Framing pedagogy, diminishing technology: Teachers experience of online learning software

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The purpose of this study is to understand the role played by cognitive framing in setting the parameters for teachers use of courseware. I use a small study of 10 teachers, emphasising two, to suggest that there are a number of 'frames' built up from previous teaching practice which influence the varieties of teachers' engagement style used to approach 'mixed medium' teaching. The study shows that teachers who have mastered a set of basic skills in using Blackboard are in some instances content to remain guided by an 'information transfer' episteme; they are technologically adequate but passive, while other teachers who have relatively basic technological knowledge can produce truly 'blended' teaching using both face to face and online modes to the best value of their respective strengths. I argue that the explanation of this rest in the frames teachers use to understand what they are doing when engaging online.. One particular frame found in interviews also suggests that an immersion in understanding one's own pedagogical practices produces more effective teaching online than does understanding technology. This has implications for teacher educators as well as for notions of pedagogy as resident in software.

Keywords: online teaching; teaching frames of reference; blended teaching; sensemaking; pedagogy in higher education.

Introduction

It would seem to be fundamental to the development of E-learning by designers and teachers, to be aware of the thinking processes teachers use as they engage with online learning software and the pedagogical approaches it embodies. Understanding this thinking is essential to both designing appropriate software and to the instructional design which incorporates or is wholly dependent on such software. However, while a great deal of the literature concentrates on how teachers should conduct online teaching of various sorts, to date, much less research has been carried out seeking to explain how teachers understand the tasks, how they formulate their responses to software limitations and opportunities and what factors influence the various responses to course management systems that teachers exhibit.

Shih et al's (2008) content analysis of studies of course management systems found a very low number of articles addressing teacher's cognition as they navigate the unfamiliar landscapes of online teaching. In a contribution to redressing this, I want to focus on that aspect of sensemaking (Weick, 1995) which posits frames and framing as an essential aspect of sensemaking cognition, to draw out the kind of thinking on which teachers base their approach to online teaching.

As a way into understanding these thinking processes, I have undertaken an investigation of ten teachers' styles of engagement with the courseware, Blackboard, in a combination of face to face and online course delivery. This shows that using the parameters of technological know how, and pedagogical awareness; there are at least four very different approaches to thinking about and using online courseware when these teachers use Blackboard to extend their normal face to face teaching..

A theoretical explanation may lie in the observation that people use old practices to deal with new situations and this might be captured in the concept of 'framing'. The idea of framing conceptualises people's approach to novel tasks as bringing with it, assumptions derived from past beliefs and experience and expectations about future behaviour and events crafted by these assumptions. Frames themselves however have many manifestations and so to determine which frames are in action for any given act or behaviour can be both problematic and revealing. There is an underlying constructivist supposition behind a cognitive frames - based approach to understanding how teachers deal with their encounters with courseware which has implications for enabling more precise theorising about the conditions of agency in interaction with technology.

This paper analyses the varieties of teachers' engagement style used to approach 'mixed medium' teaching using a framing approach and discusses the implications for their technological and pedagogical expertise. This is a question situated in the larger context of finding factors that influence instructors' adoption and use of Internet-based course management systems in ways that produce better quality teaching.

Absences and paradigms in current literature

Although much is published on how online teaching should be carried out and what skills ought to be imparted to teachers and what competencies required of them to enable them to successfully offer courses online, (e.g., (Goodyear, Salmon, Spector, Steeples, & Tickner, 2001; Anderson & Elloumi, 2004) these tend to be both normative and prospective in character. Much less is empirical and much less is work which reports on how teachers understand and experience the process of offering courses online or relates to the cognitive models of teachers. A 'crossover' article which uses both empirical and normative approaches is that of DeLaat et al who provide a small empirical study of two teachers with differing online teaching styles, but also include a tabular overview of five different authors' views of online teacher's appropriate roles and competencies (De Laat, Lally, Lipponen, & Simons, 2007). However, demonstrating the low overall number of articles which empirically study varieties of understanding of course management systems, in a content analysis of journal articles from five educational journals published between 2001 and 2005, Shih et al found that 444 of 1027 articles were related to the field of cognition in e-learning (p 958) of these they say, "…''information processing-decision making'' (4), ''cognitive psychology characteristics-mental model'' (7), and ''cognitive psychology characteristics schemata'' (10) were the least published research topics..." (Shih et al., 2008). It is not clear from their paper but it may be assumed that these articles addressed students e-learning rather than teachers e-learning, which, if true makes this research even rarer. The latter two categories as applied to teachers are broadly the subject of this paper. Davidson and Pai in their search for literature on use of technological frames of reference in information science generally note, "we were surprised to find relatively few published reports of research that actually conducted a TFR analysis or further developed the theoretical framework" (Davidson & Pai, 2004). A search confined to literature on higher education online teaching reveals yet sparer results.

Much of the literature on teachers' understanding, of online teaching posits a need for greater technological expertise and the development of a specifically 'online' pedagogy. In their survey of the "major issues and dilemmas of online teaching", Postle and Sturman (2003) note the "tendency for some to allow the technology (in this case the software) (to) direct the nature of teaching and learning". (p 21) They quote Skilbeck to show that this is not simply a constraint on the teacher, but also a constraint upon the epistemology created by a body of teaching materials.

> Knowledge is being broken down constantly into manageable, assimilable groups of elements, which are being joined with other elements in creating whole new forms, bodies, structures of knowledge. This is not a philosophical or theoretical movement; it is a result of course design strategies and procedures and the resources of technology. I doubt whether sufficient attention is being given to systematic, coherent curriculum designs grounded in clear views about the contribution of university study to either general education or lifelong learning. (Skilbeck 2001, p. 61 in Postle & Sturman p 19)

Sometimes this is identified as a problem of insufficient attention to developing a web based or online pedagogy.

Ask and Haugen (2008 p 1-2) quote Kirkwood & Price (2006) "…the use of (Information and Communication Technologies) necessitates more than simply replicating or supplementing existing teaching practices: everything governing these practices must be reconsidered and reflected upon." The implications of this are that the framing of the nature of teaching practice prior to moving to an online teaching environment is an impediment to developing effective online teaching methods

An alternative to identifying the problem of teaching online as a problem of insufficient attention to developing a web based or online pedagogy is to identify it instead as a problem of the technology itself embedding the 'wrong' pedagogy.

Adams and Morgan (2007) demonstrate this perspective. They divide online learning technologies into 'first' and 'second' generation on the basis of encoded practices they see in the software itself. 'First generation' software they claim is teacher centred and fosters 'compliant, rule-based learning' whereas

second generation software is designed to "(a) put learners in control of their learning and allow them to (b) create self-organising learning paths…" p 159

They suggest that little attention has been paid to developing a specific pedagogy for this web driven technology.

Both arguments outlined above position the pedagogy of technology either as something specific to be separately learned or as something embedded in the software. Both thus credit the technology itself with a degree of agency inasmuch as in both cases technology creates 'the problem' that must be surmounted.

This view of technology, as a 'force' or as deterministic in some respect or other, has a continuing history in technology studies as a source of debate - the 'technology wars'. Beginning with Pinch and Bijker's (1984) call for a constructivist approach to technology studies discussion took off in earnest with the debate between Woolgar and Pinch over 'relativist constructivism' (Woolgar, 1991; Pinch, 1993; Woolgar, 1993) and was perpetuated by later similar divides, as exemplified by a debate between Winner and Woolgar over the political consequences (and by implication the technological determinism) of building a bridge that purportedly excluded buses. (Winner, 1999; Woolgar & Cooper, 1999). It re-emerged more recently with new arguments for forms of determinism (in the form of the persistence of Moore's law) (Ceruzzi, 2005) and defenses of SST such as that by Clausen and Yoshinaka (2004) who suggest that the conditions of actor engagement are shaped by how problems are defined and resolved and this shapes how technology is then analysed and treated. Recently this debate has come to be recognised in discussion of teaching with online courseware. (Park, Lee, &Cheong, 2007)

In my view however, under some conditions the particular epistemic beliefs of teachers and the pedagogical principles these beliefs generate, have the capacity to leapfrog any tendency to treat technology as determinist

Research study on the sensemaking processes of teachers using *Blackboard* course management system

Drawing on work in progress within a larger project which takes as its subject, elucidating the general sensemaking processes of teachers using 'Blackboard' course management system, this study focuses on how a small group of 10 teachers frame their online teaching, as framing is a necessary ground upon which sensemaking can occur. These particular teachers use Blackboard as an element in mixed medium delivery of courses which are primarily given in face-to-face mode but which include an online element as mandated by university administration. Within any Blackboard course 'shell', class sizes were of 20 to 600 students. Classes were given face to face and online by the course coordinator. Classes above around 30 participants were shared with face to face tutors who themselves made negligible online contributions to the courses in this study. The courses were social science courses across a number of disciplines, which used a discursive mode of assessment (discussion, essays, presentations and similar) but only a few of which used online participation or discussion as part of their practice. Coordinators' use of online and electronic media was in no case highly sophisticated, but there was sufficient variation and mastery to class some as proficient.

The research question for the greater study was to discover and discuss the sensemaking processes used by teachers using the 'Blackboard' course management system, but for this segment of it, it was to identify and explore some of the cognitive frames brought to online teaching as a contribution to understanding sensemaking.

With regard to the analytic method itself, Cornelissen et al have divided the use of metaphors in organisational literature, which perform a similar function to frames as explanatory devices, into two kinds, predominant in different organisational literatures. The first they call 'projection' which is based on researchers deducing second order constructs to explain and elucidate behaviour about organisation. The second they call 'elicitation' which they describe as more inductive. It depends on researchers to "identify the symbolic and interpretive uses of metaphors in people's sensemaking and communication with one another" (Cornelissen, Oswick, Thoger Christensen, & Phillips, 2008 p 10). In a parallel with the latter, I have elicited from both what was discussed and what it was even possible to ask questions about in 2 hour interviews, some of the constructs about teaching online amongst this group. To illustrate one instance; towards the end of the interview I would try to probe how informants understood their online activities as teaching, or brought a philosophy of teaching to them. While for some this produced a ready answer consistent with their earlier discussion, for others this was impossible, as it clearly included the assumption that they had one. It was possible at times to watch a dawning comprehension during the

interview of the possibilities opened up by this idea. This was only one of a number of questions directed at elucidating frames and their particularity.

Discussion

My interviews with and observations of these teachers, shows that some are indeed, apparently directed by the software. They use the headings and functions within Blackboard much as they are given as a default and understand the inbuilt episteme of Blackboard as 'information transfer' - they essentially use the software as a readily accessible ongoing storage facility for passing on administrative information and information on topics and readings, freeing them from the periodicity of such transfer in classroom time. On the other hand, there are teachers who appear to have responded to the opportunities opened to them by the prospect of a new way of teaching by bringing a pedagogically oriented overview to all teaching media they use, turning 'mixed' media into blended media and creating something much more akin to Skilbeck's "systematic, coherent curriculum designs grounded in clear views about the contribution of university study…"

A useful explanation of how these differences in style occur lies in the concept of framing. Scholars as diverse as Kuhn (1970) Goffman (1974) Imershein (1977) Lakoff, (1987) Schon & Rein (1994) Orlikowski (1994) Weick, (1995) Davidson & Pai (2004) have argued that change of any sort often begins with the mapping of old habits onto new circumstances. We can understand these 'old habits' as a set of pre-existing culturally informed social psychological categories or frames which form a perceptual filter for understanding and through which new experiences are read. Weick explains the process of meaningfully connecting conceptual social categories with events thus: "Frames tend to be past moments of socialisation and cues tend to be present moments of experience. If a person can construct a relation between these two moments, meanings created. This means that the content of sensemaking can be found in the frames and categories that summarise past experience, in the cues and labels that snare specifics of present experience and in the ways these two settings of experience are connected" (Weick 1995 p 111). Weick however, argues that some frames matter more than others. He also argues that there are conditions of change so great that a given frame becomes no longer useful and must be reconstructed. Both of these have implications for producing effective teaching online.

Teachers in my study appeared to use prior ideas of technology and prior ideas of teaching - both technique and purpose as frameworks to structure their usage of Blackboard. In fact using technological expertise and epistemological purpose as elements of analysis, teachers in this study fell into four groups.

Teachers in the first quadrant are indeed, apparently directed by the software. They use the headings and functions within Blackboard much as they are given as a default and understand the inbuilt episteme of Blackboard as 'information transfer' - they essentially use the software as a readily accessible ongoing storage facility for passing on administrative information and information on topics and readings, freeing them from the periodicity of such transfer in classroom time. The usual assumed purpose of professional education is to move such teachers into quadrant 4, and improve both their pedagogical and their technological knowledge in order to orient their online course offerings around educational objectives.

What is most interesting here is quadrant 3 where effective teaching was produced while almost ignoring the development of technological expertise. In this instance framing online modes of delivery as one amongst many, all of which have various strengths and weaknesses but which are used in a Weickian 'bricoleur' approach, (what is best suited, and what is also to hand) in combination with a strong sense of an epistemic purpose in all modes of communication with and between students, means that the constraints of online or any other mode of teaching become far less important.

In both the quadrants 2 and 3 above, informants showed a strong tendency to 'frame' the problem of teaching by drawing on prior understanding of what teaching was 'about' developed over time and with or without a conscious reassessment of its meaning when online. For the quadrant 2 teacher, the prior frame was face to face teaching and the lecture in particular, although she avowed she preferred workshop style teaching, face to face. Nevertheless the 'lecture' frame was sufficiently embedded to create a strong unconscious 'episteme'. She understood knowledge and knowledge transfer as primarily a problem of having access to content, mostly content about the lecture supplemented with some other materials. The concept of courseware or online media as an instructional form was outside the frame sufficiently for her to express moderate surprise at the thought that working with course materials online might be teaching ("Oh right. Is it teaching? yeah, I guess it is teaching,…").

Table 1 Technological mastery level and pedagogical frame

	Engagement dimension	
Frame	Technological disinterest	Technological mastery
The problem is framed as information transfer. (top down) Blackboard is understood as a tool of educational administration and compliance	Quadrant 1 Technologically, staff accept the order and design of the instructional software as a template To structure online offerings staff use external organisational orders. (eg, Week of semester, administrative need to produce certain documents such as course guides for student distribution etc), and decide what items to add by reference to current administrative and 'housekeeping' informational needs (organisational and student). Technology is not necessary and not important	Quadrant 2. Technologically, staff are skilled enough to reorder the default software framework and 'customise' it. Information may be given in a greater number of electronic modes, but replicates face to face understanding, eg, audio lectures. To structure, staff accept some form of external administrative order as per Quadrant 1 Technology is not necessary but important
The problem is framed as Education. Blackboard is understood as a collaborative learning and teaching tool.	Quadrant 3. Technologically staff make minimal changes to software default layout and design, but utilise the various strengths of the software for teaching so that it complements face to face mode. Face to face mode is also adjusted to incorporate the now necessary online component. Structurally, external administrative and technological order of all sorts is ignored in favour of structuring around pedagogical organisation. (eg, 'topics' not 'weeks') Technology is necessary but not important	Quadrant 4. Staff maximise both teaching possibilities and technological possibilities. Teaching occurs through all media used and that media is chosen and adapted for its technological fitness for purpose. Technology is necessary and important

For the Quadrant 3 teacher on the other hand, the experience of spending several years both on developing and experimenting with new styles of face to face teaching and then examining this through her thesis had produced a strongly generalist pedagogical frame that was her first point of reference for solving new 'media' problems. They were not new media problems at all for her, they were pedagogical problems. "And one of the things is that it's very much about blended learning, so we learn about mediation at an advanced level, in class, theory as well as practice, role plays are constant, and then we have online learning as well, and the two work together". She made use of the pedagogical possibilities of online media - using online role playing exercises in a course that included face to face teaching because they lengthened process and gave time for student reading, reflection and learning rather than reacting as would occur if role plays took place face to face, an instance of 'blended' rather than 'mixed' methods.

Both quadrants 2 and 3 suggest that producing effective teaching online requires a move away from emphasis on technological skills and on a specifically online pedagogy.

The implications of this are fourfold. First, it is not necessary to be anything more than moderately technologically competent to be able to deliver innovative teaching online. Second, paying attention to pre-existing frames that teachers bring to their engagement with online teaching will help teacher educators to better design interventions to improve online teaching quality and third, work is still necessary to further understand the conditions under which existing frames break and sensemaking must occur. Lastly it suggests that positioning pedagogy as a property of software is a vestige of the 'determinism wars' and that agency rests with users.

Conclusion

Framing the mode of delivery as a medium for a pedagogical message which applies to all teaching rather than framing the technology as a McLuhanesque 'medium is the message' means teaching is less bound by the constraints of a particular medium and more likely to produce innovation in all of them.

It is not necessary to be technologically expert to provide good teaching online. Competence is enough. Good teaching with or without software stems from a clear idea of the pedagogical principles one is working to, a sensitivity to opportunities to enact them and a mindful attention to ones own practice and a willingness to experiment with all sorts of media and means to accomplish one's purpose. It is a process of expectation, enactment and belief, the stuff of sensemaking.

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