

The use of citations in educational research: the instance of the concept of ‘situated learning’

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Introduction

The debate over the next phase of the Research Assessment Exercise in the UK is now fully underway with many academics in Higher Education bracing themselves for yet another round of significant changes on how performance will be measured in terms of publications, research grant income and numbers of research students. Behind this obsession with performativity, however, there has been little discussion in the literature on what exactly the relationship is between the growth of research outputs and the growth in the cumulation of knowledge in the field of education. If, for instance, citations are to be used in some form of metrics based measure in education then is that necessarily a reflection of the cumulative development of knowledge in the field? This paper sets out to open up the debate through examining the development of one important theoretical concept in educational research through the use of citation analysis. This is offered as an ‘instance’ of how education research is developed in practice and, indeed, as a case study to illuminate how academics make

the link between theory and practice in their teaching of students in Further and Higher education (Thompson and Robinson 2008).

In particular, the study provides a citation analysis of Lave and Wenger's work on 'communities of practice' and 'situated learning' over the period 1991-2001. The data relates to educational research in the UK, although comparisons are made with the USA. The discussion considers the value of using citations as an indicator of quality within any Research Excellence Framework and argues the case for taking a broader more qualitative approach to assessing research quality in the social sciences.

Citations

Producing texts that will be cited is central to contemporary scholarship (Bazerman 1988). Citations are formal markers of the connections expressed by authors between a particular text and other works indicating where knowledge advanced in one text has been referred to by another (Garfield 1979). Citing is effectively obligatory, since texts without citations are unlikely to be taken seriously and in principle all works drawn on in a text will be represented by citations. Yet on the basis of the numbers of citations received, grants are given, positions filled and accolades awarded (Hargens and Schuman 1990). In this context, the observation that some texts are cited much more frequently than others is important. How do particular texts come to prominence? Why do some papers become central while others remain peripheral? On what basis do authors select the citations that they include in their texts, and what use do they make of them? Factors such as quality of research and timeliness of findings

undoubtedly play a part, but beyond that the processes involved in citing behaviour are much debated (MacRoberts and MacRoberts 1997, Garfield 1997, MacRoberts 1997)

A central question is whether work that is cited is part of the cumulative development of knowledge or not? By cumulative knowledge we mean knowledge which “build[s] on earlier research—by confirming or falsifying it, by extending or refining it, by replacing it with better evidence or theory, and so on” (Hargreave, 1996). Some lack of cumulation in research is inevitable: not all items of knowledge will be thoroughly discussed each time they are referred to. However, research which recurrently fails to be cumulative can be problematic as non-cumulative research is often characterized as involving “a few small-scale investigations of an issue which are never followed up [and] inevitably produce inconclusive and contestable findings of little practical relevance” (Hargreaves 1996, 2). Freese (1980, 6) states that “there is a difference between the growth of knowledge and its cumulative growth” and that scientific discoveries can only be developed through cumulative growth. He emphasizes that cumulation is very different from mere addition, and that what really counts is not the straightforward addition and integration of new knowledge but the challenge of being able “to add proportionately less and make that less count for more.” (1980, 41)

Lave and Wenger’s Situated Learning (1991)

In *Situated Learning* (1991) Lave and Wenger introduced three concepts: situated learning, communities of practice, and legitimate peripheral participation. The idea of

situated learning is that learning should not be thought of as purely cognitive. Learning must be recognised as something grounded in social contexts and cultural practices rather than as part of a process of abstract cognition. *Communities of practice* are communities to which learners become attached through their learning. Within such communities, established community-members (“old-timers”), play a part in teaching newcomers, apprentices, and in socialising them into the ways of the community. Learning about the practices of the community means simultaneously learning to be part of the community. As a result, “learning in doing” coincides with “learning to be”. The concept of *legitimate peripheral participation* refers to the gradual way in which newcomers to a community of practice gain entry to it. Their participation is initially peripheral, and will involve being an onlooker and performing routine, low-skill jobs. An apprentice’s movement from the periphery of participation towards the core involves developing social identity as well as skills. Gaining knowledge of practices means also gaining the identity of a member of the community of knowledge-users, and newcomers eventually move towards being old-timers themselves.

Lave and Wenger support their ideas by reference to a number of existing studies. Among the examples of communities of practice they discuss are Mexican midwives, US Navy quartermasters, and supermarket butchers. In each situation, they state, a similar process occurs: novices undergo an apprenticeship that involves the situated learning (often tacit) of not only cognitive but also social and cultural knowledge. If this process is engaged with satisfactorily (they discuss a situation, with reference to

the supermarket butchers, where learning is restricted) then apprentices move from a position of legitimate peripheral participation in a community of practice to one of full participation. Lave and Wenger's emphasis throughout is on classroom-based learning, the problems associated with it, and the ways in which learning through apprenticeship differs from this.

Research methodology

A key text in the field of educational research, and one which is frequently cited is Lave and Wenger's book *Situated Learning* (1991). In this study we examined (1) how this text ("Lave and Wenger 1991") appeared when cited in other scholarly works, and (2) whether the citation was made in a cumulative context. We examined each publication to assess levels of engagement with the text when it was cited and to explore whether it was cited in a perfunctory way, i.e. cited without evidence of engagement of the text in terms of its meaning or content. Studies of this type in other fields have found levels of perfunctory citation between one-quarter and one-half to be typical (Small 1982), and our assumption, based upon recent critiques of educational research, was that the proportion of citations to "Lave and Wenger 1991" that are perfunctory would be greater than this i.e. >50% of citations would be perfunctory. In addition, we examined qualitatively the texts that made non-perfunctory citations in more detail to assess whether the citations were being made in a way that indicated the cumulative development of research.

In line with current debates on the use of citations we decided to use an internationally recognized database as the source of our data analysis. This has obvious limitations as the focus is on journal papers and not books, edited books or conference papers. There are also added complications on how particular writers are cited across the dataset that requires more than a quantitative analysis of the data. However, the advantages of such a dataset are the international standing of the outputs, accessibility and peer review. In particular we have used the Web of Knowledge citation database to gather data on the journal articles that cited “Lave and Wenger 1991” in the ten years following its publication. A total of 856 articles published 1991-2001 contained a citation to “Lave and Wenger 1991.” Descriptive statistics about how often, when, and where this text was cited were produced using Stata SE Version 9.2. We have also used citation context analysis and looked at the context in which citations to “Lave and Wenger 1991” are made. Our focus in this part of the analysis was on the type of citations made. We selected a subset of articles to analyze according to two criteria: that they appeared in an education journal (371 articles), and that the first-named author was based in the UK (47 articles). We focused on a subset because the process of finding and carefully reading articles to enable citation context analysis is time-consuming and it was necessary to reduce the number of articles to be examined to a manageable level. Our focus on articles by UK-based educational researchers enabled us to concentrate on a subgroup that would be more familiar to us (as UK-based educational researchers). We knew before beginning the study that Lave and Wenger’s ideas had received attention in the UK: a 2002 review of research on post-

compulsory education in the UK (Cullen et al. 2002), found Lave and Wenger's work has been extremely influential in shaping thinking on pedagogic practice. This subset is in effect a convenience sample. It was not intended to be random or representative – and we intentionally do not use inferential statistics based on it – and it was not intended to capture all the work done by British writers, at least some of whom are based in institutions outside of the UK.

The analysis of texts

Texts may be cited in one of two ways:

(1) They may be critically engaged with. The response of the citing author to the cited text may represent rejection, affirmation, or some point in between, but the context of the citation will indicate some active engagement with the cited text. Although having one's work affirmed or supported seems the most attractive option, negational citations may be just as worthwhile, and Chubin and Moitra (1974) elaborate on how "fruitful errors" may be important for educational progress and stimulate other research. Whether affirmative or negational, this first type of citation indicates that some cumulation of research has occurred. Hargreaves (1996) definition of cumulative research as "build[ing] on earlier research", and this may involve reference to theoretical arguments, empirical findings, or methodological disputes. Whether positive or negative, engagement with a cited text shows reflection on and connection with the knowledge represented. Moravscik and Murugesan (1975) suggest that engaged citations of this sort can be identified by whether or not they are

required for understanding the argument of the citing author; they call such citations “organic”.

(2) Alternatively, texts may be cited but not engaged with. Citations may be used to acknowledge work in the general area without directly contributing to the argument of the citing text. Such citations are “perfunctory” (Moravscik and Murugesan 1975) and are effectively redundant. They may be cited alongside others which made the same point, without additional comment, or be included to indicate other work has been done in the general area. In this paper we presume that perfunctory citations show non-cumulative use of the content of a text.

In each selected text we examined the context of citations to “Lave and Wenger 1991”. By examining the citation context we establish how it has been used and whether or not this usage is non-cumulative. In each instance we identified the citation as representing affirmative or negative engagement with the cited text (organic citations), as mentioned only (perfunctory citation), or as mentioned alongside reference to previous citations (either organic or perfunctory). This typology is summarized in Table 1.

<< Table 1 about here >>

Findings

In the ten years following the publication of the book, until the end of 2001, the journal citation data provided by Web of Knowledge citation index lists 856 citations to this text. Of these citations, 371 appeared in education journals. Figure 1 shows the increase over time in references to “Lave and Wenger 1991” in all journal articles and in articles in education journals.

<< Figure 1 about here >>

Within education, the majority of citations to *Situated Learning* come from US-based writers. Writers in the UK and other countries (aside from Canada, whose citation patterns closely match those of the US) were slower to cite this text after its appearance, but their citation rate increased markedly from 1998 onward. Figure 2 shows the rising year-to-year citations of Lave and Wenger (1991) in education journals overall, by US writers in education journals, and by their British counterparts.

<< Figure 2 about here >>

Three observations emerge from these figures. Firstly, “Lave and Wenger 1991” has been cited frequently and citation to it rose steadily following its publication. Secondly, this text has been cited more in educational research than in other disciplines and, finally, although this text was initially taken up by US-based writers it is being increasingly referred to elsewhere. Frequency of types of citation among the

47 articles surveyed is shown in Table 2 (positive and negative organic citations have been put together).

<< Table 2 about here >>

Of the 27 texts that cite “Lave and Wenger 1991” organically we find only two have a straightforward cumulative relation with the text. Two other articles among the 27 are cumulative of broader bodies of work that include the text. Neither of these texts has a direct cumulation relation with Lave and Wenger (1991), since neither of them seems to rely on that text to establish their argument. The other organically citing texts primarily refer to Lave and Wenger (1991) in order to make points independent of their primary knowledge claims, or else as supplementary bolstering for their main claims.

Discussion and conclusion

The extent to which articles examined involve non-cumulative use of the work is important in terms of the comparison it affords with other subject areas. Although we found a substantial level (36.2%) of citation of Lave and Wenger (1991) to be perfunctory, this is in line with studies of other fields, including those in the natural sciences. As part of his key text on citation context analysis Small (1982) noted between 20 and 60 per cent of citations were perfunctory. Moravscik and Murugesan (1975) found levels of perfunctory citation at 40 per cent in their analysis of articles in physics. However, the second part of our analysis indicates that only a small number

of those organic citations were cumulative: strictly speaking, only 2 out of 47. The two texts that show a cumulation relation with *Situated Learning* are Kirk and Macdonald (2001) and Spouse (1998).

The article by Kirk and Macdonald is entitled “The Social Construction of PETE in Higher Education: Toward a Research Agenda”. The authors make sense of the social construction of physical education teacher education in the midst of ongoing contests and struggles over curriculum change by presenting a framework based on the theories of Lave and Wenger (1991) and Bernstein. They state that this theoretical framework uses Lave and Wenger’s “analytical tools... of legitimate peripheral participation in... communities of practice”. This is in line with Freese’s cumulation relation of theoretical inclusion, whereby “the content of one of the statements [Kirk and Macdonald’s] is asymmetrically dependent upon the content of the other [Lave and Wenger’s]. The subset could not have been formed but for the superset.

Spouse’s article is titled “Learning to nurse through legitimate peripheral participation”. In it she refers to how a situated learning perspective can be used to critique the existing literature and practices relating to nurse education. Spouse uses the examples of situated learning contained in Lave and Wenger (1991) (such as the Mayan midwives studied by Jordan and the Alcoholics Anonymous members studied by Cain) to make comparisons with entry to nursing and with student nurses’ entry to clinical practice: “the concept of legitimate peripheral participation provides a useful

framework to review the relationship between learner and clinical practitioner and professional development”. This article is thus an example of what Freese calls deductive subsumption, using established premises to “discover what we know”, asserting derived claims and expressing hidden knowledge. Both papers are offered as examples of how authors can develop their research in an organic manner and thus provide some evidence of the cumulation of knowledge.

Our study would also question the value of any external Research Excellence Framework (REF) that relies upon a metrics based calculation of citations as an indicator of quality. The evidence from our study, which is limited to a particular instance of educational research, would suggest that impact factors and quality may not necessarily correlate with one another when using citations as a measure of research outputs. Not only would such a metrics system be blind to the inherent quality of a particular research paper but also, feasibly, measure only a ‘weak grammar’ of theoretical knowledge based upon the dissemination of specialized forms of language games. The danger here is in trying to avoid the detail and not qualitatively engaging with particular texts to establish whether they are indeed organic or perfunctory in nature (Gillies 2008). Of course educational, social and natural scientific types of research are significantly different. Citations may indeed prove to be more valuable in the natural sciences than in the social sciences. However, in the field of education they are unlikely to be a strong indicator of quality given the

potential high incidence of perfunctory citations and the consequent lack of the cumulation of knowledge.

There are limitations to using citation analysis to assess research in the social sciences. One objection is that citations may not be a suitable indicator of the nature of cumulation in educational research. Unlike in the physical sciences the process of theory testing through empirical analysis may not be an appropriate model for educational research. However, if this is the case then alternative methodologies for accumulating knowledge need to be argued for as a basis for evidence-based practice (e.g. contextual and situated status of knowledge). The methodology we use here may also be criticised as being excessively “positivistic in the types of research it synthesizes and also in its own processes” (Thomas and Pring 2004). However, we have provided evidence from a range of quantitative and qualitative studies and have been transparent about the subjective judgments we have made when deciding how to categorise citations.

Finally, we are presented with a puzzle: how does a text such as “Lave and Wenger 1991” achieve prominence in the literature while directly producing little in the way of cumulative research (at least in the texts we examined)? One possible explanation for the prominence of situated learning in the educational literature is suggested by Thomas (2002) who claims that such texts offer “theory as a tool for thinking” rather than theory as the basis for empirical inquiry. In the post-compulsory education literature this ‘concept framing’ to encourage thinking about practice is used rather

often and, indeed, has been of particular value for teachers and other professionals (Gibbs and McRoy 2006). In fact, even when the concepts are used superficially, such as Foucault's meta theories, they still have made a significant contribution to the intellectual development of the field of study (Fejes 2008). Here the condition of knowledge is not associated with 'grand theory' or 'theories-in-use' but rather with theory as a 'concept for thinking' and as a way of bringing about change in educational practices.

A second and equally plausible explanation for the frequency of citations of the Lave and Wenger text is that the concepts of "communities of practice" and "legitimate peripheral participation" are attractive propositions offering an emotional and value-based appeal for professionals. Indeed, there is a certain inclusiveness about community and shared collective values that provides a counterpoint to the acquisitive and individualistic metaphors associated with behaviourism and self-directed learning. Here, Lave and Wenger are telling a credible story based upon a notion of 'narrative rationality' (Fisher 1994), with readers being convinced of the 'coherence' and 'fidelity' of the story rather than being persuaded by empirical evidence or logical argument.

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Figure 1: Citation of Lave and Wenger 1991 in education and non-education journals

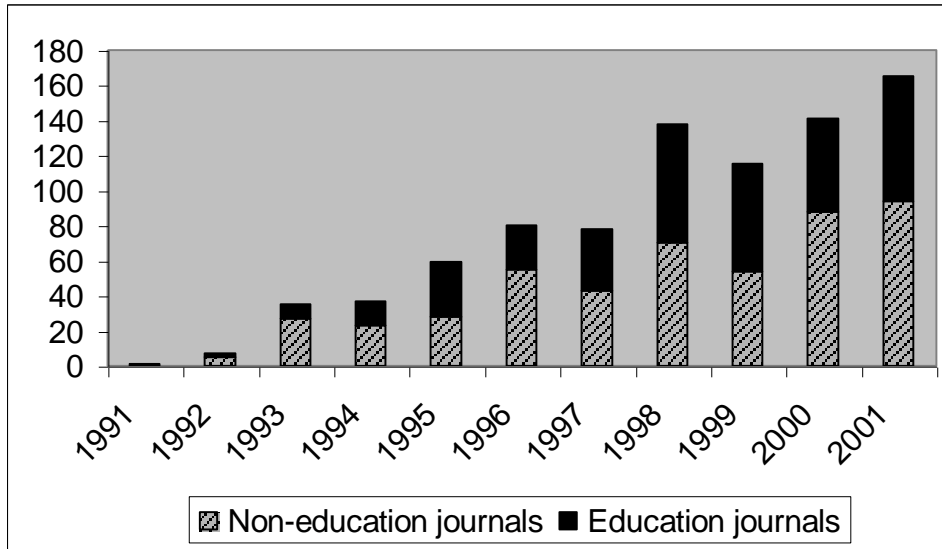


Figure 2: Distribution of citations to “Lave and Wenger 1991” per year in education journals showing overall, USA and British figures

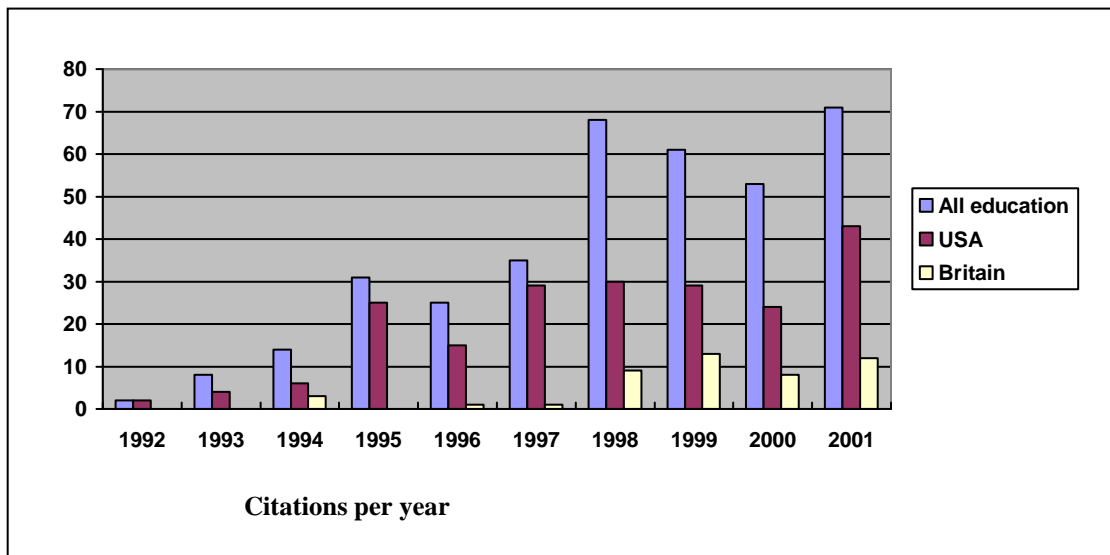


Table 1. Typology of possible responses to text, citation, and cumulation

Response to text	Positive or negative	Citation type	Cumulative
Engaged with	Positive	Organic	Yes
Engaged with	Negative	Organic	Yes
Accompanying reference to previous work	Either	Perfunctory or organic with citation of previous work	Yes
Mentioned	Either	Perfunctory	No

Table 2. Summary of types of primary citations made to “Lave and Wenger 1991”

Citation	Frequency	%
Organic	27	57.4
Perfunctory	17	36.2
Accompanying reference to previous work	3	6.4
Total	47	100.0