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Integrating Information and Communication Technology in the Classroom: A Comparative Discourse Analysis

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Abstract

The discourse about information technology is often overlooked by researchers and scholars as a means of understanding the recent process of computerization in education. The research explores this phenomenon through a comparative discourse analysis of primary and secondary school teachers and promoters of ICT integration. The results show that promoters tend to view ICT as a way of transforming education whereas teachers see it only as a means to an end. The former's vision is borrowed from a prospective current of thought, a vision of social changes based on technological advances; the latter's considers only the needs of the students and the practical ways to respond to them. The research shows that teachers are not opposed to ICT integration; they're interested in effective ways to implement learning. The organizational context into which ICT is integrated is also a major impediment when it comes to changing the teacher's practice.

Résumé: La présente recherche fait l'analyse comparative de deux corpus de discours, l'un constitué d'entrevues d'enseignantes et d'enseignants aux cycles primaire et secondaire et l'autre constitué de textes faisant la promotion de l'intégration pédagogique des TIC. L'analyse révèle une distance marquée entre les discours. Cette distance s'exprime à propos du rôle des TIC en classe, de leur place dans la pratique professionnelle ainsi que de leur pertinence en éducation. Pour les promoteurs de l'intégration pédagogique des TIC, ces technologies sont un instrument de

renouvellement pédagogique incontournable, inscrit dans les transformations récentes occasionnées par l'avènement de la société de l'information. Les enseignants, bien qu'ils ne soient pas opposés à l'intégration pédagogique des TIC, ne voient dans ces technologies qu'un outil pédagogique dont l'impact demeure limité dans l'apprentissage. De plus, selon eux, le contexte organisationnel à l'intérieur duquel s'inscrit cette intégration demeure le facteur déterminant de sa réussite.

The Discourse in the Present Context

In the last decade, teachers have had to face a major challenge as new Information and Communication Technology (ICT) was progressively introduced into the classroom. With the growing popularity of home computers and the Internet, it seemed that technology could significantly transform learning and teaching practices. However, in the past, teachers were reluctant to integrate technological innovations into their daily scholarly activities (Conseil supérieur de l'éducation, 2000; Cuban, 1986) and, at least in Quebec, this situation has not really changed over the past few years. Even if ICT is now available in almost every primary and secondary school in the province, only slightly more than fifty percent of teachers are using this technology for learning (Conseil supérieur de l'éducation, 2000; Peraya, Viens & Karsenti, 2002). This is a disturbing fact considering that Quebec's school system is undergoing a major educational reform and that ICT is one of the key elements of that reform, with millions of dollars injected into the system to make ICT available to every school in the province.

At the same time, some people question the relevance of widespread use of ICT in the classroom as most studies show no significant improvement in student performance and learning (Russell, 1999). Integrating technology into the classroom is not unanimously accepted among scholars and teachers and, according to some, it entails many dangers (Armstrong & Casement, 1998; Postman, 2000). For instance, computerizing education could limit the diversity of pedagogical approaches to the only model of academic efficiency and performance implicitly promoted by technology. As computers and the Internet are used more often in our classrooms due to government incentives, the process of computerization in education can be perceived as a new means of control imposed upon teachers and students by an increasingly invasive technology-based economic complex (Bigum, 1997). Furthermore, as professionals, teachers are concerned about problems related to adapting this new tool to their craft, i.e. problems related to the context of use, to the nature and profitable use of the information available on the Internet, to the pertinence in the learning context and so on (Peraya, Viens & Karsenti, 2002; Reynolds, Treharne & Tripp, 2003; Sasseville, 2002).

But, if there is resistance to computerization in education and if there are so many problems associated with it, what is our motivation for doing it? What is at the core of the present discourse about ICT integration in education? What ideas and images are at its base? We decided to study the problem of ICT integration in the classroom not as a technical problem but as an ideological phenomenon. As Selwyn (1999) suggested, there a

important need to conduct qualitative studies of ICT integration in order to better understand how ideas and attitudes toward technology are emerging today.

Garnham (2000) suggested that ICT is not neutral but supported by an ideological complex that borrows ideas to present currents of thought as diverse as the globalization of the economy, the new information society, the end of national policy and the advent of world government. This ideology is also fuelled by popular beliefs and representations about the impact of technological change in our society and by various images about the future, popularized in the media. Considering that representations of ICT in advertisements have already been studied (Alexander & Petkanas, 1998; Dawes & Selwyn, 1999), a discourse analysis could be a very revealing approach to better understand ICT integration in our schools. We wanted to know if there is a common way of thinking about ICT integration and use in the classroom, one that is shared by all the players in education. Or, are there different discourses confronting their respective ideas and visions about the role and use of technology in education?

Methodology

A discourse, in the enunciation theory, does not exist alone and the speaker is not the sole purveyor of meaning (Adam, 1990; Maingueneau, 1991). The discourse's ideological content and form are interwoven and related to other discourses present in society. A specific discourse is also linked to the historical, psychological and social context in which it is produced (Angenot, 1982; Bakhtine, 1981). Discourse is also viewed, by this approach, in a dialectical perspective; it is considered not only as a means to convey words and ideas but as a way to convince and it exists only in opposition to other forms of discourse that are present in the same context. The dialectical process is the basis of communication (Angenot, 1982; Bakhtine, 1981).

The objective of discourse analysis is to expose meaning by finding threads linking speech forms and discursive strategies to other types of discourse present in a specific context (Adam, 1990). The analysis is carried out through an internal examination of a speech or a text, from a pre-established grid of categories pertaining to the content (words and ideas) and to the form (syntactic forms, descriptive modes, figures of speech, etc), in order to reveal its unique discursive pattern and to expose, by a process of logical reconstruction, the relations between the discourse and the speaker's intentions.

In the present research, this type of analysis was applied to two corpus of discourse. The first was assembled from a large selection of texts aimed at teachers on the topic of ICT integration in the classroom, taken mostly from pedagogical and educational journals and magazines from 1995 to 2001 (see Appendix I). The second was assembled by interviewing twenty-three primary and secondary school teachers, from the Lower Saint-Lawrence region in the province of Quebec, Canada, on the same topic during the 2000-2001 school year (see Appendix II). The teachers were selected by demographics - representing different ages, experience and specializations - and more importantly on the

basis that they had undertaken the process of integrating ICT into their classrooms. The interviews were conducted on an open-frame basis, over a period of one year. They were exactly transcribed to written form, creating a similar form for both corpora to carry out the analysis.

The analysis was based on an already existing discursive analysis grid (Fossion et Laurent, 1981; see Appendix III) and was carried out in two stages. In the first stage, a primary selection was performed through the two corpora. This was necessary to ensure that we had two objects that were comparable. We had to ensure that the corpora were of similar form and on the same level pertaining to the content (themes and ideas). This first selection was also necessary because many of the texts and interviews were not susceptible to a complete analysis and, even if they were on the subject of ICT integration in the classroom, they did not contain enough discursive strategies to yield significant results. It could be said that the discarded texts were those who could not "speak" to the analyst. Only eleven texts and eight interviews were selected for the final discursive analysis.

The second stage consisted of a deconstructive process of the content and form of the text itself by isolating every item of the grid and exposing its meaning in relation to the text and its general discursive pattern. Each item contributes to the meaning by a cumulative effect, in the way that each element is linked logically and, partly, structurally, to the other. The analysis, considering this general discursive pattern, tries to find inner significance. Every element is thus considered from the point of view of its contribution to the meaning of what is being said and the manner in which it is helping the speaker establish his own persuasive speech. During the interpretation of the results, all individual analyses of each text were linked in a single discursive construction. One has to be constantly aware of the general ideological pattern in which the texts are set to really expose the message of the discourse. This is a very rewarding type of analysis but it is also very time-consuming as a computerized way of finding and linking all the elements in the texts is not presently available.

This type of analysis can reveal another level of meaning hidden in the speech. For instance, the use of adjectives show the speaker's appreciation for his subject but they also can be used to convey, if one considers the general discursive pattern, a belief system. For instance, ICT is often qualified as "revolutionary", its power deemed "limitless" and its use is often considered as "unavoidable" in education. This use of description, in a specific pattern of conviction, implicitly evokes the notion that ICT is a superior tool for learning and that traditional tools are somewhat obsolescent.

The main objective was to compare each discourse's patterns and determine what type of ideological sub-text was at their bases. The final results were obtained by comparing the patterns of discourse found in each corpora, exposing every converging and diverging form. This process also enabled the analyst to link these forms to other already known forms of discourse.

Results and Discussion
The Discourse in the Corpus of Texts

The corpus of texts, as a whole, can be qualified as a social discourse. It presents ICT integration in education as a result of the recent changes in society, as perceived by the speaker. Technology is mainly responsible for social evolution. The motivation of computerization in education thus lies in the recent technological progress.

> Since the beginning of the nineties, changes are accelerating in our society. Technological evolution is mainly responsible. Our way of life is changing. Is our way of teaching changing as fast as our society ? I doubt it! (File 42, p.26) *[1]

These changes are seen from a prospective angle of social evolution, evoking a somewhat futuristic image of tomorrow. The present invasion of hi-tech innovations in our daily lives is, according to this point of view, transforming both the work place and the economy. Each and every one of us is now part of a vast network, an hyperbolic vision of the Web.

> World events are taking place in our living room; we can communicate with someone no matter where in the world they are; museums and libraries are open to anyone on the Internet. Free circulation of people and goods, omnipresent technology and the influence of mass media are creating a world very different from what we lived in up until now. (File 8, p.15)[2]

This situation is also presented as an important cultural change. Science and technology are perceived to be uniquely responsible for the transformation of modern culture. Thus, culture and education, always linked in the general pattern of discourse, will be irrevocably changed as new innovations constantly and profoundly alter our way of living, thinking and communicating. It is a science-and-technology-based vision of social evolution and the new information and communication technologies are at the center of it.

ICT is viewed, in this context, as a powerful tool for change, it is not only responsible for social change, it is also attributed powers beyond any other technology in the past. The use of metaphors to describe ICT demonstrates this perception. "ICT is the new pencil of our society." (File 43, p.22)[3]

ICT not only brings about changes in the way that we deal with information, it also changes the way we think and how we view our world. Cultural change is brought about by a greater access to information and the fact that this access is provided by new technical means makes it more "scientific". This type of cultural change also creates a form of stress, fuelled by the inability of the individual to be in sync with the speed of cultural transformation; becoming an outcast in the new information society is presented as the ultimate fear.

> Our world's culture is no longer only literary and artistic, it is also technologic and scientific. ICT is at the crossroads of these two aspects. Refusing this is condemning yourself to illiteracy, not being able to integrate yourself into today's world. (File 1, p.26)[4]

This change of culture is anything but inescapable in education, with an emphasis on adapting the

field to the new tools and preparing youth for the specific future that is envisioned in the social discourse.

> Our youth's working and learning with ICT therefore becomes a major social stake. Its presence in our schools is absolutely unavoidable. It is necessary that ICT in our schools goes beyond a mere tool for teaching, it must become a global learning and working tool. (File 43, p.22)[5]

This is not only a change that will transform the school system but a profound intellectual change that will tremendously affect our youth in the future. Students of tomorrow will think differently because they will have been brought up in a world where ways of accessing and organizing information will be totally different, thus changing the way their mind works.

> New technologies have the power to stimulate the development of intellectual capacities, improving reasoning, problem solving capability and the ability to learn and to create. (File 37, p.24)[6]

> The World Wide Web […] brings about more changes because it entails new ways of representing information. It abandons the classical way of communicating which is fundamentally linear and is replacing it by a more tree-like representation of information […]. Reading abilities and strategies, i.e. understanding and navigating through written information, are considerably modified. Not adapting to it means being deprived of a modern and efficient mode of communication. (File 1, p.25)[7]

This vision of society and education is fuelled by projections created by the many possibilities offered by the new technology. The many references to media specialists, sociologists, and even popular trend-spotters and futurologists, often contribute to the construction of this type of discourse by creating images of the future based on potentialities offered by the ever increasing social, cultural and educational applications of technological innovations.

> Toffler said and I quote: "Tomorrow's illiterates won't be those who did not learn to read, they will be those who did not learn to learn." (File 42, p.29)[8]

> Marshall McLuhan's global village is now a reality. We are experiencing a quantum leap from an industrial society to a society of information. (File 41, p.58)[9]

These changes are also presented as powerful and inevitable, minimizing the effect of human will and actions, and all other political, social or economical factors, on the direction taken by social evolution. In education then, teachers will have to adapt to something they cannot escape. In that regard, the effects of ignoring the technological evolution of our society in education are often presented as having dire consequences. Ignoring technological change will put us, as a nation, at risk of being surpassed by those countries that have embraced the new technology. Our youth will be out of work and our economy will sink to the level of third-world countries.

> The economy is bringing about change. Global competition places businesses in a position of constant innovation and creation. The future will belong to those who understood the advantage of a well-trained workforce, able to think and resolve problems and be critical. Furthermore, mastering computers and technology is an unavoidable skill. (File 42, p.26)[10]

In this view, players in education have no choice but to follow technological evolution; adapting pedagogy and the school system to it is imperative.

This type of discourse is not expressed by players inside the educational sphere, it originates from sources outside the system, such as promoters of technology, government officials, groups of parents and economic leaders preoccupied with changing the current school system in an efficient way.

Social change is a global and relatively autonomous phenomenon, something that is generally perceived as being beyond our grasp. The promoter's discourse is built upon the individual's natural desire to take control and to steer change, thus transforming it into something that he can act upon instead of being subjected to. In doing so, this discourse is trying to channel the actions and is imposing a direction. In promoting technology integration in education, there is a wish to make the educational system conform to the image of a somewhat better future built by the prospective discourse. It is a will to curb change and master it. But, at the same time, a kind of self-fulfilling prophecy is at work here. The futuristic view of education held by proponents of technology in the classroom will be materialized because they are pushing every one in the field of education into taking the political and organizational measures needed to realize it.

> We must increase the number of available computers. […] these computers must be made accessible to the students. […] We must give teachers solid training and support them adequately and continually. […] We must adapt the curriculum and integrate ICT. We must also question certain traditional teaching practices. (File 43, p.23)[11]

> It's the Taylorian perspective in education that we must change: subject matter separated into different sections, sequential knowledge transmission and programs limited in time. (File 42, p.28)[12]

This discourse is definitely not a teacher's discourse; it is a leader's discourse. It does not find its roots in the classroom, the professional needs of teachers or the academic needs of students, but rather in the needs of public school officials to convince the public that this type of change is desirable and inescapable. By convincing everybody that the future has already been written, by technology itself, the proponents of technological innovations in education are trying to corner the educational system into adopting them.

The Teacher'S Discourse

The above discourse is vividly contrasted by what primary and secondary school teachers are saying. We have to point out that, contrary to what we expected, very few teachers were openly and systematically against technological advances in education or ICT integration into their craft. Their vision of ICT is more restrained, confined to the classroom setting or the general day-to-day routine of school life. ICT is generally perceived as a welcome addition to the arsenal of pedagogical tools and approaches in the classroom. Learning with technology is considered important because it is quickly becoming a common way of acquiring knowledge, but technology is always subservient to the learning goals set by the teacher.

> In my opinion, it's a very important tool [ICT] and we won't put it aside. It will stay, it will be used more and more but it's only an additional tool. It [the school] will not become, like we hear, that there will be no more teachers, only computers. (Ent-01, p.33)[13]

> I see it as a tool that can help the teacher, that also allows him a certain bond with the students, in the sense that

today, it is part of their lives; they are practically born with a computer in their hands. Therefore, it keeps you connected with their lives. I don't think it will totally replace everything, I see it as a tool. (Ent-05, p.72)[14]

Technological change is not perceived as a collective experience - or an experiment in social change - but more of a personal challenge. Solutions to the problem of integrating technological innovations into the classroom are more related to the individual teaching practice. Furthermore, this particular discourse is placing technology in its context of use - the classroom. It is closer to reality than the prospective discourse expressed in the texts. In this context, organizational problems related to ICT integration are very important.

I think that they will have to cut 75% of my teaching time to have ICT training […] it is not realistic. […] No, not after having prepared my lessons, given my lessons, prepared my exams, given my exams, attended meetings at night, maintained discipline in class, corrected exam, had meetings with other teachers, you have to relax sometimes, don't you! (Ent-01, p.17)[15]

With the current reform, with a multi-level group, first and second grade, no autonomy, my time in class is one hundred percent devoted to the students, I have to be there all the time, I have to prepare new lessons, find ways to help them learn, and give them a work method too. (Ent-08, p.105)[16]

The ultimate goal is to help the pupils achieve academic success, not to transform education nor society. The teacher's focus is on the day-to-day problems to be solved in order to reach this goal. The notion of change is, in this perspective, applied to a more defined field. If it can still be viewed as a collective experience, in some cases, the community is restricted to the school or the classroom, not society as a whole.

Teachers put more emphasis on challenges associated with the use of the new information technology in this particular setting and focus on what is impeding their efforts to use the computer or the Internet in the classroom. Their principal concern is the lack of time: lack of time to learn to efficiently operate the hardware and software, to learn about new computer programs relevant to their fields, to plan learning activities and to solve all the technical difficulties in order to achieve productive learning. Another chief concern is the lack of technical support in the school that is needed to solve all of the above-mentioned problems. Teachers are also very preoccupied with the rate of technological change and its cost for the school.

It's the time issue, we don't have enough time, as soon as you have ten minutes of free time and they see that you are free, they give you something else to do, and they say that we don't work enough, us teachers! (Ent-09, p.117)[17]

It's money! […] Because it's [ICT] expensive and it becomes obsolete too fast. (Ent-02, p.30)[18]

The teacher's discourse can be qualified as a pragmatic discourse and presents a more careful evaluation of the possibilities offered by technological innovations. The forms often found in the prospective discourse - an assertive form, with many figures of speech supported by descriptions associated with a positive evaluation of technology - are rare in the discourse expressed by theteachers. Teachers are using, in that sense, more restrained discursive strategies.

[…] we have to be careful too, because computers are a tool like the blackboard, chalk on the blackboard, like a projector and things like that; if we try to teach only with computers, we are making a big mistake. I can say that computers, learning applications, it must be used from time to time, except when teaching computer sciences, that's

> something else. (Ent-10, p.127)[19]

It can be also said that teachers are still in the process of evaluating the proper way of using information technology for teaching and learning and that this technology has not yet been completely integrated into their craft as other more traditional tools. In this sense, teachers cannot be expected to advocate the technology.

> I know that there are some things there but to say that I know about them, not really. I am more interested in what I can have to work. (Ent-01, p.35)[20]

> In geography, we are exploring, it's very visual; then in history, we are on a conceptual level, with regard to preparation, it would need too much preparation, it is really conceptual learning, it is not the same thing. ICT can be applied to some subjects but not all. (Ent-16, p.184)[21]

Finally, computers are regarded as beneficial to the students not because these machines can create a better form of learning but mainly because the knowledge and skills needed to operate the new tools are essential in today's job market. The ability to work with this new technology is perceived as an asset for the future success of their pupils.

> In my opinion, it's a technical teaching tool, that's the way I see it. It's a learning tool for the children, it's a modern tool, children need to learn to use it, they will have to work with it in secondary school, then in college and university, they have to keep up to avoid having a hole in their education and to follow technological evolution, it's important. (Ent-02, p.41)[22]

The teacher's discourse has more of a vocational tone which is in line with their pragmatic view of technology. Once again, ICT is a means to an end, not something that is profoundly changing education.

It is not however a contradictory discourse, opposed to ICT integration in the classroom, challenging the discourse found in the corpus of texts compiled for this study. It is a form of discourse that exist parallel to the prospective discourse, in the sense that is anchored in a different reality - the day-to-day experience of teachers. ICT cannot be seen as a tool transforming society and education. It is first and foremost a learning tool, used only to help attain educational goals set by the teacher.

At the same time, ICT can be seen as a means to define oneself professionally. Teachers are seeing themselves, whether they like it or not, at the forefront of a new wave of teaching. The use of ICT, even minimally, is helping them build a positive self-image as professionals. However, they are careful about integrating too much technology into their classroom because they don't want their profession to be defined by the unique ability to apply a technological means of learning. This, for some teachers, can be seen as professional downgrading or a form of regression in teacher's status.

Their vision of their profession is still rooted in human relations, and has more to do with the bond between teacher and pupil than with technological tools.

> I would like very much that, in the reform, we take into account the human factor, that's what is missing, the human element. I have more results with the students when I pay attention to human relations, and I think that they like that more, they want to be reassured, they're like us; so we should put more effort into that than into machines. (Ent-20, p.214)[23]

Teachers still believe that what really defines them is the ability to establish a bond between teacher and student; teaching is, first and foremost, the ability to use that bond to create a positive and productive way of learning. Human relations still remains at the core of their craft.

Conclusion

Although there is a marked difference between the two corpora of discourse, we cannot attribute this to a resistance to technological innovations on the teacher's part. The distance created is more the result of a difference in perspective than a mark of opposition. The teacher's discourse is anchored in reality not in prospective. It is the result of professional contingencies, an ethic of practicality as Cuban (1986) has already proposed.

Teachers do not want to dwell too much on the significance of technological change in society; they are more interested in what technological innovations can do for them and the students in the day-to-day challenge of attaining specific academic goals.

There is, however, a common thread in the two bodies of discourse, related to the direction taken by recent social and technological changes. Managing change in education requires strict planning and, with less government spending in education in Quebec in recent years, the future now seems all too uncertain for effective planning. Both groups of players have different approaches in coping with the inherent uncertainties associated with this situation. For the promoters of a more widespread use of ICT in the classroom, education can be best managed once everyone agrees on the actions to take. In that way, they present the use of technology as an effective cost saving measure.

Teachers believe that they can control recent changes in education with knowledge accumulated over the years from their professional experiences. They perceive professional knowledge as a way to steer technological change in a direction they can understand and which they feel is beneficial to their students. Cost-effectiveness may be imperative, but the student is expected to be at the center of any kind of change, not technology. Choices are restricted to the classroom community.

The social discourse on technology, in the corpora of texts, is based on an imaginary world in the sense that it is built on an extrapolation of actual trends in current social events. It is based on choices operated in a spectrum of probabilities. These choices depend upon what we wish or hope for tomorrow. Promoters of technology in education are therefore trying to set the stage in such a way that actions taken today will lead to the future they wish to have. This is why their discourse is so assertive and attractive and, to some extend, reassuring. But the images of the future found in the social discourse are incomplete because they cannot take into account all the factors that permit us to foresee the evolution of technology and its effects on future educational evolution.

We can say as much for the pragmatic discourse of the teachers because it represents the

other half of the same picture. This type of discourse cannot take into account social change because it is partially impermeable to change. Change, in the eyes of teachers, is seen as having less of an impact because education is essentially based on stability. It is important for them that, in our schools, a sense of stability and continuity be maintained to preserve knowledge and culture. This stability is ensured by preserving not only knowledge but also by trying to maintain institutions and practices.

To better understand the phenomenon of technological change in education, one has to follow the broad sense of direction inherent to the social discourse and then confront it and put it in context with the pragmatic discourse of the teachers. We also have to take into account the values we wish to convey through this type of change in education.

Our analysis revealed that these discourses are typical of two very different groups of players, with two specific visions of change - one global, the other more restricted to the school community - and different sets of values, two worlds of thought living apart in separate spheres and partially ignoring each other. Technology is a way of revealing the distance between these groups rather than a tool for bringing them together (see Table 1. "Summary of the Results of the Comparative Discourse Analysis").

From an ideological point of view, the promoter's social discourse is related to a technological form of neo-liberal ideology, based on notions of academic performance, cost-effectiveness, efficiency and free competition between academic institutions, where only the best survive, thus ensuring the betterment of the educational system and, ultimately, of society. It is also based on the idea that, with the growing competition between nations, more competitive schools are guarantee that our economy - which is, in this way of thinking, solely based on knowledge - will remain competitive. Words or expressions like "economic future", "knowledge workers", "pedagogic leaders" and "new management in learning" are the building blocks of this type of discourse. An enormous power of change is attributed to technology and the computer is perceived as the ultimate tool of efficient change.

The teacher's pragmatic discourse can be more easily associated with a humanist ideology. Technology is viewed as a new tool for learning but the relationship between teacher and student is still at the core of the process of learning. The impact of technological change is lessened by the context in which it occurs. Thus, the computer cannot fill all pedagogical needs and fit all situations all the time. Organizational and professional constraints have a far more important impact on the learning process, according to teachers, than technology itself. Problems related to the lack of time, resources and information that teachers are constantly facing in their day-to-day routine are more detrimental to the students learning than whether or not they are using the proper technology in class.

Teachers are adapting their practice to the use of information technology but only to a certain extent. They are not willing to put aside or throw away years of precious experience simply to adopt a tool that is generally perceived as ill-fitted to the framework

of their craft. Teachers are also refusing the very popular conception of professional merit by technological means. They do not want their competence as educational professionals evaluated merely by their ability to use the technology in the classroom.

Table 1.
Summary of the Results of the Comparative Discourse Analysis

Corpus of Texts	- A prospective discourse based on the inevitability of present and future social changes; - A collective discourse whose goal is to give direction on the action to take in the future; - Discourse based on the idea of performance and efficiency; - Many imperative and assertive forms; - Positive evaluation of technology; - Many figures of speech that contribute to heighten the inevitability of social change and the power of transformation attributed to technology; - Many references to other prospective discourses, presented as truthful; - The speaker as a leader.
Corpus of Interviews	- Discourse based mainly on teacher's practice; - A more pragmatic view of the future of education; - Discourse marked by individuality, the uniqueness of the speaker's experience; - Many interrogative forms related to classroom use of new technology; - Evaluations of technology are more cautious; - Figures of speech are rare; - The discourse has a narrated form; - The speaker is a witness of his own personal experience; - Personal experience is linked to the collective experience by the likeness of views and preoccupations.

Technological tools are commonly perceived as tools of performance, a way of doing things better, faster and cheaper. But from the teacher's point of view, academic success cannot be evaluated by sheer performance alone. Their work goes far beyond academic success; they are helping human beings as a whole and a human being cannot be defined solely by performance or by the capacity to get a higher education. This is why stability is so important to them.

In a way, the tools offered by information technology are failing to give teachers a more complete image and understanding of the student as a human being. ICT also fails to give them a stable basis upon which they can build their craft.

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Appendix I
The Corpus of Texts

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Appendix II

Teacher's Professional Descriptions

Interview number	Grade level(s)	Subject(s) taught	Teaching experience	ICT experience	Notes
Ent-01	Secondary I Secondary II	Ecology Biology	5 years	Moderate	
Ent-02	Secondary V	English	33 years	Expert	Assistant principal 2nd cycle
Ent-03	Secondary 1st cycle	English	9 years	Moderate	
Ent-04	Primary 1st cycle		23 years	Moderate	

Ent-05	Primary 3rd cycle		12 years	Beginner	Part-time teacher
Ent-06	Primary 3rd cycle		35 years	Moderate	
Ent-07	Secondary I Secondary II Secondary II	French History Art	1 year	Beginner	
Ent-08	Primary 2nd and 3rd cycles		7 years	Moderate	
Ent-09	Primary 2nd cycle		5 years	Moderate	
Ent-10	Primary 1st		4 years	Moderate	
Ent-11	Secondary V	English	30 years	Beginner	
Ent-12	Secondary V	Chemistry	33 years	Expert	
Ent-13	Secondary IV	Physics	32 years	Moderate	International Education Program
Ent-14	Secondary V	Physics	7 years	Beginner	
Ent-15	Secondary IV	English	31 years	Expert	
Ent-16	Secondary IV	History	35 years	Expert	
Ent-17	Secondary V Secondary V	Chemistry Physics	6 years	Moderate	
Ent-18	Secondary I Secondary IV	Geography History	8 years	Beginner	
Ent-19	Secondary 2nd cycle	French English Math	34 years	Beginner	Professional and Social Insertion Special Program
Ent-20	Secondary 2nd cycle	All subjects	32 years	Moderate	Professional and Social Insertion Special Program
Ent-21	Secondary I	Geography	7 years	Moderate	
Ent-22	Secondary II	French	32 years	Beginner	
Ent-23	Secondary I	French	23 years	Beginner	

Appendix III
Discursive Analysis Grid

(Fossion et Laurent, 1981; Sasseville, 2002)

Type of Analysis	Description and Examples
Use of pronouns	The use of pronouns reveal the presence of the speaker in his own discourse. For instance, the frequent use of the first person shows no distance between the speaker and his speech. The speaker is supporting his own words by imposing his presence in what is being said. It is generally a very convincing strategy. *e.g.: I think…; I believe…; I am convinced…; I have experienced so many reforms and I can assure you…*
Descriptions	All forms of self-description in a speech or descriptions of a specific group. These give a portrait of the speaker or the persons for whom he speaks and show how he perceives himself and others. *e.g.: I cannot think, as an experienced teacher, how technology will help us teach better…; The vast majority of teachers are like me, they believe…*
Speech registers	All use of words or expressions that can be associated to a specific register of discourse. They generally reveal the origin of the ideas in the speaker's discourse and his perception of the world around him. *e.g.: A business-like discourse: School works very much like a manufacturing plant; we apply a process to build a product that will be satisfactory to parents and society as a whole.*
Meta-linguistical precisions	All types of precisions or definitions of the words used by the speaker. These show how the speaker considers himself and those who listen to him. *e.g.: By reform, I mean not only changing the practice but also the teacher's way of thinking…*
Descriptive modes	Generally positive or negative, the use of descriptions reveals the appreciation, by the speaker, of the subject of the discourse. *e.g.: These are wonderful tools…; Learning is much more pleasing…; The internet is a poor panacea for real communication…*
Transparency and distance clues	Reveals the level of speaker's proximity to his discourse. Impersonal forms, lack of spatial and temporal markers and frequent use of the third person generally reveal a speaker who detaches himself from what is being said. The opposite is also true.
Atypical speech patterns	Frequent hesitations, unnecessary repetitions, poor or illogical argumentation can reveal internal tensions in the speech. The speaker is not at ease with the subject of his own discourse.
Figures of speech	All metaphoric or hyperbolic forms that are used in a rhetorical manner to produce an effect, to create an atmosphere, a feeling or an image to convey the speaker's beliefs.

Heterogenetic discursive patterns	The use of quotations or paraphrases to build and support the discourse. These reveal the intellectual universe of the speaker. *e.g.: It was Alvin Toffler who said…; We now live in McLuhan's global village…*

Endnotes

* All translations by the author.

1. Depuis le début des années 1990, les changements vont en s'accélérant dans notre société. L'évolution technologique en est en grande partie responsable. Autant nos modes de vie que nos modes de travail sont en train de se transformer. Notre façon d'enseigner, quant à elle, se modifie-t-elle au rythme des changements sociaux ? Permettez-moi d'en douter !» (Fiche 42, p.26).

2. Les événements mondiaux se déroulent dans notre salon; on peut converser avec une personne, où qu'elle soit dans le monde; la porte des grands musées et des grandes bibliothèques est ouverte à qui est branché sur Internet. La circulation des biens et des personnes, l'omniprésence des nouvelles technologies, l'influence des médias de masse créent un monde bien différent de celui dans lequel nous avons vécu jusqu'à maintenant.» Fiche 8, p.15.

3. Les NTIC sont le nouveau crayon de notre société. » Fiche 43, p.22.

4. La culture de notre monde n'est plus uniquement littéraire et artistique, elle est aussi technologique et scientifique. Les NTIC sont la rencontre des deux aspects. Les refuser, c'est être illettré, analphabète, ne pas s'intégrer au monde actuel.» Fiche 1, p.26.

5. L'appropriation des NTIC par nos jeunes devient donc un enjeu de société. Leur présence à l'école est absolument incontournable. […] Il est nécessaire de faire en sorte que l'informatique à l'école soit à cette image au-delà du simple moyen d'enseignement, elle doit devenir un outil de travail et d'apprentissage global.» Fiche 43, p.22.

6. Les technologies nouvelles ont le pouvoir de stimuler le développement des habiletés intellectuelles telles que la capacité de raisonner, de résoudre des problèmes, d'apprendre à apprendre et de créer.» Fiche 37, p. 24.

7. L'apparition récente des SIP […] apporte encore plus de bouleversement car elle implique une nouvelle façon de représenter l'information. Elle délaisse la communication classique qui est fondamentalement linéaire pour lui substituer une représentation arborescente. […] Les habiletés et les stratégies de lecture, c'est-à-dire savoir comprendre et naviguer dans l'information écrite, sont considérablement modifiées. Ne pas s'y adapter, c'est se priver d'un mode de communication efficace et actuel.» Fiche 1, p.25.

8. Toffler a dit et je cite : L'analphabète de demain ne sera pas celui qui ne sait pas lire; ce sera celui qui n'aura pas appris à apprendre». Fiche 42, p.29.

9. Le village global dont parlait Marshall McLuhan est maintenant une réalité. Nous

sommes en train de vivre un bond quantique qui nous mène de la société industrielle à la société de l'information.» Fiche 41, p.58.

10. L'économie pousse au changement. La concurrence place les entreprises devant la nécessité d'innover et de créer toujours davantage. L'avenir appartient à celles qui ont compris, entre autres facteurs, les mérites d'une main-d'œuvre bien formée, capable de réfléchir sur son action, de résoudre des problèmes et d'émettre des jugements critiques. De plus, la maîtrise des environnements et des outils informatiques et technologiques est vue désormais comme une compétence incontournable.» Fiche 42, p.26.

11. Il faut augmenter considérablement le nombre d'ordinateurs disponibles. […] il faut que les ordinateurs soient continuellement accessibles à chacun des élèves. […] Il faut donner une formation solide aux enseignants et leur assurer un support adéquat et continu. […] Il faut adapter les programmes d'études pour y intégrer explicitement les NTIC. Il faut aussi remettre en question certaines approches traditionnelles. » Fiche 43, p.23.

12. C'est la perspective taylorienne même de l'éducation qu'il nous faut réviser : matières à enseigner découpées en secteurs disjoints, transmission des connaissances selon un rythme séquentiel et programmes limités dans le temps.» Fiche 42, p.28.

13. Pour moi, c'est un outil très important et qu'on ne pourra pas laisser ça de côté. Ça va rester, ça va être utilisé de plus en plus mais ce n'est qu'un outil de plus, ça ne viendra pas comme ce qu'on entend dire, qu'il n'y aura plus de profs, que ce ne sera que des ordinateurs. » ENT-01, p.33.

14. Je vois ça comme un outil qui peut aider le professeur, puis aussi qui permet d'être en lien avec les élèves, dans le sens qu'aujourd'hui, ça fait partie de leur vie; ils naissent puis ils ont un ordinateur dans les mains. Pratiquement donc, ça permet de rester connecté avec ce qu'ils vivent. Je ne pense pas que c'est un remplacement complet, c'est un outil que je vois.» ENT-05, p.72.

15. Je pense qu'il faudrait qu'ils m'enlèvent 75% de mon enseignement pour avoir les cours en informatique […] ce n'est pas très réaliste. […] Non, pas après avoir préparé mes cours, donné mes cours, préparé des examens, corrigé des examens, assisté à des réunions le soir, la discipline que tu as à faire, corriger des travaux supplémentaires, des rencontres avec les autres enseignants, il faut relaxer un peu, non!» ENT-01, p.17.

16. Avec la réforme, avec un groupe jumelé, première et deuxième, pas d'autonomie, mon temps que je passe en classe, je le passe 100% avec eux autres, il faut que je sois là tout le temps, il faut que je sois toujours présente, il faut préparer de nouveaux cours, trouver des façons de leurs aider, leur trouver une méthodologie de travail aussi.» ENT-08, p.105.

17. C'est le temps, on en a pas, aussitôt que tu as dix minutes et qu'ils s'aperçoivent que tu es libre, ils te mettent d'autres choses, puis ils nous disent qu'on travaille pas les profs!» ENT-09, p.117.

18. C'est l'argent! […] Parce que tout ça coûte cher et tout ça se démode vite.» ENT-04, p.30.

19. […] il faut faire attention aussi, c'est parce que l'informatique c'est un instrument comme un tableau, une craie sur un tableau, comme un rétroprojecteur et des choses comme ça; si on essaye d'enseigner juste avec l'informatique, on vient de faire une grave erreur. Moi je te dis que l'informatique, les applications pédagogiques, ça doit être ponctuel, sauf pour enseigner l'informatique, ça c'est autre chose. » ENT-10, p.127.

20. Je sais qu'il y a des choses mais de là à dire que je suis au courant, pas vraiment. Je me suis plus intéressé à ce que je peux avoir moi pour travailler.» ENT-01, p.35.

21. En géographie, on est en exploration, c'est du visuel beaucoup ; alors qu'en histoire on en est vraiment au niveau des concepts, au niveau de la préparation, ça demanderait trop de préparation, c'est vraiment de découper des concepts, ce n'est pas la même affaire. Les technologies, ça peut s'appliquer à certaines matières mais pas à toutes.» ENT-16, p.184.

22. « Pour moi, c'est un moyen technique d'enseignement, c'est comme ça que je vois ça. C'est un outil d'apprentissage pour les enfants, c'est un moyen actuel, il faut que les enfants apprennent à s'en servir, ils vont avoir à travailler avec ça au secondaire, puis au collégial et à l'université, il faut qu'ils suivent, pour ne pas se retrouver avec un trou dans leur formation et qu'ils suivent aussi l'évolution de la technologie, c'est important. » ENT-02, p.41.

23. Mais j'aimerais bien que dans la réforme on tienne plus compte du côté humain, c'est ça qui manque, le côté humain. Moi vois-tu, j'ai beaucoup plus de résultats avec les élèves quand je fais attention aux relations humaines, puis ils aiment mieux ça je pense, ils veulent être rassurés, ils sont comme nous autres; ça fait qu'on devrait mettre plus d'efforts là-dedans plutôt que dans des machines.» ENT-20, p. 214.

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