

# Evidence-based practice in teaching and teacher education

## **- What is it? What is the rationale? What is the criticism? Where to go now?**

**Christer Brusling, Oslo University College, Centre for Study of the Professions.**

*Invited paper to a workshop at the conference Professional Development of Teachers in a Lifelong Perspective: Teacher Education, Knowledge Production and Institutional Reform. Centre for Higher Education Greater Copenhagen in collaboration with OECD, Copenhagen, November, 17-18. 2005.*

## **What is it? Where does it come from? What is the rationale?**

This movement, if I may call it that, seems to have originated in the British educational context, and with a lecture given by David Hargreaves to the Teacher Training Agency in 1996. Unfortunately I have been unable to get a copy of it in Norway – there is none in Norwegian libraries<sup>1</sup>. Lacking this original source I will rely on what comes forward in second-hand sources, in published criticisms in mainly British journals, and in later articles by Hargreaves, where he answers his critics.

Philip Davies (1999) from University of Oxford, “the other place” from Hargreaves’

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<sup>1</sup> **That doesn't mean that the movement hasn't reached Norway. A recent NOK 100 million proposal for educational research in partnership with schools show that at least the former conservative government knew about it, mainly through Demos, a British “independent think tank” (demos.co.uk)**

perspective, writes favourably about evidence-based education in an article named "What is evidence-based education?". He says that it operates on two levels, the first being "to utilize existing evidence from worldwide research and literature on education and related subjects", the second "to establish sound evidence where existing evidence is lacking or of a questionable, uncertain, or weak nature" (p. 109). The first level is described thus:

Educationalists at all levels need to be able to:

- pose an answerable question about education;
- know where and how to find evidence systematically and comprehensively using the electronic (computer-based) and non-electronic (print) media;
- retrieve and read such evidence competently and undertake critical appraisal and analysis of that evidence according to agreed professional and scientific standards;
- organise and grade the power of this evidence; and
- determine its relevance to their educational needs and environments<sup>2</sup>.

(Davies 1999, p.109).

Davies acknowledges the debt of the education sector to medicine and other health professions, which predated education with five to ten years in the implementation of the idea of evidence-based practices. According to Davies, it is derived from the University of Oxford Master's programme in Evidence Based Health Care. Hargreaves explicitly argues for evidence-based teaching by pointing to the success of the idea in medicine, and by the similarity of the work of doctors and teachers:

**Practicing doctors and teachers are applied professionals, practical people making interventions in the lives of their clients in order to promote worthwhile ends – health or learning. Doctors and teachers are similar in that they make**

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<sup>2</sup> **Note that evidence-based education in this definition curiously enough comes out as a pure intellectual exercise, lacking the final application to practice.**

**decisions involving complex judgements. Many doctors draw upon research about the effects of their practice to inform and improve their decisions; most teachers do not, and this is a difference. (Hargreaves 1997, p. )**

One reason to turn to evidence-based education is that doing so would make education less vulnerable to "political ideology, conventional wisdom, folklore, and wishful thinking", not to mention "trendy teaching methods based on activity-based, student-centred, self-directed learning and problem solving" (Davies 1999, p. 109).

But what constitutes evidence? For Hargreaves (1997) evidence is evidence about "what works". The dictionary says that evidence is "something that furnishes proof" (m-w.com). To be able to provide proof of the "working" you need to measure the outcome of the teaching activity in question, and you need a procedure of relating the measured outcomes to the activity to make the relation an evidence<sup>3</sup>. Hargreaves doesn't see much of a problem with how outcomes are constructed, but is adamant about what ought to be the preferred procedure, the RCT, the randomised control trial, often called "the golden standard"<sup>4</sup>. Davies (1999), on the other hand, is more permissive of a variety of procedures, thus voicing a broader conception of educational outcomes. In addition to RCT, he mentions survey and correlational methods, regression analysis and analysis of variance. He allows for inquiries that seek to describe the meanings different people attach to different teaching activities, and the broader and long-term consequences of them, e.g. on "students' and parents' sense of self and their sense of social worth and identity" (p. 115). Analyses of naturally occurring teaching interactions, conversation and discourse are

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<sup>3</sup> **In keeping with the parallel with medicine, I would say that not only expected and beneficial outcomes should be measured but also non-expected and possibly harmful ones.**

<sup>4</sup> **Hargreaves here echoes the standard text of research methodology from 1963, Campbell & Stanley, *Experimental and Quasi-experimental Designs for Research*: "[We are] committed to the experiment: as the only means for settling disputes regarding educational practice, as the only way of verifying educational improvements, and as the only way of establishing a cumulative tradition". Cited by Howe (2005), p.308.**

also mentioned as worth-while in this context. He further wants to ask normative questions within the evidence-based teaching paradigm: "whether or not it is right or warrantable to undertake a particular educational activity or health care intervention" (p.115).

Davies' (1999) omission of the necessary last element in evidence-based practice, i.e. how the purported evidence is to be put to use in practice, avoids a difficult and much discussed problem. Hargreaves (1999b) is of course right in pointing out that this problem is different if practice refers to policy making, as in the phrase evidence-based policy, or to teaching in classrooms, as in the phrase evidence-based teaching. The use of evidence in policy making is about deciding on "large issues concerned with levels and types of resource allocation – decisions which are difficult to undo" while the use of evidence in teaching "refer to the relatively small-scale professional practices of teachers in schools and classrooms, which can usually be easily revised" (Hargreaves 1999b, p. 245). In both circumstances enter a lot of considerations apart from "evidence". Answering critique from Hammersley (1997) Hargreaves (1999b) admits that context sensitive "'practical wisdom' pervades (both) expert medical and educational practice. There is some hard science deep in the knowledge-base of doctors, but the closer a doctor gets to an individual patient, the stronger the elements of judgement or of practical wisdom that also enters into the decision. Teachers acquire 'practical wisdom' too; but, in comparison with doctors, they have little accepted scientific knowledge to insert into their decision-making." He claims that the infra structure of knowledge available to teachers is far less developed than that available to doctors, and that teachers seem to be less efficient than doctors in finding the scientific knowledge there is. He argues that one reason for this is that the knowledge base in medicine is cumulative while that in education is not, but ought to become.

This leads to Davies (1999) second level of concerns about evidence-based teaching: "to establish sound evidence where existing evidence is lacking or of a que-

stionable, uncertain, or weak nature". Hargreaves' lecture in 1996 to the Teacher Training Agency stated that teachers only to a small extent base their practice on (hard) scientific evidence, but he didn't blame teachers but researchers for failing to produce such evidence, especially produced by RCT procedures. With the £12,000,000 funding for developing evidence-based policy and practice by research he hoped researchers would be encouraged to respond appropriately (Hargreaves 1999a). In another journal article the same year, titled "The Knowledge Creating School", he urges teachers themselves to produce the knowledge they need.

To sum up: Evidence-based teaching is a concept borrowed from the health sciences and recommended for teachers (you might add: by new-public-management-governments and elite researchers). You may get the impression that it's use implies a critique of teachers for not including research-based evidence in deliberations on how to teach, but mainly it is a critique of educational researchers for not providing the needed cumulative research-base, built on research of the randomised control trial (RCT) kind. The rationale is that once such research has taken off and its results have been efficiently disseminated, evidence-based, or evidence informed, teaching will become more frequent.

### **Critique of the notion of evidence-based practice**

Hammersley (1999) challenges Hargreaves' on three accounts: his description of educational research as non-cumulative, his prescription on how research could contribute to practice, and his argument that education should learn from medicine, which he considers a parallel to education.

Hammersley shares the view that educational research could become more cumulative, but researching 'what works' has not proved successful in this respect, despite sustained attempts: "much educational research in the first two-thirds of the twentieth century was devoted to investigation of effective teaching; and one of the reasons for the changes in educational research over the past 20 years is precisely the failure of this work to produce conclusive, cumulative findings" (p.144). But he also

reminds us that there are different meanings of the concept "cumulative".

There are obvious "problems involved in identifying distinct and standardised 'treatments' in education", Hammersley exemplifies by the "problems faced by researchers seeking to distinguish teaching styles". What about the problems in operationalising the concept of learning? What should be done about the disagreements about what students should learn? What about the problems of how to measure "the most important kinds of learning"? Hammersley asks if it is possible even in principle to do so. A preoccupation with what is easily measured may very well have profound effect on teaching, narrowing objectives accordingly.

To establish fixed, universal causal patterns in teaching seems equally difficult, if not impossible. What might be aspired to is "local, context-sensitive patterns in which interpretation and decision on the part of teachers and students play an important role. Unlike in most areas of medicine, in education the 'treatments' consist of symbolic interaction, with all the scope for multiple interpretations and responses which that implies". Hammersley thinks that "the production of information of high practical relevance usually depends on a great deal of knowledge that does not have such relevance...for science to be able to contribute knowledge that is relevant to practice, a division of labour is required: a great deal of coordinated work is necessary tackling smaller, more manageable problems that do not have immediate pay-off". Hargreaves is described as having a "narrowly instrumental view of practical relevance", promoting an 'engineering model' of the relationship between research and practice. An engineering model assumes that most teaching problems are technical, which is not likely. On the contrary they seem in most cases to be 'practical', that is involving making judgements in complex situations, exercising discretion, not following rules.

The analogy with medicine is criticised for not taking into account that the practice of medicine is more towards the engineering side of a continuum which at the other side has the practical. Even within medicine the notion of evidence-based practice

has been criticised for downplaying practical judgement in clinical situations, that “the focus of clinical practice is subtly shifted away from the care of individuals toward the care of populations, and the complex nature of sound clinical judgement is not fully appreciated” (Tonelli 2000). Hammersley cites a medical researcher who raises the same critique towards medical research as Hargreaves does to educational research: it is methodological weak, use inappropriate designs, unrepresentative and small samples, incorrect methods of analysis, and faulty interpretations. The blame is put on practitioners doing research without adequate research training, a fact that doesn’t actually support Hargreaves’ recommendation that more teacher research should lead to a stronger body of knowledge with practical relevance. Hammersley concludes his critique: “The diagnosis (of the current state of educational research) is mistaken and, taken as a whole: the prescription is likely to be lethal”.

In the North American context an equally forceful critique of the arguments for research for evidence-based practice has been voiced by Howe (2005). His critique is organised under the headings “experimentism<sup>5</sup> and scientific method”, and “experimentism and values”. The object of his analysis is a National Research Council report, *Scientific Research in Education* (2002), which he means represent a more moderate form of experimentism than other influential publications advocating research for evidence-based practice. In short he states that this report:

- unconvincingly characterizes the conduct of research as hierarchical, both temporally and logically (p. 309);
- offers little defense of its call for a renewed emphasis on randomised experiments against well-known criticisms regarding the issue of external validity (generalisability from research contexts to other contexts) (p.309);
- does not take into account Cronbach’s observation that generalizations decay,

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<sup>5</sup> **The word “experimentism” is used by Howe to refer to scientific research advocating the randomised control trial as the “best” research method.**

thus making the goal of a cumulative education science fundamentally unattainable;

- does not take into account that human intentionality significantly complicates how to understand causal explanation in social research;
- places outcomes outside educational research, by focusing on means;
- places not-manipulable variables, like socio-economic stratification, outside the limits of educational research by insisting on RCT as the method of choice, thus making educational research "a political innocent exercise".

Howe (2005) turns to Toulmin (2001) to find an alternative to experimentism – an alternative that is without the short-comings described above:

**Activities for which social research is often seen as a tool for improvement – medicine and education, for instance – call for intentional behaviour on the part of practitioners in the form of craft-based practical judgement. Stephen Toulmin observes that when performed well, these judgements must respond in a "timely" manner to the unique and unanticipated actions of other persons, as well as to their different ways of seeing things. According to Toulmin, research informing such practices should exemplify a model that is "clinical" and "democratic" rather than "applied" and "elite" (Howe 2005, p. 317).**

## **Teachers' relationship to research**

Do teachers experience a lack of research results when planning to teach? How do teachers relate to educational research? Do teachers find some research genres more relevant and practically useful than others? Does teachers' practice-based research contribute to a knowledge base of teaching? None of these questions are raised in the early discussions on evidence-based teaching, but specific answers to them seem to enter as premises to prescriptions.

I would think that the answer to the first question is no. A common place view of teachers' planning is that it is based on textbooks and concerned with amounts of "covering", using standard methods of classroom instruction: a short introduction

by the teacher, independent pupil work with textbook exercises, question-and-answer-patterns, summing up by the teacher in class. Twenty years ago research on teachers' planning was frequent, today it seems to be an almost closed field of study. Perhaps the expectations of the paradigm of evidence-based teaching on teachers to include research results in their deliberations on how to teach may lead to its re-opening.

Do teachers find some research genres more relevant and practically useful than others? Kennedy (1999) observes that:

**Many genre advocates refer to teachers to justify their arguments, claiming that teachers need more authoritative knowledge (so we should conduct experiments), more dynamic portraits that reveal multiple truths (so we should write narratives), or more richly detailed accounts (so we should do ethnographies). (Kennedy 1999, p.511)**

Case studies and ethnographies, she continues, have long been justified by:

**...contentions that educational events are governed not by universal laws of cause and effect but, instead, by human interactions and by multiple concurrent and interacting influences; that the meanings of these events can be understood only within their context; that detailed descriptions of the full range of these interactions and dynamics are the only way to accurately represent these events and their meanings; that the kind of complex dynamic knowledge represented in case studies and ethnographies is more like the kind of knowledge ordinary people use to store their experiences; and that such detailed and multifaceted descriptions enable audiences to see similarities and differences between the research setting and their own situations, thus enabling generalizations by analogy rather than by statistical extrapolation. (Kennedy 1999, p.54)**

She sets out to investigate if teachers find some research genres more persuasive, more relevant, and more influential on own practice, than others, and if so, what features of each genre contribute to these evaluations. 100 teachers were interviewed after having read five articles describing research of different genres. Results show that the three evaluative criteria were highly correlated, but also that reasons for valuing them varied across genres. Experiments appeared to be highly valued,

but so were non-experimental comparisons and narratives. Case studies appeared more influential than surveys. Independent of genre research studies proved to be particularly useful if they "helped teachers understand the relationship between teaching and learning" (Kennedy 1999, p.528). Kennedy concludes that a majority of teachers found most of the articles persuasive and relevant, but for different reasons. The genre contentions with which she started were not empirically verified.

The TTA itself designed a questionnaire on teachers' perspectives on educational research, and distributed it as attachments to journals of two teacher organisations, one for primary teachers, the other for secondary teachers. Everton, Galton & Pell (2000) report on the findings. As an unknown number of subscribers were "corporate members for local education authorities and industrial companies" they were unable to specify teachers' response percentages. It was however estimated that the first group only returned 15% of the questionnaires, the second possibly a little more. In the second group most, i.e. 84%, were filled out by school leaders. All in all: the manner this investigation was carried out does not justify its analysis in terms of "teachers' perspectives".

Does teachers' practice-based research contribute to a knowledge base of teaching? As a result of Hargreaves 1996 lecture to the Teacher Training Agency the British government allocated £54000 to the funding of teacher research projects. In an evaluation of the resulting reports Foster (1999) found that "a significant minority of the projects appeared to be practical: concerned with the improvement of teaching, learning or educational achievement, rather than the production of knowledge" (p. 383). He found "that only in a minority of the reports are factual claims well established... as a result, it is difficult to see these as much more than opinion based on pre-existing views of good practice" (p. 393). Foster concludes that critical scrutiny of findings from teacher research before dissemination is crucial, but is afraid that "the view of knowledge production and dissemination which underpins this TTA scheme sees little role for such scrutiny. The priorities are rapid production

and immediate dissemination to practitioners" (p. 395).

To sum up: There is research evidence that teachers see the RCT research genre as relevant and useful to practice, but no more so than many other research genres. There is research evidence that teachers' practice-based research does not contribute substantially to a body of knowledge on teaching, not to mention a cumulative one.

## **Concluding remarks**

In line with the observation that there is more to teachers' decision making than following authoritative evidence-based rules for practice, the discourse have changed from talking dichotomously about evidence-based/not evidence-based teaching to talking about evidence-informed teaching (Hargreaves 1999b) or the extent to which teaching is evidence-based (Davies 1999).

It is interesting to note that while waiting (?) for research-produced evidence on "what works", in teaching and in teacher education, British teacher education has become teacher training, managed by the Training & Development Agency for Schools. Its publication "Qualifying to teach. Professional standards for qualified teacher status and requirements for initial teacher training" lists skills, competencies and understandings would-be teachers must acquire (TDA 2005). Hagger & McIntyre (2000) complains that "these lists have been accompanied neither by any rationale for the items listed nor by any explanation of the conception of teaching expertise which underlies the lists" (p. 485). Not surprisingly, I found that in this publication the word 'training' appears 51 times, the word 'education' 15 times (most of these in naming school subjects or institutions), the words 'research', and 'theory' did not appear at all.

My conclusion is that there are serious problems, philosophical, historical, and political problems, with the notion of evidence-based practice transferred to teaching

and teacher education, at least in its original interpretation. But there is no question that means for dissemination research results and interpretations of what they might mean for policy and practice, must improve. The internet is of course very much suitable for this, even if the set up of dissemination of educational research may be rather more complex than the example I found of evidence-based medicine, published by the British Medical Journals Publishing Group (2005). Current examples within the education sector are Research Points, "connecting research to policy" (American Educational Research Association 2005), and the Education Coordinating Group within the Campbell Collaboration (2005).

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