# On Ernst von Glasersfeld's Contribution to Education: One Interpretation, One Example

Marie Larochelle ◇ Université Laval (Canada) <marie.larochelle@fse.ulaval.ca>
Jacques Désautels ◇ Université Laval (Canada) <jacques.desautels@fse.ulaval.ca>

***Purpose:*** According to the constructivist perspective tirelessly promoted by Ernst von Glasersfeld for more than 40 years now, the world we see is of a piece with our way of understanding and locating ourselves within it; ultimately, whenever we claim to describe the world-in-itself, we in fact are describing the product of the mapping process that has enabled us to make our way in this world and to actualize our projects within it. Obviously, this kind of perspective has consequences for the way both educational action and research on this theme are conceived of and accomplished. That, at least, is what we shall attempt to show in this article. ***Implications:*** In keeping with the claim that knowledges are constituted not in reference to reality "itself" but to practices and activities, constructivism advocates examining cognition in action – that is, in terms of how the latter is enacted in the field. Accordingly, constructivism also seeks to prompt teachers to: (1) scrutinize the processes and distinctions by which students chart out the world; (2) and to personally devise, on the basis of this experience, a model – or models, rather – of their students' future relationship to the universes of knowledge intended for learning. Likewise, constructivism also aims to prompt researchers to perform some very careful detective work into the ways in which this charting process is played out and thus to opt for a comprehensive rather than an experimentalist approach. ***Conclusions:*** To adopt the constructivist perspective also means to "de-siloize" knowledge production and to recognize that this production occurs in all spheres of society. From this point of view, constructivism can thus be viewed as a way of challenging the claims of a certain scientific establishment to *alone* possess the requisite standing for interpreting the world.
***Key words:*** Learning, teaching, research, methodology.

In three short stories said to have inaugurated the genre of detective fiction, Edgar Allan Poe brought to life a character, Auguste C. Dupin, whose comments in many ways bring to mind the comments and thoughts of that other well-known character of our day and age we know as Ernst von Glasersfeld.[1] Auguste C. Dupin and Ernst von Glasersfeld are alike in holding the view that we are always arriving too late on the scene to be able to behold a pure, as-yet un-interpreted world. Rather, the world that we are seeing and experiencing is one that has been configured according to both the notions that we entertain about it and the distinctions with which we have laden it; further, such notions and distinctions constitute practical means of our own invention, devised to co-ordinate and manage our experience of the world (Glasersfeld 1993). Ultimately, whenever we claim to describe the world-in-itself (or the "ontologically preexisting world," to resort to philosophical parlance), we in fact are describing the product of the mapping process that has enabled us to make our way in this world and to actualize our projects within it (inclusive even of the "dud" roadmaps – that is, the cognitive itineraries that have proved non-viable or indeed fatal to our assumptions and views). In short, we are describing what can be done in the world and not, to paraphrase Geertz (1988), seeing the world as it really is when only God is looking! Thus, from this perspective, knowledge is said to be operative, as it allows us to operate, act and anticipate, just as it can, obviously, lead us into dead ends, as is shown in one of the cases narrated by detective Dupin.

In "The Purloined Letter," published circa 1845, Dupin comments on the failure of the Paris Prefect of Police to locate a letter of paramount importance, tying this inability to the police chief's habits of comprehending the world and assessing the capacities of others – in this instance, the thief, Minister D, who also happened to be a poet. As Dupin informs us, in the Prefect's view a poet is by definition a fool and a scatterbrain; therefore, the kind of person who would think to hide the letter nowhere else than in some unlikely spot or other. On the basis of this assumption, the Prefect and his men painstakingly searched the thief's apartment, ripping up the inlaid pieces of the parquet floor, scrutinizing the bindings of his entire book collection beneath a microscope, peering inside the hollows of the chair legs and sinking long needles into the chair cushions – all to no avail. Further, throughout their searches, they remained completely oblivious to the letter that had been placed prominently on display atop a fireplace mantle!

All of which goes to show – and on this point Dupin the detective and Glasersfeld the epistemologist again think alike – the importance of developing a reflexive understanding of the world; in other words an understanding that is conscious of its assumptions and that, as a result, is conscious of being *one* manner of understanding or *one* "take" among other possible manners of understanding or "takes." By the same token, this does not mean that all takes or intellectual constructions are equal or

interchangeable. Indeed, the Prefect's failed efforts at finding the letter offers a telling illustration of how this is not so. On the other hand, if he and his men had previously developed the habit of thinking reflexively, they might have been able to vary their investigative approaches somewhat. In addition, they might well have been able to work up not one but several composite drawings of the thief and, as a result, would have multiplied their potentialities for action, as Glasersfeld would say.

Now, such a perspective, which holds that our ways of doing and making things bear a strong relationship to our ways of understanding the world, also comes freighted with some very strong demands in relation to teaching and to research in education. That, at least, is what we shall attempt to demonstrate in this text, which, inevitably, represents *one* interpretation of radical constructivism and, owing to this fact, *one* example of what can be accomplished with this theory.

## Teaching in a constructivist mode

If one is to conceive of teaching from a radical constructivist perspective, one must first be able to demonstrate reflexivity toward one's own beliefs and convictions, one's own words and deeds. Just as importantly, one must demonstrate the same capacity in respect of what one ascribes to others, including students. Thus one must constantly remind oneself that one's descriptions are *situated* and that, whenever the topic of the conversation becomes, for example, students' cognition, the descriptions, explanations and assessments then being aired are those of an observer bringing to this exercise his or her own classifications, connections and projects. It is not the point of view held by students concerning their own cognitive activity, as Glasersfeld (2000) has emphasized:

> "Piaget sometimes mentioned the danger of confusing an observer's view of an organism in its observed environment and observer's inferences about the view the organism generates within the domain of its own experience. In his own writings, Piaget did not always make this distinction clear, and I think that we ourselves quite often do not pay enough attention to it. "Especially in discussing education, we tend to focus on the child or the student as we see them, and we may not stress often enough that what we are talking about is but *our* construction of the child, and that this construction is made on the basis of our own experience and coloured by our goals and expectations." (p. 8)

From this point of view, and though radical constructivism does not constitute a theory of teaching, as Glasersfeld has repeated over and over again, this mode of thinking nevertheless sets out a certain number of constraints. On the one hand, there is the requirement of coming to grips with the fact that as a teacher, one acts according to one's understanding of students' cognition. And, on the other hand, there is also the requirement of putting this understanding to the test. Indeed, if the goal is to aid students in complexifying their conceptual networks and indeed generate new ones, then the viability of this understanding has to be borne out in a two-way exchange with students such that there is the possibility, where necessary, of transforming one's constructions and integrating one's students' viewpoints into it (or at least what one makes of their viewpoints!). In other words, it is critical to delve into the processes and distinctions whereby students configure the world. It is equally critical to develop, on an ongoing basis, a model (or, rather, *models* if one is to avoid succumbing to the same pitfall as the Prefect) of students' manners of conceiving not only the knowledges to which they are to be given an introduction but also their "business of being a student" (*métier d'élève*, as explicated by Perrenoud 1995).[2] Teaching from a constructivist perspective thus entails committing oneself to a recursive dialogical process, a conversation on "problematic subjects," to borrow from Bateson (1981), and therefore in a particular form of social communication, encounter or interaction.

Until now, however, as Glasersfeld (2000) has also noted, radical constructivists have paid scant attention to this social encounter in terms of any sustained effort at theorization. This apparent disinterest of theirs has given rise to harsh criticism concerning constructivism's value and relevance for shedding new light on social interactions[3] or providing insight into encounters of the kind occurring in a classroom learning situation. For indeed, as the sociology of education has taught us, this type of situation cannot be reduced to a mere encounter between epistemic subjects devoid of any projects or sociocognitive history, on the one hand, and (for example) universally enjoying a harmonious relationship with the culture of writing that is a distinguishing characteristic of Modern Education (Vincent, Lahire & Thin 1994). Nor can this situation be conceived of as though unfolding in a space devoid of issues of power or control over meanings, especially in view of the important role ascribed to the continual quantification and discipline of performance (output) and, more generally speaking, of the individual (Foucault 1975). Furthermore, it cannot be approached as though the technological artifacts and devices used in this space did not also, in a way, shape the way in which students learn how to learn. For example, a ruler, a compass, a protractor, a scale or a geographical map all serve – as is the case with any technology – to define and delimit a space of uses and, for this reason, they constitute powerful mediators of cognitive activity (Callon 1989). In short, respecting social interaction, there is an abundance of research questions, models and methods that warrant conceptualization and testing if one holds to the objective of producing a more valuable fit between radical constructivism and the classroom. At the same time, it is important to guard against viewing the classroom as a situation entirely under the sway of biographical, social or technical determinisms.

Just so, and therein lies one of the aspects brought sharply into focus by constructivism, the learning situation bears a number of fundamental uncertainties in respect of its playing out over time.[4] What is more, as several classroom experiments have brilliantly illustrated, it is indeed possible to uncover – in real time – previously undetected sources of leeway and to convert the norms, constraints and agendas framing the classroom encounter into learning resources. For example, Wood, Cobb and Yackel (1994), whose research was based in part on work by Glasersfeld, have showed how it is possible, as early as primary school, to institute communities of practice in which the students themselves foster mathematical learning and growth; this the students achieve by engaging in argument-based discussions on ways not only of solving a problem but also of defining it, all the while managing the need for these

students to take the same cycle-end examination as the other children in their school district. In the same vein, Aikenhead (1992) has shown how secondary students (ages 15 to 17) in a STS (Sciences-Technologies-Societies) program became well acquainted with the political, legal and ethical issues surrounding the various uses made of a technical artifact (in this instance, a breathalyzer) and were thus able to develop an informed point of view on technoscience,[5] this they accomplished while also demonstrating their ability to perform as well as the other students on standardized science examinations. Likewise, Roth (1998) has shown how the introduction of a technology – in this case, a glue gun – set the stage for a dual transformation amongst primary schoolchildren. To begin with, thanks to one child's contribution of a glue gun to a classroom activity centring on the construction of various artifacts (bridges, towers, etc.), the other children were able to obtain harder, more resistant bonds and, as well, more solidly structured pieces. The first outcome was thus to transform the material and discursive practices enacted in the classroom. And, in a second outcome, the structure of interactions between the various actors also underwent a process of transformation when, in particular, some of the students taught their classmates how to use this tool. Further still, as the glue gun in question was an electric model and the classroom was equipped with only two wall sockets, the students had to cluster close to the electric outlets to do their building work, which immediately created unforeseen opportunities to share, negotiate and circulate knowledge.

To sum up, and despite the reservations we have touched on above, drawing on radical constructivism for the purposes of conceptualizing and carrying out educational action opens onto picturing this action in terms of the multiplication of possibilities for teachers and students alike.[6] Clearly, embracing such an option is likely to run counter to teachers' cherished or ingrained classroom habits, for as long as we teachers continue to situate ourselves in the capacity of discoverers or as the mere spokespeople for a preorganized world, the impact of our discourses and practices will give little cause for concern. Our interventions amount to driving home such messages as "that's the way it is," "facts are facts," "the figures speak for themselves" and so on; further, any difficulty of comprehension encountered by students is merely a question of cognitive immaturity or erroneous conceptions that a solid teaching approach, seasoned with a bit of passion or drive, should be able to root out (Larochelle 2004; Larochelle & Bednarz 1998).

On the other hand, once one accepts the claim that it is not possible to perceive the objects of the world without also having a theory of the world (Douglas 1999), or the claim that facts are indeed produced – that is, fabricated (as was stated by Bachelard and, a long time before him, by Vico) – then it is a whole other (educational) story that comes into view and it is an entirely different type of relationship to knowledge and to others that is privileged (Désautels, Garrison & Fleury 2002; Larochelle 2000). For, at that point, the (inevitable) confrontation underlying all educational action no longer unfolds as though between a group of subjects (the students) *versus* a world of objects –that is, a set of knowledges that have emerged out of nowhere and that, from that point on, afford no opportunity for negotiation or ownership-taking. Rather, this confrontation stems from the encounter occurring *between* groups of actors, or *between* groups of "describers of the world" (students and biologists or geographers, for example); further, by injecting new symmetry into the relationships obtaining in the classroom, a basis is laid not only for the discussion, negotiation and indeed hybridization of the descriptions in question, but also for learning an "appropriate" way of using the descriptions thus co-developed.

## Doing research in a constructivist mode

Radical constructivism also produces its share of consequences for the design and conduct of a research project. For indeed, with the claim that knowledges are constituted not in reference to reality "itself" but to practices, activities, places and groups or communities of action (Barnes 2001; Bichofsberger 2002) comes also an appeal to examine: the relational and operational character of these knowledges; their local, situated character (knowledges embody points of view, positions, and so forth, in a given society at a given time); and, finally, their potentially controversial character, since they bring into play experiences of the world and "ways of worldmaking" (to borrow from Goodman 1992) that make for potentially rocky contact and integration, as is shown by the difficulty encountered in interdisciplinary work of managing to "see what the other sees" (Petrie 1986; Vinck 2000). In other words, constructivism urges the researcher to focus on cognition-in-action and to perform some very careful detective work into the ways in which this process is played out and negotiated in "real life" places and times.

From this position it is possible to distinguish at least three major implications for research:

1. To begin with, and on this point our views converge with several of the findings and insights afforded by symbolic interactionism and discursive psychology, constructivism prompts the researcher to examine the "making and doing" of actors. And, on this same basis, it also militates in favour of research designs of investigation that have more in common, to borrow from the image contained in a recent article by Cyrulnik (2003), with a goat path (that is, a winding, rocky trail cut into the side of a steep hillside) than with those research superhighways represented by laboratories or, worse yet, experimental research settings where, as Stengers (1987) has so aptly noted, more often than not, the outcome is to shut up the very people who are being questioned. Thus the perspective informing the researcher's investigation is a comprehensive one – one, moreover that is consistent with radical constructivism's project of developing a model that describes "how we know what we know" (Glasersfeld 1983) or, in the present case, that describes how actors know what they know.

2. Secondly, constructivism advocates opting for a conception of language that breaks decisively with the representationist conception currently predominant in the field of education. According to the latter conception, the interaction occurring between speakers is viewed as a mutual adjusting of their respective mental states – "as expressed in words" – following a series of data processing runs by each speaker (Brassac 2004). In other words, it is through a two-phase process that speakers eventually manage to convey their respective meanings to one another, with the "substance" of their

verbal exchange being assimilated to a "content" of the mind.

By contrast with the foregoing, in the constructivist model (according to which cognition is considered to be an activity and a practice, as was mentioned above), a discursive production is, in itself, said to constitute a cognitive activity. As Chauviré (2000) has emphasized, there is no need to imagine "a silent mental process forming a lining to the utterance of a sentence" (p. 54) and unfolding in some mind housed inside a brain. Furthermore, an utterance is posited as being potentially indeterminate and contextual – even for the person uttering it, who might be "surprised by his own words" (Brassac 2004, p. 11). It therefore follows that interaction between speakers is not viewed in terms of adjustment but instead of a joint dialogical production of meanings that may, moreover, be re-subjected to negotiation when one of the speakers next takes his or her turn.[7, 8] Against this backdrop, the implications of Austin's program of *How to Do Things with Words* can be seen more fully – if perhaps in an unlikely or unfamiliar light.[9] Or, as Maturana (2006, p. 96) has summed up: "Language is a manner of coexistence in coordination of doings, not a property or a faculty of the brain or what we call the 'mind'."

Such is the perspective informing the notion whereby constructivism compels adopting a conception of language that recognizes the latter's constitutive role in organizing experience and the shaping of things and events. As Bourdieu (1993, p. 33) noted, "Words do things because they create a consensus on the existence and meaning of things." Words therefore do not merely serve as the outer garb of thought (Merleau-Ponty 1976, p. 212). Nor has their meaning been "indexed" once and for all, since meaning grows out of contexts of usage, not to mention customary ways of reacting and responding; in short, meaning grows out of the history of the speakers (Quéré 1994).

3. Finally, by privileging a pragmatic conception of knowledge, radical constructivism disrupts the social hierarchy of knowledge and the accompanying "racism of intelligence" (to quote again from Bourdieu 1980) that consists in ascribing the ability to produce valid bodies of learning and knowledge to certain groups only. Constructivism thus bids researchers to "de-siloize" knowledge production and, on the contrary, to consider that "the production of knowledge occurs in all spheres of society" (Darré 1999, p. 45) – including spaces that are often associated with the consumption rather the production of knowledge, such as the world of farmers (Darré 1999), nurses (Aikenhead 2005) or teachers (Desgagné 2005). Or, to put it a bit differently, by adopting this perspective, the researcher also recognizes the capacity of those usually referred to as the task performers "to conceptualize their actions and to produce and co-produce knowledge" (Darré 1999, p. 46); and, as corollary to the preceding, this knowledge is thus not viewed as a residue or a debased version of an institutionally legitimated knowledge but indeed as a form of production in its own right.[10]

As it so happens, drawing on constructivism for research purposes may, once again, throw a wrench into a researcher's customary methodological reflexes, all the more so since there is no escaping the relativization of viewpoints that is promoted by constructivism. It is no longer possible to obtain an overarching vantage point – a dictum that applies to all discourses, including those of researchers claiming to adhere to constructivism. There is no way of speaking or acting as though the phenomena, substances and events that we are speaking of and that we are claiming to encode had appeared out of thin air and existed independently of our ways of containing the world in our discipline-based frameworks and projects.

It is critical to be able to specify the place from which one speaks and to account for the various assumptions and commitments by which one configures the world and, as a result, be able to reintroduce, following the suggestion of Foerster (1982, 1992), "the properties of the observer into the description of his or her observations." The reintroduction of such properties represents a major break with the usual scientific text which rests, on the contrary, on a rhetoric that tends to erase all traces of human activity and to facilitate the "naturalization" of the affirmations in question – that is, to persuade readers that they are indeed beholding a given fact or phenomena, and indeed the world, as it really is (Gross 1990; Larochelle & Désautels 2002).[11]

Thus, as was the case above concerning education, with radical constructivism it is a whole other (research) story that comes into view just as it is an entirely different type of relationship to knowledge and to others that is privileged.

## Concluding remarks

For more than 40 years now, Ernst von Glasersfeld has been urging us to share in the ceaseless making of this dual narrative through, notably, numerous seminars and workshops as well as the hundreds of contributions he has penned in a broad range of fields (such as psychology, philosophy, linguistics, cybernetics and, of course, education) and on themes often assumed to be self-evident, particularly in mathematics and science teaching (such as the notions of truth, objectivity and the transparency of language).

As is clear from the abundance of publications being written under the banner of constructivism, Glasersfeld's urging has not gone unheard, just as, moreover, the range of modes of appropriating constructivism's potentialities for generating, evolving and actualizing action and research in the field of education

ABOUT THE AUTHORS

*Marie Larochelle* is Full Professor at the Faculté des sciences de l'éducation of Université Laval. For many years, she has actively researched socioepistemological problems related to the teaching/learning of scientific knowledge. Her publications have been primarily in the field of science education and constructivism. Her current research interests focus on how students and future science teachers figure or represent the tensions, disagreements and socioethical issues that shape the practice of the technosciences.

*Jacques Désautels* is Full Professor at the Faculté des sciences de l'éducation of Université Laval. For more than 20 years, he has been concerned with the pedagogical and ideological dimensions of science teaching. He has author or co-authored several works and articles, written from a socio-constructivist perspective, in the field of science education. His current research interests focus on the type of power/knowledge relationship fostered by the teaching of the technosciences.

testifies to the many, varied paths being pursued in Glasersfeld's multidirectional footsteps![12]

All things considered, the really astonishing thing would be that no such diversity should have occurred. As has been pointed out by Heinz von Foerster, one of Ernst von Glasersfeld's long-time friends, with radical constructivism, we have now resolutely entered into the "realm of nontrivial machines." By this image, Foerster (1997) is referring to the whole of those machines, systems and organizations which, once fed a stimulus A, do not then necessarily produce B, since their history and projects also mobilize them to do what they do – making a shambles of our expectations and predictions along the way. They are disobedient machines, enthusiastically engaging in "venturesome thinking" (*la pensée qui se risque*, in Barthes's words) – the type of thinking to which the work of Ernst von Glasersfeld testifies most convincingly. This non-orthodoxy is, in our view, really quite wonderful, particularly in view of the intellectual freedom Ernst von Glasersfeld has passed on to us, thanks to which one may devise ways of acting and making one way forward in the world, including the world of education.

However, as with every groundbreaking contribution, Glasersfeld's work brings into play stakes whose importance should by no means be underestimated. For, above all, challenging the idea that our knowledge reflects the ontologically preexisting world amounts to challenging (to borrow from Latour 1999, pp. 27–28) "the most fabulous political capacity ever invented" – namely, the capacity "to make the mute world speak, to state the truth in the absence of discussion, [and] to put an end to interminable debates via some indisputable authority deriving from things themselves." From this perspective, radical constructivism may also be considered as a way of engaging in politics otherwise.

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## Notes

1. The introduction to this article is based on excerpts from the address given by Marie Larochelle on 18 June 2006 on the occasion of the Université Laval (Québec, Quebec) graduation ceremony at which Ernst von Glasersfeld was awarded the degree of doctor of education *honoris causa*. In these excerpts, Larochelle brought out a similarity between Glasersfeld and Dupin, the celebrated detective portrayed by Edgar Allan Poe. She realized only recently, while re-reading the preface to Glasersfeld's 1987 book *The Construction of Knowledge*, that its author, Heinz von Foerster, had also noted this very same similarity. Indeed, some 20 years had gone by since she had last read this preface, with the result that in June 2006, she genuinely imagined that she was working from an association that had previously gone unnoticed!
2. The fecundity of this perspective in terms of revisiting certain problems of teaching and learning science has, moreover, become widely recognized and has, in the last few decades, generated an extensive program of research that has systematically elicited the views of students of all ages concerning particular concepts (e.g., that of particle, ecosystem, revolution, objectivity, and so on) as well as the fields from which such concepts have emerged (What is science? What is history? etc). By way of example, see Audigier (1993), Désautels & Larochelle (1998), Leach, Driver, Scott & Wood-Robinson (1996).
3. For example, according to Gergen (1995), radical constructivism involves a dualism that results in postulating the individual and society as two independent entities. It is not possible in this article to examine the various arguments he brings to bear, but in our view it would be worthwhile taking up the solution proposed by Kuhn (1983), who showed that production of scientific knowledge is a simultaneously cognitive and social process. The paradigm (set of theories, exemplars and standards) is constitutive of the science community that constructs the paradigm, and the stabilization of this paradigm proceeds through the recruitment, into this community, of new members who in turn learn to work within the framework of the paradigm and pursue the standard task of resolving enigmas until such time as new controversies arise. In other words, paradigm and community are mutually constitutive, in a circular manner that recalls the recursive processes seen stabilizing around eigenbehaviours, as Foerster (1997) has suggested. In a similar manner, individuals and societies are mutually constitutive, as part of a process of interpenetration or overlap; by way of corollary, the emergence of the sovereign individual or the sovereign society is the result of analytical distinctions made by observers from a particular perspective.
4. It is thus possible to model an educational situation as a complex, dynamic and indeterminate system whose future changes cannot be predicted and which may indeed evolve toward a range of different stable states (attractors, eigen-values, etc.) or, on the contrary, become chaotic.
5. For example, the students were given a look into the "interpretive flexibility" exhibited by scientists toward data in situations requiring them to establish, for example, the norms governing acceptable blood alcohol levels. In the process, they were able to acquire some critical distance toward the commonly conveyed, idealized images and opinions of science.
6. In a recent article intended to provide an overview of the question, Kirschner, Sweller and Clark (2006) maintain that various forms of teaching based on constructivism (such as discovery teaching, inquiry teaching or problem-based teaching) have proved to be a failure where learning is concerned. For several reasons, their argument does not hold water. To begin with, from a methodological point

of view, the authors do not explicate how they went about constituting the corpus of research on which they base their verdict. Nor do they provide much in the way of specifics relating to the theoretical and methodological frameworks characterizing the research work that they examined, or to the overall context of inquiry in which the various research projects were conducted. The authors stick to a "rhetoric of outcomes (or effectiveness)," whereas one would have thought them willing and able, on the basis of their blanket assessment, to articulate a robust, full-fledged line of argument. One would have also expected them to conduct a careful, comprehensive discussion of constructivism – which is patently not the case here. Instead, one is treated to a few definitions of their own cobbling and that amount to little more than clichés (e.g., p. 78). Indeed, one well wonders what these authors actually understand about constructivism – they who claim to adhere to a mechanistic and realist theory of cognition (short- and long-term memory), who approach learning as though it were some sort of chest of drawers (in this drawer, working memory, in that one, long-term memory, etc.) and who, quite obviously, are unfamiliar with the models of self-organization bearing on memory, for example (Clancey 1997). They have, on the other hand, demonstrated a most surprising ability to tie constructivism to such things as permissiveness or the absence of guidance. Only a woeful ignorance of the reality of education, constructivism and the scientific literature on the subject can explain their assertion that a teaching approach drawing on the tenets of constructivism will reduce education to a self-guided experience, with teachers no longer having to "orient" students' efforts to construct a conceptual structure, for example. Such is clearly not the case, as the research of Woods et al. or Aikenhead, cited in the body of this text, has so amply shown. Likewise, their lumping together of constructivism and discovery teaching bespeaks a dismaying degree of misunderstanding on their part, as it is constructivism's claim that knowledges are not, precisely, an immediately or spontaneously transparent product and thus cannot be made the end goal of some artless, naïve process of discovery. In short, there are grounds for asking oneself whether the authors were taking aim at the wrong target and whether indeed the real cause for concern is not their own folk conception of constructivism. Admittedly, exhausting the list of objections would take quite some doing, and besides, the space requirements of this footnote would no doubt make any such attempt here entirely unfeasible. In another recent publication of ours, however, we develop a more full-bodied critique of this kind of writing, which these times of educational reform have produced on a scale approaching that of a glut. (Désautels et al. 2005).

7. Along the lines of the educational situation referred to above, this model of linguistic interaction would benefit from being "socialized," and from ascribing greater importance to the negotiation of "positioning relationships" (*rapports de places*) that are often brought into play in this type of interaction – i.e., involving negotiation of the authority deriving from such things as social status, institutional position, gender, age, prestige, experience, "high marks," etc. (Kerbrat-Orecchioni 1987).
8. For an illustration of this discursive negotiation process as it is engaged in by secondary students, see Larochelle & Désautels (2001).
9. Translator's note: Certainly one of the most fruitful models to explore and explicate the "economy of linguistic exchanges" in reflexive or constructivist terms is to be found in Pierre Bourdieu's seminal *Ce que parler veut dire*, 1982, which was brought out in an English edition by J. B. Thompson (translated by G. Raymond and M. Adamson) under the title of *Language and Symbolic Power* by Harvard University Press: Cambridge MA in 1991. The French title of Bourdieu's work – which, more literally rendered, equates with *What Speaking Means* – was intended as a wink at J. L. Austin's *How to Do Things with Words*, whose title itself contained a gently mocking allusion to do-it-yourself manuals (first brought out in 1962 by Clarendon Press and translated into French as *Quand dire, c'est faire* by Seuil: Paris in 1970).
10. One outstanding case of this is to be found in the *Association française contre les myopathies*. Infantile spinal muscular atrophy, an incurable neuromuscular disease, was originally considered to be an orphan disease. In numerous cases, doctors did not even know what name to give the disease, much less what palliative care to suggest. Eventually, parents were the ones who, as they gradually formed an association, took charge of the exceedingly difficult task of documenting cases, establishing comparisons and classifications, providing the initial descriptions of the developmental path of children suffering from the disease and of disease stages. In this regard, one may say that parents were the ones who produced the first knowledge about this terrible disease. See Rabeharisoa & Callon (1999).
11. It is the imposition of a particular intellectual layout (*Introduction, Method and Materials, Results, Discussion*), serving to bracket off, in steps, the contingencies inherent to research (as well as any traces of the observer) that enables the text to produce this genuinely political effect. In this connection, Madigan, Johnson and Linton (1995) have performed a most instructive analysis of the *American Psychological Association* (APA) style sheet, which in several fields is considered the sacrosanct authority on the rules governing the composition of articles and research reports.
12. Several works illustrate the diversity of interpretations that have been developed about this subject, with this diversity constituting – to follow Kuhn (1983) – one of the conditions for the practice and development of knowledge referred to as scientific. For a summary of the debates in education, see, in particular: Glasersfeld (1991), Jenkins (2002), Larochelle, Bednarz and Garrison (1998), Phillips (2000), Steffe and Gale (1995), Steffe and Thompson (2000), and Tobin (1993). For an overview in other fields, see Volume 23 of *Social Studies of Science* (1993); see also issues 18 and 19 of *Cahiers critiques de thérapie familiale et de pratiques de réseaux* (1997, 1998) and issue 17 of *La Revue du MAUSS* (2001).

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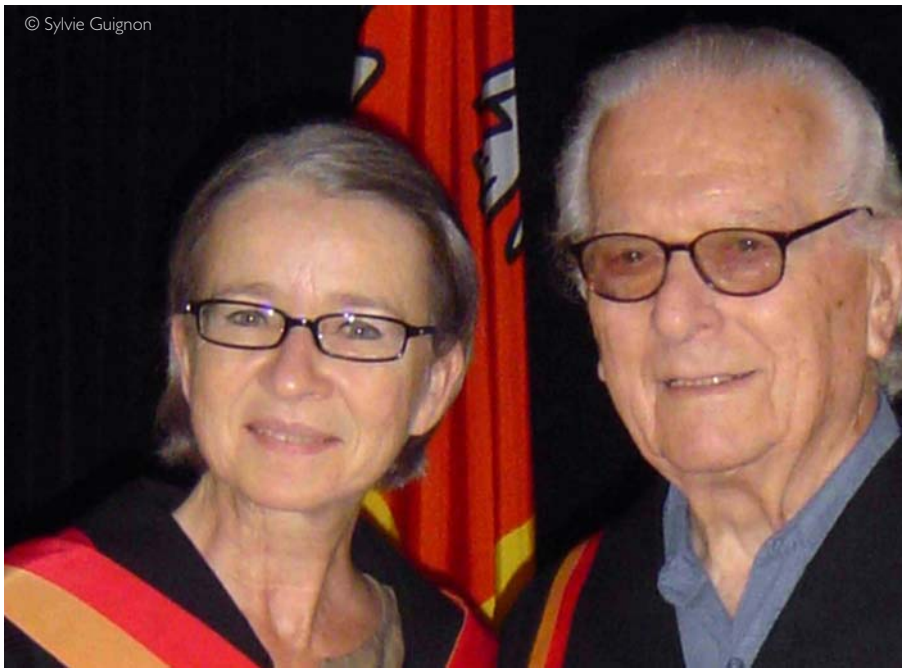


Ernst von Glasersfeld together with one of the authors, Marie Larochelle, in Québec, 18 June 2006.