11 THE DISCOURSE OF LEARNING TECHNOLOGY IN CANADA: UNDERSTANDING COMMUNICATION DISTORTIONS AND THEIR IMPLICATIONS FOR DECISION MAKING[1]

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Abstract

Discourse is an important part of the institutional environment of organizations, but the potential influence of societal discourse on learning technology decision making has not been examined. This paper explores societal discourse on technology in education, with a particular emphasis on costs and benefits, and the significance of this discourse to management practice and policy making. It uses a combination

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of qualitative and quantitative techniques in an effort to assess communications distortions, guided by Habermas' standards of validity claims *for communications: truth, clarity, sincerity, and legitimacy. While the findings are preliminary, it suggests that there are significant distortions in the societal discourse. A potential consequence of these distortions is impaired decision making at the organizational and political levels.*

1 INTRODUCTION

This paper explores the discourse related to the adoption and use of learning technology (LT) in Canadian post-secondary institutions. An analytical framework is developed that draws upon the Habermasian concept of the ideal speech situation and his validity claims (truth, sincerity, clarity, and legitimacy) as a conceptual tool for assessing the discourse on learning technology.

The paper illustrates distortions in the discourse, suggesting that these distortions impair reasonable decision making about enhanced learning technology. The paper shows that advantages of enhanced learning technology are discussed far more frequently than disadvantages, that costs and benefits of LT are not fully assessed, and that critics of LT are frequently marginalized. It is assumed throughout the discourse that there is value in LT, but there is very little real evidence provided to support such assumptions.

The paper concludes that applying Habermasian communicative rationality standards to decision making about learning technology will help to make decisions more reasonable. In particular, there are many questions to be asked regarding the costs and benefits of learning technology, issues that are not adequately addressed in the existing discourse.

2 LEARNING TECHNOLOGY

There is a range of technologies that are used to support learning in post-secondary institutions, including electronic mail, presentation systems, multimedia and computer-based applications, audio and video conferencing, and Web-based applications (Bates 2000). Although much has been written on the benefits of these technologies (e.g., improved learning, reduced costs, and improved access), the empirical evidence to support such claims is mixed and the outcomes seem to be tied to particular applications. Yet despite the lack of clear evidence demonstrating the value of adopting technology to support learning, use of and expenditure on, learning technology in the higher educational sector continues to increase (Green 2000b, 2001).

Advocates of technology in education maintain that "higher education is becoming part of a 'knowledge and learning industry' in which competition forces every institution to rethink its products and markets," and suggest that "half of all of education beyond high school will soon be online" (Finkelstein et al. 2000, p. 7). Distance education is described as a killer application, offering universities competitive advantage (Fornaciari et al. 1999). Some institutions (e.g.,Athabasca University) do offer a substantial portion of their curriculum entirely online although at most universities distance learning activities remain a small proportion of their enrollments (Green 2001). In addition, a number of universities are establishing mandatory requirements for students to acquire laptop computers (Burg and Thomas 1998).

In an environment where learning technology is widely used, those who resist it are characterized as Neo-Luddites. But their resistance is considered futile in the face of this learning revolution (Oblinger and Rush 1997). Nevertheless, Noble (1998) and Robertson (1998) challenge learning technology on political grounds, with Noble warning that "digital diploma mills" may destroy the foundations of education by promoting an uncritical or subcritical corporate agenda. Feenberg (1999) argues that the benefits of learning technology are overstated and have not been demonstrated empirically. Apart from the "paucity of empirical evidence that interactive learning technologies are any more effective than other instructional approaches," there are questions about the quality of much of the research, in part because studies often confound media with methods (Phipps and Merisotis 1999; Reeves 1993, 1998, 1999). Others caution against buying into the myths of information technology, insisting that technology will not become cheaper nor will it prove to be a cash cow. Although champions of the learning revolution, Oblinger and Rush were among the early voices calling for rigorous financial assessment of IT investments.

Overall, it appears that the results achieved by using technology to enhance learning should be understood to be affected by a wide range of variables including the type of learning technology, the type of course, the type of learners, the instructional design, and the nature of support services (Bates 2000). The most consistent finding is that what matters most in learning is "the instructional methods students experience and the tasks they perform" (Reeves 1999).

Thus, while learning technology may be a useful tool, it is no panacea. But as has been noted above, post-secondary institutions continue to invest in LT, even without clear evidence of its benefits. Indeed, *The 2001 National Survey of Information Technology in U.S. Higher Education* (Green 2001) identifies "assisting faculty [to] integrate technology into instruction" as "the single most important IT issue confronting campuses over the next two or three years."

3 MOTIVATION FOR THE STUDY

It is evident that post-secondary institutions will continue to be faced with many decisions regarding whether, and how, to adopt the latest innovations in LT. The theory and practice of systems design assumes that such decisions are rational (Burleman et al. 1996; Galliers 1993; Lederer and Sethi 1996; Ward et al. 1996). (This rationality is reflected in the standard systems development life cycle approach, as described in information systems textbooks.) The assumption of rationality implies that a decision to adopt a specific learning technology, for example, would be made when it could be demonstrated that the benefits of deploying the technology outweighed the costs.

But a study of technology deployments shows that often the decisions to build or use specific technologies are not based solely on rational criteria. Hackney et al. (2000) suggest that it is not possible to follow a prescriptive rational approach to information systems planning in environments where strategy formulation is serendipitous and emergent. Systems design may be guided by organizational rituals (Robey and Markus 1984) or influenced by politics (Attewell and Rule 1984; Markus 1983). The context of organizational decision-making must be considered, as well as the informal processes in organizations (Tyre and Orlikowski 1994). Many researchers, including Desanctis and Poole (1994), Hirschheim and Newman (1991), Markus and Robey (1988), Orlikowski (1992), and Walsham (1993), argue that there is a complex relationship between technology and organizations, meaning that technology decision making and implementation cannot be understood in terms of simple rational models. In addition, it is recognized that organizations engage in mimetic or imitative behavior with respect to their institutional environments (DiMaggio and Powell 1984; Meyer and Rowan 1977). Often, the influence of these societal norms is invisible and taken for granted yet very powerful (Roy and Seguin 2000).

While it may be that all technology decisions are rational, and that decision making can be influenced by the institutional environment in which it takes place, technology decision making should still, nevertheless, be as *reasonable* as possible (Abell 1991). One way to improve the reasonableness of decision making is to gain a better understanding of the limits to rationality that may be imposed by an institutional environment. Discourse is an important part of the institutional environment of organizations, thus analyzing institutional discourse offers a means of revealing societal norms, and making explicit the implicit assumptions about the nature of the institutional environment.

4 RESEARCH QUESTIONS AND METHODS

The purpose of this paper is to explore the institutional environment in which decision making about learning technology takes place through a critical analysis of the societal discourse. The methods for doing this are described below. This exploration is guided by several research questions:

- What is the nature of societal discourse about learning technology?
- Are there distortions within this discourse?
- If there are distortions in the discourse, what impact does this have on decision making related to LT?

4.1 Theoretical Framework

Several studies have explored the role of discourse in management (for example, Alvarez 1996a; Clegg and Palmer 1996; Furusten 1995; Ket de Vries and Miller 1987). Scholars have also emphasized the need for paradigmatic diversity in the study of information systems and, in particular the value of critical perspectives (Hirschheim 1985; Hirschheim and Newman 1991; Lee 1994; Lyytinen and Klein 1987; Mason 1991).

A number of IS researchers have provided perspectives on information systems drawing on Habermas (Lyytinen and Hischheim 1989; Lyytinen and Klein 1985). Ngwenyama and Lee (1997) used Habermas' validity claims in an examination of e-mail exchanges to explore contextuality as an aspect of communication richness. Truex and Klein (1991) outlined an interpretation of information systems based on Habermas as the formalization of language games and suggested that this formalization can be rendered as a grammar.

While focusing on an urban planning context, Forester (1983) has proposed that Habermas' communicative rationality be used as a standard to assist organizations to make planning more rational by exploring the distortions in communications "which threaten to undermine common sense." He maintains that the theory of communicative action and the ideal speech situation (Habermas 1984) provides a theoretical framework which can be used as a standard to assess communications and to reveal communicative distortions.

This study builds on Forester by to applying Habermas standard of validity claims as a conceptual tool for analyzing distortions in IT discourse. It operationalizes the validity claims by identifying characteristics of texts, or speech dimensions, that roughly correspond to Habermas' validity claims (i.e., truth, sincerity, clarity, and legitimacy) and uses a combination of qualitative and quantitative content analysis to explore them (see Table 1).

Table 1. Validity Claims and Speech Dimensions

Validity Claim	Result	Distortion	Speech Dimensions
The propositional content is true.	Truth	Misrepresentation	Argumentation and evidence
The speaker is honest (or sincere) in what she says.	Sincerity	False Assurance	Metaphors and connotative words
What is said is linguistically intelligible and comprehensible.	Clarity	Confusion	Rhetoric and semantic rules
What the speaker says (and hence does) is right or appropriate in the light of existing norms or values.	Legitimacy	Illegitimacy	Use of experts

4.2 Text Selection and Coding

This paper focuses on the discourse related to learning technology reflected in high circulation publications in the period from 1993 to 1998. Although technology has been used to support learning for several decades, it is noted that discourse about LT entered the mainstream at about the same time as the public became aware of the information highway, a term that was coined by then U.S. Vice President Al Gore in 1993. Indeed, one of the major reasons governments were interested in developing the information highway was as a means of improving access to education for all citizens (Council for an Ontario Information Infrastructure 1994; Information Highway Advisory Council 1995; National Institute of Standards and Technology 1994a, 1994b).

The texts that were analyzed in this study were identified using standardized searches in a wide variety of online databases (including ABI/Inform, Canadian Business and Current Affairs, Canadian Education Index, ERIC, General Science Index, Lexis/Nexis, and Social Science Abstracts). An initial search yielded over 10,000 articles published in 144 different periodicals, and 3,450 articles published in major Canadian and U.S. newspapers. Circulation figures were used to identify the most widely read publications relevant to each part-discourse, so as to find texts that represented the dominant discourse. In this study, the source for texts representative of popular discourse was the *Globe and*

Mail (a high circulation Canadian daily newspaper). Texts from *Communications of the ACM* and *Educom Review* were considered for the academic part-discourse, and the sources for practical part-discourse texts were *Academe*, *University Affairs*, *InfoWorld*, *Canadian Business*, and *University Manager*. (We acknowledge that the publications selected have their own particular characteristics which shapes the discourse.)

From this list of sources a total of 218 relevant articles were identified. These articles were supplemented with 57 texts related specifically to the deployment of one learning technology project, Acadia University's "Acadia Advantage" program, which introduced laptop computers for all students in the university. Although the part-discourses were analyzed separately, there are surprisingly few differences in the overall nature of each discourse. In this paper, the discussion refers to aggregate findings from all three part-discourses. A more detailed analysis of each part-discourse is provided by Cukier (2002). Texts were coded both manually and using NUDIST. Text dimensions, which corresponded to Habermas' ideal speech, were used as a framework for coding (see Table 1) including advantages and disadvantages claimed and evidence supporting them; metaphors and adjectives; and use of jargon and authorities or experts cited.

5 FINDINGS

5.1 Truth Claims: Argumentation and Evidence

Truth claims, in which the propositional content is true, are assessed by considering argumentation and evidence in the discourse. Specific questions that are applied to understand the truthfulness of the discourse include:

- What is said about the technology?
- Are the issues and options clearly defined?
- What costs and benefits have been identified and assessed?
- What evidence has been provided to support these arguments?
- Has the relevant information been communicated without distortion or omission (here frequencies are of value)?
- Are there ideological claims which are unexamined?

When considering what is said about the learning technology, it is evident that the discourse favors discussion of advantages of LT, rather than of disadvantages (Table 2). The claimed advantages (Table 3) outnumber the claimed disadvantages (Table 4) by a factor of 3 to 1 over the period under study. What

Table 2. Summary of Advantages and Disadvantages
(Number of Text Segments, Aggregate Data 1993–1998)

	Advantages	**Disadvantages**
Popular texts	100	44
Academic texts	194	56
Practical texts	156	70
Total	**450**	**170**

Table 3. Claimed Advantages (Number of Text Segments)

Advantages	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**Total**
Improve interactivity/ collaboration	11	12	11	143	8	9	64
Access to information	15	12	8	11	9	8	63
Improve access to learning (time/space)	10	18	4	13	8	7	60
Improve learning	4	5	9	8	9	10	45
Improve communication	11	6	5	6	9	5	41
Reduced costs	5	6	8	11	4	5	39
Change role of professor	3	2	8	14	6	6	39
More/better research	7	7	2	4	3	2	25
Working with industry	4	3	1	4	3	7	22
Other*	6	5	10	12	11	8	51
Total	**76**	**76**	**65**	**96**	**70**	**67**	**450**

*More choice, saves time, international markets, position institution as a leader, more convivial, cut note-taking, standardize technology, reduce dropout rates, reallocate resources

is also interesting is the fact that at the beginning of the period the ratio of advantages to disadvantages is 7:1 (77:11) while at the end of the period there appears to be more balance (67:41). There also seems to be shift in focus through the period: what begins with an emphasis on cost savings, improved productivity, etc., gradually shifts to arguments emphasizing the quality of education, increased interactivity, and changing teacher/student relationships perhaps as the costs of the technology begin to become more apparent and the early claims for increased productivity fail to materialize.

Table 4. Stated Disadvantages (Number of Text Segments)

Disdvantages	1993	1994	1995	1996	1997	1998	Total
Labor intensive development	3	4	0	6	5	6	24
Professors need new skills	3		1	6	5	4	20
Expensive	0	2	1	6	4	7	20
Lower quality	0	3	0	1	3	4	11
Students feel alienated; loss of community	1	1	1	4	3	1	11
Lack of access in remote areas	0	2	2	2	2	1	9
High tuition	0	0	0	5	1	3	9
Loss of control (hate, plagiarism, etc.)	2	4	1	1	0	1	9
"No substitute for traditional education"	0	0	1	2	2	4	9
Limited research on effects	0	1	1	2	2	2	8
Information overload (jumble)	0	0	1	4	1	2	8
Not cost saving	1	1	1	3	0	1	7
Need skills to use	1	2	2	4	0	1	7
Conveys nonverbal information poorly	0	1	0	1	1	2	5
Threat to faculty employment	0	2	1	1	0	1	5
Facility opposition	0	0	0	2	0	1	3
Not a secret weapon	0	1	0	0	1	0	2
Inadequate lecture/discussion	0	0	0	2	0	0	2
Total	**11**	**24**	**12**	**50**	**31**	**41**	**169**

Not only are disadvantages rarely discussed, there is very little evidence put forth to support claims of the advantages offered by LT. A number of representative quotations from the discourse are provided below to illustrate these points.

One of the major arguments made in support of LT is improved efficiency and cost savings. In announcing plans to develop a virtual university in the western states, Colorado's Governor Roy Romer focuses on "the potential for increased learning productivity…technology can be an effective and cheaper way to help people learn" (Hall 1995, p. 45). Among the major benefits sug-

gested are "improving instructional quality and effectiveness, increasing student's access to higher education by making access more convenient, promoting greater productivity and accountability in the use of public funds" (West and Daigle 1993, p. 31). Particularly in the early stages, the promise of the technology to improve productivity and reduce costs is paramount (Foa 1993, p. 27). What is perhaps most interesting, however, is that even in the academic journals there are very few articles that actually provide any empirical evidence to support their claims of benefits: most the benefits are simply asserted.

A number of claim are made that online learning is more interactive and also more appealing to students (Bourette 1996, p. D7). "It has the power to change where, when, how and with whom, learning takes place" (Lewington, August 17 1995, p. D1). "Improving accessibility by supporting distance education and making education more convenient is a major incentive for technology-enabled learning" (Lewington, March 17, 1994, p. A4). "Anytime/anyplace learning saves students time and improves accessibility" (Kilian 1994, p. A13).

The enthusiasts argue that technology improves learning. Some go as far as to suggest that in some ways LT is superior to traditional classroom education. They claim that the Internet is more *interactive* than the traditional classroom.

> Compared with the traditional lecture method, the Internet can be a much more interactive learning medium which encourages discussion and collaboration. In on-line classes, students can discuss ideas, conceptualize and problem solve through chat groups. In cyber-courses, more emphasis is put on "project learning" or "discovery learning" and can be more demanding and difficult than just listening and taking notes, Mr. Such says (Bourette 1996, p. D7).

Of course, there is nothing to prevent discussion or problem solving in traditional classes. It is merely a matter of instructional design. Nevertheless, throughout the discussion, there seems to be an assumption that use of the Internet automatically promotes more interaction.

> As a result, the role of the traditional lecture has been diminished, while out-of-class activities, such as discussion groups, on-line tutorials and the use of the Internet, play an increasingly significant part in the learning process (Sommers 1997, p. C5).

The most enthusiastic of the proponents suggest that online learning is superior to face to face communication. Some suggest it is more convivial or

intimate, that online courses "may even create a kind of tutorial intimacy that most students and teachers have never known" (Kilian 1994, p. A13). Indeed, one proponent goes so far as to suggest that it can improve communication:

> face-to-face interaction can often hinder communication, Ms. Harasim counters. On-line, the social barriers of race, appearance, gender, and class evaporate, and women in particular say they can finally make themselves heard. "Students have said to me that for the first time, they can focus on the message instead of the messenger," she says (Bourette 1996, p. D7).

Very occasionally, however, there are suggestions that one motivation for investing in technology is market positioning: Queen's University Principal William Leggett said the high-tech business classroom is only one of several initiatives to position his institution as "a leader in the use of technology." The impacts on learning or utility are not discussed (Lewington, October 25, 1996, p. A10). Disadvantages are mentioned much less frequently than advantages, and are not really part of the dominant discourse as shown in Table 4.

Some observers question the notion that technology will save costs and also raise issues related to quality. A textbook is not a course, whether it is in print or electronic:

> You can't just put 15 weeks worth of lecture material onto the Web. You have to plan the experience so that it makes sense on the Web. It absolutely means more planning if you want quality. And planning is time and time costs money. Unfortunately, you can't build virtual classrooms with virtual dollars (Nusca 1998, p. C9).

Some acknowledge the labor intensiveness and expense of producing quality learning technology experiences. Interactive course development is expensive.

> He estimated that it takes about 40 hours of work to develop one hour of useful interactive programming for students—the equivalent of $100,000 if developed by a full professor for a 30-hour course (Lewington, October 25, 1996, p. A10).

Very occasionally, questions are raised about the very nature of education and attempt to distinguish it from training. They also question whether or not the emphasis on developing computer related skills or the focus on "education as product for market" is appropriate.

> One should not make too much of these developments, however. They could be to education what decaf is to real coffee: a miracle of science, but one best employed as an occasional replacement, rather than a full-time substitute. The great value of the university is the opportunity to meet face to face with other students and to have one's own ideas challenged, deliberately in seminars and laboratories and midnight arguments, incidentally just by the act of being on campus, poised to encounter the unexpected. A university devoid of large and sustained doses of this sort of personal contact is, to borrow from John Kenneth Galbraith, like fornicating through a mattress. It lacks a certain *je ne sais quoi* (*Globe & Mail* 1994, p. A10).

Several things are noteworthy. First, there is virtually no evidence presented to support the claimed advantages. Even in the academic literature, most of the articles make assertions without any empirical evidence. The benefits were for the most part simply asserted.

Second, there are clear omissions. Costs are generally not mentioned or they are only partially addressed. For example, while several articles mention that students of the Acadia Advantage program must pay $1,400 per year for a mandatory laptop computer lease, few mention the $24 million investment in infrastructure that was needed to support the program, much of it donated by vendors. Certainly no one raised the question of the impact on financing this would have on a system-wide basis. When they are mentioned, the assumption that the costs are outweighed by the benefits is also reflected in the early articles (Press 1994, p. 15). In the entire period, only four of the academic articles made any reference to the costs of the technology.

There are also a number of examples of logic which seems somewhat peculiar. One of the best examples of flawed logic is in the case of the Acadia Advantage: A recurrent claim is that the program "increased access to technology" for students. "The program can also be seen as a great equalizer especially if the costs are made affordable." Acadia's Director of Public Affairs, Bruce Cohoon, says "parents often end up buying their children computers for university, but not every student gets one. But at Acadia, the playing field is level. Students have equal access to learning" (Murphy 1998, p. 34). The reason students in the Acadia Advantage program have equal access to computers is because they are forced to lease them (arguably at inflated prices). The notion of a level playing field is a powerful metaphor, but it is difficult to see it as an accurate description of the Acadia Advantage. In this respect, it is an inductive fallacy—a faulty analogy (Michalos 1986).

5.2 Sincerity: Metaphors and Descriptors

If communication is sincere, the speaker is honest (or sincere) in what he or she says. Sincerety claims are assessed by considering metaphors and connotative words in the discourse. Specific questions that are applied to understand the sincerity of the discourse include:

- Do metaphors and connotative words promote or suppress understanding?
- Do metaphors and connotative words create false assurances?

As will be demonstrated in the discourse excerpts provided below, much of the power of the discourse is in the invisible assumptions, the invocation of metaphors and associative language. Metaphors can act as a subtle, almost invisible, way of shaping belief systems. A summary of the dominant metaphors found in the LT discourse is provided in Table 5.

Table 5. Dominant Metaphors and Descriptors (Number of Text Segments)

Metaphor	1993	1994	1995	1996	1997	1998	Total
Distance learning	15	6	21	38	4	22	106
Network	20	11	10	30	4	10	85
Internet	4	7	8	21	14	29	83
Web	0	3	5	25	25	21	79
Online	0	7	1	18	19	25	70
Interactive	17	10	8	15	14	7	70
Virtual	7	8	9	24	4	11	63
Highway	5	37	8	9	1	0	60
Information	7	26	8	10	5	2	58
Electronic	7	7	8	9	11	3	44
Classroom	0	5	3	9	6	2	25
(Cool) New technology	2	4	1	2	5	6	20
Other*	23	32	18	44	46	41	204
Total	**107**	**162**	**108**	**254**	**157**	**179**	**967**

*The Internet, connectivity, revolution, transformation, telelearning, cyber, cutting or leading edge, laptop, wired, campus, future, global, remote learning, tool, frontier, super, 21st century, state of the art, pathway, caves, plugged in, plethora, weapon. vs. old days, thinkpad university, labyrinth, outdated, town hall, hi tech, vs. classroom death knell, old days.

At the beginning of the study period, the dominant metaphor was the electronic or information (super) highway. This network of networks is driven by an explosion, the irresistible force of technology.

> When the superhighways were built in the '50s and '60s, one could not possibly estimate the spin-offs that would result.…I think that the analogy holds true for electronic highways. We need them. We're going to witness an information explosion, a technology explosion. We simply cannot afford not to be doing those things (Arnault 1994).

The discourse enthusiastically proclaims:

> The sweeping technological advances in learning technologies, now in the prototype phase, will be the substantive achievements of the twenty-first century. The educational equity and access to knowledge that this represents is much like the invention of the printing press (Davis 1993, p. 21).

Roberts states that "nowhere does the information revolution fall with greater force than in the academic community" (1994, p. 30). The metaphors of *revolution* and *paradigm shift* recur again and again: "The Revolution in Electronic Technology and the Modern University" (Hall 1995); "Interactive Multimedia and the World Wide Web: A New Paradigm for University Teaching and Learning" (Kaplan 1997); the university of convergence (Hall 1995); global classroom (Graham 1995); information technology is tearing down traditional boundaries; large scale, revolutionary projects; a new teaching and learning paradigm; revolutionary innovation; the digital revolution promises to swell a tide of change of historic proportions in our cultural sea. The time seems right to seize the moment and attempt to shape forces that will be irreversible in any event. Computers are far and away the most flexible tools ever created by mankind and, as such, they will eventually revolutionize how most subjects are taught (Bollentin 1998, p. 52). The overall teaching-learning paradigm is different. The influence of the information superhighway metaphor is also evident in the growing emphasis on infrastructure, whether technological, human, or instructional. The associative language that is used also creates meaning. For example, the appeal to novelty—in a culture that values progress, newness, and change—can be as powerful as it is invisible (Michalos 1986, p. 95). The technological imperative is almost palpable.

The virtual university is the term *du jour* and infrastructure enters the lexicon in a big way:

> this infrastructure is a reengineered vision of a university's educational processes. Distance education has taken on a new meaning that emphasizes interactivity in learning technology as an enabler of a reengineering of the educational process itself. An electronic infrastructure supporting these processes should not impose technology restrictions on the players (Chellapa et al. 1997, p. 41).

Technology is liberating, it will set us free from the tyranny of time and place constraints. This anytime/anyplace metaphor is extended with the growing popularity of the expression of ubiquitous computing which emerges at the end of the period. The ubiquitous presence of computers in the classroom and in the dormitory has changed the way computers are viewed and used. "The ubiquitous presence of computers implies a paradigm shift in the way students work" (Kiaer et al. 1998, p. 50).

There is some recognition of the religion of technology: "A few educators and their benefactors see technology itself as a savior: buy the hardware and save the college.…We know what matters most is how you use the technology" (Ehrman 1995, p. 43).

> [He] had a religious experience, technically speaking.… Multimedia development is a passion. It feeds our interests and has a dramatic, positive effect on our students (Andrew and Goldman 1995, p. 37).

Other authors suggest cynical motives propel all those "except for a relatively small number of true believers" (Gold and Mingle 1996, p. 29). Technology "evokes passion from devotees" (Shneiderman et al. 1995, p. 49).

The birth of these technologies is heralded like the birth of another savior: "we do know that computing's most exciting gift has been the birth of new communications technologies and their ability to open undreamed-of opportunities for extending the humanities knowledge base" (Jones 1997, p. 28).

There is also invocation of the broader societal discourses on corporatization: "Knowledge is our business" (Roberts 1994, p. 28); "Students will view education as a consumer good, investing time as well as money based on comparative value" (Plater 1995, p. 40). There is a shift from a producer-dominated to a consumer-dominated enterprise (Alvarez 1996b, p. 30). "Society expects higher education to become more flexible in its course and curriculum offerings in order to meet the new educational needs of a learning society…. consumers of instruction" (Graves 1996, p. 30). One article is actually titled "Business Designs for the New University: What Happens if the Institution with the Obsolescent Business Design is a University?" (Denning 1996, p. 27).

5.3 Clarity

Clarity requires that what is said is linguistically intelligible and comprehensible. Clarity claims are assessed by considering three questions:

- Is there use of jargon?
- Are there terms that are not explained?
- Is there evidence of obfuscation?

There is no doubt that clarity is one of the more difficult standards to apply. There are a number of ways in which confusion may be created in specific speech acts (Michalos 1986, p. 38). The suggestion that technologists use jargon to confuse rather than illuminate is certainly not new (Franklin 1992). When we consider the texts reviewed above, we see examples of intensive technical detail describing high speed fiber optic networks, which seem to be evoked more as a way of conveying leading edge innovation than because of their relevance. The technology almost seems to have a life of its own.

> IBM Canada, for instance, has signed a comprehensive deal with Acadia University in Wolfville, N.S., to provide ThinkPad Laptops (100-megahertz processor, 12 megabytes of random access memory, a 540-MB hard disk, a quad-speed CD-ROM with sound chip and 10.4 inch color display) for all students (Tausz 1996, p. C6).

Often there is an implicit assumption that newer, faster, bigger is better. In addition, the technical language may present a barrier to understanding rather than an enhancement. In Tausz excerpt, for example, a number of terms are used but not explained and the importance of providing the technical specifications of an IBM ThinkPad is unclear.

5.4 Legitimacy: Whose Interests?

Legitimacy claims consider whether what the speaker says (and hence does) is right or appropriate in the light of existing norms or values. Legitimacy claims are assessed by considering the inclusivity of the discourse, and by assessing the extent to which the discourse relies upon experts and sources. Specific questions that are applied to understand the legitimacy of the discourse include:

- Who is speaking, who is silent, what are their interests?
- What is privileged? What is not said about the technology?
- What is assumed or implied?
- What is missing or suppressed in the discourse?
- How are the decisions legitimized?
- Who is involved? Who is not involved?
- What are the stakes and interests involved or excluded?

The question of whose voices are heard is an important one. Invariably there are experts (rather than enthusiasts) on the one hand and critics on the other. This nomenclature has a subtle but important effect as it implies that critics are distinct from experts. Nowhere is the imbalance in participation in discourse by experts versus critics more apparent than when discussing the Acadia Advantage. Not only do administrators outnumber other actors, but where other groups are represented, they are represented by a few. There are 62 citations from administrators, compared to 31 from faculty and 13 from students. One professor, an enthusiastic user, accounts for the almost half (12) of the comments on behalf of faculty.

For the most part, those who question, criticize, or object to the introduction of technology are generally marginalized. They are resistant to change, they have irrational fears, or they are neo-Luddites simply denying the facts of life. No rational basis for this fear or resistance is acknowledged in the articles (Holden and Mitchell 1993, p. 34). Rather than explore the basis of the resistance, those who question the application of technology are an obstacle to be overcome or are delusional and out of touch with reality. "Reluctant colleagues express resistance to change their teaching styles and anticipate a large effort to use the electronic classroom" (Shneiderman et al. 1995, p. 50). Not only are they afraid, not only are they resistant to change, but they are inert.

> Nowhere are the constraints of time and place more noticeable, paradoxically, than in today's classrooms ….Natural inertia and resistance to change contribute to this phenomenon along with the fear of creating a diminished social environment for building and joining communities of discourse (Graves 1996, p. 30).

There is little explicit acknowledgement of the relationships between the corporate sector and educational institutions. One of the articles refers to the grants or funding received from vendors to implement the projects. Generally, however, vendors' motives are stated or assumed to be focused on improving

education. Little reference is made, for example, to the size or importance of educational markets or the obvious market value of showcasing technology, even though "higher education represents a major market for telecommunications, probably the fourth largest area after the federal government, industry and state governments" (Gillespie 1994, p. 32). The interests of suppliers may not be synonymous with the interests of educators or governments. Similarly, the impact of vendor funding on research into technology in education is beyond the scope of this paper but is a dimension of the reproduction of the discourse that could be explored.

David Noble's anti-technology essay on digital diploma mills might have been entitled "The Emperor's New Clothes."

> Beneath that change [technological transformation] and camouflaged by it, lies another: the commercialization of higher education. For here as elsewhere technology is but a disarming disguise.…they [the champions of computer-based instruction] ignore…the fact that their high-tech remedies are bound only to compound the problem, increasing further, rather than reducing, the costs of higher education (Noble in Shneiderman and Herman 1998, p. 22).

It is certainly the most critical paper published during the period in question. What is striking is that Noble's article was published with not one but three critiques. Shneiderman resorts to ridicule:

> Does he [Noble] think professors publishing books and universities requiring texts from commercial publishers are also examples of "commoditization"? Is the university requirement to publish in journals (run by companies or professional societies) an example of monopolistic practices? Does he fear that purchases of chairs and desks results from "interlocking directorates"? (Shneiderman and Herman 1998, p. 23).

6 IMPLICATIONS AND CONCLUSIONS

This paper has demonstrated that Habermasian validity claims can be applied to text to expose distortions in communications. It has also revealed that there are a range of distortions in the prevailing discourse on learning technology. These distortions take a variety of forms. A summary of the findings is provided in Table 5.

Table 5. A Summary of the Learning Technology Discourse Assessed in Terms of Habermasian Validity Claims

Claim	Summary of Findings
Truth	• discussions of application of the technology are not nuanced regarding appropriate application • most of the discussion focuses on the benefits with little mention of the costs • there is little empirical evidence to support the claims • there are unstated assumptions regarding the inherent value of technology
Sincerity	• the use of metaphoric and associative language strongly reinforces the value of the technology and marginalizes criticism • the invocation of revolution, information economy, and religious metaphor also links to other broad political and ideological discourses that reinforce the value of technology and progress
Clarity	• there is some use of jargon • technology is invoked as a value
Legitimacy	• experts cited tend to be administrators, vendors, and politicians • critical perspectives are largely excluded and when included are marginalized • the research literature is self-referential • there are complex interrelationships and between vendors and universities and the media that are seldom explicit (e.g., vendors employ graduates, donate to universities, fund research, fund publications directly and indirectly through advertising) • often the interests are not stated (e.g., vendors marketing aspirations)

What is particularly striking, and unexpected, is the absense of any significant differences in the patterns revealed in the three part-discourses that were analyzed. While much has been written about the problems of resistance to technology and the neo-Luddites who plague efforts to introduce innovation, this paper suggests that there may be value in paying equal attention to the problems associated with uncritical and unreflective technology enthusiasm. Rather than dismissing technology critics or, as we have seen throughout the analysis of the discourse, marginalizing them, allowing them more play may produce a healthier decision-making process.

Although the study did not explicitly examine organizational decision making, previous work on institutional isomorphism and the role of norms shaping organizational behavior suggests that the findings regarding the nature

of discourse on learning technology are relevant to the understanding of technology planning. Although the results are not conclusive, the enthusiasm about learning technology seems to be particularly pronounced at the beginning of the period, coincident with the rise in discussions of the information highway.

Other studies on management fashions and fads (e.g., Abrahamson 1996) have suggested that the unbridled enthusiasm at the beginning of a trend fuels hype, often resulting in the benefits being oversold. Many of these fads achieve broad acceptance and lead to large expenditures only to suffer a backlash when they fail to live up to their promise (Abrahamson and Fairchild 1999; Sterman and Wittenberg,1999). The process of learning technology that has been described would seem, at one level, to parallel the life cycle of management fads. While further research is needed, there is some evidence to suggest that the pattern is not unique to LT but probably applies to other technologies.

While at one level its seems absurdly obvious, both the review of the academic literature and the systematic analysis of discourse suggest that there is little consideration given to the costs of learning technology. Often the benefits are assumed, not demonstrated. The questions implied by communicative rationality, surely, can only help reduce uncertainty, regardless of the basis upon which the decision is ultimately made: What *are* the benefits? What evidence is there to support the claims? What do we really know and what do we not know? What are the costs? What other impacts might the technology have? What do the acronyms really mean? Are there taken-for-granted assumptions that should be questioned? Who should be involved? What perspectives should be considered? Not only should paying attention to communicative rationality improve decision making, but, arguably, the success of technological innovations in the long term might actually be enhanced by moderating the positive feedback processes including the marketing media hype and extravagant claims of efficacy. In other words, a critical perspective may reduce the chances of technology being oversold, and thereby, ironically, enhance its diffusion. In order to achieve rational decisions a critical perspective is essential because it enables decision makers to separate the wheat from the chaff, or in this case, the broader societal hype about technology from what is in the best interest of universities and the principal stakeholders in post-secondary education.

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