

Communication Technology and Pedagogical Power

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Abstract

The ideas put forward here, although supported by empirical studies on the work of teachers and their profession (Mukamurera, 1998, 1999; Lessard and Tardif, 1996; Tardif and Lessard, 1999), examine, mostly from a philosophical and sociological perspective, the foundations of educational communication with respect to the role and meaning of ICTs in education. This article presents a critical reflection, wholly theoretical and non-objectifying, on the relation between ICTs and teaching. Because it is critical in nature, this reflection is not neutral. It is based on suppositions concerning the nature of teaching, and, in broader terms, on human communication and the technologies enlisted to support it. The reflection presented in this article is divided into two sections. First, it briefly pinpoints the main features of pedagogy in relation to the work of teachers in schools. In so doing, it considers educational communication as it takes place, in classroom interaction between teachers and students. Second, it examines how ICTs can form part of educational communication in schools and examines the kinds of impact they may or could have on relations between teachers and students, and on education in general.

Presentation

In developed societies, children born after the Second World War have grown up with television, which has become for them an almost natural phenomenon simply because it has always been present; its sociotechnical production has been eclipsed by its use: one pushes a button and it turns on without question, that is, without the need to question it as a human product, fixed and dated, as a historical construct, bearer of meaning as well as social, technical and communicational practices. This same naturalization phenomenon is currently taking place for children of our present generation with regard to information and communication technologies (ICTs), as these are becoming increasingly common elements in family and social and educational environments. We must attempt to distance ourselves from this familiarity and minimization.

As highlighted by Heidegger many years ago in his essay on *The Question Concerning Technology* (1954), material technologies, from the most simple to the most complex – from the Neolithic chopper to the next generation computer – are not “things”, “material objects” that we find “in the world” and that we can use simply as “tools” or “instruments”. The human world is not a toolbox in which people find ready-made techniques to serve their purposes. A school and a classroom are not boxes in which we find different technical objects (books, chalk, computers, cubes, etc.) to meet passing educational needs. Technical actions and objects do not constitute a category of objects and actions such as aesthetic objects, economic objects, sexual activities, etc. In reality, all human activity that is in the least way organized has a certain technical dimension (*Anthropologies et sociétés*, 1989) and every human object is the product of technicity (Leroi – Gourhan, 1983).

From our perspective, technologies are human “products” resulting from human praxes and thought; they are what Jean-Paul Sartre, inspired by Marx, in his Critique de la raison dialectique (1985), called practical-inertia, that is, constructs produced and rationalized by human beings and representing, through tangible mechanisms and means, practical and symbolic human projects. This is precisely why technologies are bearers of meaning and praxes: far from being “things in the world”, neutral objects and, at first glance, a-significant, they are, in a sense, symbolic and cognitive projections made real, praxes made concrete through, for instance, a system of operational, functional and material objects. From this standpoint, their tangibility, their shape, their structure, their use and function stem from these practical and symbolic projects that they continue to represent and carry through their diverse uses and functions. Furthermore, because they stem from human thought and praxis, technologies are always found within networks, technical groupings, systems of tools and practices also derived from previous praxes and projects that structure and are structured by social relationships among humans. To question technologies – in this instance ICTs in terms of their links with pedagogical power within schools –, also implies questioning the praxes and thoughts that brought technologies to the forefront and that are pushing them to become integrated within pre-existing technical groupings and social relationships, particularly technologies that are at the basis of current school pedagogy.

The ideas advanced in this text, if based on empirical studies on the work of teachers and the teaching profession (Mukamurera, 1998, 1999; Lessard and Tardif, 1996; Tardif and Lessard, 1999), are focused mostly on the philosophical and sociological discussion on the foundations of pedagogical communication with regard to the place and meaning afforded to ICTs. With our preceding works as a starting point, we have deliberately chosen to adopt a speculative and argumentative angle for this discussion, convinced that such a perspective, which we consider essential, currently appears to be greatly overlooked at the present time, when it is not entirely set aside for economic emergencies and the technological fantasies of a society that increasingly measures its power solely in terms of the productions it engenders without measure.

The discussion that we put forth is a critical reflection, non-instrumental and non-static, on the relationships between ICTs and pedagogy in schools. Because it is meant to be critical, our reflection is not neutral. It is supplemented by certain presuppositions regarding the nature of pedagogy and, more globally, human communication and the technologies that provide it with support and material devices. We are focused on what can be referred to as the sphere of “critical theory” (Apple, 1982; Bromley and Apple, 1998; Habermas, 1973; Wolton, 1999), whose principal function is to shed light on the power relations and social rationales of domination and exclusion, included in projects that are seemingly democratic or consensual, even universal or open to all, much as the Internet appears to be today. We believe that interactions among human beings – which of course include pedagogical interactions between teachers and students – are forever structured by power relations (physical, corporal, symbolic, linguistic, economic, ethical, etc.) that inevitably lead to distortions, conflicts, detours and resistance within the communicational process. We also believe that the introduction of a new element – in this case ICTs – within these processes, must be understood in light of its impact on the organization of the power structures that already exist. Thus, ICTs do not fall from the sky: since they are produced within and from pre-existing powers, it is essential that we question their ties to these powers. Stemming from these presupposed critiques, our reflection will be two-fold.

First, we will outline the principal characteristics of school pedagogy with regard to the work of teachers in schools. We will also look at pedagogical communication as it seems to exist in the work of teachers interacting with students in the classroom.

Second, we will study the way in which ICTs can become rooted in pedagogical communication in schools and the impact they can or could have on the relationships between teachers and students as well as, more globally, on school pedagogy.

School pedagogy is a social and communicational practice

From our point of view, what we call pedagogy is first and foremost a social and communicational activity, that is, a collection of interactions exposed through languages and symbols between educators and the educated, groupings that are more or less institutionalized, depending on the times and societies involved. To understand this activity, it must be looked upon within the social organization that makes it possible: the school.

In our societies, the school represents a fundamental social institution, as important, materially and symbolically, as the engineer's office, the scientist's laboratory, the doctor's office and the worker's factory. For close to four centuries, it has constituted the dominant means of socialization and training in our modern societies. Yet, far from diminishing with time, we notice that this means of socialization and training, referred to as schooling, is forever expanding, and this well beyond the institution that has historically supported it, that is, the school. Actually, in today's reality, we seldom find social sectors (families, corporations and professions, industries, sports and leisure, etc.) in which there are no means of socialization and training reproducing the shapes and contents of schooling, particularly those of a didactic-pedagogical nature. In many ways, we live in a "pedagogical society" (Beillerot, 1982), that is, a society that takes ownership of school practices and massively applies them to non-scholastic activities (Vincent, 1994): continuing education, in-service training, parental education, sports and leisure, etc.

The school that we are familiar with is the product of a rather lengthy historical evolution that began around the 17th century with the "little schools of charity" and colleges. According to Hutmacher (quoted by Novoa 1987: 66), school organization developed rapidly: "At the end of the Ancient Regime, European countries have a multitude of schools (colleges and grammar schools) already working within a rather common model: young, same age students are divided in classrooms of stable composition according to their previously acquired school knowledge; these students have no say in the objectives of their training and are expected to receive knowledge given to them by adults for whom teaching is a sole or primary function". But it is only at the end of the 17th century and in the 18th century that this new social organization became consolidated and spread, while the 19th and 20th centuries ensured its expansion through compulsory education and the democratization of schooling. Later on, the increasing importance held by the schooling phenomenon showed that it answers to the strong internal needs of modern societies. How does such an organization work and, more importantly, what relationships does it forge between adults and children?

Whether reduced to its most simple expression, as in small country schools with only one or two classrooms, or huge establishments with thousands of students and dozens of classrooms, in terms of its socio-physical organization, the school has, for four decades, relied on a simple and historically very stable device: classrooms, that is, more or less closed spaces (almost always very closed), in which teachers work apart from one another, while

accomplishing most of their work. The current teaching system in North America and Europe still relies on such a device. As expressed by Lortie (1975), this organization of the work of teachers with students can be referred to as “cellular”. Teachers have a large jurisdiction over what happens in “their” classrooms, where they have direct and personalized interactions with students. However, these daily interactions, which last for a number of years, allow for the instruction and socialization of new generations.

Nature of school pedagogy: A technology of interaction

At the heart of this cellular structure, current teaching is conceived of as a job and, like all work performed in a formal institution (industry, hospital, university, bank, etc.), it is therefore an activity with specific goals, in pursuit of an “object”, for which techniques and knowledge are used and which is undertaken according to a given process. Human work, whatever it may be, involves an instrumental activity, that is, an activity dealing with an object or a situation to transform it, for the purpose of attaining a pre-determined result. Moreover, any work process relies on the presence of a technology through which or with which the object or situation will be dealt with, treated and modified. In other words, there cannot be work without technique; there cannot be a work object without a technical relationship between the worker and the object. The technical facet is thus inherent to any type of work, just as in teaching.

From this standpoint, the teacher, like other workers, uses techniques, a “technology” in the broad sense of the word. We can define “teaching technology” as the collection of means used by teachers to attain their goals in school-work activities with students. This definition signifies that a teacher’s technology is nothing other than the means he/she uses to attain goals during interactions with students. Yet, such a definition closely resembles what we would normally refer to as “pedagogy”. Characterized as such, pedagogy cannot be confused with “tools” (hardware or software), that is, with material techniques (videos, movies, computers, multimedia, etc.), nor with particular techniques with which it is so often mistaken or associated: group teaching, tutorial, programmed teaching, cooperative learning, etc. These means are a part of technology, not all of it. Generally speaking, pedagogy is an invisible material technology, particularly since it concerns the prescription of social ties and the symbolic organization of teaching. It is therefore necessary to study all the means used by the teacher, and not only the visible, material elements. In this manner, the division, organization and presentation of subject matter in class with students also constitutes the pedagogical means (Shulman, 1986). In the same vein, group control and student motivation are key problems of teacher technology (Doyle, 1986).

According to several authors (Chartier, Julia, Compère, 1976; Compère, 1997; Gauthier, 1993; Novoa, 1987; Petitat, 1982; Vincent, 1980, 1994), at the end of the 17th century, school pedagogy presented the following characteristics which are still valid today:

- First, it relies on a number of institutional devices, spatial and temporal, that delineate and structure an autonomous social space, closed and separate from the surrounding community milieu, and within which the children are subjected to a lengthy learning process (socialization and instruction) spread out over several years. School pedagogy begins when the establishments keep the children within their walls and territories to subject them, over a long period of time, to a particular treatment, collective and common, that does not have an equivalent in the surrounding social community. In such a context, school pedagogy fosters new social educational relations between new groups and actors – teachers and students – within a new social organization.

- These social relations are based upon a new system of practices: exercises, memorization, repetition, corrections and rewards, examinations, homework, etc. This pedagogy has three characteristics: it is codified, that is objectified and written, particularly through curricular order; it is geared towards groups of students collectively, and not individuals; finally, it is impersonal and regulated, valid for all members of the organization, teachers as well as students.
- This new system of practices prescribes different attitudes and imposes diverse social behaviours that are typically school related: postures and regulated corporal activities, attendance control, control of time and space, monitoring of students by the teacher, obedience, etc. As a social space, the school therefore defines, through its attitudes and behaviours, a range of social relations between those who teach and those who learn. These social relations are schooled, organized and publicized by the school code of conduct.
- School pedagogy uses different tools (books, notebooks, textbooks, blackboard, etc.) that are all graphic artefacts of written culture and knowledge, codified and objectified. School discourse is basically a discourse that is written and to be written; in this way it stands out from the other practices of informal education. Today's school stemmed from the "readers' society" (Chaunu, 1966, 1982), when books and writing became accessible to the masses and dominant over oral tradition and non-written knowledge.
- It requires the presence of a staff whose status (teacher) and central function (teaching the same things, at the same time, in the same way, to groups of students) cannot be found elsewhere in the social world surrounding it.
- Finally, like all collective human constructs, it undertakes a common project through which the actions and goals of agents take on their meaning: to act in depth on children for the purpose of socializing them, moralizing them and instructing them according to the proper rules of the organization. School pedagogy thus aims for thorough action: it does not limit itself, as may be believed, to filling children's heads with useless knowledge; on the contrary, it retains children for several years (approximately 16 nowadays), to impress upon them, day after day, in an in-depth action that shapes their personality, their sensitivity, their behaviours and their thoughts.

Historically speaking, this collection of characteristics outlines a new social working space: scholastic teaching conceived of as a particular form of work on the human being, that is, a job in which the worker relates to its object (students) in the fundamental mode of human interaction. Teaching within a school environment actually means to show up in person in a classroom and interact upon and with a group of students in order to modify their thoughts and behaviours to meet work objectives. Teaching is therefore an interactive job, bringing together human beings who act according to each other's behaviour. Unless otherwise proven, schooling and socialization (or education) indeed require this direct presence, regular and repeated over many years, of teachers with students.

From this perspective, we can take a second look at the previous definition and make it more specific by saying that pedagogy is the collection of means used by the teacher to attain his/her goals in the context of educational interaction with students. The field of pedagogy thus refers to the concrete interactions between teachers and students. Pedagogy is therefore what we call a "technology of interaction" (Cherradi, 1990; Dreeben, 1970; Hansfeld, 1983, 1992; Tardif and Lessard, 1999). In other words, teaching is a profession of human relations,

that is, a job based on interactions between people who are in the presence of one another. It thus follows that the study of pedagogy can never ignore the conditions and constraints that are inherent to human interaction, particularly the normative, affective and symbolic conditions and constraints, as well as those linked to relations of power, control and authority. In other words, pedagogy is an instrumental activity, but it is also a technology of human interaction; it is an “interactive technology” and, consequently, it bears the mark of the human relations upon which it is built. How does this technology of interaction work, concretely? Within this text, it is impossible to study in a detailed manner the diverse forms of interaction between teachers and students; we will limit ourselves to a brief description of the work performed in the classroom¹.

Pedagogy as interactive and communicational work

When we observe teachers working in their classroom, what stands out is the strong language-related aspect and, more generally, the communicational facet of their interactions with students.

By definition, any social interaction is directed towards another party, whether the latter is physically present or not. This characteristic of the action is closely linked to language or, by and large, to communication. As Habermas (1987, p.33) specifies, communicational activity

[...] concerns the interaction of at least two subjects able to talk and act that engage in an interpersonal relationship (be it through verbal or extra-verbal means). The actors seek an agreement regarding a situation of action, in order to consensually coordinate their action plans and, from there, their actions themselves [...]. In this action model, language takes on a preeminent place.

Teaching is not so much doing something; it is doing something meaningful with others: the meaning that circulates and is exchanged in the classroom, the meanings conveyed, recognized and shared, are then the medium for pedagogical interaction. School pedagogy is first and foremost an orally expressed and significant action, in short, a communicated activity. It is geared toward a collective other (the group of students) through the activity of a talking subject (the teacher) whose actions are filled with meaning and who is attempting, using various linguistic and symbolic means (group set-up, working rules, tasks, division and presentation of subject matter, etc.) to obtain the understanding and collaboration of this collective other.

Subsequently, pedagogical action cannot be reduced to the subjective meaning it is given by an isolated actor, teacher or student. Because it is interpreted and shared simultaneously by different actors, because it refers to a common context within which the actors are all present and interact immediately with each other, because it occurs in an institutionalized setting, pedagogy is a social and communicational activity. From this standpoint, reflecting upon the interactions between the teacher and the students in the classroom calls to mind the question of the pedagogical communication that takes place among them. In other words, we can say that pedagogical communication operates

1 For a complete study of the work of teachers with their students, see Tardif, M. and Lessard, C. (1999). *Le travail enseignant au quotidien*. Belgique : Éditions de Boeck.

simultaneously on three levels that are constantly intertwined: interpretation, imposition and communication itself.

Interpretation

As shown in many studies on teacher thought (Calderhead, 1987, 1996; Clandinin and Connelly, 1995; Clark and Peterson, 1986; Handal and Vaage, 1994; Tochon, 1993a, etc.), teachers are interpreters of what takes place in the classroom. But this interpretation activity is not limited to oral or written discourse. Teachers must constantly “read and interpret” the class, how students move, their reactions, their progress, their motivations, etc. In this regard, most of what we call pedagogy pertains to work stemming from interpretation: the teacher has expectations, preconceptions (referred to by cognitive psychology as previous knowledge), from which he/she interprets or understands what is happening in the classroom. Teaching, therefore, is to interpret the activity undertaken that allows for meaning to be attributed to what is taking place. A teacher, in a certain sense, is a “reader of pedagogical situations”; someone constantly vigilant with regard to any deviations that could occur, requiring the improvisation of an immediate response. This improvisation depends on the teacher’s experience, knowledge of students and classroom history (Sternberg and Horvath, 1995; Tochon, 1993b).

Imposition

Teachers, however, do not only interpret, they also impose meaning, direct pedagogical communication, and contribute in this way to guide the current action program, depending on the meaning they wish to put across. From this standpoint, pedagogical communication is always biased and calls upon power relations: contrary to the idea that teaching is exclusively a procedure of data processing, a process of knowledge construction, we believe that it is greatly a process for the imposition of meaning. The teacher works with the realization that he/she knows something that the students do not and must learn, and is thus responsible for imposing this particular something (rules, knowledge, etc.) in the classroom. As an imposition process, didactic-pedagogical communication acts upon the forms and codes of communication as well as on its content and the norms at stake (Bourdieu, 1982). The imposition of meaning is even more important when we consider that the teacher is a worker whose tools and professional mandate are, to a great extent, composed of meaningful materials and significant goals (Durand, 1996). A doctor also imposes meaning on his patient, for instance in telling him that he is afflicted with a particular disease. But the teacher, in a sense, works with meaning on meaning, thanks to meaning. A teacher’s basic teaching materials are discourse, knowledge, rules, meaning to say, all realities permeated with meaning.

Communication

The teacher not only interprets and imposes meaning, but verbalizes and shares it as well when communicating something to others. Communication is constantly at the heart of pedagogical action. It is not added to action, it is action in itself as experienced by teachers and students. This simple fact enables us, in particular, to understand why the expressive and communicative qualities of teachers’ personalities play such a big role in teaching: these are qualities (empathy, humour, etc.) that lead us back to the communicative nature of pedagogical action, within which the teacher’s personality becomes a true means of communication, a kind of work tool.

In the traditional model, in-class communication occurs according to a linear scheme whereby a producer transmits a message to a receiver through a particular channel or medium. Without going into a detailed analysis of pedagogical communication, it is clear that this is not how the actual process occurs. It is more closely related to the “orchestral model” developed by the “new communication” (now 50 years old!) and used by social science researchers, particularly in psychology, anthropology and sociology (Bateson and Winkin, 1984). For instance, it is clear that communication is not a one-way process because students communicate with their teacher. In fact, a large portion of students’ work also consists in interpreting what the teacher wants and wants to say. These students also communicate with one another, either in twos or in larger groups, possibly even collectively as a student body. The teacher must control this communication which is peripheral in comparison to the one he/she wants to impose on the group, either by interrupting it, by using it to his/her advantage, etc. Thus, in terms of the message, it can be said that it is constantly polysemantic. Far from the simple transmission of information or a clear message, it touches upon several messages at once: the subject matter to learn, of course, and also the manner in which to do so, appropriate behaviour, what the teacher will or will not tolerate, etc.

In short, the teacher, immersed in pedagogical action in the classroom, develops with students significant interactions in tasks of 1) interpretation with regard to what is happening as it is happening, 2) constant imposition of meaning, 3) generating a complex process of communication with students.

Yet, to understand the importance of these phenomena, we must bear in mind that for students, these pedagogical situations occur repeatedly on a daily basis every school day for close to 16 years. These types of communication and practices therefore produce a long-lasting and deep action: they allow for the school socialization of students, their education in institutionalized thought and their schooling in knowledge areas and competencies upon which social and economic life are founded.

ICTs and School Pedagogy

In light of the preceding developments, the question of interest to us is not: what is the use of ICTs as technological productions and what can they bring to school pedagogy? Rather, it is: how can ICTs, as social products influencing meaning and practices, be inserted within pre-existent practices and pedagogical techniques? Will they support them as they are? Reinforce them? Transform them? If so, how? By whom and for what purpose? In this text, it is obviously impossible to answer all of these questions. We will therefore limit our discussion to three interrogations with regard to ICTs and their ties with school pedagogy: the cellular structure of pedagogical work, student/teacher interactions and school knowledge.

ICTs and the opening of the cellular structure of pedagogical work

As previously stated, for four centuries the school has stood upon the same basic structure: closed classes in which teachers and students interact. Even though school has constantly grown for a century now, this growth has occurred as the addition of more and more classes, triggering the hiring of new teachers. It is quite different for most other social and economic organizations in particular, for which technological changes and new work management methods have created not only an increase in production but also a reduction in personnel, as well as the regular reorganization of work units. With the classroom, we are

therefore dealing with a very stable organizational device. Thus, phenomena as important as education for all children in the 20th century, the bureaucratization of school, state ownership, the increase in schooling, etc., have not bent or seriously modified it. If other types of organization have been and still are attempted (open-area schools, tutoring, etc.), they have never in any way threatened the pre-eminence of the traditional classroom. Moreover, this very device is replicated when schools are built, as in non-occidental societies.

Without giving a detailed analysis of this question, it should be recalled that the birth of school pedagogy in the European societies of the 17th and 18th centuries, was closely linked with the emergence of new forms of state power, with the capitalist ethic that provided education with new organizational modes and new values (speed, efficiency, order, control, effort, merit, etc.), and with the establishment of a new order of secular knowledge aimed primarily at controlling individuals and social groups (Foucault, 1975; Vincent, 1980). Enveloped by these powers – those of the State, of Work and of Knowledge –, school pedagogy increasingly became a new institutionalized social practice, progressively taking the place of other, older modes of socialization and education (traditional, domestic, local, informal, etc.). In short, school pedagogy rose above other forms of education and conserves its pre-eminence even today (Vincent, 1994).

In our opinion, however, with ICTs, it is truly the first time in almost four centuries that the supremacy of the classroom, as the sociophysical structure of pedagogical work, is seriously threatened, when it can open up and become unravelled in light of new educational and instructional modes founded upon new forms of interactions between teachers and students. A classroom is a controlling device, both temporal and spatial, a set of cloisters maintaining teachers and students in a proper scholastic location and time. From this perspective, ICTs currently elucidate the question of a possible dissociation between schooling (both instruction and socialization) and this historically very stable controlling device, in other words, between institutionalized schooling portrayed in schools and classrooms, and schooling as the training process of socialized members of our advanced modern or post-modern societies.

Indeed, like the preceding technologies, from the book to audiovisual devices, the originality and the strength of ICTs in the area of school pedagogy, seem to us to lie in their potential to replace in-class interactions with distance and out-of-class interactions, that is, interactions that escape the spatial-temporal boundaries of the classroom. We are not only dealing here with distance education, but more seriously with the distancing of teaching as it has existed since the institutionalization of the school. In Canada, this process of distancing has already begun, as experiments are conducted in the territories and provinces with teaching that is no longer based on the co-presence of teachers and students within traditional classes (Haughey, 1999; Jefferson and Edwards, 1999). At the present time, it is difficult to foresee the exact forms and magnitude that these experiments will take in the near future; however, we can already put forth the plausible hypothesis that they will only grow and multiply.

This hypothesis, of course, incurs several technical and financial difficulties (that we believe will be resolved within the next decades); but beyond these difficulties, what is truly at stake is socio-political. Indeed, as was previously stated, the cellular device upon which the pedagogical work within schools is based is an institutionalized form (formal and codified) of control over education that allows for direct action, in-depth and regular, by teachers on students, in order to have control over them, through a system of rules and pedagogical practices: a thorough, long-lasting influence referred to as school socialization and instruction. However, if we admit that ICTs can, for the first time in four centuries, destroy or at least seriously unravel the institutionalized form of school pedagogy with all the

accompanying controls, if ICTs can delineate and open up the spatial – temporal boundaries of the classroom, so emerges the following question: is it possible to instruct and educate, in short, to school new generations without the classroom or the institution, or at least by implementing socially acceptable forms of learning beyond the classroom and outside the school? In this case, who will control these forms of learning, who will instruct and socialize the new generations, and for what purpose, based on which principles, values, and for which educational, social, political and ethical concerns? With the opening up of the classroom as the basic cell of the school institution, the question now concerns the invasion of pedagogy and, more importantly, of school space by social forces that surround the school.

How, for example, can ICTs, apparently neutral technological instruments, be incorporated in the numerous divisions and exclusions (of race, sex, class, ethnicity, wealth, culture, language, geography, etc.) that still structure school space, from top to bottom, inside as well as outside the act of schooling? Do they transcend these divisions and exclusions, or do they give them new forms, so mystifying and effective that they will be new and seemingly far removed from the traditional forms of school pedagogy? Moreover, beyond the instrumental dimension, the social and cultural aspect of ICTs remains greatly problematic and gives rise to diverse interpretations depending on the individuals, groups and forces that attempt, through ICTs, to impose their vision of school, of learning, of pedagogy, etc. ICTs currently serve as symbols for all sorts of projects, many of which are clearly contradictory. ICTs are used as instruments to promote school democratization, since they allow segments of the population that are less affected by schooling to be reached; but at the same time, they enable parents, individuals, groups, simply to withdraw children from school and promote, outside the classroom, new training and socialization modes removed from the authority of the school.

Nevertheless, it would be a misconception to believe that school is a purely passive and reactive institution, and that it will merely adapt to ICTs. Quite the opposite, as demonstrated by its stability and historical longevity, the school is a strong institution, one that is capable of reproducing in time and space the way it functions and its organizational devices, and to impose them on other social sectors. In fact, the evolution of ICTs in itself shows that the discourses and school practices also invade computerized communication and the Internet. For instance, many projects and sites devoted to training, education and learning take on the modes and contents of school pedagogy: objective-centered approaches, segmentation of contents, artificial steps in learning, division by subjects, summative evaluation, etc.

Ultimately, while governments, schools and private businesses prepare to invest millions of dollars into ICTs to integrate them in school and classroom space, while financial resources allotted to schools are simultaneously drastically reduced, it is appropriate to question the openness of these two spaces – that of the classroom and that of the school – and to seriously ponder why, by whom, and to what intent they will be occupied, filled and owned. Currently, we note that the transformation of the role of the State, the rise of the trade model at the very heart of culture and social interactions, and the globalization of markets indisputably lead to new forms of social regulation likely to fill quite rapidly the new spaces opened up by ICTs within the school and the classroom. For example, in many American schools, the introduction of ICTs implies the infiltration of the school and classrooms by private businesses, businesses that not only supply technical infrastructures, but also contents and values: competition, consumption, marketization, cronyism, marketing of school knowledge, etc. Most of the time, these values and contents reflect managerial neo-liberalist ideologies that aspire to restructure the school so that it may better correspond to the new organizational forms of industry and finance, marked by flexibility, preponderance of

competency on qualification, team work, the empowerment of the self-employed, responsible worker, mobility, etc. (Bromley and Apple, 1998; Ginsburg, 1988; Ginsburg and Linday, 1995; Lessard et al., 1999)

ICTs and student/teacher interactions

According to the previously proposed definition, pedagogy is the technology of interaction used by teachers with students. It is therefore necessary to “lower” ourselves, so to speak, to the level of these daily interactions if we wish to truly understand the pedagogical impact of ICTs rather than merely make general statements regarding the school system or ponder technical questions.

Yet, in accessing and opening up the school and classrooms, ICTs do not invade spaces that are technically virgin or bare, but ones that are already structured by techniques, discourses and pedagogical practices. Furthermore, school pedagogy, as previously stated, is first and foremost a social and communicational activity: it is a spoken action, a communicated action, an action that is directed towards another, a collective entity – students – with whom the teacher works in the classroom. Even then, ICTs as a process of computerized communication, and as a social communicational practice, must be positioned not in terms of a scholastic place devoid of communication, but rather already filled with communication and communicational activities. This leads us to the problem of the connection of ICTs, as technologies and processes of communication, to the pedagogical interaction technologies and communicational practices that they generate and that were briefly presented earlier. Simply, how will ICTs tie in to student/teacher interactions? What place will they hold?

For many people, ICTs will not merely change school pedagogy but rather categorically improve, simplify and enhance learning. As Cuban (1997) did, we can call these people “technophiles”. For Cuban (1997:18), “ the dream that drives technophiles is filled with students who learn more and with much less difficulty than in traditional classes, and teachers who help students to understand the contents and use competencies that would only very rarely appear in lessons and comments addressed to entire groups.” The enthusiasm of technophiles is often limitless!² Yet things are not so simple!

2 For example, Lessard et al (1999) quote Arthur Andersen, head of a firm, who claims to be able to market the school of the future, a school guaranteeing quality at an affordable price. In a document called *Transforming Education: Breakthrough Quality at Lower Cost*, it is written that : “ the existing education system is a monument to its own time and place, but a woeful anachronism in ours. Designed in the 19th Century to prepare workers for the transition from farms to factories, it still copies the work methods of the Industrial Age. Children are assumed to be empty vessels into which bits and pieces of data can be poured as they move by in lockstep, assembly-line fashion » (1997 :2). Yet, today, «being prepared for the empowered workplace means being a self-directed worker, not just having the capacity to answer questions or carry out commands. And being adequately prepared for today's collaborative decision making also requires a more active, self-directed form of learning » (1997 : 3). Ultimately, « the revolutionary changes in the world of work demand that our schools go far beyond the '3Rs' to create a new, broader set of « basics » that enable them to cope with the complexity wrought by accelerating change – including the ability to engage in systems thinking, to utilize technology in learning, to work cooperatively in high-performance teams, to take initiative, and to actively acquire new skills as needed » (1997 : 3).

Indeed, until proven otherwise, we note that schooling, as a socialization and training process for new generations, is founded upon direct, personalized and daily interactions between teachers and students, interactions that must be repeated for many years so that their goals may be attained and a deep and long-lasting influence be exerted on children and adolescents. As a profession centering on human relations, teaching thus requires human interactions, human exchanges between adults and children. However, these relations are truly human, meaning that they are not at all limited to the exchange of information or to strictly cognitive training; rather, they touch upon all facets of human relations: intellectual, of course, but also emotional, affective, ethical, political (that is, tied to the power relations of individuals), linguistic, symbolic, etc. This is why teachers must present themselves in person and as a person when entering the classroom to work with students rather than leaving their emotions, values, beliefs or personalities in the locker room or staffroom. In fact, the very person embodied by the teacher becomes a means for interactive work. Yet, clearly, the richness and complexity of interactive work, that call upon the various facets of the human being in relationship with others, are non-reproducible through artificial communication systems and the coupling of man with machines, no matter how “interactive” their interface. In this sense, the belief that ICTs could technically replace human interactions as sources of human training is nothing more than a pipe dream: only human beings can humanly train other humans. This basic truth lies at the very root of the fundamental anthropological reality of educational activity: the human being is one who needs others to become human, and it is through mediation with other humans that his own humanity is rendered possible. From this standpoint, ICTs would, in fact, only serve a peripheral and instrumental purpose in comparison with the core of the interactive student/teacher relations that constitute the heart of pedagogical action.

Moreover, as we previously stated, teaching is a communication profession and normative enunciation appears, in our view, to lie at the core of the teaching action. When teachers speak with and to students, they systematically impose norms, evaluations: “yes, good, well done, no, that’s wrong, that’s incorrect, you can’t say that, that’s fine,” etc. It is therefore not an objective discourse, declarative, informational, but “deontic”, that is, a discourse that divides the world, things, people, acts, words, in qualitatively different regions subject to preferences and choice, rules and sanctions. This deontic discourse calls upon modal operators of classical logic: “the possible, the impossible, the necessary and the contingent as in that which is allowed, forbidden, compulsory and forbidden.” (Pharo, 1985, p.164). The discourse of teachers also has a certain level compared to that of students: to teach is not only to say something, to convey information, it is also to say it in a particular way, in light of linguistic and cultural codes; this discourse thus exemplifies, in its forms of expression, the mastery of a certain language level. And yet, it is difficult to see how the enthusiasm of the technophiles could correspond to the reality of pedagogy characterized as a moral profession, one that is ethical and aims to impart on the students a system of beliefs, norms, visions of the world, in other words, values.

ICTs, culture and school knowledge

The last question of interest to us here concerns the link between ICTs and culture, as well as school knowledge. A few truisms should be recalled:

- School never conveys all of a society’s culture to new generations. Rather, it selects, organizes, transforms and transposes certain elements of the social culture into school culture (Forquin, 1989).

- This process of transposition ultimately relies upon selection criteria and on the establishment of cultural hierarchies. School cannot keep and transmit everything; it must therefore select within the global culture, a partial and model culture that it considers to be exemplary and a beholder of the future (Tardif, 1996).
- This model culture creates the order of school knowledge, that is, the order of knowledge, the competencies and values taught to students. In today's school, the order of school knowledge is, on the one hand, a reproduction and a transposition of academic knowledge (Chevallard, 1985; Jonnaert and Lenoir, 1996), particularly from institutionalized scientific or academic fields (mathematics, history, geography, social sciences, etc.). On the other hand, it is the renewal of certain established cultural traditions (values, beliefs, ideologies, religion, etc.)
- But school knowledge is not merely reproduction and transposition; it also has an autonomy and history internal to the school institution (Chervel, 1988, 1998; Petitat, 1982). School does not only reproduce, it also produces its own cultural models (for instance, a verbal-intellectual culture) and generates its own hierarchies (for instance, the historically weak and ambiguous status of physical education in the hierarchy of school subjects).

It follows from these few comments that school and teachers never convey simple information or general knowledge; rather, they always communicate formal, structured and hierarchically organized knowledge.

Concretely, this means that in the pedagogical work with students in the classroom, the discourse of teachers in action attempts, as was previously noted, to impose on them “arbitrary” modes and contents of culture and school knowledge. From this perspective, in-class teaching resembles a dialogue whose focus or intent would be imposed on those communicating. It is not a question of agreeing to something in general, but rather on the intent of the lesson and working rules for the group. Pedagogical communication thus presented resembles a theatrical production in which the script is written expressly for someone who is not involved in the given scene. In other words, the school knowledge that is at stake in teaching and learning is to a great degree external to the situation; it stems from a socio-historical construction (a scientific field, a normative system such as grammar) produced by a body of agents (scientific communities, elite, etc.) and it is transformed by school programs that, in turn, build a certain model of scientific culture to meet schooling needs. Unless we imagine an entirely new teaching system, it is difficult to see how we could retain, as a whole, the constructivist proposition that school knowledge should be constructed by students. Let us not forget that school knowledge is never submitted as a pure cognitive object but rather as a project of imposition from one culture to others. The task of the teacher thus consists of naturalizing this culturally arbitrary imposition by making it meet the interests or needs of the students. Inversely, but in the same vein, the classical explanation for failure will often call upon natural causes: lack of intelligence of certain students, laziness, etc.

However, these phenomena too often appear hidden in discussions or debates on ICTs. Indeed, we speak of ICTs as procreators of information, as new modes of management, circulation and distribution of knowledge, but without considering the fact that school knowledge is never general knowledge, neutral information, but always the result of a process of selection, transformation and hierarchical ordering of social knowledge transposed into school knowledge. School pedagogy itself depends on an order of knowledge considered as legitimate. Teaching and interacting with students is inevitably to impose this legitimate knowledge, to teach “school subjects”, “school truisms”, “school values”, etc.

If we admit that ICTs are not neutral technologies, but the result of social and symbolic praxes, it becomes appropriate to question cultural models, cognitive hierarchies, modes of transposition and reproduction of knowledge that they, in turn, try to impose on teachers and new generations. In our opinion, current discussions on ICTs should focus more on the cultural foundations of these technologies: what are the cultures, hierarchies and cultural values, the beliefs and cultural knowledge conveyed and imposed by ICTs?

Concluding Comments

This text aimed to be a non-instrumental reflection on relations between school pedagogy and ICTs. Our reflection was led by the idea that ICTs and pedagogy are both social and communicational practices and that, as such, their ties cannot be limited to technical questions.

Essentially, pedagogy appears to us as a technology of interaction assisting teachers in the accomplishment of the work process with students. This interaction technology is not limited to objects and material devices, but also includes all of the interactive and communicational means that intervene in class and help teachers act in a meaningful way to instruct and socialize students. Furthermore, this interaction technology carries the imprints not only of human interactions between teachers and students, but also those of the school environment and its cellular structure. Pedagogy is a social and communicational praxis that occurs in a school time and space that are already greatly saturated by controls, rules, norms, procedures, etc.

In this sense, the integration of ICTs in pedagogy does not take place in a neutral milieu, a technologically empty space, but, instead, within a cellular device that is already filled with interaction technologies. The connection of ICTs to pedagogy, therefore, does raise a series of questions – that we discussed in the second part of the text – on the compatibility of present-day technologies with regard to the knowledge that they convey and rank hierarchically, the modes of pedagogical communication control and on the potential repercussions of ICTs on the opening up of the classroom as well as on the human interactions that occur between teachers and students.

As products of social and communicational praxis, ICTs are, from the onset, bearers of discourse. Ultimately, we believe today that the following interrogations must be raised: who discourses through ICTs, what is the nature of this communication, who leads the discourse and what does he say, what does he mean? This questioning invites us to go beyond the technological preoccupations to broaden our vision of ICTs and to view them as cultural and communicational productions, in order to better situate them within the social power structures that govern our society, as well as within schooling as a dominant mode of training for this society.

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