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Why 'What Works' Still Won't Work: From Evidence-Based Education to Value-Based Education

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Abstract The idea that professional practices such as education should be based upon or at least be informed by evidence continues to capture the imagination of many politicians, policy makers, practitioners and researchers. There is growing evidence of the influence of this line of thought. At the same time there is a growing body of work that has raised fundamental questions about the feasibility of the idea of evidence-based or evidence-informed practice. In this paper I make a further contribution to this discussion through an analysis of a number of assumptions that inform the discussion. I focus on the epistemological, ontological and praxeological dimensions of the discussion and in each domain identify a deficit. In the epistemological domain there is a knowledge deficit, in the ontological domain an effectiveness or efficacy deficit and in the practice domain an application deficit. Taken together these deficits not only raise some important questions about the very idea of evidence-based practice but also highlight the role of normativity, power and values. Against this background I outline the case for the idea of value-based education as an alternative for evidence-based education. As I am generally concerned about the expectations policy makers hold about what evidence can and should achieve in professional practices such as education, my contribution is primarily meant to provide educators and other professionals with arguments that can help them to resist unwarranted expectations about the role of evidence in their practices and even more so of unwarranted interventions in their practices.

Keywords Evidence-based education · Evidence-based practice · Evidence-informed practice · What works · Epistemology · Ontology · Praxeology · Values · Value-based education · Power · Normativity

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Introduction

The idea that professional practices such as education should be based upon or at least be informed by evidence has become influential in many countries around the world (for a recent overview see Wiseman 2010). A quick scan of journal titles not only indicates the growing popularity of the idea of evidence-based practice but also highlights its presence in a large number of professional domains, ranging from medicine—where the idea of evidence-based practice was initially developed in the early 1990s (see Guyatt et al. 1992)—via such areas as social work, mentoring and even library and information practice, through to education.[1] There is, of course, something intuitively appealing about the idea that evidence should play a role in professional work, and it is difficult to imagine an argument against engagement with evidence. This is even more so because professions, unlike other areas of work, lay claim to the possession of "specialized knowledge and skill thought to be of value to human life" (Freidson 1994, p. 167). This not only raises general questions about the basis for the knowledge and skills professionals deploy. Given that professional work is generally orientated towards human well-being, there seems to be a prima facie case for basing professional action on the best evidence available.

This is not to say that evidence should be the *only* thing that matters in professional practices. The important question, therefore, is not *whether or not* there should be a role for evidence in processional action, but what kind of role it should play (see also Otto et al. 2009). This at the very same time requires reflection on the question what kind of role it can play, as there is no point in having expectations about evidence that are impossible to achieve. The latter point is particularly important in relation to the uptake of the idea of evidence-based practice by policy makers, where there is a tendency to expect far too much from evidence (see for example, Weiss et al. 2008). This becomes deeply problematic in those cases in which it is argued that professionals should only be allowed to do those things for which there is positive research evidence available—an approach which Holmes et al. (2006) have, in my view, correctly identified as a form of totalitarianism.[2]

The idea of evidence-based practice has generated a substantial amount of discussion between those who are generally in favour of giving evidence a more prominent place in professional practices, and those who have raised concerns either about the idea of evidence-based practice in general or about its applicability in specific professional domains (see for example, Hammersley 2005; Smeyers and Depaepe 2006; Holmes et al. 2006; Cornish and Gillespie 2009; St. Clair 2009). While some caution about what can be expected from scientific evidence, others continue to promote research that emulates "the medical model" as the solution to many if not all problems in the field of education (for such a view see Prenzel 2009; for an alternative see Biesta in press). In my own contributions to the discussion (Biesta 2007a, b; 2010a) I have particularly highlighted the 'democratic deficit' of the uptake of the idea of evidence-based practice in education, emphasising how a particular use of evidence threatens to replace professional judgement and the wider democratic deliberation about the aims and ends and the conduct of

[1] A (random) selection of journal titles devoted to the idea of evidence-based practice: *The Journal of Evidence-Based Medicine*; *The Journal of Evidence-Based Healthcare*; *The Journal of Evidence-based Dental practice*; *Evidence Based Nursing*; *The Journal of Evidence-Based Social Work*; *Journal of Evidence Based Health Policy and Management*; *The International Journal of Evidence Based Coaching and Mentoring*; *The Journal of Evidence Based Library and Information Practice*; *The Journal of Evidence-Based Practices for Schools.*

[2] Holmes et al. (2006) also use the notion of 'micro fascism' to criticise the discourse on evidence within the health sciences and make a convincing case for the use of this notion.

education (see Biesta 2007a). In this article I will revisit some aspects of this earlier discussion and will add some further dimensions to the analysis. I will present my reflections in the form of a case for value-based education as an alternative for evidence-based education. Calling the idea of value-based education an alternative, is not meant to suggest that evidence plays no role at all in value-based education but is to highlight that its role is subordinate to the values that constitute practices as educational practices.

In my analysis I will focus on three aspects: epistemology, ontology and practice. In each case I will present two different 'readings' of the particular dimension. In the case of epistemology I will make a distinction between representational and transactional epistemologies; in the case of ontology I will make a distinction between closed and open systems; in the case of practice I will make a distinction between application and incorporation. In all three cases I will identify a deficit. In the epistemological domain there is a *knowledge deficit*, in the ontological domain an *effectiveness* or *efficacy deficit* and in the practice domain an *application deficit*. Taken together these deficits not only raise some important questions about the very idea of evidence-based practice but also highlight the role of normativity, power and values. In the final section I will discuss the implications of these deficits for the practice of education which, in turn, will lead me to my case for value-based education. As I am generally worried about the expectations policy makers hold about what evidence can and should do in relation to professional practices such as education, my contribution is primarily meant to provide educators with insights and arguments that can help them to resist unwarranted expectations about the role of evidence in their practices and even more so of unwarranted interventions in their practices.

Evidence About 'What Works'?

A useful starting point for the discussion of the idea of evidence-based practice can be found in the meaning of the word 'evidence' itself. The Oxford dictionary defines evidence as "the available body of facts or information indicating whether a belief or proposition is true or valid".[3] While evidence therefore has to do with the question of truth, it is important to see that under this definition it is not evidence itself to which the question of truth or falsity applies. If we define knowledge as 'justified true belief'—which implies that for someone to know something it must be true, it must be believed to be true, and the belief must be justified—then evidence plays a crucial role in the justification of such beliefs.[4] Evidence, in other words, contributes to the case for holding a particular belief as true and in this regard its meaning is slightly different from that of the word 'knowledge.' This is not just semantic play—although it is interesting to ponder the different rhetorical effects of the notions of 'evidence-based practice' and 'knowledge-based practice'—but opens up the possibility that what counts as evidence can be broader than just true knowledge (think, for example, of the role of testimonies and witness reports in building up evidence in a court case). It also suggests that rather than there being a mechanistic connection between evidence and truth, there is a need for judgement about the relative weight of what is being submitted as evidence for a particular belief or proposition.

[3] "Evidence." *The Oxford Pocket Dictionary of Current English.* 2009. Retrieved September 15, 2009 from Encyclopedia.com: http://www.encyclopedia.com/doc/1O999-evidence.html.

[4] Whether it is possible to conceive of knowledge as 'justified true belief' is another matter. The issue has been a topic for discussion ever since Gettier (1963) provided examples of justified true beliefs that would not count as cases of knowledge.

While all this may be so in theory, things tend to work out more crudely in practice (see also Hammersley 2009). In discussions about evidence-based practice 'evidence' is often exclusively considered in cognitive terms, that is, as knowledge and, more specifically, as true knowledge. Evidence is further narrowed down to scientific knowledge understood as knowledge generated through scientific research. In effect the focus tends to be on one particular kind of scientific research, namely *experimental research*, and, more specifically, the randomised control trial, as this is considered to be the only reliable way in which valid scientific knowledge about 'what works' can be generated. The emphasis on the idea of 'what works' is, in itself, relevant because of the fact that many if not all professions operate on the model of initiating change in order to bring about a situation that is considered to be better or more desirable. The question whether professional interventions will have the desired 'effect' is, therefore, a very important one, which explains why in discussions about evidence-based practice the 'what works' questions plays a central role.

There are, however, three issues that need to be considered in relation to this. The first issue—the *epistemological* dimension of the discussion—has to do with the question how we can generate knowledge about 'what works' and, more specifically, how we should understand the status of knowledge generated through experimental research. The second issue—the *ontological* dimension of the discussion—has to do with the question how links between interventions and effects are actually achieved and particularly how it is possible to make things work in the social domain. The third issue—the practice dimension of the discussion—has to do with the question to what extent professional practice can actually be said to be based upon knowledge or evidence and whether we should understand the advance of evidence-based practice indeed in terms of the application of scientific knowledge.

Epistemology: Representation or Transaction?

I have suggested that despite the more precise meaning that can be given to the notion of 'evidence,' the evidence that is supposed to form the basis for practice is commonly seen as true scientific knowledge about 'what works' generated through the application of randomised controlled trials. One question this raises is how 'truth' should be understood in this context. Although relatively little attention has been paid to the epistemological dimensions of evidence-based practice, the discussion gives the impression that the case for evidence-based practices relies on a representational epistemology in which true knowledge is seen as an accurate representation of how 'things' are in 'the world.' If we are indeed able to generate true and complete knowledge about how things are in the world and about the laws that govern the connections between things, then it should at some point be possible to say with certainty that when we do A, B will follow. Viewed from this angle the fact that we do not yet have such knowledge in fields such as education is not a structural problem but a practical one: it indicates that we do not yet have conducted sufficient research in order to be able to encapsulate all factors, aspects and dimensions that make up the reality of education. If we are able to coordinate our research efforts and channel available resources all in the same direction then, so the argument often goes (see for example, Prenzel 2009), we will, at some point in time, have a perfect evidence-base for educational practice—and, on the same logic, for any other field of practice.

I do not consider it very fruitful to engage in abstract discussions about whether true or objective or complete or perfect knowledge is possible or not, not in the least because in such discussions those who are in favour and those who argue against often base their

arguments on a similar set of premises (see Bernstein 1983; Biesta and Burbules 2003; Biesta 2005). I rather wish to highlight a more practical point which has to do with the tension between a representational epistemology and an experimental methodology.[5] Whereas a representational epistemology sees knowledge as a picture of a world independent from and unaffected by the knower—an idea which John Dewey has helpfully referred to as a 'spectator view' of knowledge—experimentation is always an *intervention* in that world. From a representational point of view such interventions can only be seen as distortions of the world, which implies that they pose a threat to the possibility to gain true knowledge.[6] The way out of this predicament is not to discredit the role of experimentation in the generation of knowledge—one could argue, after all, that most if not all of the knowledge that underlies modern technology has been generated through experimentation and intervention—but rather to investigate the implications for epistemology of an interventionist and experimental approach to the generation of knowledge. This is precisely the route taken by John Dewey in his writings on knowledge and knowing.

Elsewhere I have discussed Dewey's views in detail (see Biesta and Burbules 2003; see also Biesta 2007a). Here I wish to highlight one important implication of Dewey's view—an implication that has important ramifications for the epistemological underpinnings of the idea of evidence-based practice. The point is that if we take experimentation seriously in our understanding of what knowledge is and how we can get it, we have to give up the spectator view of knowledge—the one which assumes that knowledge is about observing a static, observer-independent reality—and rather have to concede that the knowledge we can gain through experimentation is knowledge about *relationships* and, more specifically, about relationships between (our) actions and (their) consequences. In contrast to a *representational* epistemology we can call this a *transactional* epistemology (Biesta and Burbules 2003). In a transactional epistemology experimentation no longer appears as a distortion of reality but rather as an indispensable element of the way in which we gain knowledge about reality. Such knowledge is not a depiction of a static world 'out there'—in the traditional sense of the word such knowledge is not objective because we are involved in the production of it. Yet it also isn't knowledge just created by our minds—which means that in the traditional sense of the word it is also not subjective. It rather is knowledge about the world *in function of* our interventions. Taking experimentation seriously thus means that we have to give up the idea that it is possible to achieve complete knowledge about reality. This is not because our knowledge can always only be a subjective approximation of reality—the view espoused by Karl Popper—but because 'the world' always appears in function of our interventions and because 'the world' changes as a result of our interventions. Rather than spectators of a finished universe, Dewey's pragmatism amounts to the idea that we are participants in an ever-evolving universe.

Dewey's transactional epistemology appears to suit the idea of 'what works' rather well. After all, the focus is entirely on relationships between actions and consequences, which suggests that the knowledge generated trough experimentation can indeed tell us 'what works.' But there is a crucial difference between a reading of the notion of 'what works' in terms of a representational epistemology and in terms of a transactional epistemology. Whereas in terms of a representational epistemology knowledge about what works extends to the future—after all, if we have complete knowledge about reality as it is in itself, this knowledge should remain valid in the future—the transactional view implies that all we

[5] This is a very brief summary of a point made in much detail by John Dewey—see for example, Dewey (1929).

[6] This is an issue that has also troubled the interpretation of quantum physics.

can know concerns relationships between actions and consequences that have occurred in the past. Whereas a representational epistemology would suggest that our knowledge provides us with *certainty*, a transactional epistemology—the one that can take experimentation seriously—can show us what has been possible in the past with *no guarantee that what has been possible in the past will also happen in the future*. A transactional epistemology allows us to make warranted assertions about what has worked in the past but not about what will work in the future. Knowledge about what has worked in the past is, of course, tremendously important in our attempts to deal with problems in the here and now, as it can provide us with new and different ways to understand the problems we encounter in the here and now and because it can provide us with hypotheses for problem solving in the present. It can make, in Dewey's words, our action and problem solving more intelligent. But what evidence generated through experimentation cannot do on this account, is provide us with rules for action and even less with dictates for action.[7] I wish to refer to this gap between the knowledge that can be generated through experimental research and the way in which this knowledge can be utilised as the *knowledge deficit* of evidence-based practice, indicating that there is always—structurally, not pragmatically—a gap between the knowledge we have and the situations in which we have to act. In this regard the so-called 'knowledge-base' for practice is never sufficient and never will be sufficient. This, in turn raises the question how this gap is closed in practice—something to which I will return below.

Ontology: Causality or Complexity?

For the discussion about evidence-based practice there is not only the question whether it is possible to have perfect knowledge about the relationships between interventions and their effects; there is also the question about these relationships themselves. How do interventions work? How are links between actions and effects established? The simple—and by now we should actually say: simplistic—idea is to assume that interventions are causes and results effects and that, under optimal conditions, the causes will necessarily generate the effects. This is a kind of 'magic bullet notion of causality which, if possible at all in the social domain, actually only exists under very special conditions. In the language of systems theory such conditions can be described as those of closed systems: systems that are in a state of being isolated from their environment. Open systems, on the other hand, are systems that are characterised by a degree of interaction with their environment. Whereas closed systems operate deterministically, open systems operate at most probabilistically. Recursive systems are systems that in some way feed back into themselves, so that the behaviour of the system is the result of a combination of external factors and internal dynamics. Semiotic systems are systems that do not operate through physical force but through the exchange of meaning.

Using these distinctions we can say that most processes in the social domain operate as open, non-deterministic systems. In many cases such systems operate as recursive systems

[7] I wish to emphasise that the point I am making here does not rely on a claim for the alleged superiority of a transactional epistemology. Rather than seeing my point as a general philosophical one, it actually centres on the question what follows if we apply an epistemology that can take experimentation seriously. The 'case' for a transactional epistemology is therefore only based on the attempt to overcome the tension—if not contradiction—between the experimental methodology that plays a central role in the ideas of proponents of evidence-based practice and the representational epistemology that they seem to employ in arguing for the alleged superiority of the knowledge generated in this way.

because of the fact that the 'elements' that make up the system—human individuals—have the capacity to think, which means that they can alter their behaviour on the basis of their interpretations and understandings rather than only as the result of physical 'push and pull.' Social systems generally are semiotic systems in that the interactions between the elements are not based on physical force but on meaning and interpretation. Stated in these terms, education can be characterised as an open recursive semiotic system. It is a semiotic system because the exchanges between teachers and students are not exchanges at the level of physical force but at the level of meaning. The system operates as a recursive system because teachers and students act upon the basis of their interpretations and understandings. Educational systems are generally open systems because they interact with their environments (albeit under conditions of complexity reduction; see below).

The language of systems theory is helpful because it can highlight that whereas much talk about 'what works' is premised on the assumption of closed deterministic systems, social reality—the reality of many of the practices that are supposed to developed into evidence-based practices—is anything but a closed deterministic system. Much talk about 'what works,' to put it differently, operates on the assumption of a mechanistic ontology that is actually the exception, not the norm in the domain of human interaction. This is one of the reasons why "the extraordinary advances in medicine, agriculture and other fields" that are supposed to have been the result of "the acceptance by practitioners of evidence as the basis for practice," particularly evidence from the randomised controlled trial (Slavin 2002, p. 16), cannot be expected that easily from a field like education since the dynamics of education are fundamentally different from the dynamics of, say, potato growing or chemistry.[8]

I wish to refer to this as the *efficacy deficit* of evidence-based practice, indicating that in the social domain interventions do not generate effects in a mechanistic or deterministic way, but through processes that—structurally, not pragmatically—are open so that the connections between intervention and effect are non-linear and, at most, probabilistic.

Given the efficacy deficit, one might begin to wonder how anything at all is achieved in the domain of professional action and in the social domain more generally. Part of the answer lies in a phenomenon to which I suggest to refer as complexity reduction (see Biesta 2010b; see also Osberg and Biesta 2010). Complexity reduction has to do with the reduction of the number of available options for action for the elements of a system. Fast food restaurants are a good example of a system with reduced complexity as the number of available options for action—both for customers and for staff—are significantly reduced so as to make a quick and smooth operation possible. The protocols used by call-centre workers are another example of complexity reduction, although in those cases the gain is often not in the speed of the process but in its comprehensiveness, i.e., making sure that all aspects are covered in an order that is convenient for the call-centre worker, not necessarily the customer. Complexity reduction not only happens in commercial organisations. The school is another prominent example of a system operating under conditions of complexity reduction. Schooling as a social institution can in itself already be understood as a way to reduce the complexity of human learning by giving it a particular social location. School buildings reduce the complexity of human learning by isolating it from everyday life and

[8] This argument can be read as an ontological or as methodological argument. Systems theory tends to take the methodological route, arguing that phenomena operate *as if* they were closed, or open, or recursive systems. In terms of notions of causality and how this plays out in social interaction, it can be helpful to make distinctions at the ontological level such as between a 'causal ontology' and a 'social ontology' (see Biesta 2010c).

giving it a physical location. The school year, time tables and curricula put learning within temporal boundaries. Further reduction of complexity takes place through such measures as putting students of similar age, ability or achievement together, exposing them to the same content through the use of staged curricula and, perhaps most importantly, by introducing regimes of assessment and examination through which, from the vast number of possible outcomes of schooling only those are selected that are considered to be valuable (for more on this see Biesta 2010b).

Along these lines complex open systems generally come to resemble less open systems, that is, systems where there are fewer possible connections between inputs and outputs, between actions and consequences and where, as a result, regularity and structure begin to emerge.[9] Seeing how this is brought about begins to make visible the kind of work—and also the amount of work—that needs to be done in order to create the kind of order in which things can begin to work and in which connections between actions and consequences begin to become more predictable and more secure. Rather than to think of such regularities as naturally occurring phenomena, they are actually in the most literal sense social constructions. To say that these are social constructions is neither to say that they are good nor that they are bad. While in some cases complexity reduction can be beneficial, in other cases it can be restraining. But since any attempt to reduce the number of available options for action for the 'elements' within a system is about the exertion of power, complexity reduction should therefore be understood as a political act.

Practice: Application or Incorporation?

The idea of complexity reduction is not only important in order to understand why and how it is possible to make things work in complex open systems such as education. It also helps to challenge a claim that is often used to argue that fields such as education should become evidence-based. The claim, as quoted above, is that the "extraordinary advances in medicine, agriculture and other fields" are the result of "the acceptance by practitioners of evidence as the basis for practice," particularly evidence from the randomised controlled trial (Slavin 2002, p. 16). The question this raises is whether it is indeed the case that we should understand the advances in such fields as the result of the application of scientific knowledge. One of the most interesting arguments against this way of thinking about the technological success of modern science has been developed by Bruno Latour, particularly in his books *The Pasteurization of France* (Latour 1988) and *Science in Action* (Latour 1987). In these books Latour provides a critique of the epistemological understanding of the influence of modern 'techno-science' (Latour's phrase) on modern society. In the epistemological interpretation the idea is that 'techno-scientists' construct 'facts and machines' in their laboratories which are then distributed to the world outside of the laboratory. The successful distribution of facts and machines to the wider world is generally taken as an indication of the special quality of the knowledge underlying such facts and machines.

While Latour sees no reason to doubt that techno-scientists are able to create effective facts and machines in their laboratories, and while he also does not wish to doubt that at a certain moment in time such facts and machines show up in other places then where they were originally constructed, he does challenge the claim that we should understand this as

[9] A question I will not be able to deal with in this article is to what extent attempts to reduce complexity at the very same time increase complexity. For an interesting reflection on this issue see Rasmussen (2010).

the application of facts and machines developed in the laboratory in the world outside of the laboratory. Latour suggests that what instead has happened is the transformation of the outside world into the conditions of the laboratory. He writes:

> No one has ever seen a laboratory fact move outside unless the lab is first brought to bear on an 'outside' situation and that situation is transformed so that it fits laboratory prescriptions. (Latour 1983, p. 166).

In his book on Pasteur, Latour argues that the success of Pasteur's approach was not the result of the application of this particular technique across all farms in the French countryside. Pasteur's technique could only work because significant dimensions of French farms were first transformed to get them closer to the laboratory conditions under which the technique was developed. As Latour argues, it is "only on the conditions that you respect a limited set of laboratory practices [that] you can extend to every French farm a laboratory practice made at Pasteur's lab" (Latour 1983, p. 152). The 'pasteurization of France' (Latour 1988) is but one example of how the modern world has changed as a result of modern science, and again and again Latour argues that this is not the result of brining facts and machines into the world 'outside' but of the transformation of the world outside so that it becomes part of the laboratory conditions under which things can work and can be true.

Latour refers to "this gigantic enterprise to make of the outside a world inside of which facts and machines can survive" as *metrology* (Latour 1987, p. 251). Metrology can be understood as a process of creating 'landing strips' for facts and machines (ibid., p. 253). It is a transformation of society, an incorporation of society into the network of techno-science, so that facts and machines can 'travel' without any visible effort. There is therefore, as Latour explains, "no outside of science but there are long, narrow networks that make possible the circulation of scientific facts" (Latour 1983, p. 167). The field where this process is perhaps most visible is that of medicine as much medical knowledge and technology only tends to work under very specific conditions. In some cases it can be left to individuals to create these conditions—for example by giving instructions that certain medicines should not be combined with alcohol, or should not be used if one is planning to drive a car. But in other cases medical knowledge and technology can only be made to work under the more strict and controlled conditions of the hospital. From this angle the hospital is a 'halfway house' between the laboratory and the world which makes it possible for medical knowledge and technology to work. While on the one hand we can think of the omnipresence of hospitals, care homes, general practitioners and so on as a beneficial development, it is important to bear in mind how all this is part of a much wider medico-pharmaceutical 'complex'—a vast network of people, things, money, careers, interests that, through its sheer size and number of connections has made it quite difficult if not impossible to think differently about health and medication and, more importantly, to do things differently in this field.

In line with the other two deficits already mentioned, I suggest to refer to this aspect as the *application deficit* of evidence-based practice. By this I mean to highlight that to think of the impact of modern science on society in terms of the application of scientific knowledge—which is central to the notion of evidence-based and evidence-informed practice—at least misses important aspects of what makes the application of such knowledge possible (particularly the work that is needed to transform the outside world so that knowledge becomes applicable) and perhaps even serves as an ideology that makes the incorporation of practices into particular networks invisible. All this is particularly important because these developments tend to limit the opportunities for people to do and

think otherwise—something that can particularly be seen in the ongoing struggles to create opportunities for 'alternative' medicine (and the very phrase 'alternative' already shows the power of what is considered to be 'normal'). It is from here, then, that we can move to questions of normativity, power and values.

From Evidence-Based to Value-Based Education

I have argued that with regard to the idea of evidence-based practice we can identify three deficits: a *knowledge deficit* (knowledge about the relationships between actions and consequences can only ever provide us with possibilities, never with certainties); an *efficacy deficit* (in most if not all cases of social interaction we have processes that operate as open, recursive systems, as a result of which the connection between actions and consequences can never be totally determined); and an *application deficit* (the idea that practices can change through the application of scientific knowledge makes the work that is done to transform practices so that knowledge can begin to work invisible). These three deficits already raise serious doubts about the 'project' of evidence-based practice and the way in which it is usually presented. In addition I have introduced the notion of *complexity reduction* as a way to understand how in open recursive semiotic systems it is possible to make things 'work,' that is, to create more 'patterned' connections between actions and consequences. The way to do this is to reduce the number of available options for action within the system. I have highlighted that this raises questions about *power*. The issue, after all is, who has the power to reduce options for action for whom. It also raises issues about *normativity* as any deliberate attempt to reduce complexity articulates particular preferences about what is desirable. All this plays a central role in educational practices because education is not simply about any learning or about any influence of teachers on students. Education is a teleological practice—a practice framed by a *telos:* an aim or purpose—which implies that decisions about educational actions and arrangements always have to be taken with an eye on the desirability of what such actions and arrangements are supposed to bring about (see also Biesta 2010a).

The teleological character of education provides us with one important reason for suggesting that questions about 'what works'—that is questions about the effectiveness of educational actions—are always secondary to questions of purpose. It is only when we have provided an answer to what we hope achieve that we can begin to ask questions about the ways in which we might be able to achieve such outcomes—bearing in mind all the limitations discussed above. Given that evidence can at most provide us with information about *possible* connections between actions and consequences and therefore is entirely located at the level of the means of education, the idea of evidence-based practice is problematic, because if evidence were the only base for educational practice, educational practice would be entirely without direction. This is one reason why, in education, values come first (see also Ax and Ponte 2010).

This situation is not different in those cases in which proponents of evidence-based practice would go for the less strong option of evidence-*informed* practice. The point again is that if we wish to use any knowledge about possible relationships between actions and consequences, there is still an important judgement to be made as to whether we wish to apply this knowledge and this, again, is a value judgement (see Smith 2006; Biesta 2009). Such value judgements have two dimensions. On the one hand there is the question of the *general* desirability of information about what might work. The point here is that even if we were able to identify the most effective way of achieving a particular end, we may still

want to decide not to act accordingly. There is, for example, important research evidence on the influence of the home environment on educational achievement. Yet it most cases we would find it undesirable to take children away from their parents simply to improve their chances of educational success somewhere down the line. (There are of course cases where we do decide that this is the most desirable thing to do, but this is not dictated by knowledge about what works, but by complex value judgements about what the most desirable way of action is—which, in this particular example, requires a careful evaluation of potential benefits and potential harm of intervention versus non-intervention.) In the case of education there is not only a requirement for a general value judgement about the desirability of particular ways of acting. There is also a requirement for what we might refer to as an *educational* value judgement about the means that we can use in education to try to achieve certain desirable outcomes. The reason for this lies in the fact that in education there is an internal relationship between means and ends. The means we use in education—our teaching styles, the ways in which we try to promote certain ways of doing and being—are not neutral with regard to the ends but potentially also teach something to students. Punishment is a good example of this as we may well have strong evidence about the effectiveness of some forms of punishment, and we may even have come to the value-judgement that with regard to the use of punishment in a particular situation the benefits outweigh the disadvantages. Yet still we may decide not to use punishment as it would teach children "that it is appropriate or permissible in the last resort to enforce one's will or get one's own way by the exercise of violence" (Carr 1992, p. 249)—a problem that works out similarly in those cases where the question is whether we should use rewards in education or not.

These points show that values are not simply an element of educational practices, but that they are actually *constitutive* of such practices. We might even say that without normative orientations, without decisions about what is educationally desirable, without an articulation of the *telos* of *educational* practices, these practices simply do not exist—or at least they do not exist as educational practices. It is, therefore, only in light of decisions about the aims and ends of educational practices that questions about evidence and effectiveness begin to have any meaning at all. There is, after all, no evidence to generate or collect if we do not first decide about what the aim or purpose of the practice is. This is not to suggest that once such a decision has been made evidence can take over, because to the extent to which evidence can be generated it always needs to be 'filtered' through decisions about what is educationally desirable. Yet the argument is not simply one between the primacy of values *versus* the primacy of facts. I have also tried to argue in this article that many of the claims about evidence and its capacity to be a basis or source of information for practice are flawed or at least problematic. This is not only because there are limits to the kind of knowledge that can be generated and limits to the extent to which there can be strong and secure links between actions and consequences in the human and social domain. Perhaps the most serious problem for evidence-based practice is that there is actually very little evidence to support the idea that the transformation of such fields as medicine and agriculture is indeed the result of the application of scientific evidence about 'what works' in these fields. The 'project' of evidence-based practice therefore urgently needs to be rethought in ways that take into consideration the limits of knowledge, the nature of social interaction, the ways in which things can work, the processes of power that are involved in this and, most importantly, the values and normative orientations that constitute social practices such as education.

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