" and provided a means of managing the course via course information, assignment due dates and a class schedule. (p. 175). Evaluation was of a formative nature and "was based on a blend of empirical and qualitative approaches" On the qualitative side, "transcripts of the electronic discussions were kept and analyzed for recurring themes and were compared later to anonymous, written comments on the course." (p.176). One to two hour interviews with students were conducted by Campbell, who also asked students to respond to items from the transcripts and written evaluations. Quantitative data was collected by means of a written, in-class survey as well as through an additional survey instrument administered via the Internet on their own time.

At the evaluation stage, "student comments were analyzed on each instrument three times. The first reading of the data was one of grounding or contextualizing. By reading quickly through the data sets, general impressions were obtained of the tone and direction of the students' thoughts and progress of the course. These impressions tentatively suggested both emerging themes, design recommendations and a theoretical construct for the paper. Second, each piece of data (i.e., each individual email message, each survey, and each interview) was grouped . . . and, finally, each data set was compared for common themes occurring in all three." (p. 177).

Among a number of implications and recommendations from the study, the authors stated:

> As we try to 'think out of the box' on learning design, both for traditionally-delivered and innovatively-imagined course, designers, learners, evaluators and administrators are constantly testing our own assumptions about teaching and learning. For many of us, the working environments in which we do this are not innovation-friendly, and yet we continue to take the risk because we believe that we're engaged in something so fundamentally transformative that we dare not abandon the enterprise (p. 184).

In another study, Powell (1998), sought to establish how "two different schools in very different socio-economic neighborhoods were able to achieve technology integration" (p. ii). After having observed classroom activities and following informal discussions with staff, Powell conducted hour long interviews with school administrators, computer lab facilitators and one or two teachers within each school. She attempted to establish, through the participants' articulation of such things as school goals, mission statements, professional development memos etc., clear examples of how technology usage was being made a priority within the school. Profiles of each of the participating schools were developed and analysis was based on the discovery of the factors the author felt were driving the implementation of technology into the curriculum.

Tetlock (1995), sought to examine the effects of a curriculum-based software package in the mathematics classroom. She was interested in the changes that take place in the teaching process when computer-assisted instruction is implemented and what effect upon students' attitudes regarding both mathematics and computers occurred when they were exposed to mathematics teaching using curriculum-based CAI materials. (p. 10). Three active teachers provided data via a weekly report form that posed questions formulated by the researcher so as to allow them to reflect on their teaching behaviour and the impact that using the software had on their teaching and on their students. These forms were completed on a weekly basis while a taped and transcribed meeting every two weeks provided explanations and enhancements of the written submissions. Two Likert-type attitude scales, based on existing models, were developed and employed to determine student attitudes towards mathematics and computers and, as well, a course evaluation form was administered to students at the completion of the course.

Gillispie (1996), sought to discover the nature of business faculty's perceived values when using Computer-Mediated Communication for instructional purposes and looked at how closely that use matched Roger's five characteristics for adopting an innovation (compatibility, complexity, observability, relative advantage and triability). These characteristics were summarized as follows: "if an innovation is to be a success, the individuals will need to perceive it as being compatible with what is already being used. It must be relatively simple to use, visible to others, have an advantage over current methods being used, and be capable of being tried before being implemented." (p. 7). Data collection for this study was limited to a mail survey to business instructors at four North Carolina universities which gathered extensive information relating to CMC uses in classrooms, the perceived values of its use (advantages and disadvantages), and the relationship of that use to Rogers characteristics as listed above. The Statistical Package for Social Science, a quantitative software tool, was used to process all of the resulting information and to generate numerical, "frequency of response" style data.

In each of these studies, different methods were utilized in an attempt to get at the facts behind academic faculty's use of the Internet for the delivery of teaching materials. The next section of this study has detailed yet another way of adding to what is currently known about this subject.

Chapter 3 Methods and Procedures

The purpose of this study was to examine the teaching process at the post-secondary level when Internet-related technologies were used in the delivery of educational materials. More specifically, the purpose was also to ask the question: how and why do a group of post-secondary instructors choose to use the Internet as a teaching tool? As well as trying to discover details about the use of these technologies in the classroom, it was also the aim of this study to try and determine the impetus behind that usage. This study followed investigations (as referred to above) into the area of faculty perceptions of technology usage in the classroom in studies by Katherine Tetlock in 1995 at the University of Manitoba and by Cynthia Gillispie at the Virginia Polytechnic Institute and State University in 1996. Tetlock examined how the teaching process changed when a curriculum-based, Computer Aided Instruction program was implemented in mathematics classrooms, while Gillispie sought to determine the perceived values and extent of use for instructional purposes of CMC (Computer Mediated Communication) by business faculty at four North Carolina universities. This study addressed similar questions and expanded upon the work begun with their research while utilizing different methods and procedures.

Participants

The participants in this study consisted of a group of 4 professors from the University of Manitoba in Winnipeg, Canada. These individuals were selected primarily because of their current use of one or more of the main components of the Internet (The World Wide Web, Email, Newsgroups, Videoconferencing, Whiteboards, FTP, IRC, Chat rooms). They were representatives of different faculties and departments and were characterized mainly by their interest in utilizing these technologies in their classroom teaching activities. These individuals were drawn from the membership of an Internet user discussion group organized by the University Teaching Services unit at the University of Manitoba.

Procedures

The data obtained from this study is qualitative in nature and was collected by means of in-depth, personal interviews and a careful evaluation of the results of those interviews. A covering letter stating the purpose of the study accompanied a short description of the methodology to be employed and a release form that granted permission to tape-record the interviews. A pilot interview was conducted prior to the actual interviews and this allowed for adjustments to be made to the list of questions ultimately presented to the participants. Questions were not presented to the participants until the time of the actual interview so as to guarantee that all responses would be spontaneous and unrehearsed.

The interviews were conducted with 4 individuals purposively chosen from the membership of the University Teaching Services discussion group on the basis of a demonstrated usage of Internet technologies in the classroom. The interview questions gave participants a chance to comment at some length about their classroom activities involving Internet usage. Audio tape was used to record the interviews and the resulting data was subsequently transcribed for later analysis.

The choice of the long interview for gathering information was decided upon in favour of the more typical method of sending out a survey or questionnaire as it was felt that the former technique offered the chance to obtain information that was considerably richer in substance and nuance than that which could be gathered with the latter.

"In contrast to the questionnaire," stated Gay (1996), "the interview is flexible; the interviewer can adapt the situation to each subject. By establishing rapport and a trust relationship, the interviewer can often obtain data that subjects would not give in a questionnaire. The interview may also result in

more accurate and honest responses since the interviewer can explain and clarify both the purpose of the research and individual questions." (p. 262). Specifically, the "Long Interview" style was described by McCracken (1988) in the following manner:

> The long interview is one of the most powerful methods in the qualitative armory. For certain descriptive and analytic purposes, no instrument of inquiry is more revealing. The method can take us into the mental world of the individual, to glimpse the categories and logic by which he or she sees the world. It can also take us into the life-world of the individual, to see the content and pattern of daily experience. The long interview gives us the opportunity to step into the mind of another person, to see and experience the world as they do themselves. . . . Without a qualitative understanding of how culture mediates human action, we can know only what numbers tell us. The long qualitative interview is useful because it can help us to situate these numbers in their fuller social and cultural context. (p. 9)

Again with reference to this technique, in a study to determine the communications practices and activities of college Webmasters, Beard and Olsen (1999) stated that: "Such a research approach—in -depth interviews with small, purposive samples of informants—naturally limits the generalizability of the findings. However, a qualitative approach was deemed most appropriate for this investigation because the lack of available research on Webmasters provided little guidance for investigating their role in in a quantitative fashion and using a structured survey questionnaire. (p. 203).

The data collected through these interviews was summarized in a descriptive manner and was analyzed in accordance with the guidelines established by McCracken, (see below).

McCracken (1988), lists four steps as guidelines for the method of inquiry he has termed the long interview:

1. *Review of analytic categories* - where he insists that the researcher engage in an exhaustive review of the literature. This "enables the investigator to define problems and assess data. It provides the concepts on which the percepts depend." It also, he continues, sharpens the researcher's "capacity for surprise. (Lazarsfeld 1972b). The investigator who is well versed in the literature now has a set of expectations the data can defy. Counterexpectational data are conspicuous, readable and highly provocative data. They signal the existence of unfulfilled theoretical assumptions, and these are, as Kuhn (1962) has noted, the very origins of intellectual innovation" (p. 31).

2. *Review of cultural categories* - "where the investigator begins the process of using the self as an instrument of inquiry." A "deep and long-lived familiarity with the culture under study" gives the investigator "an extraordinarily intimate acquaintance with the object of study . . . and to provide them with "a more detailed and systematic appreciation of his or her personal experience with the topic of interest." (p. 32).

3. *Discovery of Cultural Categories* - where the actual questions to be asked of the participants are constructed with the intent "to allow respondents to to tell their own story in their own terms . . . to move them to talk without overspecifying the substance or the perspective of this talk." (p. 34).

Finally, in step 4, *Discovery of analytic categories*, the "careful, verbatim transcription of interview data" is analyzed in such a way as to "locate the investigator securely in the fine details of the data"

by moving "from data to observations and from these to meta-observations and from these to still more general observations" and finally on to "general scholarly conclusions."(p. 48).

Having completed steps 1 and 3, and possessing what step 2 calls an "intimate acquaintance with the object of study" by virtue of the fact that I have, since the late 1980's, taught college-level graphic design and journalism students how to design and communicate with print, interactive and, more recently, (since 1993), World Wide Web applications, the data analysis suggested in step 4 was begun.

Data was analyzed at length using "close reading" techniques that attempted to examine texts or statements closely in order to get a more profound meaning from them. A document from The Writing Center at Harvard University described close reading as a methodology used in many disciplines and characterized by multiple readings that analyze a text carefully so as to allow the reader to identify key words and phrases that are of greater importance than others. The document continues:

> Now examine these words and phrases closely. What patterns emerge? What ideas recur? You may have to read these words and phrases a few times to discover multiple meanings in the text: words that mean more than one thing, phrases that could yield a literal and metaphorical reading.
>
> After you read these passages a few times and have discovered patterns within them, formulate a statement to answer your question. This statement should reflect your inferences and speculations about the meaning of the text; it should also reflect your ability to focus on one idea within the text.

> . . . A close analysis of a few passages will produce a stronger text than a superficial commentary on many passages. (no date given par. 4-6)

Information gathered in this study was analyzed using a combination of the close reading technique sequenced with the methodology suggested by McCracken in his description of the long interview. Internet teaching profiles of participants were developed with reference to each specific interview and then an analysis of each of the questions as answered provided a cross-reference.

Chapter 4 Data Analysis

Part A Profiles

This chapter will analyse the qualitative data resulting from the interviews with the four professors. Part A will construct profiles of those professors while part B will analyse each of the basic interview questions and the resulting responses.

Professor "A" works in the area of Agricultural Economics. He is a relatively new professor and is just beginning to plan and prepare materials for Internet delivery. He is quite concerned with providing his students with the best in terms of what he teaches them and sees the Internet as yet another way to do that. When questioned in the interview, (June 15th, 2000), as to why he was planning to augment, with Web-based delivery, the lecture, lab, Powerpoint, and email format he had currently been employing, his response was, "well, I'm committed to being the best teacher I can be, so I'm not going to let some new technology come along and not give it a try." He believes that Internet technologies can be useful in this pursuit of teaching excellence:

> I think the important thing in these classes is to have as many kinds of rapport with the students as possible. If they know you are maintaining your website, putting up your course notes, answering emails—in a sense it's not person to person sometimes —but it is the consensus that there's a give and a take order. You might get more of a flow in terms of developing rapport with the students. In some ways it's a bit frustrating for me at times but it makes me a lot more accessible—because they can email me. It makes me more accessible. I set up office hours and I can insist that they just come at that time but it doesn't usually work out that way. The students are very comfortable with email—almost more than I am. In some ways it increases their ability to learn from the instructor.

Excited about the prospect of Web use as a supplement, Professor A was cautious when he began to comment on some of the things he had heard and read recently regarding the delivery of courses completely via this technology:

> "Independent learning takes an incredible amount of discipline and one of the things that an instructor or professor can provide is what I call pacing; where they say, 'this is where you should be now'. Especially for these first year students coming in with all of the things they have to adjust to—they need a lot of pacing. I can certainly see it [web learning] as an advantage to someone who is in the work force and needs to upgrade and doesn't have a lot of time to attend classes. I do think we may be dreaming here if we think we can deliver university material for a full degree without any professor interaction. I don't think it would work out. One of the reasons why people send their kids in here is they want them to form a network of business acquaintances and friends across the province and they know if they send them here there will be 100-120 quite progressive farmers who will form lifelong friendships and networks. There are a lot of things that happen in education that aren't just courses."

When commenting on a question about the changes that Internet technology could bring to the educational process, Professor A's thoughts followed a similar line:

> Q: Would you say it's transformative? That it changes everything, or changes things dramatically? A: Well there are suggestions like this. Actually the end of universities and colleges as we know them. I think that's extreme. I kind of think of it in terms of other things. Let's say you have a really good web program on coaching soccer. We

> don't need a coach, we just want all the students to get on the web, learn the system and go out and play. I don't think it's going to work. I don't think humans work that way.

Professor A does not teach by employing any well-articulated, classical, learning theories. However, he does build his lessons according to an actual plan for delivery that is based on an almost instinctive knowledge of how people learn:

> My overall approach is to be transparent. This is what we want to do, then we do, and then I say 'this is what we've done - now let's see if we can demonstrate'. That's my basic approach. The reason why I think this has a lot of potential is that you can get feedback very quickly, even in a large class. That's where I see it working really well. I have a lecture, a lab, a review and then an online web sort of review and a quiz. Learn by doing. The more hands-on it is, the more physical it is, and the more they use their senses—the more they're going to learn. I took a course recently that stated that in a straight-out lecture, in the first ten minutes, there's a fair amount of attentiveness but then it starts to drop off after an hour and 15 minutes. They say that ten minutes after the class (students) can retain about 10% of what was said and I think it goes down faster after that. So, what I try to do is first lecture and then in an hour and 15 minutes have some pauses and add some technology or something to try to bring them back into line and try to get another 7 or 8 minutes of attentiveness in there.

When asked about his motivations regarding his interest in Internet technologies in the classroom, Professor A was quick to acknowledge that factors such as the media had an effect on his decisions:

"The media has a huge effect . . .I'm sure I'm influenced by the media. . . . I think generally the people who are making the decisions about facilities are thinking "well, technology is coming' and they get that from the media." As for any departmental or peer pressure involved in his decisions to use this technology, he admits that while there is no formal pressure to do so, much of the drive to "get wired" comes from the department as a whole simply wanting to stay current with the industry for which they provide education and training:

> There hasn't really been any pressure. Probably in our department, I'm using more of this sort of technology than anyone and we really are free to teach and use what we think is best. In terms of the accounting systems—before we were using a manual accounting system which was developed a number of years ago—moving that whole part of my teaching to electronic has been a request of the department. It's something we've wanted to do, and along with that comes other technology, so all of a sudden you're saying—no we're not going to use the old farm account book, we are now going to use a computer software application or the Internet. . . . That to a certain extent is department driven because we feel that's where the industry is going. No, there's not really pressure, in fact it's really quite nice. I can more or less handle the classes how I want. But they do look at the reviews. They want to look at the reviews. If the students are asking for it then we give it to them.

In terms of a possible downside to the use of this technology, when asked what he felt could be lost by educators as they adopt a more electronic mode of instruction, Professor A looked to his own experiences in the classroom and then related those experiences to a more global conclusion: "The risk I see—and I think I experienced it a bit in one course where I maybe went too far with

technology—is that some part of the focus becomes the technology. Then I think you've lost what you're trying to do. The technology becomes the focus rather than the tool. That's where you stand to lose. You sort of have to push it to a certain extent and then maybe back off a little bit. There's definitely a downside and society as a whole is a bit of an experiment."

In answer to a different question earlier in the interview but with similar thoughts about negative consequences of Internet technology use in the classroom, Professor A stated an opinion that was to be repeated by other participants in different ways in the interviews to follow:
"Sometimes learning can be fun and there are times that this is a great advantage to learning something. But there's no easy way to take away the pain of actual learning other than to work through it. I don't know if the Web helps people understand that."

In order to re-cap the profile, then: Professor A is a young, fairly new, energetic educator who strives to be up-to-date, cares deeply about giving his students the best he can in terms of a learning situation and is willing to try anything he feels would improve his chances for doing so. He is concerned, however, that a wholesale adoption of these technologies in the classroom could lead to a degradation in the quality of education his students receive and that there is a danger of the technology, rather than the educational process, becoming the prime focus. He freely admits to being influenced by the media and his department in the adoption of these new methods of teaching, but finds that influence to be positive in that it leads to his department and himself becoming more responsive to the needs of students and the industry that ultimately employs them.

Professor "B" is a more established presence at the University of Manitoba and has been teaching with Internet augmentation in the field of Anthropology for more than 5 years, (at the time of this interview on June 15th 2000). He can be characterized, at this point in time, as a pioneer in the use of these technologies at this institution in that he has had no real training in their use and has developed his own materials while teaching himself how to construct them for electronic delivery. He believes that teaching with the Internet works best when used as a supplement to traditional modes of instruction, and lists his reasons for using it as follows:

> There are really a number of different reasons. Initially I really built it around an area of Anthropology that is difficult to present in a print form because it really requires a lot of diagramming (kinship studies). When you're talking about social relations and biological relations among people you have to kind of see it to really understand it—you have to have it drawn out. And it's hard really to present that stuff in the classroom because you show a complicated diagram—and what are they going to do with it? It's something that they have to be able to take home and work through and struggle on it. In print form it's expensive to put up graphic material—especially when I use color coding, or some animation with it—you really can't do that in print. You can really get a very effective presentation of space and process and categorization by developing the website. So that was the prime area. The other thing I like about it is the hypertext structure—essentially to develop cross-referencing between different categories and different levels. I find that that's a second effective aspect of it. Those are the major areas. As I've gone into it I've developed other reasons for using it. One of the courses that I've just sort of started with and am getting into in my research, is the Internet as Anthropological subject matter. One of the courses I teach is called the

Anthropology of Cyberspace. Then you're actually looking at social relations, cultural construction and language use and things like that in cyberspace. There's a lot of web-sites out there like that take students to research materials and chatgroups and virtual communities.

The third effective reason is that you can create links to supplementary material, and that's very useful. For example, I'm doing a website for a textbook company and one thing that they want covered there is this same sex-marriage thing. So they've got a little box in the text on same-sex marriage—and on the Internet side, I want to develop that a little bit. There's a CBC documentary that's online—so I put a link into *CBC Documentary* and that gives them a whole other dimension they can get into from the national aspect. And then I have another link that goes back to the Supreme Court decision that forced the province of Ontario to change their definition of spousal responsibilities, so they can go and read the court decision. You can provide a lot of supplementary material and give your students the option of really going into depth.

Although Professor B views the use of the Internet as a means to create a more interesting and fuller teaching tool, he has been using the technology for a long enough time to realize that it is not without its problems. When asked to expand on these he explained:

I guess the major problem is basically that of time. I don't think the university has really identified it as a critical area, and therefore people that do this more or less don't get any kind of teaching break to do it. This is much more time consuming than traditional preparation of lectures so you've got to steal from your research time. I've

kind of adapted to that as this has, in part, become part of my research, but there's still a major time problem. Another problem is simply student interest and participation. One of the courses I offer is a distance course—a distance session which is delivered solely on the web—that is basically self-study. They get a website designed for them, they've got assignments and things put up on the web and if they want to communicate with me there's email. They do it on their own time. I started off the first year with 2 students, the second year I think I had 5 and this is the third year and it's gone back down to 2. I thought that they'd be jumping to get in but the student response has not been good. When I started this about 3 years ago, I wanted to introduce it to my on-campus class - I think there was a class of about 100 students - and I told them they had the option to use [web-related materials], so I set up this website for them but found the interest just wasn't there. Students, for some reason, don't seem to be jumping into it unless they are forced to use it.

In an interesting turn of events, however, Professor B's teaching materials appear to be appreciated by an entirely different audience than those for whom they were originally intended:

Now another experience that I have had is quite an informal one that I can compare to: I've had a website up now for about 5 years and it's been publicly available, so it's not only my own students that use it but I get students at other universities using it as well. And I get hundreds of emails from faculty and university students—mostly from the US but also from Australia, Britain, Japan, and Belgium saying how effective it is and that it really helped them learn the material and that it was much better than the

usual format and that they really had difficulty studying it in print form but the web-based stuff with the use of graphics and hypertext linking was much more helpful. And yet I don't get that response from students in my class.

Other problems that Professor B has experienced as he attempts to develop and deliver the electronic side of his teaching materials involves the matter of basic support from the institution:

> More time. Mainly training opportunities. I'm mostly self taught on this and there aren't a lot of training opportunities. When I first started this they had a programme where they basically gave us, I think, a total of 6 hours of training through Computer Services in courses they set up for information providers—and that was very elementary. The rest of it has been on my own and I've had to struggle through some of that —but I have it organized now. What I've done is undertaken to teach courses with UTS (University Teaching Services) and that's how I learn. I wanted to learn how to do some CGI programming so I said 'I'm going to give a course in CGI programming' and I forced myself to go ahead and do it. That's been my strategy, and that's generally how I learn it. I would like to have better training opportunities. The other thing is getting support for attending conferences and things like that. I'd really like to go out to Calgary to a conference there. I know they're doing a lot more stuff now than we are and it would be really interesting to see what those folks are doing. I've indicated a number of times in grants that I've applied for that I'd really like some funding to attend these conferences—but again, this university is not actively pursuing this.

In terms of his use of learning theories as part of his general teaching strategy, Professor B offered a response that demonstrated a reasoned and obviously well-used theory as to how students learn:

> I'm not sure I could identify it as a learning theory or not—but I use kind of a strategy or an approach—and It differs according to the specific site I'm developing. With the site on kinship, one of things I use is to kind of present things at different levels of extraction. Hypertext facilitates that because I can essentially lay down what are three different lines of presentation in different degrees of extraction. One level is fairly conceptual and theoretical. Another level is concrete case-study material that relates the case-study material to the concept and the third level is empirical description. And I lay the material down on those three levels in parallel. My idea of the presentation is to build it from the top down, Illustrate the concept, and then you have detailed ethnography on the other levels. It's also open to the students viewing it in a number of alternative ways depending upon learning styles so you start from the description and work your way up or you can start from the theory and work your way down. . . . There is kind of hierarchy there where you go from description to application of concepts to comparison to conceptualization . . . and I think Hypertext lends itself very well to that.

Again, to summarize: Professor B is a pioneering user of this technology in the classroom. He has used it to develop his own teaching materials because he saw, at an early stage, that the Internet was a valuable supplement to traditional means of teaching that allowed him to do things he just couldn't do with other forms of communication. He is concerned about the considerable amount of time involved in the preparation of these Internet-based teaching materials and laments the fact that he

must borrow from his research time in order to successfully deal with his own learning curve. He is disappointed that the institution as a whole doesn't appear to offer much support in terms of personal and professional development time, training or funding for conferences. He has, however, solved these problems to some extent by making the Internet itself into a research subject with a newly developed course based on the idea of the Anthropology of the Internet.

The influence of the media as a driving force behind his use of these technologies is a non-issue with Professor B as he feels that he was involved in this "long before it became a media issue". Rather, his use of the Internet and the accompanying preparation of teaching materials is based on a desire to better communicate his ideas to his students. Although he employs no specific and overt learning theories in this endeavour, they remain an implicit part of his thinking and he is able to articulate their details clearly and instantaneously when questioned.

Professor "C", interviewed on June 15th, 2000, is another "power user" when it comes to the use of electronically-mediated teaching supplements, but in his case, the learning curve usually associated with hardware and software utilization is mostly absent. His area of specialty is Cytogenetics, plant genetics and Bioinformatics and he has been using Internet technology as a classroom supplement since 1994. A self-taught computer expert, he adopted these technologies well before they became widely available and continues to develop novel ways of using them to facilitate the delivery of his educational messages. This has not always been an easy task in a system that has been traditionally slow in embracing anything viewed as being outside of the mainstream:

> It's fun but it's also a lot of work and in many cases it's a lot of pushing uphill to get things that you want. When I first arrived here I started putting together a centralized

> computer facility for DNA sequence analysis which is now done in so many areas of research in biology. This was probably around 1991 and I wanted to give a seminar to show how to run some of the programs and just to give people an idea of the look and feel of the system. I was looking for a classroom where they could hook up a simple terminal—just a character terminal 80 characters by 24 wide—and then project that output on to the screen. Even over in Engineering, I had to fight to get them to set one up that would work well. Actually, this was something that I did when I was an undergraduate in about 1978. . . . I embarrassed them into it by saying 'I was doing this back in 1978, at least let's do it here in 1991'. So that's an example of the type of fight that you have to get into because you're doing something a little different that people are accustomed to doing.

As a result of his expertise and because of a desire to provide the best learning situation possible in what is a complex and highly technical area of science, Professor C has developed many of his own solutions to the problems associated with electronic teaching, and has recently incorporated the Internet into an existing network that he designed for his department:

> In the PC world we have what's sometimes referred to as the fat client model—meaning that everything resolves on the desktop - the drive, the disk drive, the hardware, the programmes. Everything is physically on the desktop that you're using. The Internet world is a server-based world and in that case much more of what you're using is out on a server somewhere . . . In my lab we do everything in Unix with what's called the X-Windows desktop which drives the windows on the server and sends them wherever they need to go. Anyone can do anything from anywhere. I don't

> carry a laptop home, I have a computer at home and I log into my server from there. Last week I was at Cornell University giving a seminar and the server here was displayed on the computer there. The Internet is fast enough now that I was able to run programs, open up windows in real-time, and you hardly noticed that the machine was half a continent away.

It is really no surprise, then that Professor C is a strong supporter of computer and Internet technologies in the classroom: "I think the technology alone is it's own justification. We need to educate a group of students who are comfortable working with computers and working with the Internet . . . I think, in the long term, it's better—there are more advantages to giving people more choices than there are disadvantages. I think having the stuff available outweighs not having it." In addition to the pedagogical aspects, Professor C also cites several practical applications for this technology:

> Well, one reason is to make it easier for me. It's a bit of work getting the lecture into place the first time, but once you've got it, modification is very easy and reorganization is easy too. I have the luxury of deciding that I might want to switch around my topics and it's relatively easy to do. Quite frankly, if you come to class armed with a bunch of artistically drawn overheads and all that, you really don't want to have to change the course. So the overhead approach motivated you not to change your course and not to update your content, whereas now I update every time I teach a course. I think especially in the areas that I teach, it would criminal of me not to update because in some cases I throw away 1/4 to 1/2 of what I taught last time. I have to have some kind of a dynamic technique to accommodate this.

What might be a surprise, however, is the fact that even a technology user at this level has some reservations about a wholesale move into post-secondary learning that is entirely an online experience:

> I think it's pretty limited in terms of teaching a complete course. I don't want to try to run a full course on the Internet. There's really an important element in being able to look at the actual people and tell whether they are totally lost or that they're really getting it. You can do some of this with videoconferencing—though I'm not convinced that it's adequate actually. Mind you, I haven't tried videoconferencing yet, but what I have seen of it hasn't convinced me. Of course this could lead to the question of whether or not we should just have virtual universities and get rid of the classrooms. The answer is an unequivocal no to that.

Again, as with Professors A and B, it is a concern for the students, the recipients of his efforts, that convinces Professor C that Internet delivery is best used as a supplement to traditional modes of instruction. This becomes even more clearly defined when he considers his reasons for using it to post lecture notes on one of his websites:

> I want to refer to what I call the student as stenographer model in which you go to a lecture and your professor is writing equations and chemical structures on the board at high speed and you just hope that you can get it in the right place because if you miss even one of them, you'll have a completely wrong answer. Not only do you not have time to think in class but you don't always have the certainty that you're getting all the right information. So I decided that I wanted to make the lecture materials available in advance so that people could come to class with them and actually have them to base their own notes on.

. . . [However], in many cases, the students were not going the extra mile to learn the material the way they would when they took their rough notes from lecture and re-copied them later. Recopying notes is a very reliable way of learning things, and if you have the published notes people don't always do that. I would contend that it's still a good idea to have everything available for several reasons. If the student doesn't get to class it's a lot better than getting notes from someone else. Also, in many of the things I teach, you just don't have textbooks. With Cytogenetics - the last good textbook was written in the early 1980's and no-one has been able to assemble together the acquired expertise to update the material to a modern-day course. Bioinformatics texts are the same way.

I also say that if you are the type of person who learns best by taking notes and then re-copying them over again—then do that. If you want to get the final notes and pick them up to use for studying—by all means do that. I think that you're giving the student more options. I try to state at the beginning of the course that different people have different means of learning and, by all means, do whatever works for you. I think in the long term it's better—there's more advantages to giving people more choices than there are disadvantages.

As well, Professor C echoes some of the sentiments expressed by Professor A with reference to a larger problem associated with the use of a teaching medium that, in the minds of some observers, makes the learning process seem easy:

> One thing I like to get on to is that this whole thing [the Internet] makes things easy and accessible. I think that part of any learning experience is having to do things that are hard. Part of what you learn with a university education is how to work under pressure and do things that are hard. There has recently been a healthy trend towards making education a little more organized and thinking about students when preparing the teaching material. There certainly have been professors in the past who had the attitude that the students were there to listen to whatever they had to say and felt they were under no obligation to organize their thoughts in such a way as to make them understand. I think that has changed—which is good. At the same time, perhaps, we may have gone a little too far in the other direction where it's now expected that everything will be just laid out very neatly and cleanly—and maybe we do too much of that. I don't really know the answer.
>
> Ultimately you get out into the "real world" and you're slapped with problems that aren't well organized for you and if you don't have experience digging through mush and bringing out something of substance you are in big trouble.

When asked what professors stood to lose by using Internet teaching technologies, Professor C expressed concerns regarding the issue of intellectual property and the ownership of materials created and placed on the Web:

> "There's always the question of who owns your intellectual property—does the university own it or do you own it—and if you've already put stuff on to a web server,

> the university may feel a little less fussy about using it for their own purposes. [As well], anybody can download anything that you have on the Internet. My philosophy on that has been that until such time as I'm ready to put in the work it takes to write a textbook, I'm not going to worry about it. I'm not losing anything until a textbook is in place and then I'll lose money."

In similar statements to those expressed by Professors A and B, the problems of focusing too much on the technology and spending too much time in preparing Internet teaching materials were also a significant factor to Professor C :

> There is the real temptation to spend far more time on the Internet stuff than you would have spent if you were teaching with the overheads. . . . Many people get so caught up in the technology that they spend less time thinking about the actual subject matter. So the professor has spent a lot of time making little animations, DNA molecules, all kinds of cute little animals floating around or whatever—and it didn't really add anything to the understanding of the topic that they were trying to get across.

These problems seemed to be more than compensated for, however, by the positive aspects of Internet use and the things professors such as himself could ultimately gain because of that use:

> Well, I think they gain one of the things that I've gone into it for: convenience. It's a means of efficiency to be able to solve a problem once and not have to worry about it again and to be able to modify things quickly. Everybody wants to save time. And—you get better exposure. I'm always getting emails from everywhere in the world from people who want to use something from one of my websites or who are

> interested in something I had on a website. As far as research is concerned, I've had inquiries from a company that discovered our research work through a *Yahoo* search and since then we've been involved in some commercial negotiations with them. I've had any number of people discover what we're doing and want to interact. If you aren't on the Internet you're not searchable. If you are on the Internet you are searchable and people are going to find things.

In summary: Professor C is an advanced user of electronically-mediated education materials who has sequenced Internet technology into his existing network-enhanced teaching. He is, in his own words, "far ahead of the curve" when compared to most users of this technology and has pioneered its use in both his department and his faculty. Although he uses the Web and other Internet applications for their convenience, their time-saving qualities and for professional contacts, he has not lost sight of the fact that the most important uses still focus back on the students who ultimately are the recipients of his efforts. He sees these technologies as a useful way to address such things as different learning styles, while at the same time wondering if they are not making things just a little too easy in terms of actual knowledge acquisition and problem solving. He is, as were Professors A and B, a committed educator who uses this technology as a supplement to traditional means of teaching, and considers it as yet another tool in the wide variety of those that are currently available.

Professor "D", interviewed on June 26th, 2000, is, in many ways, the most advanced user of Internet-related teaching materials in this group. His experience with this technology is as wide as some of the others, but the depth to which he has taken its use—combined with the level to which he has obviously thought about its impact and pedagogical repercussions—is immediately evident. Much

of this connoisseurship stems from the fact that he is a professor of Astronomy who has used computer technology in general for 37 years—the last 7 of which have been focused on the use of the Internet as a classroom tool. In addition, he has recently been associated, through a secondment, with the University Teaching Services group and has organized and taught many seminars and presentations in the use of electronic teaching technology for other university staff and academic personnel. While expressing many of the same concerns as the other interviewed professors about the subject of Internet-mediated teaching, he was also able to provide insights that exhibited a level of understanding that could only come from someone who had been thinking about these matters for quite some time. He will try any new technology that comes his way when designing his classroom materials and is currently exploring the various modules of the commercial application Web CT.

When asked about his reasons for using these technologies, Professor D's answers echoed some of the student-centric comments of the earlier interviews:

> I guess initially because it's there—in the sense that I'm a technophile. I like these sorts of things, so I try them. But gradually I am seeing that there are specific supplemental uses. I'm thrilled by the feedback that I've been able to provide via the testing inside Web CT. That's helped me a great deal. I also like the calendar tool [in Web CT]. . . . I guess my primary reason for using the technology is finding uses for it that I think are educational, useful and valid for my students. I use it for motivational purposes, to increase learning and I also think there are things than can be done for increasing interaction between the students.

In answering related questions regarding the things educators stand to gain and lose through the ongoing use of this technology, Professor D's responses followed a similar line of thinking:

I'm hoping to gain—and I think many educators could gain—more satisfaction from the students in the sense of giving them a supplement to their learning; of having more tools available for their learning. So in that sense its a better way of learning. In that respect, from the little I know about how people learn, the more ways we can give them to access information and ideas, the better. I don't think we'll ever lose the other options either because a lot of people learn that way too. I think the main thing is to have more tools that are useful to the student and that helps me as an educator in the sense that my purpose is to try and find ways that will help students learn. Every single thing I get I want to use.

. . . You lose what you give up and I'm not sure I'm giving up anything by taking on another tool. The thing that I'm giving up is some time. People say that you lose contact with individual students but you don't—you only do that if you give it up. I'm not willing to give it up; I'm using it as a supplement. I'm hoping it gets me to some of the students that don't want interact with me. I honestly don't see that I'm losing anything.

Indeed, over and over again and in question after question, one gets the sense that this is an educator who thinks constantly about ways to motivate, excite and entice his students to learn; whether with the Internet or by more traditional means. When discussing the application of learning theories while developing courseware that utilizes Internet technology, he provided a direct negative response, but then proceeded to offer something equally as compelling instead:

No, because I don't really know learning theories. I do consciously think about the little bits I've heard and the things that I've gained in terms of interacting. I know a few things that work. I know some things that work with some students and over time I've gotten better in the sense that I can deal with more students. There's always students you never reach, that never get motivated or students that are motivated that you just can't help. We can always argue that they haven't had the background preparation—and that's fine, but I still have to deal with that. I have this intuitive sense and that's why I'm willing to proceed with the designing of an instructional module. I have a strong sense of what I know will work with a good variety of students. I think I can design something that would, in some sense, deal with these students in the same way that I deal with them when they come in to see me. That's what my goal is—to be able to construct or design something that will allow me to interact with a student through a machine, in a similar way to what I might do in my office.

. . . I think those people who are concerned about their teaching do think about what's happening. I think very strongly about the interactions with students. One of the things that bothers me about the way we teach is that we don't have enough time to give individual instruction. If we could give individual instruction we'd have a lot more positive results, although with a lot fewer students. Overall I think that we'd produce a lot more students who were really good.

The design of an instructional module that would allow for true interaction with his students was something that came up several times in the interview with Professor D. At one point, when he was

discussing some of the problems associated with preparing teaching materials for use on the web, his thoughts were as follows:

> The main thing is time. I think I have a reasonable handle on what I'd like to do. I don't know that I have a reasonable handle on how to do it. Actually, while I'm on leave, I am going to try to design—with real emphasis on designing—an instructional module on a subset of astronomy called a Hertsprung-Russell diagram. I hope to design all the background and maybe storyboard it in detail and I might use Hypercard. I think that might be an effective way for me to organize my way of doing it. My own feeling, though, is that it is an awful lot to do.

The subject appeared again in greater detail when Professor D discussed the ways in which he felt the Internet as a teaching tool could be transformative:

> In a year's time, if I'm successful with designing this module—if that works out to be doable on the Internet—then that might change considerably what I would do. The problem is I'm not willing to give my students the textbook and say 'come back in December and we'll give you an exam'. Putting notes up, even amplifying the notes with videos and animations doesn't do it. I mean, I'm not sure lecture does it either, but I'm more comfortable personally with lectures because I've been doing them for years, and for some students it works. Some students love lectures and get a lot out of them and that is interactive in the sense that they are on their own interacting with what's happening. So it does work in that way.

The vision I have is to try to have some true interactivity. When I say that I want to design this module, I'm trying to think of designing it with a natural language interface where there's actual responses to real questions. The reason I think it's doable to a certain extent—it's clearly not doable on a really deep scale—is that many of the questions I get asked are very trivial and I can usually predict what they're going to be. Some of them are a little deeper, but even those I can predict somewhat and my way of dealing with questions when a student comes in is to start asking questions to probe what they know. Usually that's because they either don't know something or aren't secure in making an association—in making the jump, or don't see that these things are just logically consistent and they lead some place. So you're trying to encourage them to do that—and I think some of those things can be built in. It's really tough in the sense that you have to think of all the directions that they're going, but what's possible there, what I really like about doing things by computer, is that you can track what's happening, you can read through it and you can see what happened or what you didn't expect was going to happen. The thing about it is that something like the transformation will only occur in my mind when we start getting programmes that truly interact—and we don't just say they're interactive because you've got multiple choice buttons, or you've got different routes you can take.

I would say that most of those are no more interactive than a book. And a book is interactive. I'm not denying that a book is really good and has good interaction and we don't usually—except in distance education, and we know there are problems in distance education—we don't just give students a book and expect them to learn. I

> think the transformation will require quite a bit of time and some investigation in this direction. So, I'm trying to find some people from outside of Astronomy who might be able to help; who understand these things. First of all, I'm looking to build up a concordance of the language—that is, the language that surrounds the module that I want to work with. I think there is a concordance programme available and I'll try to put in as much discussion of these areas and build up frequency tables and things like that and then talk to some people who have tried some natural language stuff. Although I don't know if anybody has been really successful with that. So, it's not transformative for me at this point—although the vision is that maybe it *could* be transformative.

In detailing his reasons for wanting to develop this interactive teaching module, Professor D's focus again pointed back to his students. When asked if he designed his own teaching materials and either adopted, adapted or invented them outright, he replied:

> All of the above. There's an important background to that question in the sense that I'd love to design my own materials—not necessarily because I think I can do it better—but I find that if I use other people's materials, very often I don't think their way so it doesn't fit. . . . What I find is the biggest difficulty is in the matter of depth of concepts. It's hard to find a good textbook. My style of teaching has developed gradually over the years to the point where I like to do a few topics considerable depth. . . . I come back to topics over and over again and try to go deeper with them. What I find is that there are no textbooks that are written in this style. So I feel that textbooks should be a resource for the students—so that if they don't understand, and don't get

help from me directly, that they have another resource. I'd like to design my own materials where I can give them a broader view, but of course, the difficulty there is that you can't do it; you don't have the time. So I adopt, adapt and invent. I must say, though, that things are growing and I'm hoping that some people will soon be doing really good stuff. There isn't really good stuff at this point.

It might be surprising to some, after reading the above, to find that Professor D has similar opinions to the other professors interviewed when it comes to the questions of whether or not a quality post-secondary, university-level education can be delivered via the Internet alone:

> My best use of it is as a supplement. I have never seen, to my way of thinking, a course that has been only delivered live via the Internet. Although I have heard of Web CT courses through UBC online that functioned almost entirely through the bulletin board, discussion groups, forums and assigned projects. So what that is, in some sense, is my image of something like a seminar. It looked very much like a seminar class except they didn't meet together in a room. They had discussions, they did presentations, they broke up into smaller groups, they did projects and they recorded their projects. So that sort of course may work.

> As another example, the state university in California at Pomona runs courses in international affairs online and again, it appears that it's a discussion sort of thing—project oriented, where you read materials, you discuss them, interact, do a project on which you would report online and things like that. And that seems to be effective.

Something like what I'm doing, although a little bit tougher— I'm not sure. Ask me in about 20 years.

Expanding upon this idea at a later point in the interview, Professor D continued in a similar vein:

I'm not versed in educational theory, but just from my experience, what motivates a lot of students are personalities. There are a lot of students who fall in love because of the content, because of the ideas, and those students can do it this way [points to computer]. The others, who fall in love because of the way it's presented; the discussion and the actual personality, need *this* [points to self]. There are some students who are quite outstanding and look hungrily for interaction or for guidance or something and if you don't have the flexibility of *this*, that's lost in some ways. I think there's always going to have to be live teaching in more of a frame than just online discussion—although that's pretty good. I mean, online discussion—where you start talking with someone that you can see is really bright—can be really good but it's really getting together and sitting and talking face-to-face that very often does it. I know I don't do it as much as *my* mentor, who was very good about taking you out for coffee and sitting and talking but I do I think that it's important. I think there's a lot of students who need that. I really enjoyed that—I thought that was great. I found it thrilling to be associated with someone I thought was knowledgeable. I think that may relate to the courses that I think have been successful: that there was a lot of interaction. Content courses like the sciences where there's a lot of stuff to memorize and things like that, if you just put that out, it's deadly. You have to have some personality behind it and provide some background stuff.

> . . . I feel that I know the technology really well and I'm not convinced in the slightest that I can do it [teach entirely with the Internet]. Training can be done really well, I think—where you've got specific sets of instructions when you want to do certain repetitive things; where you don't necessarily have to make a decision—one that's outside the scope or the training.

At other times during his interview, Professor D expressed different concerns about some of the more negative aspects of utilizing the new technologies in his classroom, and at one point, he referred to problems similar to those of Professor B before him:

> It suddenly occurs to me that I do know what would enhance my current use of this technology. More help and more time. And, if I could—money to hire people—but I don't want to have to chase them. Money, in some senses, should be provided for us to help develop, and again, I don't have the time to chase. The chasing of money has these ties to it. You know: we'll give you money if you work in this area to accomplish this. I need to accomplish things in the areas that *I'm* keen about, and that *I've* got ideas about, and I'm not willing any more to rob [from what I want to do] and try to build up ideas and enthusiasm in some other area. I've got what I think are a lot of really good ideas and I'm slowly developing them. If I could get the money and help— yes, that would enhance my current use. I don't want any more new technology right at the moment. I mean the stuff I've got, and the stuff that's available is really terrific.

. . . We've got so many new things, new ways of doing things during the last 7 years. The Web, which is an immensely rich tool, has only been around in a useful form for 7 years this March and there's no way that we're anywhere close to really understanding how to use it. One of the things that bothers me is the constant demand for research to indicate what works and what doesn't work. I haven't got a clue, and I don't think the research is too effective yet because there hasn't been time for people with ideas to do things. You know it's important to do the research and it's important to find out, but it's also very important to realize that the research is in the very early stages of development and even though there are a lot of people working very diligently on it, we may not have the few brilliant ideas yet. The tool is there and there's lots that can be done with it. Unfortunately, the manufacturers of equipment and the software producers always want their income so they're constantly modifying and changing things so we don't ever get a handle on what we can do. That's why I'm tending to avoid development issues, and I'm tending to avoid going to meetings and conferences where they talk technology because I've got more than enough technology to deal with with what I want to do.

I'm now dealing with it in the sense that I think almost anything that I could envisage could, in principle, be done. I don't know whether I could get the money or the resources to do it, so my approach now is to think very carefully about what I want to teach and what I want students to learn and if I have a way that I want to do it, how would I go about doing it, what things would I get them to do—and then I sort of design that in a rough outline and go in and restrict myself more and more.

Finally, when asked about whether there was much in the way of administrative or peer pressure involved in his decisions to develop online learning materials, Professor D continued with this same line of thinking:

> I think there is pressure from the administration to do things. Not necessarily negative pressure. They're encouraging verbally, they're encouraging very slightly financially but the rest of the encouragement isn't there. There isn't really strong financial help, and the matter of financial help needs to be in the area of manpower support and in time off so that people can learn. This takes a lot of time and I would argue that it's not so much the learning of the computer, it's the learning about what have I been doing for the last 30 years in my teaching, and how do I think about doing that in the context of the new technologies. The administration has verbally given support for it, but they don't have money so they don't do it. Now it's hard to say whether it's the administration or my colleagues that are responsible for the lack of support in terms of recognition. For example, for tenure and promotion, something like this would not be recognized very strongly by most tenure committees. I would argue that that's probably because there is not yet general recognition of its worth amongst the professoriate. Administration might be able to impose it but that would not be the way to do it. It's really got to be the faculty that says to their colleagues that are interested in this—and unfortunately there is a very small proportion that are interested in this—that this is worthwhile and to support them in their endeavours. We will work to give you time off, and at the departmental level, you could get a course off in order to do this. But they have to get money in order to be able to do that. In some senses there is

> peer pressure to not use the Internet. You will probably not get promoted or will not get tenure if you spend your time doing this rather than doing your research. I would say that compared to other pressures to do other things, department and peer pressure to use the Internet is very small.

Again, in summary: Professor D is an advanced user of Internet-related technologies whose evident skills in this area place him into the upper ranks of educators world-wide who are experimenting in these areas. He is, like the other professors interviewed, an obviously committed educator who believes that the newer teaching tools are best used as a supplement to the existing canon of traditional techniques. He is willing to concede, however, that since we have been using this new medium for only a short time, things may change quickly. With this in mind, Professor D is currently studying the possibilities inherent in a teaching module that will attempt, to a moderate degree, to duplicate the classroom experience of teacher/student, question/answer interchange in an interactive, computer-based system. He is concerned, as were the others, that there is not enough administratively-sanctioned support for the development of Internet-based teaching materials and questions the current academic climate that rewards traditional research yet pays only lip service to research involving emerging technologies.

What stands out most prominently in the interview with Professor D, however, is his dedication to his teaching and the fact that everything he discusses ultimately re-focuses back to its usefulness or effectiveness in classroom and learning-related situations. Even though he has no formal educational background, his every thought and action gradually returns to this student-centered, transmission-of-knowledge baseline. Although he is as advanced in this area as he is with his technology, he never

gives the impression that he is in any way complacent about his knowledge or his accomplishments. One gets the sense, when talking to Professor D, that this is someone who will continue his research and development into both the pedagogical and technical aspects of his profession for some time to come. In his own words: "I don't think we really know how people learn. All we can do is try all our tricks."

Part B Interview Question Analysis

As a way of cross-referencing the above information, it was decided that a detailed analysis of each of the interview questions as answered by the four professors was necessary. However, rather than undertaking an exhaustive survey of absolutely everything that was said, an abbreviated version that covered the salient points was employed instead. In addition, comments from a fifth individual who shall be referred to as Professor E, were included in this section when they were applicable. He is a professor in the Faculty of Education specializing in the area of educational technology and is a member of my thesis committee so it was felt to be not quite appropriate that his comments become a part of the main body of this study. However, since he volunteered to pilot-test a first draft of the research questions for this study, and since his observations sometimes were quite illuminating, it was felt that some of those observations should be included in this section.

1. Utilization Questions:

With reference to question #1, as each professor detailed his use of Internet-related technologies as an active part of his teaching strategy, it became clear that the amount and type of use varied considerably. Professor A used mainly e-mail assignments and web "notes-posting" as teaching devices and was only in the beginning stages of considering the development of a web-based course in Farm

Financial Management for diploma students. He had only been using these technologies for a year or two but noticed that his students responded positively to his efforts in instructor evaluations and was encouraged to continue. Professor B had been using Internet teaching technologies for about 5 years and made extensive use of email, newsgroups and a number of websites, but had also taught some synchronous distance ed. courses that utilized chatrooms and whiteboards in a limited fashion. Professor C used websites for notes-posting as early as 1994 and as an active part of his teaching since 1997. He began using newsgroups for teaching purposes in 1995 but was disappointed with their success:

> I think the first newsgroup in Cytogenetics would have been around 1995. I created a news group that I tried to get people interested in using as a way of discussing home-work assignments and for discussing problems coming up perhaps on the final or midterm. It wasn't really very widely used. People were just not accustomed to Internet news groups.

Similarly, when he discussed the use of videoconferencing, chatrooms and whiteboards, he expressed related misgivings:

> We haven't done any videoconferencing or whiteboards or chat groups. I haven't gotten into chatrooms at all. In some areas they might be useful—I think in particular in an area like a literature course or a writing course or a philosophy course. One of the problems with that form is that unlike newsgroups, things are more fragmented. It's more of sound-bite kind of thing rather than a well thought out paragraph. In news groups you often make a point by putting up a reply to things and you have to do a little more thinking. What you say is organized a little better as well.

> I think with a chatroom you don't retain a very long history of what has been discussed whereas with a newsgroup, if you've been gone for a week you can still go through all the articles leading up to today and you can see what people have been talking about, and consider what you have that's new to contribute.

This was a relatively consistent opinion amongst the professors who had either used or were considering the use of the secondary utilities of the Internet. Either they had not tried such things as Videoconferencing, whiteboards and chatrooms or they had tried them and had not been overly impressed with their potential to become part of their array of educational tools. Indeed, although Professor D was effusive about his extensive use of the e-mail and Web portions of the Internet and referred often to the development of his planned interactive teaching module, his thoughts on some of the other tools were less than positive. Of whiteboards, which he tried once, his comment was "it ain't great. At least the WebCT implementation of it isn't great." With reference to IRC and chatrooms, his comments were as follows:

> There is a chat room function in WebCT. Again, I didn't use it in the class—I used it in a workshop. I've never been impressed with chatrooms. The problem is that I can shout very easily in chatrooms because I can type fast. A lot of people can't and that's difficult.

With regards to the sub-questions associated with question one, there was, again, a considerable variety of responses that often resolved themselves into a kind of consistency of attitude when viewed in retrospect. In question 1b, (Do you design your own materials? Do you adopt, adapt or invent?) all of the interviewed professors were unanimous in the fact that they used any means of development that

worked for their online course materials. They all adapted, adopted and invented as the situation demanded, although Professors C and D were obviously stronger in the latter category with their hardware and software solutions to their specific teaching needs.

With question 1c, (What problems have you experienced in implementing these technologies in your teaching?), the responses revolved around the problems of availability of equipment and the time and funding needed to develop courseware. Professor A's answer was as follows:

> Well, in terms of using the web in class which I have done to a certain extent, one thing is that some of the classrooms don't have the built in technology. Our bigger classrooms have it, but some of the smaller ones don't. I tried the odd portable unit, but it didn't always work out that well. That's something that has to be resolved. That's one of the problems. You have to have an Internet connection and you have to have a data projector

Professor B echoed this concern and added a second:

> Well, there are several problems, [one of which is] simply getting the technology set up and running. I guess the major problem is basically that of time. I don't think the university has really identified it as a critical area, and therefore people that do this more or less don't get any kind of teaching break to do it. This is much more time consuming than traditional preparation of lectures so you've got to steal from your research time. I've kind of adapted to that as this has, in part, become part of my research, but there's still a major time problem.

Because of his existing computer skills, Professor C's problems in implementing the new technologies had not really been an issue, although he did refer to problems similar to the above that might have been the case had his own abilities been less evident:

> The university does offer courses in creating websites. I've never been to any of them simply because I was so far ahead of the curve they wouldn't have done any good. However, if you are not proficient in making websites there is nobody who will make them for you. In some departments they may have secretarial staff who know how to put together web pages but right now you're pretty much on your own.

Professor D's description of his problems with the implementation of the new technology was short and to the point, and although he went into greater detail in other parts of his interview, at this juncture his comment was as follows:

> The main thing is time. I think I have a reasonable handle on what I'd like to do. I don't know that I have a reasonable handle on how to do it.

All of the interviewed professors had stories of various successes with the use of this technology in their classrooms, but one thing most of them alluded to when questioned about the nature of those successes had to do with the positive feedback they received as a result of their efforts. From Professor A:

> One thing I've had are very, very positive student evaluations. We usually do an informal one half way through the term, and then we do a detailed one at the end of the term, so you do get a lot of feedback. You do see the range so you get a pretty good perception of what the reception has been. I've had positive reviews, so that kind of makes you keep going at it

Professors C and D commented in a similar fashion: "Certainly in the student evaluations that we get at the end of the course, people are pretty satisfied with web-based delivery."(C)

". . . about 4 student gave me the strongest positive feedback I've ever had— saying unsolicited that it was the greatest thing they'd ever experienced in their school life." - (D, discussing the results of an online exercise he had prepared for his students).

Professor B, who had had some problems with motivating his students and getting them interested in his Internet-mediated courses, nevertheless answered in a similar fashion—but with a twist: "Well mostly it's from the feedback I get—not from my own students, but from faculty and students elsewhere."

The sub-question dealing with what each professor felt could enhance his use of technology in the classroom was sometimes more successful in eliciting commentary on some of the problems they were experiencing while trying to implement it:

> More time. Mainly training opportunities. I'm mostly self taught on this and there aren't a lot of training opportunities. . . . The other thing is getting support for attending conferences and things like that. (B)
>
> More help and more time. And, if I could—money to hire people—but I don't want to have to chase them. Money, in some senses, should be provided for us to help develop, and again, I don't have the time to chase. . . . If I could get the money and help—yes, that would enhance my current use. (D)

With question 1f, (Is the Internet itself an effective means of delivering all course materials or is it best used as a supplement?), the consensus was definitely in favour of the supplemental usage, but it was this question that also generated some of the most interesting discussion as to why each professor believed this:

> There's a lot of experiment going on. The idea of a degree earned on the web to me is a real far one. I would want to check the quality of the student. There is probably a small sector of the population that would have the self-motivation to do it, probably about 5%. (A)

> I think it's pretty limited in terms of teaching a complete course. I don't want to try to run a full course on the Internet. There's really an important element in being able to look at the actual people and tell whether they are totally lost or that they're really getting it. You can do some of this with videoconferencing—though I'm not convinced that it's adequate actually. Mind you, I haven't tried videoconferencing yet, but what I have seen of it hasn't convinced me. Of course this could lead to the question of whether or not we should just have virtual universities and get rid of the classrooms. The answer is an unequivocal no to that. (C)

> My best use of it is as a supplement. I have never seen, to my way of thinking, a course that has been only delivered live via the Internet. . . . I feel that I know the technology really well and I'm not convinced in the slightest that I can do it [teach entirely with the Internet]. Training can be done really well, I think—where you've got specific sets of instructions when you want to do certain repetitive things; where you don't necessarily have to make a decision—one that's outside the scope or the training. (D)

Probably one of the most interesting comments, however, came from Professor E, referred to above as the volunteer from the Faculty of Education who piloted an early draft of the interview questions:

> A course delivered exclusively on the Internet has some limitations obviously. For the most part I suspect that current course offerings are little more than electronic correspondence courses and many of the things that I see being done are little more than page turning activities. I see assignments being handed in electronically which is efficient. For example, my son is doing 3 courses at Athabasca University now and he has communication with his instructor via the Web, and submits assignments that way and gets his grades back that way if he wishes it. For course materials and content that can reasonably be done through "read this, answer these questions and come and write such and such", I think this is an OK medium. But in cases where you need a discussion, in graduate courses especially, and where there are issues where the attitudes and values of students are important, I think that's where the Internet doesn't do the deed. We can try doing things through newsgroups and chat groups and stuff like that but that's a fairly poor second cousin to face-to-face conversation. However, for some things it may well be just fine, and that's a decision instructors have to make. Is this going to do the job well enough to justify using it?

2. Justification Questions:

In the Justification section, two main ideas emerged as the various professors addressed the main question, (What are your primary reasons for using this technology in your teaching, ie. why are you using it?). Several of the participants focused on the fact that the Internet has become yet another useful tool in addressing the needs and different learning styles of their students while others were

impressed with the ways in which the various Internet technologies made their jobs easier in spite of a sometimes daunting learning curve. As an example of the first idea, Professor A states: "Well, I'm committed to being the best teacher I can be so I'm not going to let some new technology come along and not give it a try. There are people using it effectively so if it can make my program better, I will." Professor D also found this to be an important aspect of the new technology: "I guess my primary reason for using the technology is finding uses for it that I think are educational, useful and valid for my students. I use it for motivational purposes, to increase learning and I also think there are things than can be done for increasing interaction between the students."

Although the other professors voiced similar thoughts to the above in answer to other questions in the interviews, several of them focused more specifically at this juncture on the second idea expressed above: that of making their jobs easier. Professor B's response, quoted earlier in the text above, had to do with the fact that many concepts and ideas in the field of Anthropology were difficult to explain verbally or in print and that a Web version simplified this task: "You can really get a very effective presentation of space and process and categorization by developing the Website. The other thing I like about it is the hypertext structure—essentially to develop cross referencing between different categories and different levels." He was also impressed with the fact that a great deal of supplementary material could easily be made available enabling him to "give the students the option of really going into depth."

Professor C also found that his use of the Internet had simplified his teaching job—but for slightly different reasons. Specifically, he commented on the ability to update his materials and modify them more easily than had previously been the case:

> Well, one reason is to make it easier for me. It's a bit of work getting the lecture into place the first time, but once you've got it, modification is very easy and reorganization is easy too. I have the luxury of deciding that I might want to switch around my topics and it's relatively easy to do. Quite frankly, if you come to class armed with a bunch of artistically drawn overheads and all that, you really don't want to have to change the course, so the overhead approach motivated you not to change your course and not to update your content, whereas now I update every time I teach a course. I think especially in the areas that I teach, it would criminal of me not to update because in some cases I throw away 1/4 to 1/2 of what I taught last time. I have to have some kind of a dynamic technique to accommodate this.

It is interesting to note at this point that in the pilot interview, Professor E's comments incorporated both of these two main ideas into a single thought:

> Because my business is technology and pedagogy I have to embrace it because it's part of what I do. But more fundamental than that is my perception that it can help me do things more effectively and efficiently. It can help me accommodate learning styles, if I want to do that kind of thing, but mostly it's a more powerful way of orally and visually, and in print, presenting information to students. That enhances their opportunity to learn. My job is to create an environment that will enhance the potential to learn and, I know that by embracing some of this stuff, I can do that. So that's why I do it.

There were a number of different interpretations evident in the responses to the second part of the section dealing with justification, (The Internet as a teaching tool has been described as 1) amplifying 2) transformative, 3) administrative, 4) technical, 5) innovative. How would you view it within the scope of these categories?), but some of the most interesting comments and probably the most consistently complete answers came from Professor D. Although the other professors did address this section, their comments often became a springboard for their thoughts about other concerns regarding Internet usage in educational settings. One might argue that their attention could have been re-focused to the question at hand, but it was felt that their comments had the potential to be of greater use elsewhere in the study. As some of those comments have been quoted in the previous section of this document, Professor D's responses will be used here as the most typical answers to each of the descriptions listed in the question, although comments from the others will be added when applicable and to the point.

With reference to the amplifying qualities of the Internet, Professor D's comments were as follows: "I would say in certain areas of content, yes—it amplifies. In astronomy very much so, in that I can get students to see a much wider range of what Astronomy is about and what astronomers do in some of the questions that are being dealt with. This is a great motivational thing, so yes, it is amplifying—and I'm quite sure I use it this way."

Professor C had a slightly different view as to the meaning of this term: "I suppose amplifying in one sense is that you have access to more information than you would in a textbook and you have accesses to different sources of the same information. If you don't understand one—you go to another, and if you don't like what one has said you can go to another."

In terms of the Internet being a transformative medium, Professor D's thoughts were as follows:

> I would say for me it has not been transformative in that I'm still doing things that I've always done and I'm simply adding to that with the Internet. I'm still going into my lectures. It's modified my teaching a bit in that I feel more comfortable at times with not amplifying as much in class. Not amplifying as much or leaving them hanging a bit more came naturally to me because I realized that they now have an additional resource tool. . . . The thing about it is that something like the transformation will only occur in my mind when we start getting programmes that truly interact—that we don't say they're interactive because you've got multiple choice buttons, or you've got different routes you can take. . . . It's not transformative to me at this point although the vision is that maybe it *could* be transformative.

Professor C interpreted this part of the question in a different manner:

> It's very interactive, so in that respect—when you're reading a textbook or listening to a lecture—you're absorbing. Whereas with a website you might take the time to actually think about what you're reading and you have the choice of many different links sitting there and you can choose which of those you're going to look at. So, in that sense, I suppose that you are transforming your own learning experience into what you're interested in.

Professor E offered yet another interpretation of the transformative nature of the Internet:

> Does it change the structure of things? Absolutely. Certainly in the old traditional sense of the sage on the stage, it is partly true—although it's a peculiar metaphor. It

means that my role changes—that I have to think not only of the old things I used to do, but also of the potential of the new things. It also means that students see things in different ways and they have to look for information in more than one place. Before they could count on it all being in one place—now it may end up being in a different place altogether.

The Internet as an administrative device was addressed by Professor D in the following manner:

> That's one thing that I didn't mention about WebCT that's important for the class. For my first year class, all of my grading was done within WebCT. I gave questions outside of WebCT, I printed out and marked those and then entered them into the program. What web CT has is the ability for the students to go in and see their own grades at any time. I don't have to post them. I sent out a message to the mailing list saying they're now available so go take a look. There is the possibility that we can progressively enter things so they can continuously check their progress. So in that sense, yes, it is administrative .

Most of the other professors agreed that the Internet could be administratively useful in certain "housekeeping" tasks such as grading, notes posting and the like. So too, most of them agreed that there was a definite technical component in learning to use the Internet as a teaching device—although this question elicited an interesting response from Professor D: "Technical? I don't know what that means. It's a very difficult thing to describe. I've been using computers for 37 years so easy means intuitive to me. I can overcome most of the technical aspects of it."

Professor D also provided an interesting response when asked whether he viewed the Internet as innovative:

> It's not just the Internet, it's the idea of using the computer. One of the major benefits of using a computer is that you can do things that you've never been able to do before. You can visualize mathematical functions that you've never done before, you can simulate time scales. You can do things inexpensively, really cheaply and there's a wealth of visual information. We have so few pictures compared with all the things that are out there. The things that we can do—and again, this is motivational, not necessarily instructional, although ultimately it is instructional—there is a lot of instructional value at looking at lots of images. Once someone is attuned to what those pictures are really showing—flipping pages and starting to think a little—if some ideas have been put in there when they look at it, I'd say it could be very innovative. We could do it other ways too but this is a tool that is effective.

In the final sub-questions of the Justification section, the participants were asked what they felt educators gained and what they lost by utilizing Internet tools in their teaching. Probably the most succinct and to-the-point response came from Professor B: "I think that it can create a more interesting and more complete teaching tool. . . . I don't think they have anything to lose. I mean—yes, if you spend too much time on it and neglect your research, you might lose some publications. I think some of the time economies are real problems that the university doesn't really recognize."

Professor C referred back to an earlier comment and stated that he felt instructors could gain exactly what he had gained from it: more time. "It's a means of efficiency being able to solve the problem

once and not having to worry about it and to be able to modify things quickly. Everybody wants to save time." In terms of what educators stand to lose by using the Internet as a teaching device, C's comments focused on the intellectual property concerns quoted earlier in the Profiles section (p. 61). As well, Professor D's comments on this subject have been quoted at length in the Profiles section (p. 64) so it remains only to give the final word to Professor E, who again offered some insightful comments:

> What do educators gain by using internet tools in their teaching? On a personal level they gain access to professional information, they gain access to teaching resources, they have the world as a virtual library that their students can access. But that means on the other side of it they have to start thinking in different ways. You no longer give an assignment that says, tell me the attributes of Mars. It's got to be something that compares and contrasts the attributes of Mars to Pluto or something like that. So you actually make students do things with the data, because it's trivial now to go out and find any fact-bit of information. So what we can do with this—and I think this has a big potential—what we can do is learn how to ask the higher order questions, and for some, especially those in the public school system, I think that's a good thing. By asking that compare and contrast question about one thing or another—implied in that is that the student will learn the causes of the list for the reasons why. So we're embedding the low-level stuff in a higher level activity and it becomes a process activity. So we've got a different sort of presentation strategy now—in fact it's not even a presentation strategy it's a learning strategy.
>
> What do they lose? Well, those who need to stand in front of a group for their own

personal gratification or to feel powerful will slowly lose some of that. I think some people are also discovering that they're not always right, so that's a bit of a challenge because there are alternative points of view out there. I think they're losing their innocence in a lot of ways. The content that's available to them is so diverse, so interrelated, that your discipline just doesn't stand by itself. It's all connected now and that's part of learning too. Learning to find connections to develop your own mental schemas becomes important. We don't know what texts students are reading when we give them an on-line assignment any more and we don't know the truth of that text so it presents enormous challenges to be sure of the validity in what we're doing.

3. Learning Theory Questions:

The third main question and its sub-questions produced some interesting answers. (Do you consciously employ any learning theories when developing courseware that uses any of the Internet-related technologies? If so, which ones and how do you integrate them?). Although several of those comments have been quoted above in the Profiles section, it was felt that for a question of this importance, a listing of the replies as a discrete group was necessary to maintain clarity.

Having been associated with disciplines other than Education, most of the interviewed professors had little formal training in that particular area and, as such, could not articulate any accepted, "textbook" learning theories in an explicit fashion. However, each one was able to relate a personal methodology of teaching that was almost tacit in nature—not due to previous training, but present in their preparation and actual teaching nonetheless. Professor A's answer to this question provides a good case in point:

> My overall approach is to be transparent. This is what we want to do, then we do, and then I say "this is what we've done - now let's see if we can demonstrate'. That's my basic approach. The reason why I think this has a lot of potential is that you can get feedback very quickly, even in a large class. That's where I see it working really well. I have a lecture, a lab, a review and then an online web sort of review and a quiz. Learn by doing. The more hands-on it is, the more physical it is, and the more they use their senses—the more they're going to learn.

Likewise, Professor C's reply showed a similar sensitivity to thinking about the process of teaching and about the different ways different people learn:

> I have learned over the years that it is better to teach a few things really well than to try to cram everything in and have them learn nothing. If I am teaching a lecture with chalk and a blackboard, it's kind of a stream of consciousness thing, and the student has to decide for themselves how to conceptually break it down into topics and how to organize it. And maybe that's actually a good thing—maybe we don't do them a favour by doing what I do when I make web pages. I use a lot of subheadings to break it up into main topics, and my subheadings are almost always declarative sentences. 'This is the point I want to get across for this piece of information', so there should be no question in their minds as to what I'm trying to say. Again, maybe that's not the best thing—maybe they should have to ferret out for themselves the important organization behind it. For me at least, it helps to have it organized, although I think it is bad to organize it for the students.

> I think maybe another learning theory is that people learn by seeing. My web pages, which are actually reproduced lecture notes, are designed so that they can be read like you would read a textbook. During a lecture I have the things that I really want them to see in the subheadings and the pictures—which are all big enough so that they can see them as if they were on a slide projector. So I can ramble on as much as I want to on a particular figure that I'm showing and I would probably be on roughly the same topic as what's physically written on the page. It certainly won't be a verbatim recitation of what's written on the page, and that's good I think. That way they're getting two different presentations of the same material, so in that respect they still gain something by reading the actual lecture notes because it's not precisely what I talked about in class.

Again, Professor D's remarks do not reflect any officially sanctioned learning theory as such, but as with the other professors, he has obviously put considerable thought into the matter. In answer to the question he replied:

> No, because I don't really know learning theories. I do consciously think about the little bits I've heard and the things that I've gained in terms of interacting. I know a few things that work. I know some things that work with some students and over time I've gotten better in the sense that I can deal with more students. There's always students you never reach, that never get motivated or students that are motivated that you just can't help. We can always argue that they haven't had the background preparation—and that's fine, but I still have to deal with that. I have this intuitive sense and that's

why I'm willing to proceed with the designing of an instructional module. I have a strong sense of what I know will work with a good variety of students. I think I can design something that would, in some sense, deal with these students in the same way that I deal with them when they come in to see me. That's what my goal is—to be able to construct or design something that will allow me to interact with a student through a machine, in a similar way to what I might do in my office.

. . . I think those people who are concerned about their teaching do think about what's happening. I think very strongly about the interactions with students. One of the things that bothers me about the way we teach is that we don't have enough time to give individual instruction. If we could give individual instruction we'd have a lot more positive results, although with a lot fewer students. Overall I think that we'd produce a lot more students who were really good.

Professor B's response to this question is probably the closest of any of the four to a fully articulated learning theory:

I'm not sure I could identify it as a learning theory or not - but I use kind of a strategy or an approach—and It differs according to the specific site I'm developing. With the site on kinship, one of things I use is to kind of present things at different levels of extraction. Hypertext facilitates that because I can essentially lay down what are three different lines of presentation in different degrees of extraction. One level is fairly conceptual and theoretical. Another level is concrete case-study material that relates the case-study material to the concept and the third level is empirical description. And

> I lay the material down on those three levels in parallel. My idea of the presentation is to build it from the top down, illustrate the concept, and then you have detailed ethnography on the other levels. It's also open to the students viewing it in a number of alternative ways depending upon learning styles so you start from the description and work your way up or you can start from the theory and work your way down. . . . There is kind of hierarchy there where you go from description to application of concepts to comparison to conceptualization . . . and I think Hypertext lends itself very well to that.

It is probably Professor E who provides the best window into the area of learning theories and their use or lack thereof in the planning and preparation of educational materials for Internet teaching purposes. Because of his association with the Faculty of Education, which is, after all, the group that concerns itself most intimately with these matters, it would seem logical that this would be the case. However, his comments, and the ideas they encompass give a surprising but altogether plausible explanation for what appears in the statements above.

> One of the problems for someone like me who studied a lot of learning theory through undergraduate and graduate degrees is the notion of becoming expert. When you're truly expert in something, you do it automatically and intuitively because you know that what you're doing is right. So, do I consciously say 'is there a learning theory connected to what I'm doing?' The answer is no. But can I explain the learning theories that connect to the way I'm presenting information—absolutely. I don't really think much about learning theories but I think about instructional design; the elements of instructional design. What does it take to make a package stand by itself? How is

that structured? It's modular instruction because these things have to stand on their own and be independent so I ask myself what do I have to do within that to make sure that it works? Basically we're looking at a glorified correspondence format for this stuff [electronically-delivered educational materials] so there's a title, there's a good introduction that explains what's going on, there's a series of activities built around maybe websites or whatever else, there's some kind of opportunity for rehearsal of the activities by students embedded in it, and then there's some way of assessing information and collecting data about student successes at the end. So I'm very conscious of that general ID model and that dissemination model which is fairly linear. Now I don't know for sure what's always going to happen in the middle part, in the procedures part, where people are learning the content or being presented the content—and that's where I'll choose to read a book or go to a website. That's where the entertaining part of the design usually comes for me. So I don't really consciously think about it. I mean I think about the really basic things—about the need for clear presentation of information, the need for well-structured, guided activities that will facilitate the ingestion of the information. I certainly think about how I have to gather that information. I think very clearly about the need for objectives and I'll write those out in some cases —and I'll write them in behavioural terms or I'll present them as adjunct questions. I certainly look for the consistency between them—between the final product that I want from them and to how this stuff is presented. There's got to be a one-on-one correspondence there. So I think about it more that way. . . . In my head I have kind of an internal list of pedagogical opportunities. Things that I can do with it—be it to design a website, or find a video, I've got all that stuff and what I consciously do

> is match those against the very specific instructional task I want to achieve. There's definitely a mapping in there for me and it's quite overt. That's where we need to enhance the expertise and understanding of those working on the Internet. I see lots of people just doing it because they can. I tend to cut to the quick. I do integrate them consciously by virtue of instructional task.

Even though a direct process for the application application of learning theories to the planning of electronic teaching materials is most evident in Professor E's comments, it is necessary to reiterate the one of the most important messages arising from the discussion around this question. Again, from Professor D: "I think those people who are concerned about their teaching do think about what's happening." Because of his background and training, Professor E was able to articulate the process a little more clearly in pedagogical terms, but it is obvious that the others, in their own fashion, think about these things a great deal as well.

4. Issues Questions:

Since the introductory section of this study focused heavily on the possible influences of the various media upon the impetus towards teaching with the Internet, it was again deemed necessary to list the comments of the various professors in a fairly complete form—even at the risk of repeating passages that had already been quoted in the Profiles section. The extent to which media hype is responsible for a wholesale move to electronically-mediated education was an important sub-question appended to the main questions which sought to determine, in a more general sense, the how and why of faculty Internet utilization. It is with reference to that perceived importance that any possible repetition might occur.

When considering the first two parts of the main issues question, (In your view, how significant is the mass media as a driving force behind the use of Internet technologies in your classroom? In classrooms in general? and—How much do the outside influences of the mass media such as newspapers and magazines and television influence your thinking about and utilization of Internet-based teaching?), Professor B was probably the most succinct and to the point when he stated flatly: "I had started this before it really became an issue.", before moving on to the next question.

Professor A was a little more forthcoming in his reply:

> Well, obviously the media is huge and there's a lot of advertising about the Internet and the Internet is becoming a lot cheaper too. . . . It isn't an excessive expense so the media is making people understand how available it is. Since the media mind is 20 second news clips and 20 second sports clips, that, in some ways, creates a problem because people have to be patient in terms of learning. They need to take the time to study. The media has a huge effect on that.
>
> . . . To a large extent I look at the mass media and I see how they communicate to people and I think there might be something there that I can carry to the classroom. Not in terms of how we deliver the courses—there we're free to use whatever technology we wish. I'm sure I'm influenced by the media, though. I look around and when I see certain applications, I really start to consider how they will effect my own field and eventually how they're going to impact the ag insurance business.

Professor C framed his answer by questioning the levels to which the various media will actually investigate any particular story:

> It's certainly not driving it for me. . . . I think the media is totally clueless when—I shouldn't say that because I know the media uses the Web as a way of finding information, so journalists are aware of how to use it and that's probably good. That doesn't seem to come forward much in the reporting, though. The media has been treating the Microsoft case in the United States as if the primary issue was the bundling of the web browser and the operating system, but if you actually go to the website for the Department of Justice in the U.S. and read the different things there you find that's only one of a large number of issues that deal with licensing agreements and bundling of all kinds of software, availability of source code, availability of libraries. It's the tip of the iceberg but this is the only thing the media seems to talk about. That's one thing that makes me kind of question how much they really understand the media, or the Internet.
>
> . . . Again, the media is not out to educate but it's out to get a good story. I think they like to show whatever looks good on camera. They will tend to emphasize whatever part of it looks good to them but that doesn't necessarily provide a balanced view of how the thing works or what people are doing with it.

Conversely, Professor D's comments provided a more positive view of the media's influence; one that recognized the fact that perhaps a little pressure from outside influences could help him in his enthusiastic adoption of the electronic technologies in his classroom:

> It isn't the driving force behind the use of Internet technology in my classroom. It probably has an influence and in some ways it's beneficial for me in the sense that it's pressing the university to think that we've got to do this stuff. So they're putting some money into it and I get the benefit. I'm not driven by the fact—I don't believe a lot of the stuff that's being said and in fact I know that they're wrong. I especially find offensive the suggestions that there's going to be online university and they're going to wipe out these places. Unfortunately a lot of administrators are scared by it.

In a later comment, Professor D also speculated as to possible sources beyond the media that might be generating the drive to teach using these technologies:

> I'm sure that it's driving a lot of the university. It's hard to say whether it's the media—although I guess in some sense it is the media because the hype is repeated there. The media is not necessarily creating the hype. The hype's being created partially by the vendors, partially by the enthusiastic faculty that are keeners on it.

Finally, Professor D concluded his thoughts with some comments regarding the general nature of media influences and about his opinions as to the effects of the those influences have upon educators who are just beginning their careers:

> It affects my thinking about it a great deal. Trying to do things and stuff. The things they say make me think. There is occasionally good information in the mass media about things that are being done effectively but overall, I don't think they are interested in the details of education. They're interested in some ways in materials that go in and the materials that go out but not about the stuff in between.

> I'm sure it does have an effect in that I keep doing it. [using the Internet in my teaching]. I think I would probably keep doing it without the mass media stuff. I don't think I feel pressured. I'm retiring in three years so I'm not feeling very pressured. If I was a young person, though, I would feel very pressured about it and I would be doing stuff with it because it's clear that no matter what area you're in, you're going to eventually be really pressed. So I think it affects my thinking but not in a very positive or happy way.

Professor E was fairly emphatic regarding what he felt about any possible influences the media might have as educators move towards a more electronically-driven classroom. This might stem from the fact that he is not only a professor in the Faculty of Education, but is also involved in the field of Educational Technology. When presented with question 4 his response was:

> Absolutely, the media has driven this. Everything is Internet based, and as I said before, if you don't have a website for whatever you do, you aren't in the world. I think there must be terrible pressure on folks who haven't significant means to stay up to date and I am worried that we're creating a two class society. Those who have will clearly get further ahead in this area and those who haven't will have trouble.
>
> . . . The Department of Education has mandated the technology and it infests every curriculum that's out there. It's a cornerstone for delivery. But our teachers still have to learn how to use it well and my biggest concern is that people are doing it because they can—not because it's pedagogically appropriate. I think that's really crucial. I

> don't think enough people are asking the question—is this the best way to do things? They're doing it because there's pressure to do it. And with that comes some sort of liability, I'm sure. I really do think that people are doing this for the wrong reasons. Some of the very technologically literate ones have, in my view, lost sight of their primary responsibility of disseminating information. They're creating camels rather than horses, when a horse could probably get there a lot faster. I suspect that in the long run, there'll be some sort of filtering of the less effective uses but it's still going to be some years before the audience gets sophisticated enough to say—hey this is garbage.

In the final sub-questions of the Issues section, Professors C and D provided what were probably the most representative answers. For question 4b, (How much are you influenced by departmental or peer pressure to use the Internet in your teaching?), their answers were also remarkably similar:

> I've been some of the pressure actually. I've gotten other people into it. I think it's reasonable to say that other than our department creating a website and leaving the option open to having class materials linked to the website, that there's neither a discouragement from doing so or any push for everybody to have all their course materials posted. (C)

> I think there is pressure from the administration to do things. Not necessarily negative pressure. They're encouraging verbally, they're encouraging very slightly financially but the rest of the encouragement isn't there. There isn't really strong financial help, and the matter of financial help needs to be in the area of manpower support and in

> time off so that people can learn. . . . In some senses there is peer pressure to not use the Internet. You will probably not get promoted or will not get tenure if you spend your time doing this rather than doing your research. I would say that compared to other pressures to do other things, department and peer pressure to use the Internet is very small. (D).

And, in the last question of the section, (How is your job different now, due to Internet-based teaching, than before?), Professor D probably says it best:

> Not a great deal. It's an additional tool so I'm dealing with another tool—or weapon [laughs]—in the arsenal and I guess I'm doing more email. I've been doing a lot more thinking during the last 3 years about how to motivate my students to participate more. I'm doing a lot more thinking about what sorts of methods get students to work together and, in particular, what sorts of questions lead to a snowballing effect for discussion. It's hard finding the problems or discussion things that work. Since the Internet I guess what I'm doing a lot more is trying to think of what things really don't need to be done in my lectures because they can be done here. In that sense it's been different from what I'm doing at the moment—although I *was* doing that before—I just didn't have as rich a tool.

Chapter 5 Conclusions and Recommendations

> Internet analysts will eventually be seen as embarrassing symbols of our times. They are like 18th-century witch hunters, or 19th-century snake-oil salesmen. Faddish, goofy and self-refuting, they signal a doomed search for a unified field theory in ever-illogical markets. Our pinning of a tail on these people threatens yet to make us all into a bunch of donkeys. —Paul Kedrosky, Professor of business at the University of British Columbia (2000, p. D11)

In the Literature Review section of this study, reference was made to an article in the September 6th, 1999 issue of Maclean's Magazine entitled *Back To School Online*. In that article, Rory McGreal, the executive director of TeleEducation New Brunswick, added his voice to many others who contributed to this six page paean to Internet technology in the classroom. In the September 5th, 1999 issue of the Winnipeg Free Press, in a syndicated Canadian Press article devoted to the same subject, McGreal's comments were again cited, but with this additional nugget included: "If you can teach it in the classroom, you can teach it at a distance." (McGreal in Weber, 1999, p. A7)

In the October 2000 issue of University Affairs, in an inside cover advertisement for Web CT software, Murray W. Goldenberg, President of WebCT-Canada and senior instructor in the Department of Computer Science, at the University of British Columbia is quoted as saying, "Now setting up your online course is so easy you can do it in under 15 minutes. That's the beauty of WebCT 3.0."

Whether the hype originates with the mass media, is generated by the technology industry or is promulgated by university professors themselves, (whether in the employ of the technology industry or not), it is still hype, and—as a reliable source of information, hype will always be found to be lack-

ing. Not everything that can be taught in the classroom actually can be taught at a distance, and anyone who has tried WebCT knows for a fact that it will take considerably longer than 15 minutes to set up an effective online course. But the hype remains—and, as committed educators try to make sense of the realities of a wholesale move to some level of electronically-mediated education, they will also need some way of negotiating that hype so as to discover the larger truths that might be out there. One way of doing this is to listen to some of those selfsame educators who are labouring at the forefront of this trend and to record their thoughts in a rigorous, academic fashion as they relate their experiences.

The purpose of this study was to examine the teaching process at the post-secondary level when Internet-related technologies were used in the delivery of teaching materials. More specifically, the purpose was also to ask the question: how and why do a group of post-secondary instructors choose to use the Internet as a teaching tool? As well as trying to discover details about the use of these technologies in the classroom, it was also the aim of this study to try and determine the impetus behind that usage. This study was conducted by means of in-depth interviews with four technology-using university faculty members from various disciplines who were asked to share their thoughts about a number of basic questions. It is with reference to the replies to those questions that any concluding statements to this study must begin:

1. **Utilization:** What components of Internet technologies do post-secondary faculty use as teaching tools? (The World Wide Web, Email, Newsgroups, Videoconferencing, Whiteboards, FTP, IRC, Chat rooms).

2.**Justification:** What are the primary reasons for faculty use of this technology in teaching, ie. why are they using it?

3. Learning Theory: Do post-secondary faculty consciously apply learning theories to their Internet-based instruction? If so, how?

4. Issues: How significant are the mass media and other outside influences as driving forces behind Internet-mediated education?

With regards to the first question, it was discovered that most of the four professors used the common, expected Internet tools in their teaching: email, the Web and newsgroups. Use of the less common, peripheral utilities such as videoconferencing, whiteboards and IRC or chat was minimal. Professor D made extensive use of WebCT, although most of his efforts in this area were destined for websites, and Professor B had done some distance ed. instruction via teleconferencing. A table showing the various professors' usage patterns for the various Internet utilities appears below:

	Email	World Wide Web	Newsgroups	Videoconferencing	Whiteboards	Chat/IRC	Other
Professor A	Yes	Yes	No	No	No	No	No
Professor B	Yes	Yes	Yes	No	Yes	Yes	Teleconferencing
Professor C	Yes	Yes	Yes	No	No	No	No
Professor D	Yes	Yes	Yes	No	No	No	WebCT

With question 2, where the professors were asked to explain why it was that they used Internet technologies in their teaching, the almost unanimous response focused around the idea of their personal motivation to use the best tools available to them. Using the Internet provided the professors themselves with important ways to save time, update their materials, perform administrative duties and explain ideas and concepts that were just too difficult to deliver in any other way. However, it also

provided them with a yet another way to augment their traditional methods of delivery and ensure that the needs of their students were being met in the most complete and efficient manner.

In terms of the inclusion of any learning theories (question 3) in the planning of their electronically-mediated teaching materials, most of the four interviewed professors admitted that they probably did not use them consciously, but as Professor E explained while relating his own experiences—the incorporation of learning theories at the post-secondary level was more an intuitive exercise than an overt one. None of the participants could name any specific theories that they referred to while they planned their lessons but all of them were able to articulate a view as to how they recognized that different people learned in different ways and all were able to explain how that fact was reflected by what they did in the classroom.

Almost all of the participating professors agreed that the mass media had some effect on the use of the Internet in the classroom. Most of them didn't feel that they, personally, were compelled to teach with the Internet as a result of media hype, but they admitted that there were definite influences. In many cases, however, those influences were seen to be beneficial when, for instance, the media made them aware of new products and trends that could be incorporated into their teaching or exerted an influence on administrators to become concerned with providing support for what the professors, often innovators in these matters, wanted to do. Because most of these individuals *were* innovators, though, they were not as concerned about their own ideas becoming influenced by the media hype as much as they were about the educators of the next generation being pressured into immersing themselves in electronic technology just to keep up. And—in almost all cases, it was felt that the media were less interested in the details of education and more focused on simply getting a good story.

In terms of a more general set of conclusions to be gleaned from the assembled interview data, it must first be recalled that in a study such as this, which used qualitative data gathered from only a few sources, it is difficult to make any sweeping generalizations as to what can be reliably predicted. Again, from Beard and Olsen (1999), cited at an earlier point in this text: "Such a research approach —in depth interviews with small, purposive samples of informants—naturally limits the generalizability of the findings." With that in mind, however, it is still possible to focus on those points that occurred repeatedly throughout the interview process and to emphasize them once again for the benefit of anyone who is interested in the concerns of practicing, professional educators as they investigate the ways in which these new technologies impact upon the traditional modes of teaching.

Probably one of the most obvious conclusions to be drawn from the collected data concerns the issue of support for the efforts of these professors as they develop their new teaching materials. If university administrators are seriously concerned about Internet teaching beyond the level of simple lip-service, they must identify a means to supply the resources in terms of financial support, development time, and training opportunities for those who are involved in these investigations. Throughout the cited literature and from the text of the interviews, there emerges a repeated refrain: teaching with this technology is time-consuming. Learning the technology, preparing the teaching materials, keeping up with the overwhelming amount of student feedback in the form of email, grading and the like—can, in most cases, double the time commitments of the professor who decides to invest in the electronic methods. To identify this area as a priority and to then back away from supporting those individuals who take up the challenge is an administrative stance that clearly must change before any serious progress is made.

Another general conclusion that must follow from the text of the four interviews is that of the inadvisability of attempting to teach everything to everyone with the Internet and having no live instructional presence in the classroom. All of the professors agreed that while the new technologies represented a powerful new tool that enhanced their existing array—the Internet on its own was not a sufficient substitute for the "warm body" at the head of the classroom. Some agreed that the Internet might be a useful enough stand-alone instructional tool in basic training exercises or in graduate work with students who were self-disciplined enough to manage with a minimum of guidance and supervision, but for everyday, large class-size undergraduate groups, it would fall short. The benefits of being able to read the faces of students to see if they were "getting it", the providing of the necessary "pacing" to insure that the class was always where they should be in terms of progress through the year, and the simple inspiration that comes from being taught by a knowledgeable, sensitive and magnetic personality were all factors which the professors thought would seriously damage a first-class educational experience by their absence. Internet teaching, in the opinion of these four users of that technology, must remain a supplement to the traditional modes of instruction. By all means, add it to the existing canon, but do not let it take over.

One final general conclusion relates quite closely to the above statements but should nevertheless be identified as an important point in its own right. A deep and overriding concern for the students who remain at the receiving end of all of these efforts should always take precedence over any other factors involved. Educators who decide to include these tools in their repertoire must remember not to let the technology alone become the focus of the exercise and thus interfere with the process of learning. As Professor E warned above: "Some of the very technologically literate ones have, in my view, lost sight of their primary responsibility of disseminating information. They're creating camels rather than horses, when a horse could probably get there a lot faster."

Conversely, educators must also guard against allowing the technological solution to make the resulting learning seem too easy—and as a result, leave the students unprepared for the hard realities of solving problems in the "real world" outside of academe. Again, the focus must always return to the student and those educators must constantly ask themselves if what they are doing is the best way to get necessary information across while still accommodating the greatest number of learning styles possible. If it is not, then perhaps the novel and exotic camel ought to be put aside in favour of the steady, stable and dependable horse.

In terms of possible directions for any future research into this area, attention must first be drawn to the long interview technique as a method with which to gather information. McCracken's evaluation model provides a richness of nuance and detail that cannot be duplicated by any other form of inquiry—and is highly recommended as a means by which to conduct future research of this kind. To receive, in an immediate and unrehearsed fashion, the thoughts and opinions of experienced, inquisitive and inventive educators as they investigate this new medium, is to gain an understanding of the associated issues and problems that no questionnaire or survey could possibly convey.

Again with reference to the long interview technique, it is suggested that further studies also limit the numbers of participants to four or five individuals. Any more than this would produce amounts of data that would quickly become unwieldy and difficult to analyse. The smaller number of participants allows the researcher to concentrate more completely upon the details of the resulting data and to recognize connections and patterns in the various texts that might go unnoticed in a larger sample.

Suggestions for the subject matter of future research might include the conducting of similar long interview sessions with different groups of individuals. Instead of identifying competent users of Internet technology as participants, other researchers might choose to identify a group of thoughtful non-users and determine some of the reasons as to why they have chosen against using the new technologies. Other studies might ask similar "how" and "why" questions of individuals who have a vested interest in this technology; for instance, instructors of distance education courses and military or commercial trainers using the Internet to train or re-train service and technical personel. Further studies might also focus on other levels and types of educational institutions as target groups. Community college instructors and teachers in the early, middle and later years of the public school system could be asked similar questions about their motivations with regards to how and why they are choosing to teach with the Internet.

In closing, it only remains to point out the necessity for educators who are involved in teaching with the Internet to guard against falling prey to the easy and obvious solutions being suggested by outside sources. The voices promoting the total Internet solution and the end of the traditional university are perhaps not the ones who should be driving the current electronic teaching trend. The media might be telling the rest of us that these are the ones who know what's happening, but again, in the rush to get that good story—the sexy stuff—out there, they are perhaps overlooking the group who should really be doing the driving: committed educators working quietly away in the background trying to figure out how to do it correctly. Those who understand how people really learn—and those who are working to build effective situations in which that learning can occur.

Appendix A

Part 1 - Letter to thesis committee member who volunteered to pilot interview questions

I am in the final stages of a MEd thesis proposal and am piloting my instrument. The purpose of this study is to explore how and why university faculty members use the Internet. I have explored the literature in some depth and have a broad understanding of issues and problems. What my study intends to do is take an in-depth, qualitative approach in order to obtain data on how specific individuals approach and use Web based instruction.

Parameters:

- I will give you the questions both orally and in print.
- I will tape record the entire session, with your permission.
- My estimate is that this interview will take 60 minutes.
- I want you to mainly to be a target audience member.
- However, please think out loud as you read the questions.
- Do not at this stage be a critic of the questions. Rather you must act as a target audience member.

I will ask questions dealing with four issues: utilization questions will explore how you use the WWW. Justification" questions will probe why. Learning theory questions will ask whether your WWW teaching is grounded in any particular learning theories. Issues questions ask your thoughts about what influences your decisions.

Part 2 - Letter to prospective participants

Dr. Xyz:

I understand that you are someone who is involved in teaching with the Internet. I am involved in the process of conducting a study which will become the basis of my MEd thesis in the Department of Curriculum, Teaching and Learning in the Faculty of Education at the University of Manitoba. I am currently at the stage of establishing a group of participants and, due to your experience, I would like to be able to interview you for this study.

The purpose of the study is to explore how and why university faculty members use the Internet as a teaching tool. What I intend to do is to take an in-depth, qualitative approach in order to create descriptive profiles as to how specific individuals approach and use Internet-based instruction. The study will be based mainly on the "long interview" techniques as described by McCracken (1988) in his book, The long interview. Interviews will last about an hour and will, with your permission, be recorded to audio tape. As alternate means of recording interviews are not possible at this time, participation in this study must be limited to those professors who have given their permission. Audiotapes will be retained until the successful completion of the study and will then be destroyed.

Parameters:

- Interviews will take place at your convenience (place and time) and will ideally be conducted during the months of May and/or June 2000.
- I will give you the questions both orally and in print.
- I will tape record the entire session, with your permission.
- A pilot of the instrument has indicated that this interview will take approximately 60 minutes.
- All information gained from the interviews will be held in confidence and the anonymity of participants is guaranteed.

• You are under no obligation to participate in this study and have the right to withdraw at any time.

I will ask questions dealing with four issues: utilization questions will explore how you use the Internet in your teaching. Justification questions will probe the reasons why you are doing so. Learning Theory questions will ask whether your Internet-mediated teaching is grounded in any particular learning theories. Issues questions ask your thoughts about what influences your decisions.

At your request, a transcript of the interview can be forwarded to you so as to allow you to review or clarify any content from the interview proceedings. Please note that this will require a slightly longer time commitment on your part than the one hour listed above. Upon completion of the study, I will be pleased to email you a summary of the major findings. Also at that time, I will, upon request, make available copies of the entire completed study.

Additional information may be requested from the undersigned at or from my faculty advisor, Dr. Denis Hlynka.

Thank-you in anticipation of your participation of this project.

Sincerely;

Eric E. Crone

Part 3 - Consent form

Consent Form

for: Teaching With The Internet: The How and Why of Faculty Utilization

A study by Faculty of Education Graduate student Eric Crone

Please indicate your willingness to participate in this study by attaching your signature in the space below. I will contact you by telephone in the near future.

Signature: _____

Date:_____

Appendix B

Interview Questions

Interviews with selected professors were based on the following questions:

Utilization:

1. How do you personally use the Internet and its associated physical applications (The World Wide Web, Email, Newsgroups, Videoconferencing, Whiteboards, FTP, IRC, Chat rooms, other) in your teaching?

1a) How long have you been using these technologies in your teaching?

1b) Do you design your own materials? Do you adopt, adapt or invent?

1c) What problems have you experienced in implementing these technologies in your teaching?

1d). What successes have you had in implementing these technologies in your teaching?

1e) What do you feel could enhance your current use of technology?

1f) Is the Internet itself an effective means of delivering all course materials or is it best used as a supplement?

Justification:

2. What are your primary reasons for using this technology in your teaching, ie. why are you using it?

2a). The Internet as a teaching tool has been described as 1) amplifying 2) transformative, 3) administrative, 4) technical, 5) innovative. How would you view it within the scope of these categories?

2b)What do educators gain by utilizing Internet tools in their teaching?

2c) What do they stand to lose?

Learning Theory:

3. Do you consciously employ any learning theories when developing courseware that uses any of the Internet-related technologies? If so, which ones?

3a) How do you integrate them?

Issues:

4. In your view, how significant is the mass media as a driving force behind the use of Internet technologies in your classroom? In classrooms in general?

4a) How much do the outside influences of the mass media (such as newspapers and magazines and television) influence your thinking about and utilization of Internet-based teaching?

4b) How much are you influenced by departmental or peer pressure to use the Internet in your teaching?

4c) How is your job different now (due to Internet-based teaching) than before?

Re-cap:

5. Is there anything else you would like to add to clarify or expand any of your thoughts or comments?

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