Radical Constructivism: Epistemology, Education and Dynamite

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> Context • The current situation in philosophy of science includes central, ongoing debates about realism and anti-realism. The same question has been central to the theorising of radical constructivism and, in particular, to its implications for educational theory. However the constructivist literature does not make significant contact with the most important, mainstream philosophical discussions. **> Problem** • Despite its overwhelming influence among educationalists, I suggest that the "radical constructivism" of Ernst Glasersfeld is an example of fashionable but thoroughly problematic doctrines that can have little benefit for practical pedagogy or teacher education. My critique has a positive goal: it is important to understand why constructivism has generated such severe polarization and disputation. A symptom of the problem is the concern with the most abstruse and obdurate problems of philosophy that have no conceivable bearing on educational practice or anything else, for that matter. The diagnosis is confirmed by those pedagogical recommendations that are allegedly derived from radical constructivism that are touted as revolutionary but are platitudes of common sense. I suggest that, ironically, this observation itself provides some pedagogical insight. **> Method** • The approach adopted for the topic is critical, philosophical analysis of the various claims and theses of radical constructivism in the light of philosophy of science and psychology. **> Results** • The findings of the paper are that central theoretical claims of constructivism are couched in an unclear and unnecessary jargon that obscures the implausibility or banality of these claims. **> Implications** • The value of the paper lies in providing an analysis and critique of central, influential claims of radical constructivism both in relation to issues in epistemology and also in relation to the alleged bearing of these claims on pedagogy. It is suggested that, contrary to the claims of radical constructivists, there are few if any implications for practice and applications.

> Key words • **Learning, teaching, metaphysics, epistemology, realism, fallibilism.**

Introduction: A secular religion?

Denis Phillips (1997: 152) has said of constructivism, "Arguably it is the dominant theoretical position in science and mathematics education," and he remarks that "[a] cross the broad fields of educational theory and research, constructivism has become something akin to a secular religion" (Phillips 1995: 5).

We must distinguish the sociological form of constructivism from the psychological or "radical" variety. The latter is a theory of individual mental activity principally championed by Ernst von Glasersfeld (1995a), who sees its origins in Kant, Berkeley and Piaget, among others. The sociological variety of constructivism has been at the centre of the "science wars" and has the most dramatic, and largely unnoticed, implications for education. However, the two varieties of constructivism are not entirely distinct and the literature on von Glasersfeld's "radical constructivism" is replete with endorsements of the central tenets of social constructivism. Thus, Kenneth Tobin and Deborah Tippins write:

"Science does not exist as a body of knowledge separate from knowers. On the contrary, science is viewed as a set of socially negotiated understandings." (Tobin & Tippins 1993: 4)

In view of their relativism, these sociological doctrines have been described by Larry Laudan (1990: x) as "the most prominent and pernicious manifestation of anti-intellectualism in our time." The issues and their consequences for education have received attention elsewhere (Slezak 1994a, b, 2000, 2007) and here I will focus specifically on the psychological form of constructivism.[1] Referring to von Glasersfeld's radical, psychological variety, Paul Cobb (1994a: 4) referred to the "fervor that is currently associated with constructivism" and Paul Ernest has written:

"In the past decade or two, the most important theoretical perspective to emerge in mathematics education has been that of constructivism. … Ironically the attacks on radical constructivism … which were perhaps intended to fatally expose its weakness, served as a platform from which it was launched to widespread international acceptance and approbation." (Ernest 1995: xi)

1 | There is a third variety of constructivism that deserves to be clearly distinguished from the others, namely, the "constructive empiricism" of Bas van Fraassen (1980), which has received no attention among educationalists, though it has been among the most important recent views in the philosophy of science. This doctrine is a form of anti-realism or instrumentalism whose provenance can be traced at least as far back as Osiander's notorious 1543 preface to Copernicus' *De Revolutionibus*. Later, Bellarmine's view of theories as held only *ex suppositione* was central to the Galileo Affair, and remains a major issue in the philosophy of science.

Despite such hype, and despite its overwhelming influence among educationalists, I will suggest that the "radical constructivism" of von Glasersfeld is an example of fashionable but empty "intellectual impostures" (to use the term of Alan Sokal and Jean Bricmont 1998) that can have no benefit for practical pedagogy or teacher education. My harsh critique has a positive goal: it is important to understand why constructivism has generated such severe polarization and disputation (see Matthews 1998; Phillips 2000).

"Recoiling into metaphysical fantasy"

Evidently under no illusions, von Glasersfeld has remarked "To introduce epistemological considerations into a discussion of education has always been dynamite" (quoted in Ernest 1995: xi). I am concerned to give an analysis of the explosive mixture. A symptom of the problem may be seen in the remarkable range of philosophical issues raised in the constructivist literature. These include extremely abstruse questions whose relevance to any practical or theoretical problem in education is surely doubtful. Thus, among the topics discussed are Berkeleyan idealism, Cartesian dualism, Kantian constructivism, Popperian falsifiability, Kuhnian incommensurability, Quinean underdetermination, truth, relativism, instrumentalism, rationalism and empiricism, *inter alia*. By seemingly plausible increments, we are led from questions that arise in everyday classrooms to the most arcane problems of metaphysics. Something has gone wrong if the teacher of ordinary school curricula must confront the deepest philosophical puzzles and perplexities of metaphysics. Excellence in teaching or teacher training cannot depend upon grappling with disputes that have preoccupied philosophers since Plato. Somehow good teaching has managed to flourish despite the persistent obduracy of these problems. As I will show in more detail, we get a sense of the paradox when we juxtapose the extravagant philosophical preoccupations of constructivism with the practical precepts that are actually offered. Thus, recently, explaining the morals of his constructivism, von Glasersfeld avers "Rote learning does not lead to understanding" (Cardellini: 182). Similarly, he suggests "After a while they [i.e. students] will become interested in why certain things work and others do not; and it is then that teachers can help to foster this interest that leads to understanding" (Cardellini 2006: 182). Such insights are surely familiar to teachers innocent of constructivism or any other philosophy, for that matter. We will see that this stark discrepancy between philosophical pretensions and practical pedagogy is the consistent pattern in constructivist writings. For example, as Nola (1998: 33) has noted, effective teaching methods that may be an alternative to didactivism cannot be inferred from a non-realist philosophy of science.

Nevertheless, Jerry Gale (1995: xii) identifies problems with "Cartesian epistemology" and the "mind–body split," although the educational relevance of such issues remains utterly obscure. How could any issue concerning the mind–body problem have the slightest bearing on educational theory or practice? Gale (1995: xiii) suggests that constructivist approaches "differed from the Cartesian model in viewing knowledge in a nondualistic manner so as to avoid the mind–body split of endogenic (mind-centered) and exogenic (reality-centred) knowledge" (Gale 1995: xiii). In passing, we might note that the mind–body split is an entirely different issue from that of the objective reality of a mind-independent world, though Steffe seems to conflate these. Steffe does not deign to indicate how Cartesian dualism might be relevant to science teaching. As a card-carrying materialist, like most philosophers today, I doubt that I am a better teacher for *that* reason. Some of my best friends are dualists and great teachers. Not least, Descartes' own exemplary, foundational contributions to modern science and mathematics were hardly inhibited by his alleged "lapses."

Such examples suggest that we should be somewhat skeptical concerning the claim that we have been somehow seriously misguided in our conceptions of knowledge and science since Ancient Greece (see Glasersfeld 1995b: 6). Von Glasersfeld suggests that his conception of constructivism arose "out of a profound dissatisfaction with the theories of knowledge in the tradition of Western philosophy" and he has suggested that adopting his constructivism "could bring about some rather profound changes in the general practice of education" (Glasersfeld 1989: 135). He recommends: "Give up the requirement that knowledge represents an independent world" (Glasersfeld 1995b: 6–7). On one construal, this is, of course, Berkeley's notorious idealism and has no implications for teaching or anything else in everyday life outside the philosophy seminar room. With Samuel Johnson, we might be inclined to refute such "ingenious sophistry" by kicking a stone. On a different construal, the idea that there is no mind-independent world is undoubtedly a radical proposal. If taken seriously as a practical matter the notion would be evidence of clinical derangement and of little benefit to educators. Of course, as noted, despite such extravagant philosophical claims, the concrete educational recommendations that von Glasersfeld actually offers are rather modest. Von Glasersfeld has addressed this kind of objection invited by his frequent allusions to Berkeley[2] and he responds by distinguishing ontological issues from epistemological ones, explaining that "constructivism is a theory of knowing, not of being":

> "The constructivist conclusion is unpopular. The most frequent objection takes the form of the accusation that constructivism *denies* reality. But this it does not. It only denies that we can rationally know a reality beyond our experience." (Glasersfeld 2001: 10)

And again, to be fair in making attribution, von Glasersfeld has also written:

> "[From] the naive commonsense perspective, the elements that form this complex environment belong to a *real* world of unquestionable objects, as *real* as the student, and these objects have an existence of their own, independent not only of the student but also of the teacher. Radical Constructivism is a theory of *knowing* that, for reasons that had nothing to do with teaching mathematics or education, does not accept this commonsense perspective … Superficial or emotionally distracted readers of the constructivist literature have frequently interpreted this stance as a denial of 'reality'." (von Glasersfeld quoted by Phillips 1995: 6)

2| I am grateful to an anonymous referee for drawing my attention to this point and forcing me to clarify it.

The difficulty presented by such remarks is that von Glasersfeld's position is rendered obscure by appearing to vacillate between idealism, instrumentalism and fallibilism. Above all, at the very least, von Glasersfeld's frequent citing of Berkeley encourages some who may not be "superficial or emotionally distracted readers" to ascribe a denial of reality, especially when others explain the constructivist views in idealist terms. Thus John Shotter (1995: 41), evidently endorsing von Glasersfeld's constructivism, says:

"We also take it for granted that it no longer makes sense to talk of our knowledge of an absolute reality – of our knowledge of a world independent of us – because for us there is no 'external world,' as it used to be called." (Glasersfeld 1995: 41)

Von Glasersfeld himself encourages the inevitable attribution of idealism in remarks in which he mistakenly claims "All the great physicists of the 20th century … did not consider [… their theories] descriptions of an observer-independent ontological reality" (quoted in Cardellini 2006: 181).

These philosophical doctrines have a rich literature and, at best, it remains entirely unclear what radical constructivism may contribute beyond re-stating familiar views in a mixture that includes the views of Vico, Berkeley and Piaget, *inter alia*. Fully acknowledging the distinction between denying a mind-independent world and the claim that we cannot know it, it remains that the relevance and bearing of these matters on education must remain zero. The conclusion may be drawn from Moritz Schlick, who "felt justified in maintaining that a proposition could be compared with reality" (Schlick 1979: 401). For example, he reports checking a travel guide-book description of a cathedral "with 'reality' by looking at the cathedral" (ibid: 400). Schlick has been construed as making a case for naïve realism (Matthews unpublished), but it may perhaps be understood in the spirit of John Austin (1962) as revealing the spurious nature of the entire debate. In Woody Allen's version, upon first hearing the idealist philosophical claim that we have no access to reality and everything is an illusion, he remarks "In that case I definitely overpaid for my carpet." This is, of course, a variant of Johnson's response to Berkeley.

Of course, notwithstanding the qualifications that can be found in von Glasersfeld's writing, the worry about realism is a central concern of his constructivism, and remains a central issue in philosophy too. Matthews (unpublished) has drawn attention to Philip Kitcher's characterization of *The Inaccessibility of Reality Argument* (IRA). He says "the IRA is a terrorist weapon that anti-realists employ with enormous confidence" (Kitcher 2001: 156). However, an important warning has been voiced by Hilary Putnam (1994), who notes, "The besetting sin of philosophers seems to be throwing the baby out with the bathwater," as each new generation or fashion ignores the insights of earlier periods. In particular, in the same spirit as Schlick, Putnam says it is important to find a way "to do justice to our sense that knowledge claims are responsible to reality without recoiling into metaphysical fantasy" (Putnam 1994: 446). The responsibility recommended by Putnam is the familiar, commonsense, naive realism that von Glasersfeld rejects. It is surprising enough that philosophers need to be reminded not to lose sight of a commonsense realism. It is somewhat harder to explain that educationalists need the same advice

Piaget's "Construction of Reality"?

Von Glasersfeld says Berkeley's insight

"… wipes out the major rational grounds for the belief that human knowledge could represent a reality that is independent of human experience." (Glasersfeld 1995a: 34)

"Kant's 'transcendental philosophy' … is a purely rational analysis of human understanding and provides a model that is in many ways fundamental to the constructivist orientation." (ibid: 39)

Thus, we see that, like Berkeley, Kant is cited by von Glasersfeld as one of the sources for his constructivism, though we might wonder how to derive educational implications from the *Critique of Pure Reason*. Kant's' transcendental idealism' and his attempt to find an alternative to a pure "phenomenalism" is an unlikely basis for pedagogical theory or instructional interventions. In defense of von Glasersfeld's allusions to Kant, it may be suggested that transcendental idealism serves as the basis for educational theory in the work of Wolfgang Fischer and others. However, we see a more skeptical view in Ruhloff's (2001) account of the way that Fischer is given credit for having "introduced the transcendental-critical-sceptical approach to present-day German pedagogical discourse." Ruhloff writes:

"In his use of the word 'scepticism', he explicitly rejects building upon the classical 'academic' and 'Pyrronic' scepticism, as well as upon philosophical sceptics from the modern era … For Fischer, Plato's concept of scepticism as he ascribed it to his Socrates in his early dialogues seems far more fruitful for philosophy of education." (Ruhloff 2001: 63).

Ruhloff concludes, "There are no compelling reasons … to draw a lesson or practical pedagogical instruction from the results of skeptical analysis" (Ruhloff 2001: 64). Indeed, in the spirit of my own deflationary conclusions here, Kant wrote, "The only thing necessary is not theoretical learning, but the Bildung [education] of human beings, both in regard to their talents and their character."[3]

Nevertheless, von Glasersfeld (1989) sees important consequences following from a person's "cognitive isolation from reality." However, Kant's idea that knowledge of the world and of the self are two aspects of the same schema is not a denial of the objective reality of a mind-independent world as von Glasersfeld appears to think. Kant's idea is also expressed by Piaget, who clearly acknowledges a knowable objective world beyond our sense-data. Despite possibly "flirting with idealism" (Boden 1994: 79), Piaget (1972**a**: 57) says that his epistemological position is "very close to the spirit of Kantianism," both in its constructivism and in its sensitivity to the need to avoid Berkeleyan idealism. Thus Margaret Boden writes:

3| 1778 letter to Christian Woke quoted in Munzel (2003).

"Piaget is aware that as a constructivist he must be careful to avoid idealism – or, to put it another way, that he must answer the sceptic's challenge that perhaps all our so-called 'knowledge' is mind-dependent illusion. He tries to buttress his commonsense realism by appealing to the biological basis of knowledge." (Boden 1994: 79)

Piaget himself explains clearly:

"… So to attribute logic and mathematics to the general coordinations of the subject's actions is not an idealistic overestimation of the part played by the subject; it is a recognition of the fact that, while the fecundity of the subject's thought processes depends on the internal resources of the organism, the efficacy of those processes depends on the fact that the organism is not independent of the environment but can only live, act, or think in interaction with it." (Piaget 1971: 345)

Although the title of Piaget's 1999 book *The Construction of Reality in the Child* is suggestive of the constructivist doctrines that von Glasersfeld has championed, Piaget's own text leaves little doubt about the significant difference between these two. Thus, while von Glasersfeld is at pains on every occasion to emphasize the unknowability of reality and the need to abandon notions of objectivity and truth, Piaget by contrast, writes in an altogether different mood. The conclusion of his book is titled "The Elaboration of the Universe" and he asks how the world is constructed by means of the instrument of the sensorimotor intelligence. In particular, Piaget speaks of the shift from an egocentric state to one "in which the self is placed … in *a stable world* conceived as independent of personal activity" (Piaget 1999: 395; emphasis added). Elsewhere Piaget explains:

"The universe is built up into an aggregate of permanent objects connected by causal relations that are independent of the subject and are placed in objective space and time. Such a universe, instead of depending on personal activity, is on the contrary imposed on the self…

"During the earliest stages the child perceives things like a solipsist who is unaware of himself as a subject and is familiar only with his own actions. But step by step with the coordination of his intellectual instruments he discovers himself in placing himself as an active object among the other active objects in a universe external to himself." (Piaget 1999: 397)

Thus Piaget is quite unselfconscious in speaking about the existence of an independent reality:

"Accommodation of mental structures to reality implies the existence of assimilatory schemata … Inversely, the formation of schemata through assimilation entails the utilization of external realities to which the former must accommodate." (ibid: 398)

He explains that the dual processes of assimilation and accommodation lead to a shift from egocentrism to an objectivity and enables "the subject to go outside himself to solidify and objectify his universe" (ibid: 402). Elsewhere Piaget writes:

"The theory of knowledge is therefore essentially a theory of adaptation of thought to reality, even if in the last analysis this adaptation (like all adaptations) reveals the existence of an inextricable interaction between the subject and the objects of study." (Piaget 1972b: 18)

The problem is that of "determining how knowledge comes to terms with the real world, and therefore what relationships obtain between subject and object" (ibid: 6). These are ways of talking that von Glasersfeld has emphatically repudiated, and so it is evident that his version of constructivism is quite different from Piaget's. It has been suggested that the foregoing interpretation of Piaget's realism would undermine von Glasersfeld's radical constructivism but it may be misleading because the quotations are all taken from English translations of the original French.[4] However, the exegetical question of Piaget's real meaning is of secondary interest in relation to the merits or otherwise of von Glasersfeld's views. At worst, von Glasersfeld's position gains no support from Piaget, and at best von Glasersfeld's Piagetian views remain just as open to criticism.

4| I am grateful to an anonymous referee for making this point.

The philosophical urge

Von Glasersfeld is evidently suffering from what Richard Rorty has called "the philosophical urge," namely, the urge to say that assertions and actions must not only cohere with other assertions and actions but "correspond" to something apart from what people are saying and doing…" (Rorty 1979: 179). By contrast, in the spirit of Putnam's (1994) "second naiveté," Rorty says that a Quinean naturalism questions

"whether, once we understand … when and why various beliefs have been adopted or discarded, there is something left called 'the relation of knowledge to reality' left over to be understood" (Rorty 1979: 178).

Aside from the question of its possible bearing on pedagogy, von Glasersfeld is evidently led into his Berkleyan worries by failing to distinguish questions of epistemology concerning the warrant for our beliefs from questions of metaphysics about the existence of a mind-independent world. That is, he conflates questions concerning the reliability of knowledge with the question of metaphysical realism. We see the former concern with justified belief in the first paragraph below and the latter, quite different concern with a mind-independent reality, in the second:

"In most departments of psychology and schools of education, teaching continues as though nothing had happened and the quest for immutable objective truths were as promising as ever.

"For some of us, however, a different view of knowledge has emerged, … This view differs from the old one in that it deliberately discards the notion that knowledge could or should be a representation of an observer-independent world-in-itself …" (Glasersfeld 1989: 122).

Again, we see a *non-sequitur* in the move from a concern about the reliability of knowledge to idealism:

"The existence of objective knowledge … has been taken for granted by educators. Recent developments in the philosophy of science and the historical study of scientific accomplishments have deprived these presuppositions of their

former plausibility. Sooner or later, this must have an effect on the teaching of science. … I am presenting an alternative theory of knowing that takes into account the thinking organism's cognitive isolation from 'reality'." (Glasersfeld 1989: 121)

We might wonder how anything in the curriculum or in teaching methods might be affected by this insight. Apart from such practical matters, any solution to our "cognitive isolation from reality" is unlikely to help solve the problem of objective knowledge since the arguments for realism are not the same as arguments concerning reliability and warrant for knowledge claims. That is, the epistemological problem of "objective knowledge" is left untouched by "recoiling into the metaphysical fantasy" of Berkeleyan idealism. Rather, the current philosophical answer to the epistemological problem is the acknowledgement that there is no absolutely certain foundation. Instead, philosophers settle for a fallibilistic naturalism captured in Quine's epigraph from Neurath:

"Wie Schiffer sind wir, die ihr Schiff auf offener See umbauen müssen, ohne es jemals in einem Dock zerlegen und aus bestend Bestandteilen neu errichten zu können." (Otto Neurath, quoted as epigraph in Quine 1960: vii)

That is, we are like the sailor who must repair his ship while sailing in it. The entire ship may be rebuilt, but only one plank at a time. Von Glasersfeld's concerns about metaphysics are addressed in Quine's following remarks:

"Ontological questions, under this view, are on a par with questions of natural science. (Quine 1961a: 45)

"… our statements about the external world face the tribunal of sense experience not individually but only as a corporate body." (ibid: 41)

"Hence it is meaningless, I suggest, to inquire into the absolute correctness of a conceptual scheme as a mirror of reality. Our standard for appraising basic changes of conceptual scheme must be, not a realistic standard of correspondence to reality, but a pragmatic standard." (Quine 1961b: 79)

Charitably construed, von Glasersfeld's concerns may be seen as expressing the familiar epistemological position of Quine himself, even if this is not a "post-epistemological" view, as he is pleased to call it, or a "successor epistemology" as Gergen (1995: 23) says. Von Glasersfeld's notion of "viability" seems best understood as a "coherentist" position concerned with what he calls "the goal of a coherent conceptual organization of the world as we experience it" (Steffe & Gale 1995: 7), and with "the goal of constructing as coherent a model as possible of the experiential world" (ibid: 8). Despite his own evident intentions, charitably re-interpreted, von Glasersfeld's words need not be construed as an idealism or solipsism as they have often been taken. Instead, they can be read as a Quniean holism and fallibilism. It is in keeping with his insistence on rejecting an unknowable ontological reality to read von Glasersfeld's remarks as Quine's holism. Further, von Glasersfeld might be taken to echo Quine's famous aphorism "To be is to be the value of a bound variable" when he says: "I claim that we can define the meaning of *to exist* only within the realm of our experiential world and not ontologically." (ibid: 7). Following Quine, our ontological commitments are *ipso facto* the posits of our best theories and have nothing to do with an inaccessible, unknowable reality lying beyond our experience, our theories or the "veil of ideas." It is this repeated emphasis on an inaccessible or unknowable reality by von Glasersfeld that warrants the repeated charge of idealism.

Disastrous idea

Von Glasersfeld has fallen victim to a notorious problem in philosophy concerning the direct objects of perception and knowledge. This is the problem of the "veil of ideas," which seems to intervene between the mind or our theories and the world, and which has posed a difficulty for philosophers at least since the Cartesians, Malebranche and Arnauld, through Locke and Berkeley and the sense-data theories of A.J. Ayer in the 20th century. In psychology, too, the problem has given rise to Gibson's "ecological" or direct realism as a response to traditional representationalist theories. We see this clearly in von Glasersfeld's articulation of his doctrines:

"… it is this construction of the individual's subjective reality that, I want to suggest … should be of interest to practitioners and researchers in education …

"One of Vico's basic ideas was that epistemic agents can know nothing but the cognitive structures they themselves have put together. … God alone can know the real world … In contrast, the human knower can know only what the human knower has constructed.

"For constructivists, therefore, the word knowledge refers to a commodity that is radically different from the objective representation of an observer-independent world that the mainstream of the Western philosophical tradition has been looking for. Instead, *knowledge* refers to conceptual structures …" (Glasersfeld 1989: 123).

It is precisely this idea that we know only our own ideas or "conceptual structures" directly rather than the world that is the source of the traditional puzzle. Putnam (1994) provides a succinct diagnosis of this "disastrous idea":

"… our difficulty in seeing how our minds can be in genuine contact with the 'external' world is, in large part, the product of a disastrous idea that has haunted Western philosophy since the seventeenth century, the idea that perception involves an interface between the mind and the 'external' objects we perceive." (Putnam 1994)

Besides this "disastrous idea," the conflation of the metaphysical problem of realism with epistemology is also encouraged by much "post-modern," "post-positivist," "post-epistemological" writing. Thus, for example, in their recent book, Barnes, Bloor and Henry (1995) deny their own idealism but accuse all their sociological constructivist colleagues of this charge (see Slezak 1997, 2000). Nevertheless, despite being explicitly repudiated by Bloor, as by von Glasersfeld, such disavowals are not quite enough to exculpate them since there are grounds for seeing a confusion in their writings between idealism and fallibilism. They reject the external world when they evidently wish to reject absolute, infallible

truth claims. Of course, the fallibility of our scientific knowledge is undoubtedly an important insight but is hardly new with radical constructivism and it is unclear who the target may be for von Glasersfeld's critique on this score.

Von Glasersfeld's further worry about the gap between thought and reality mediated by ideas is the familiar one posed by Locke and Malebranche and, more recently, by John McDowell (1994) in his significantly titled work *Mind and World*. However, in the present context, whatever the philosophical merits of von Glasersfeld's concerns, the question is how these bear on any issue of conceivable educational interest.

Epistemology or pedagogy?

Von Glasersfeld sees his version of constructivism as a new approach to epistemology that departs from traditional conceptions. Meyer (2008) recently notes that von Glasersfeld and followers such as Gergen (1995) immodestly view constructivism "as a replacement for a whole field of philosophy." However, despite such rhetoric, it is difficult to see what might deserve to be seen as revolutionary or even controversial about the central doctrines. Von Glasersfeld (1995a) explains that radical constructivism is "an unconventional approach to the problem of knowledge and knowing" that

"starts from the assumption that knowledge, no matter how it is defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience." (Glasersfeld 1995a: 1)

It is unclear why such truisms might warrant extravagant claims for being radical and revolutionary. On a straightforward interpretation, we might ask: Who has ever doubted that knowledge is in the head? In an interview, von Glasersfeld was asked whether constructivism is to be understood as an epistemology or pedagogy. His answer is most revealing for what it *fails* to say. Von Glasersfeld simply restates the formula of Berkeley as if this serves as an answer to the question: "… there is no way of checking knowledge against what it was supposed to represent. One can compare knowledge only with other knowledge" (Glasersfeld 1993: 24). The questioner is unlikely to have found this answer satisfying. Other questions sought to clarify the "differences between constructivism and idealism." Again, von Glasersfeld's answer is rather unhelpful, simply re-iterating that "we can only know what our minds construct" and that "the "real" world remains unknowable" and that "I could be one of Leibniz' monads" (ibid: 28). Teachers might wonder how this could help them in the classroom. When pressed on this question concerning "the implications of constructivism for a theory of instruction," von Glasersfeld suggests that there are many. These include the following: "It is … crucial for the teacher to get some idea of where [the students] are," that is, "what concepts they seem to have and how they relate them" (Glasersfeld 1993: 33). This inference seems a modest recommendation that is far from the "rather profound changes" promised. Similar platitudes are typical:

" Asking students how they arrived at their given answer is a good way of discovering something about their thinking. (Glasersfeld 1993: 33)

"Whatever a student says in answer to a question (or 'problem') is what makes sense to the student at that moment. It has to be taken seriously as such, regardless of how odd or 'wrong' it might seem to the teacher. To be told that it is wrong is most discouraging and inhibiting for the student. (ibid: 33)

"If you want to foster students' motivation to delve further into questions that, at first, are of no particular interest (from the students' point of view), you will have to create situations where the students have an opportunity to experience the pleasure inherent in solving a problem." (ibid: 33)

We may assume that such insights are what Tobin (1993: ix) has in mind when he refers to constructivism as "A paradigm for the practice of science education". Tobin has his own contributions to offer:

"A most significant role of the teacher, *from a constructivist perspective,* is to evaluate student learning. In a study of exemplary teachers, Tobin and Fraser found that these teachers routinely monitored students in three distinctive ways: they scanned the class for signs of imminent off task behavior, closely examined the nature of the engagement of students, and investigated the extent to which students understood what they were learning. If teachers are to mediate the learning process, it is imperative that they develop ways of assessing what students know and how they can represent what they know." (Tobin & Tippins 1993: 12; emphasis added)

In brief, good teachers make sure students pay attention and understand the lesson! Inevitably one wonders how differently a teacher might do things if not operating "from a constructivist perspective."

From the metaphysical to the mundane

Von Glasersfeld has promised:

"… if the theory of knowing that constructivism builds up on this basis were adopted as a working hypothesis, it could bring about some rather profound changes in the general practice of education." (Glasersfeld 1989: 135).

Elsewhere he has suggested that, "taken seriously," radical constructivism "is a profoundly shocking view" that requires that "some of the key concepts underlying educational practice have to be refashioned." Among these "profoundly shocking" recommendations he suggests the following:

"… students will be more motivated to learn something, if they can see why it would be useful to know it" (Glasersfeld 1995a: 177).

"Teaching and training are two practices that differ in their methods and, as a consequence, have very different results. … rote learning does not lead to 'enlightenment'" (ibid: 178).

"…in order to modify students' thinking, the teacher needs a model of how the student thinks" (ibid: 186) .

"Students should be driven by their own interest" (ibid: 188).

"…talking about the situation is conducive to reflection" (ibid: 188).

Contructivese	English
cultural apprenticeship	learning
neutralizing a perturbation	learning something new
personal construction and meaning making	understanding
the mediation process and negotiation with an authority	teaching
community of discourse	group
communities characterized by distinct discursive practices	different groups
appropriate experiential evidence, cultural tools and conventions of the science community	scientific data and theories
dialogic process	talking
discourse practices	talking
unbroken contingent flow of communicative interaction between human beings	talking
the way in which novices are introduced to a community of knowledge through discourse in the context of relevant tasks	talking in class
The discursive practices in science classrooms differ substantially from the practices of scientific argument and enquiry that take place within various communities of professional scientists	kids in school do not do the same thing as scientists
engagement	paying attention
off task behaviour	not paying attention
experiential constraints of the ever-present socio-physical context	the real world

Table 1: Dictionary for translating between "Constructivese" and English.

"To engender reflective talk requires an attitude of openness and curiosity on the part of the teacher, a will to 'listen to the student.'" (ibid: 188).

These are all undoubtedly sound recommendations, though hardly deserving to be regarded as "profoundly shocking." Indeed, such platitudes are characteristic of constructivist instructional advice, though they are typically dressed up in a gratuitous technical jargon that serves only to hide their banality. Thus, it is instructive to subject an example to careful analysis.

Rosalind Driver et al. write:

"… learning science involves being initiated into scientific ways of knowing. Scientific entities and ideas, which are constructed, validated, and communicated through the cultural institutions of science, are unlikely to be discovered by individuals through their own empirical inquiry; learning science thus involves being initiated into the ideas and practices of the scientific community and making these ideas and practices meaningful at an individual level. The role of the science educator is to mediate scientific knowledge for learners, to help them make personal sense of the ways in which knowledge claims are generated and validated, rather than to organize individual sense-making about the natural world." (Driver et al. 1995: 6)

We might reduce the foregoing passage without remainder to the following brief platitude:

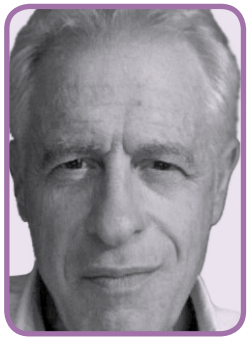
"Learning science involves learning science. Individuals cannot rediscover science by themselves. So, the role of teachers is to teach."

Here, too, the serious question raised is whether there is any substance behind the polysyllabic prose, or whether, in George Orwell's (1984) phrase, it merely gives the "appearance of solidity to pure wind." I suggest that the psychological variety of "radical" constructivism has little to offer between the metaphysical and the mundane. Taking the sentences individually, Driver et al. say "learning science involves being initiated into scientific ways of knowing." The ring of plausibility, if not profundity, in this assertion derives from its being pure tautology. "Learning science" presumably *means*, or may be paraphrased as, "being initiated into scientific ways of knowing." Likewise their remark that "The role of the science educator is to mediate scientific knowledge for learners" is like saying that the role of the butcher is to mediate animal products for consumers or the role of the bus driver is to mediate automotive vehicular transportation for commuters. Their assertion is merely a circumlocution for saying that the role of teachers is to teach. These illustrations may serve to indicate a widespread tendency to recast truisms in pretentious jargon to create the illusion of deep theory. Tobin and Tippin (1993) provide another typical illustration:

"Constructivism suggests that learning is a social process of making sense of experience in terms of what is already known. In that process learners create perturbations that arise from attempts to give meaning to particular experiences through the imaginative use of existing knowledge. The resolution of these perturbations leads to an equilibrium state whereby new knowledge has been constructed to cohere with a particular experience and prior knowledge." (Tobin & Tippins 1993: 10).

Translation: Students sometimes learn new things. Tobin and Tippins conclude their article with the following remarks:

"… it is our contention that constructivism is an intellectual tool that is useful in many educational contexts. …We do not claim that use of constructivism as a referent is the only way to initiate changes of … a comprehensive and sig-



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nificant scope, but from our experience we can assert that constructivism can assume a dialectical relationship with almost every other referent in a process that culminates in a coherent world view consisting of compatible referents for action." (Tobin & Tippins 1993: 20)

Translation: Constructivism is consistent with some other theories. Constructivist "buzz-words" serve to give an air of profundity but have ordinary synonyms which reveal the platitudinous nature of the propositions they assert. These include the following list:

Mediating, negotiating, appropriating, discursive practices, community of discourse, social construction, meaning-making, appropriating meaning, interventions, co-construction of knowledge, dialogic interaction process, symbolic realities, cultural tools, representations, perturbations, negotiation of meaning in social interaction, enculturation.

Instead of merely saying "talking among teachers and students," we can say "the discursive practices that support the coconstruction of scientific knowledge by teachers and students" (Driver et al. 1994: 9). Instead of saying simply that "teachers explain new ideas," we can say the "teacher's role is characterized as that of mediating between students' personal meanings and culturally established mathematical meanings of wider society" (Cobb 1994b: 15). Rather than the truism that "teachers and students exchange ideas," we can say "speaking from the sociocultural perspective, [we] define negotiation as a process of mutual appropriation in which the teacher and students continually coopt or use each others' contribution" (Cobb 1994b: 14). Where someone might wish to say only that "students figure things out for themselves in class with others," a more impressive rendering would be "learning is characterized by the subjective reconstruction of societal means and models through negotiation of meaning in social interaction" and "students' interactive constitution of the class-room microculture" (Cobb 1994b: 15). "Learning through lessons in school" is better rendered as "students' subjective reconstruction" through "teacher's and students' interactive constitution of the classroom microculture" (Cobb 1994b: 15). And saying that "students learn different things at different times" may be recast as "Rather than successive equilibrations, … learning may be better characterized by parallel constructions relating to specific contexts" (Cobb 1994a: 7).

We may conclude, in the spirit of Orwell's advice regarding "Politics and the English Language," by attempting to counteract the effect of terms that produce a kind of anaesthesia of the brain or are like cuttlefish squirting out ink. Accordingly, in Table 1 I offer a dictionary for translating between "Constructivese" and English. Linguistic informants who are native speakers of the exotic dialect have confirmed that the translations are accurate.[5]

Of course, it will be objected that this kind of translation is to misrepresent and to belittle the major theoretical concepts and insights of constructivist work.[6] It is relevant to recall that such admitted satire or *reductio ad absurdum* has a serious purpose, as seen in venerable precedents such as C. Wright Mills's (1959) exposé of Talcott Parsons' pretentious "grand theory." If warranted, such translations make an important point that goes beyond mere ridicule. They reveal what I have elsewhere (Slezak 2007) referred to as the "paradox of pedagogy." In a survey of the literature going well beyond radical constructivism, I have suggested that leading theories in cognitive science taken to be important for education are utterly without bearing despite the ritual claims of relevance. As the banality of the foregoing translations suggests, teaching and learning are among the natural, intuitive mental skills that humans display through a tacit knowledge rather than explicit theory or doctrine. In the light of an undeniable history of centuries of successful teaching, it seems clear that teachers and learners may manage effectively, even superlatively, without knowing or caring about psychology, much less epistemology or metaphysics. I have argued that teacher and learner are perhaps best conceived on the analogy of speaker and hearer in a conversation. The insights we have noted from von Glasersfeld amply confirm this point regardless of their supposed radical constructivist rationale. It should not be surprising that the communicative com-

5| I am referring to amused reactions of the audiences at conferences where this material was first presented: 2nd International MOFET Conference on Teacher Education, Wingate Institute, Netanya, Israel, 1 July 1996, 5th International History, Philosophy and Science Teaching Conference, University of Pavia & Como, Italy, 15–19 September 1999. A similar translation manual has been provided by Matthews (2000).

6| I am grateful to an anonymous referee for making this point and forcing me to elaborate my discussion here.

petence underlying teaching and learning will be the kind of automatic, instinctive skill familiar from other cognitive domains of special human expertise. To the extent that this is so, neither the teacher or learner need explicit theory to explain what they are doing and are unlikely to benefit from it. If we take the foregoing translations seriously rather than their Constructivese originals, we recognize that teaching and learning are part of the rich, complex human communicative interaction of which we have effectively no theoretical understanding at all. Just as teaching someone to ride a bicycle does not require providing the physics and mathematics actually involved in the cognitive-motor ability, I have suggested that teaching in general may be more like instruction for bicycle riding: the best advice is "Hold tight and pedal fast." Admittedly, it counts against this view that it would make much educational philosophy superfluous, and many departments and academics redundant, but I have suggested that it may have some merit nonetheless. In the end, I offer von Glasersfeld's own insight in support of this conclusion: despite the extravagant rhetoric we have noted about the "profound changes in the general practice of education" that constructivism implies, von Glasersfeld himself makes my own more modest point:

> "In summary, the best teachers have always known and used all this information, but they have known and used it more or less intuitively and often against the official theory of instruction. Constructivism does not claim to have made earth-shaking inventions in the area of education; it merely claims to provide a solid conceptual basis for some of the things that, until now, inspired teachers had to do without theoretical foundation." (Glasersfeld 1995b: 15)

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