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How to cite:

Thorpe, Mary (2010). Philosophies and theories at the basis of student-centered educational models. In: XV Congress on Technology and Distance Education: Challenges and Innovations of Higher Education Faced with 21st Century Students, 3-5 Nov 2010, Universidad Estatal Distancia, San Jose, Costa Rica.

For guidance on citations see [FAQs](#).

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Version: Accepted Manuscript

Link(s) to article on publisher's website:

<http://www.uned.ac.cr/xvcongreso/english/presentacion.shtml>

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Philosophies and theories at the basis of student-centred educational models

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Introduction

'Student-centred' is a term that I hardly ever hear nowadays in my own institution, which is a university in the UK that teaches students primarily using an interactive, multi-media learning environment driven by frequent continuous assessment – a system we refer to as 'supported open learning' though it is also distance education too of course. However, during the 1980's, the promotion of student-centred as opposed to tutor-centred learning were as frequent as calls for constructivist and collaborative learning were in the nineties and turn of the century. So my title feels like an invitation to look back in time to deconstruct what we were trying to do in promoting student-centred education. However, in looking back and exploring what lay behind the rhetoric, we can make connections with our current preoccupations and challenges.

My own perspective of course may not necessarily reflect that of educators more generally. Looking at the Wikipedia page on student-centred learning reveals an area of dispute, with several objections to the emphasis portrayed on this page in August 2010. An extreme polarisation between teacher-centred as promoting an entirely passive approach to learning and student-centred as resolving most of the major challenges in schooling, is presented. Reasons to adopt a student-centred approach for example are listed as follows:

- Strengthens student motivation
- Promotes peer communication
- Reduces disruptive behaviour
- Builds student-teacher relationships
- Promotes discovery/active learning
- Responsibility for one's own learning

There is an implication that these positive effects will automatically follow from adoption of a student-centred approach. Not surprisingly, the neutrality of the article has been disputed on wikipedia and issues taken up on the talk page. This illustrates that 'student-centred' is most certainly not a dead idea and still provokes strong emotions.

So what does it mean to be 'student-centred'?

Conceptions of 'student-centred' vary and even more importantly, the operationalisation of this abstract idea has not attained any degree of consensus. Typical of most discussions of the term however, is a dualism between tutor or teacher-centred education on one

hand, which is portrayed as having the negative version of a series of characteristics of student-centred education on the other, characterised as wholly positive. Educational practitioners and many of those who have done research into its use in higher education, have aligned student-centred with 'good' and teacher-centred with 'bad' educational practice. It may be helpful therefore to review the research into some of the core ideas which are drawn upon in student-centred education. Two of the most important are that individuals differ in how they learn best and therefore learning opportunities should accommodate these differences, and that the primary focus of educational institutions should be on supporting learning not on what is taught and examined. Associated with these core ideas are principles of student choice in what and how to study, and students developing awareness of their own learning and how best to promote that. Student-centred learning in higher education has been associated with practices of reducing lectures and increasing group discussion, negotiated assessment and involving students in decision making about the curriculum and study process. Accordingly we start with a selective coverage of the research into learning that highlighted the differences between individuals as they learn, on which many of the claims about the desirability of student-centred approaches is based.

Research into individual differences in learning

Messick et al (1976) set out the case for emphasising individuality in learning, based on two major themes: the first that individuals 'differ substantially in their styles of thinking and modes of creative expression' and the second that 'the value position that education...should actively foster individual fulfilment and hence should adapt to...these essential human differences to promote greater learning and creativity.'

They draw upon extensive research into cognition in support of these themes, making a key distinction between cognitive styles versus cognitive strategies. The former are manifestations of personality, being stable attitudes and preferences for ways of processing and organising information; cognitive strategies reflect decisions about how to respond to the requirements of a particular task and task situation. While cognitive style is not easily amenable to being directed and changed, cognitive strategies are part of decision-making processes and therefore accessible to conscious reflection and so more able to be changed by the individual learner.

Cognitive strategies for example include contrasting ways of tackling learning, such as working first on general ideas about a topic as opposed to starting with understanding the parts in order to build knowledge of the whole. Other decisions may involve study duration, frequency of study, efforts to become more reflective or to develop metacognitive skills and so on.

Hartley (1998) also provides a useful overview of this area, pointing out that student-centred learning arose from research into the psychology of learning, primarily cognitive approaches. Behaviourism can also support elements of a student-centred view, focusing on reinforcement and the way in which the consequences of doing something tend towards the repetition of that behaviour. Since individuals differ in what they find positively motivating, it is desirable to relate reinforcement to understanding what motivates particular learners and therefore to move towards a student-centred approach.

However it is cognitive research primarily that has driven appreciation of individual differences in learning. This research looks at mental processes of attending to and working on information and sensory impressions in working memory, and on the ways in

which long term structures and schema are built up in long term memory, reflecting individual experiences and interpretations.

One of the most significant contributions in this research is the demonstration that individuals actively interpret the meaning of stimuli in the environment, and that this interpretation reflects what the learner already knows and has experienced. This is at the heart of the observation that what is taught does not necessarily determine what is learned, because learning is filtered through what is already known. Ausubel's work in this area emphasised the importance of 'advance organisers' which signposted the position of new learning material in relation to previous material taught and to general knowledge, so that the learner can see where something 'fits' into an existing framework, in advance of tackling the new material (Ausubel, 1963). Ausubel's dictum expresses succinctly why a focus on where the individual is starting from matters so much in fostering meaningful learning:

The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him (sic) accordingly" (Ausubel, 1968, p. vi)

Issues raised by the promotion of individual differences in learning and student-centred education

Student-centred education was at one stage almost a movement in education, which drew upon research but went beyond a purely research-oriented agenda. It raised practical implications that have not been fully addressed. The practicalities of relating adequately to individual learners for example, present obvious challenges of cost and teacher time, whether in the context of schooling or higher education. Even in the context of a system such as distance education, where learners themselves can make some of the most important choices in terms of where and when to study, it has not been feasible to offer several different versions of the same course, each oriented to different cognitive strategies or learning styles – even if it were possible to reliably identify such. In any event, all forms of effective higher education require that the work of each learner is individually assessed, and the costs of such responsiveness have always entailed thus far, that there is a limit to how much response to individuals is achievable. Online teaching opens up the possibility of responsiveness to include peers responding to each other, but whether or not that constitutes 'student-centred' can also be argued.

In relation to the research base however, much cognitive research has been undertaken in laboratory conditions or in rather specialised circumstances, remote from the day to day realities of schooling/education. The move from identifying individual differences into operationalising student-centred education in practice, has been left largely to individual practitioners to implement. We do not have a very convincing evidence base that student-centred approaches, where they are claimed to exist, necessarily lead to the benefits predicted for them.

Laurillard (1993) has also challenged research into student learning which categorises students according to a typology attempting to reflect their individual differences. She comments on the use of survey instruments which invite students to comment on their approach to learning, expressing their extent of agreement with statements such as these:

- I try to relate ideas in one subject to those in others, whenever possible
- I like to be told precisely what to do in essays or other set work
- It's important for me to do really well in courses here.

Factor analysis of the results of questionnaire surveys of student learning have been used to construct more general approaches, which have been termed 'deep, surface and strategic' approaches to learning (Entwistle, and Tait, 1990). Although the original researchers have always emphasised that students show both consistency of approach alongside variation according to the task and context (Ramsden, 1992), this research has also been taken up by practitioners as a way of categorizing students as falling into one of the three categories of deep, surface or strategic learning. Laurillard advises more caution:

We do not have strong enough evidence of the existence of stable individual learning characteristics, whether motivation, learning style, or study pattern, to need to abandon the idea that a student's approach is most meaningfully seen as being interactive with particular learning situations, and therefore context-dependent. That does not mean that there is no antecedent influence on what a student does during learning. The entire pre-history of their academic experience up to the time of a learning session can be implicated in what they do...each individual student is probably more accurately described as having a repertoire of approaches of which one will be salient for a particular task. (Laurillard, 1993, p.34)

The general idea of learning styles however persists among practitioners who seek to respond to individual differences and find a way of grouping learners by codifying their differences as a practicable and appealing way forward. In a review of the use of learning styles inventories, Coffield et al identified 71 models in use, of which 13 are in widespread use and influential in the field. The weakness of the research base however is a product partly of 'the large number of small-scale applications of particular models to small samples of students in specific contexts' (Coffield et al, 2004, p.2). It also reflects entrenched ideological differences between researchers and even the promotion of particular models by commercial interests.

This report however would be an excellent place to start for anybody seriously interested in the opportunities and risks in using learning style models and measurements in their practice. The authors comment on the complexity of the field and the disputed nature of the research, particularly around the issue on which we have touched here, of whether individuals manifest traits that are reasonably consistent though open to variation and change, or whether it is more productive to look at 'the context-specific and situated nature of learning and the idea of learning biographies rather than styles or approaches' (Coffield et al, 2004 p3). Furthermore, learning style models depend on test instruments which need to be examined in terms of their reliability and validity, as well as the effect sizes of the differences so measured and their impacts on learner behaviour.

Following analysis and review of the reliability, validity and relevance of 13 of the most well known models, the authors contend that the differences between them do matter and that those with the best measures of reliability, consistency, construct validity and predictive validity, and with the more modest claims in relation to practice, are preferred starting points. It is salutary also to be reminded (in the Coffield et al review, 2004) of the conflicting findings prevalent in the field, such as around one of the core notions, which is that where teaching and learning styles match, more positive outcomes will follow. Smith, Sekar and Townsend (2002) reviewed the research and found 'nine studies which showed that learning is more effective where there is a match and nine showing it to be more effective where there is a mismatch' (quoted in Coffield, et al, p39).

Although there are several positive recommendations, including the benefits of raising awareness about how one learns, both as a teacher and a student, the overall tone of this report is to advise caution. Doubtless reflecting the huge pressures on educational

institutions and individual learners and teachers alike, they conclude that 'too much is being expected of relatively simple, self-report tests' (Coffield et al, p.57) and that the respondents themselves may give answers that reflect how they would like to see themselves learning, or their perceptions of the preferred responses, more than an accurate reflection of their learning behaviour. Practitioners should also consider the benefits of other courses of action, such as strengthening the practice of formative assessment, where relatively large effect sizes have been shown across a range of educational levels and across countries. In addition, focusing so much on individual learners deflects attention from the need for institutions themselves to change the ways in which they foster and support learners and teachers.

Issues of power in teaching and learning

Student-centred learning was also associated for at least some, with the ideas of Carl Rogers in relation to respecting the autonomy of individuals and extending towards them unconditional positive regard. Ideas about power in education, and the undesirable impact of powerlessness on the part of students, has fed into some versions of student-centred education and perhaps fostered an unrealistic polarisation between student control versus teacher control. In the context of practical educational systems, the reality is that some balance has to be found between the two.

Practitioners themselves have also countered some of the more extreme claims of the student-centred 'movement' if it can be called that. In the context of higher education for example, it is argued that learning to practice within a disciplinary community is what higher education is about. It is valid therefore for students, particularly at the beginning of their studies, to expect their teachers to demonstrate what it means to practice within a particular disciplinary community, rather than for themselves as learners to define their own starting points and learning tasks. Study as cultural practice entails acceptance that some – notably teachers - are at the heart of the practice, and should not sidestep the power, nor the responsibility, that their position as teachers entails. That responsibility is to establish the conditions in which students can engage most effectively in a curriculum which reflects a shared academic culture rather than the personal views and starting points of student novices in the culture. Individual differences of this sort will not disappear of course, but can be left to the learner to manage, providing that the design of the learning tasks and environment respect their starting points and give them adequate opportunity to participate and make progress (Northedge, 2003).

From individual differences to situated cognition

While student-centred learning as an idea has not disappeared, it does not appear to be the main goal among educational reformists, in a context where emphases on the connections between study and the economy have increased, and where technology now plays such a dominant role in the experience of young people. As an illustration of how educational models have changed and moved beyond student-centred as the central idea, the emphasis on peer learning in the work of Boud and colleagues (2001) provides a useful illustration. They do not see peer learning as a single undifferentiated strategy but as a loose collection of approaches including the following:

- Learning partnerships – dyads with occasional meetings and mutual support
- Study groups – 5-7 students meet regularly to research a topic which they then teach to the rest of their peer group

- Student-led workshops/presentations – small groups present a topic to others in their group and evaluate the results
- Peer grading and assessment – peers take part in marking and providing feedback on each other's work.

These and other practices are intended to encourage reciprocity in learning and to strengthen lifelong learning ability. This is not the peer teaching model where advanced students are paid a fee to teach students at an earlier stage in their degree studies. The thinking on which this approach is based is made clear in the introduction to Boud, Cohen and Sampson (2001)

In everyday life we continually learn from each other. For most of the things we need in our working and personal lives we find enough information and guidance from friends and colleagues. It is relatively uncommon to take a course or consult a teacher. We draw upon whatever resources we need wherever we can find them...It might be argued that these are not necessarily the most efficient ways to go about learning and that they do not always lead to us obtaining accurate information, but they do meet the needs of most people in a timely and convenient fashion. The advantage in learning from people we know is that they are, or have been, in a similar position to ourselves. They have faced the same challenges as we have in the same context, they talk to us in our own language and we can ask them what may appear, in other situations, to be silly questions. Learning from each other is not only a feature of informal learning, it occurs in all courses at all levels...The first approach, when stuck on a problem, is normally to ask another student, not the teacher. Not only can they provide each other with useful information but sharing the experience of learning also makes it less burdensome and more enjoyable. The power of peer learning is manifest daily in popular culture and many books and movies illustrate its influence. (Boud et al 2001 p1)

The authors make clear that this approach is 'based on the assumption that there is considerable benefit in taking what we know of the value of informal peer learning, making it explicit and using it more directly in the design and conduct of higher education courses.' The emphasis on learning in everyday contexts and on relationships where the power of teachers in authority is reduced, suggests that this approach draws strongly on research into learning outside formal education and on a situated theory of learning. This research is the focus of the next section and helps us see how education has been influenced by anthropological and socio-cultural approaches to learning as distinct from the cognitive approaches with which we began.

Socio-cultural approaches to learning.

Fuelled by the need to address why formal education fails some children and for all of us, does not transfer smoothly and reliably to transform our capabilities in society and the workplace, researchers turned during the seventies and eighties to find out more about how people learn outside formal education. (In an account as brief as this one, much is missed out but I should point out that earlier research by Vygotsky, Leontiev and others played a very strong role in raising awareness of the importance of cultural tools and of social relationships in shaping how people learn.) This research identified the limitations of focusing purely on cognition and it raised the importance of the context for learning – not only in the sense of a container in which learning happened, but also as an element contributing to the learning. Rogoff says this in her introduction to Rogoff and Lave (1984):

Cognitive developmental work has been overly concerned with describing mental changes which are assumed to occur within the individual independent of contextual influences...Observations that children's capabilities appear quite different in their familiar environments than in the laboratory have increased developmentalists' concern with the role of context...These findings that laboratory skills seem rather separate from thinking outside of the laboratory may lead to an assumption that only in natural environments can valid measure of people's real cognitive processes be found...However, the dichotomy of laboratory vs. 'natural' cognition is an oversimplification...to assume that under ideal circumstances people's underlying capacities or processes can be attributed to their internal functioning without concern for the context of their activity is unrealistic. *Thinking is intricately interwoven with the context of the problem to be solved. The context includes the problem's physical and conceptual structure as well as the purpose of the activity and the social milieu in which it is embedded.* One must attend to the content and the context of intellectual activity in order to understand thought processes. This is the case for any situation in which thinking is studied, including the laboratory context, which is not context-free, as researchers frequently assume...Evidence suggests that our ability to control and orchestrate cognitive skills is not an abstract context-free competence which may be easily transferred across widely diverse problem domains but consists rather of cognitive activity tied specifically to context. (Rogoff & Lave, 1984, p1-3, emphasis added)

This account of the importance of context in learning, and the challenge to purely cognitive approaches, fed into an approach termed variously 'situated cognition' or 'situated learning'. The Journal of the American Educational Research Association, *Educational Researcher*, carried many articles debating the emphasis on cognitive versus social approaches to learning over this period. One of the most cited articles was Brown, Collins and Duguid (1989) who criticised formal schooling in so far as it promoted a view that knowledge can be completely abstracted from its context of use and efficiently transferred to the learner in the form of 'abstract, decontextualized formal concepts' (Brown et al, 1989 p32). They argued against the assumption that we can separate what is learned from how it is learned and used.

The activity in which knowledge is developed and deployed, it is now argued, is not separable from or ancillary to learning and cognition. Nor is it neutral. Rather, it is an integral part of what is learned. Situations might be said to co-produce knowledge through activity. Learning and cognition...are fundamentally situated.' (Brown et al, 1989 p32)

The authors acknowledge their debt to the work of Jean Lave on apprenticeship and everyday cognition. Her anthropological study of tailors in West Africa and their use of apprenticeship for reproduction of the social practice of being a tailor, helped to shift perceptions among learning researchers about the embeddedness of learning in physical and social environments and the processes of legitimate peripheral participation that could be used with such positive effects for learning in 'communities of practice' (Lave, 1988, Lave and Wenger, 1991). They focused on why activity and situations are integral to understanding and learning, arguing that decontextualised concepts are like tools that we know about but cannot use. Formal education must address this by relating learning to the professional communities and contexts of use of the knowledge which is their goal. Getting inside such contexts and communities is the only way, they argued, to understand what knowledge means and what it is for. Academic disciplines are primarily communities, connected not just by shared tasks but 'bound by intricate, socially constructed webs of belief, which are essential to understanding what they do' (Brown et al 1989 and Geertz, 1983). Consequently the culture of schooling is

seen as inauthentic because it requires forms of activity and practices different from the academic communities outside schools and without connection to those contexts.

Brown et al promote the approach of cognitive apprenticeship as 'supporting learning in a domain by enabling students to acquire, develop, and use cognitive tools in authentic domain activity...the term apprenticeship helps to emphasize the centrality of activity in learning and knowledge and highlights the inherently context-dependent, situated and enculturating nature of learning.' (Brown et al, 1989 p39). This approach also leads to an emphasis on social interaction and conversation as the primary ways in which cultural practices are learned and also changed. Informal conversation among groups and teams is essential for learning and schooling should incorporate this not try to inhibit learning from each other and sharing problem solving.

It may be possible to see how such an approach moved educators away from their focus on differences between individual learners as the driving force in how they should teach. Situated cognition/cognitive apprenticeship are approaches that put activity and embodied communities into the driving position. Just as learners in real life - whom Brown et al refers to as 'just plain folks' - do not start by identifying how they differ one from another but build ways of talking and acting most likely to help them to achieve their shared task, so it should be in education. Schools, it is argued, should design the activity and the interactions between learners in ways that support their being able to use knowledge within authentic settings i.e. in contexts of use outside of schools. If 'student-centred learning' is meant to indicate practices most likely to lead to effective learning, then emphasis on groups rather than individuals, and on authentic apprenticeship tasks would count as 'student-centred' within this vision. How different though this is from the approaches that have typically been associated with 'student-centred', which emphasise individual learning styles and learner choice. There are connections too, in the emphasis on group discussion and learning rather than teaching, under both headings, but in other ways they start from a different point and lead in different directions.

Research on learning and the implications for formal education.

Following publication of this and other articles about situated cognition and situated learning, some counter arguments and qualifications of the position outlined by Brown et al in their 1989 article have been made. Palincsar (1989) for example disagrees that it is necessary 'to adopt the belief system of the disciplinary cultures in which...educational tools are to be used.' She goes further, querying what is so valuable about practitioner culture that it must be assimilated? Rivalries, splinter groups, weak links and so on, may mean that there is little shared culture. She also challenges the practicality of enculturation into the number of disciplinary cultures that are part of the mainstream of teaching, in terms of time, willingness of practitioners to engage and so on.

These criticisms were taken further by Anderson, Reder and Simon (1996), who argued that situated learning has influenced education towards approaches that are not necessarily progressive or supported by research, though this may not be the intention of the researchers involved. They summarised the central claims of situated learning's agenda for education as follows:

- Action is grounded in the concrete situation in which it occurs
- Knowledge does not transfer between tasks
- Training by abstraction if of little use

- Instruction must be done in complex, social environments (Anderson et al, 1996, p5)

In each case they provide critique and some counter argument. Action may be situationally grounded for example, but to generalise beyond that to argue that all knowledge is specific to a local context and will not transfer, is misleading. The fact that students who demonstrate mathematical expertise in everyday situations but cannot succeed in school maths, does not prove that expertise in school maths never transfers. Research has shown that transfer of learning may completely fail or may succeed to varying degrees – dependent on factors such as the similarity between the contexts, amount of practice, and the representation of the transfer task (see Anderson et al, 1996 for numerous references in support of these statements). Research into encouraging transfer, points towards practices that clearly increase the likelihood of transfer occurring:

...transfer is enhanced when training involves multiple examples and encourages learners to reflect on the potential for transfer (Anderson et al 1996, p.8)

It seems therefore that if students are made aware of the need to use their learning in different contexts, and helped to become aware of the cues that signal the need to use existing skills, more transfer will happen. In relation to claims 3 and 4 above, the authors provide evidence of research which does show that abstraction can improve learning and performance and that complex social environments may not necessarily aid learning. Some skills can be trained separately from addressing the skills required to perform complex social tasks in situ e.g. an accountant might first learn how to construct and use tax codes before using these during interaction with clients. Part training independent of the larger task can be more effective, but it is also likely to be important to train in the complex situation of whole task performance. Anderson et al (1996) give the example of an orchestra player; hours of independent practice alone are essential for a good performance, but so is rehearsal as a member of the full orchestra. To assert that only one approach is important is misleading and judgements about how much abstraction and how much part-training are required clearly depend on the nature of the domain or practice, the task and the context. The authors argue for more research into when narrower or broader contexts are required in education, and when narrower or broader skills are optimal for effective learning. Their conclusions acknowledge the positive contribution of the situated learning movement, but reassert the importance of not-overclaiming the position and the need to recognise that there are no easy generalisations:

‘while cognition is partly context-dependent, it is also partly context-independent; while there are dramatic failures of transfer, there are also dramatic successes; while concrete instruction helps, abstract instruction also helps; while some performances benefit from training in a social context, others do not.’ (Anderson et al, 1996, p.10)

The balance we require: we need both acquisitive and participatory learning.

Educational practice reflects many things over and above research into learning. However, policy makers, practitioners and researchers alike construct educational systems drawing upon a rich vein of metaphors about learning which shape what we think learning is and how it should be fostered in our schools and universities. Sfard (1998) draws our attention to two core metaphors about learning that run through all our debates, namely the metaphor of learning as having something or possessing something, and learning as being more able to participate in something. We might counterpose them as metaphors of having more on the one hand (acquisition metaphor) and on the other, being more (participation metaphor). She

charts the changes from an emphasis on cognition and on what the individual has in their head, towards the more situated and participatory approaches to learning that we have just outlined. Her conclusion though is salutary. She reminds us of the huge range of what it is that we learn over a lifetime, and that this range of kinds of learning means that no single metaphor is enough to cover everything. She also tries to disabuse us of the tendency to polarise theories or paradigms, arguing that behaviourist accounts can draw on participatory metaphors as well as acquisitive, while social theories of learning can draw on acquisitive metaphors as well as participatory – even if implicitly.

This feeds in to her conclusion, which is that we need both metaphors, acquisition and participation, because of the range of our learning and because of the fact that it is better to walk on two legs than one. Each paradigm challenges the other and stimulates sharper thinking and problem solving, reducing our tendency to easy conclusions and the hubris of thinking that we can develop a theory to cover learning as a whole:

The relative advantages of each of the two metaphors make it difficult to give up either of them. Each has something to offer that the other cannot provide...metaphorical pluralism embraces a promise of better research and a more satisfactory practice. The basic tension between seemingly conflicting metaphors is our protection against theoretical excesses, and is a source of power...the metaphors we use should not be held responsible for unsatisfactory practices, but rather their interpretations. When a theory is translated into an instructional prescription, exclusivity becomes the worst enemy of success. Educational practices have an overpowering propensity for extreme, one-for-all practical recipes. A trendy mixture of constructivist, social-interactionist, and situationist approaches – which has much to do with the participation metaphor – is often translated into a total banishment of ‘teaching by telling’, an imperative to make ‘cooperative learning’ mandatory to all, and a complete delegitimatization of instruction that is not ‘problem-based’ or not situated in a real-life context. But this means putting too much of a good thing into one pot. Because no two students have the same needs and no two teachers arrive at their best performance in the same way, theoretical exclusivity and didactic single-mindedness can be trusted to make even the best of educational ideas fail.’ (Sfard, 1998, p11)

So this brings us back to where we began, which was with an idea – being student-centred – that can stimulate much useful thinking about effective educational practice, but when used as a slogan in order to polarise practice into good and bad categories, works to undermine critical thinking and review of practice.

Bringing it back home to online and distance education

Over more than a decade, online teaching methods have provided new opportunities for taking forward the agenda of student-centred education, in the sense of exploiting technology for ways of supporting effective learning. The approach of constructivism towards learning, emphasising the ways in which learners actively construct meaning through their own experience and interpretations, has been at the heart of efforts to construct environments online where learners will be motivated to engage and to become actively involved in learning. In a much quoted article, Jonassen et al (1995) set out arguments for distance education to move away from a behaviourist approach and towards social, participatory approaches, that reflect emphases in Brown et al’s language of learning as enculturation and peer discussion:

Our belief is that technology can be used to create communities of learners and practitioners and can facilitate the interactions and activities necessary for solving real-world problems...constructivism can help us reconceptualise distance education by using

the new technologies to significantly alter how we conduct distance education...constructivist principles provide a set of guiding principles to help designers and teachers create learner-centered, collaborative environments that support reflective and experiential processes. Students and instructors can then build meaning, understanding, and relevant practice together and go far beyond the mere movement of information from instructors' minds to students' notebooks.' Jonassen et al 1995, p8)

The article unashamedly sets up a polarisation between cognitive psychology and situated learning, arguing categorically that 'learning is conversation' and that communities of practitioners socially negotiate the meaning of phenomena. The authors talk of a revolution in learning theory which has transcended the old dialectic of behaviourism-cognitivism, and a revolution with which they clearly intend to be aligned. While this may not be a balanced account of the research literature, it certainly marked a turning point in how the possibilities for distance education pedagogy were perceived, and a rallying cry for moving away from anything like a programmed instruction approach, towards richly interactive learning environments. The authors focused on principles of authentic context, construction of knowledge, collaboration and conversation – all of which could be delivered in appropriately designed online learning environments. Perhaps the most widespread tool used for this purpose has been online conferencing, text only and asynchronous, now increasingly audio-visual and synchronous. Threaded through Jonassen et al's account is the desirability of building communities of practice using these online approaches. I conclude this paper with a brief discussion of the impact of Wenger's (1998) approach to communities of practice, as one of the theories underlying this, and with some reflections on the challenges of working with the new possibilities that technology offers in the twenty first century.

Wenger's theory drew, as he states explicitly, on the earlier work of Jean Lave, and builds onto this a narrative about practice communities that has been hugely influential in terms of higher education approaches to online teaching (Hodgson and Reynolds, 2005). His theory sets out communities of practice as developing around shared tasks, inter-dependency in achieving the task and a shared terminology and discourse. The community is core to learning of the practice which is its object, in that new entrants work within it, using legitimate peripheral participation at the outset, and gradually work closer to the centre of the practice as they develop their expertise. Their learning is integrated with their sense of identity, as learning to be a practitioner within the community involves shared practices within a boundary which marks out the community from others. Boundaries are a sign of learning and learning at the boundary between communities is portrayed as both difficult and particularly rewarding.

Educators seeking to make the best use of online interaction have often described their efforts in terms of building online communities of practice. Where students share the same practice in their off-line lives, this might be a realistic goal. More often, the original idea of a community of practice was stretched to encompass students as themselves constituting a community of learners, or a community of shared interests, if not practices. The practical experience of building online communities has proved to be challenging and many practitioner accounts demonstrate the barriers that novices experience in contributing to online forums, the need for expertise in design of tasks and environments such that contributions are sufficient to generate a lively and welcoming environment, and the challenges of evaluating the results (Putz & Arnold, 2001). Researchers have generated new ways of analysing contributions online (Garrison et al, 2006), in an effort to see whether online interaction and community has delivered the kinds of complex conceptual learning and personal transformation that has so often been the acclaimed goal.

There have been successes in this area (Leach, 2002 and Thorpe et al, 2007) as well as failure, but we have moved beyond the early studies which focused on limited comparison

between face to face classes and online, in order essentially to check out that the online experience was no less effective than the face to face (See Arbaugh et al, 2009 for a review of such studies in the context of Business). Students entering further and higher education take for granted the use of technology as core to their learning. While several major studies have countered the over-simple characterisation of a 'net generation', all have shown that most students use a core of technologies on a daily and weekly basis, with significant minorities going further in terms of their use of social networking and active contribution to the Web (Kennedy et al, 2008; Jones & Cross, 2009). The integration of technology into students' social lives entails that both areas overlap and interleave, with informal connections offering support for many students as well as diversion (Jones and Healing, 2010).

In the context of UK higher education students in their first year, a recent survey did not show that they experienced disappointment through insufficient use of technology in their university courses (Ipsos MORI, 2008). Nevertheless, how best to use ICT remains a challenge, and one in which the terms of the challenge have changed considerably since the calls for student-centred learning around thirty years ago. Situated learning criticised education for being cut off from the practitioner communities where knowledge is used. ICT has ensured that students are more connected with each other than ever before, in terms of informal connections while studying. However we have some way to go in using technology to build more and more productive connection between the specialised contexts of universities and the organisations and societies that their students and they should serve. Hemmi, Bayne and Land (2009) describe how educators who use Web tools for blogs, wikis and so on, tend to impose constraints on the tools so that they fit with familiar ways of organising and assessing. This may be justifiable in terms of the higher education context. But there is also some evidence that teachers do constrain their ideas about ICT usage so as to fit existing ideas about teaching (Gonzalez, 2010). However, ICT can be used not only to deliver existing teaching objectives, but to exploit the new potential arising from the social and individual connectedness that ICT can deliver, freed to some extent from constraints of place and time. In a recent study at the Open University, students studying a range of work-related courses were able to make more effective connections between what they were learning and its usefulness for them in work. As adults studying alongside home and work responsibilities, they found that online study tended to reduce the boundary between their experience of study and their experience of work.

Some aspects of this were very familiar; students made better use of time because they could access their courses wherever they had broadband access, including at work. They used their work experience to decide whether the technology on their course was helpful or otherwise. Some tools were taken from the study context and used at work, enhancing the student's capability even during the study process. Extensive use of synchronous audio-visual conferencing in a Masters Engineering course enabled small teams of students to work collaboratively on a project where the group marks determined their own pass or failure. Students were highly enthusiastic about this use of ICT because they could not otherwise have worked as a team, and reflection on the team process was enhanced through replay of their audio-visual conferences – something that cannot normally be done with face to face meetings.

...I think it's an excellent course. ..for me it reflects what happens really...living in the real world in so much as you know, you often don't have the luxury of meeting face to face, you've got to...network with people...in different parts of the world. Particularly you know, in the company I work with...and some of the tools I've learnt on [MEng.] has been really good for that. So I think it's a really useful course, yeah...without a doubt it's been of benefit. .. I think if the OU tried to make it more structured and regimented you would lose

some of that learning experience...things you can apply to your own work context. (Andy, student on Team Engineering, MEng course)

The courses included in this study were developed recently at the Open University, and in different ways sought to make connections between study and work, enhanced by use of ICT. ICT enabled students to work at the boundary between work and study and while campus-based universities have some experience of this through practices such as placements and sandwich courses, these normally affect a small number of students and the boundary between study and work remains. ICT can support much more extensive connections between the university and the world beyond it. It can enable students to move across this boundary easily and frequently, if they so wish. Is this a form of student-centred learning? Perhaps so, but it seems more important now to ask whether it is a form of effective learning and if so why? Our study was on a small scale and we are careful not to overclaim its significance. Nevertheless, envisioning new potential made possible by ICT, taking us beyond what we have been able to deliver before, is an important response to the challenge we all face in the 21st century, where technology is an integral part of our students' lives.

Conclusion

This paper has been about the connections between research and practice, stimulated by my theme of student-centred learning. This has been a personal response to my theme and not an exhaustive account. Our conference signals the very great challenges we all face in the conditions our students face in the 21st century – and also the opportunities. Whatever 'student-centred' meant over the last thirty years, it must surely be redefined and rethought now. Technology will inescapably play a role in that rethinking. We often hear it stated that technology should serve pedagogy but technology plays a more active role than that would imply. The huge emphasis on constructivism in distance and online learning in the late twentieth and early twenty first century for example, was, I suggest, as much a product of the dialogic possibilities of online forums as it was of a commitment to the desirability of constructivism as a theoretical position. I close with a quotation from an author who expresses the relationship between pedagogy and technology, in my view, both accurately and persuasively:

...all pedagogies necessarily involve technologies of communication and thus the history of pedagogy is inextricably linked to the history of media...pedagogies never live independently of prevailing media...technologies work dynamically with pedagogies, not for them, and in the process they become mutually determining.
Cousin, 2005, p118-119

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