

Using socially constructed technology to enhance learning in higher education

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Abstract

This paper provides a short account of the educational benefits and pitfalls of using Web 2.0 technology (e.g. wikis and blogs) in teaching and learning in higher education. It draws on constructivist principles to explain and support the use of collaborative learning tools in higher education, and explores the factors necessary to create a successful e-learning environment. Support for use of such e-learning tools is placed in the context of recent shifts in pedagogical approaches to learning, the increase in demand for higher education, the widening participation agenda, and the technical revolution. It intends to convey the importance of developing collaborative learning communities within higher education, whilst keeping focus on the pedagogical, rather than technological, reasons for change.

Keywords: constructivism; virtual learning environment; collaborative learning.

Over the past few decades the demand for higher education has increased exponentially, with the percentage of the population who attain a degree rapidly rising. This has inevitably created funding issues and input costs related to output, and so institutions have been required to focus efforts on promoting self-directed learning outside of lectures. Some educators have attempted to address this using technology to bridge the gaps between in-class learning and core unit requirements through online discussions and formative assessment. This expansion and widening delivery of education has coincided with a technological revolution. The online learning environment can offer educators new opportunities for adapting learning and teaching, and offers students a more holistic learning experience.

There exists high pressure on institutions to adopt e-learning technologies, which originate from policymakers and stakeholders who are driven by political agendas reacting to demands for economic and social development. Anderson et al. (2006) outline two key drivers to adopting e-learning: the need to 'upskill' the population; and the need for accessible and flexible access to education to meet the lifelong learning agenda.

With this shift towards online learning and the widening participation agenda, teaching staff must reassess and reconsider their conceptions of student learning and what students need (Gibbs 2000, cited Kahn and Baume, 2003). With an increase in the use of the internet and the World Wide Web, the past decade has seen educators experimenting with different forms of distance, open and flexible learning. E-learning for education and training professionals spread rapidly over a few years (Clarke, 2004) and is now extremely popular all over the world. It provides learners with an alternative to face-to-face learning, and allows for deeper engagement in learning. Encouraging students to manage information rather than merely accumulate it will result in stronger connections in long term memory and a deeper level of understanding. Deep learning requires the student to pay attention to the underlying meaning, as opposed to surface learning that involves mere description and rote learning, and which often occurs as a result of low levels of motivation. Deep learning depends on levels of engagement, so the more the student is engaged with the topic the more likely it is that deep learning will occur (Ramsden, 1997).

With learning environments becoming more virtual and mobile, it seems no longer acceptable to simply use these environments to deliver content alone to students. In addition to critical assessment and evaluation of information, it is vital that collaborative and interactive communities are created within these environments, in order to foster the higher level thinking and reflective processes we want our students to develop.

The purpose of this paper is to explore whether we should in fact be thinking of education and learning in terms of changes in communication and information technologies, and whether learning can be enhanced through the use of Web 2.0 tools. Are we at risk of placing too much emphasis on the technology whilst not giving enough consideration to the pedagogical implications of e-learning?

Why should we be using Virtual Learning Environments (VLEs) for teaching and learning in higher education? Recent pedagogical shifts in theories of learning have progressed

from behaviourist models towards social constructivist models. Society has now recognised that learning is contextual and more than a simple linear step from A to B. The author's views on learning are supported by constructivist theory, which maintains that learning is developed through activity and emphasis should focus on creating social contexts for learning, rather than on individual tasks. VLEs may encourage students to work collaboratively, and share and re-use resources. E-learning may also develop student-centred learning, where the student is at the heart of everything that is done. Collaborative communication tools within VLEs emphasise this shared social context of learning. However, this technology must be combined and supported with effective pedagogy and reflective teaching (Garrison and Anderson, 2003).

Online learning is tending towards a constructivist pedagogy, and by encouraging student interaction and learning through construction of personal meaning, collaborative learning is likely to rate high within this arena. It is therefore highly desirable that new tools and technologies such as blogs, wikis, and discussion boards are at least tried and tested in the hope that they assist in this constructive learning with which our education system is striving to align. Many of the technologies that are now used in teaching and learning were not originally designed as pedagogical tools, but the introduction of social software into an educational setting has the potential to enable learners to become more active in their learning and provide more opportunities for learners to collaborate with peers and develop higher order cognitive skills. New tools such as wikis, blogs and podcasts all lean towards supporting a constructivist way of learning, as they encourage students to construct their own content.

Recent shifts in higher education have resulted in the view that university education should consist of 'critical communities of learners' (Garrison and Anderson, 2003, p.23). This has 'become a practical necessity in the realisation of relevant, meaningful, and continuous learning' (Garrison and Anderson, 2003, p.23). If the use of interactive learning tools in higher education aims to achieve higher order learning in these VLEs, then a community of learners is a vital element of this educational experience (Garrison and Anderson, 2003).

This idea of communities of learners is supported by a social constructivist view of learning, underpinned by the premise that knowledge creation is not an individual experience, but a shared one, and knowledge comes about through negotiating within these collaborative discourse communities (Prawat and Floden, 1994). There have been

many studies investigating the ways in which higher order thinking and increased cognitive processing can be encouraged in collaborative learning environments such as discussion boards (e.g. Schellens and Valcke, 2005; Kanuka and Garrison, 2004). However, simply setting up these discussion forums within web management tools and VLEs does not guarantee the efficient and effective use of these facilities. Hung and Der-Thang (2001) point out that people forming a community do so because they are able to identify with a common shared goal and identity, or a common need. These authors propose that the understanding of what makes these communities vibrant and sustainable may be possible through the exploration of situated cognition and the related notions of Vygotskian thought and communities of practice. A vibrant and sustainable e-learning environment depends on the consideration of four factors: situatedness, commonality, interdependency, and infrastructure. Learners are more likely to pick up implicit and explicit knowledge if learning is embedded in rich situations, if the tasks are meaningful, and if they have a reason to work together by having something in common. It also helps if they depend on one another in terms of varying degrees of expertise, competency etc., and if they understand the structure of the community with which they are engaging. Due to the reflective and metacognitive nature of learning, the e-learning environment should concentrate on tasks to foster 'learning through doing'.

If the factors discussed here are the necessary ingredients for a successful and efficient e-learning community, then simple discussion forums may not be able to negotiate the complexities of sustaining an online community. In this respect, the author believes that it is pertinent that web tools and technologies are applied to educational settings only if they can afford to engage and link the learners sufficiently. It is the author's opinion that tools such as wikis and blogs attempt to move beyond the potentially unstructured notion of a discussion forum, by creating links and offering richer collaborative opportunities to its learning community. This computer supported collaborative learning helps to promote peer interaction, and can facilitate the sharing of knowledge amongst a group of learners (Lipponen, 2002).

Blogs are sometimes used as a form of student communication in higher education, with increasingly more courses using this method to engage students and encourage more detailed and complex levels of communication and reflection. Williams and Jacobs (2004) propose that blogs are a product of convenience rather than design. Blogs encourage the sharing of knowledge, interactivity, community and debate, and are therefore useful in

increasing collaborative learning. Oravec (2002a; 2002b) claims one of the benefits of blogging is that it is suited to students' 'unique voices' (Oravec, 2002b, p.618), thus empowering them and encouraging critical and analytical thinking. This follows from the assumption that if one wants to develop and sustain one's 'own voice', then it is first necessary to create and defend opinions. Writing blogs encourages students to confront their opinions, be critical and analytical of these opinions, and also consider how others may interpret or reflect on these opinions (Armstrong et al., 2004)

In order to assess the educational value of blogging Ferdig and Trammel (2004) suggest that it may be useful to draw on educational theories of Vygotsky. They propose that blogging is able to support and encourage knowledge construction because of the immediate and comment based nature of the blogging system. The blogging interface is set up in a feedback system design and therefore naturally encourages reflection and analysis, and the revisiting and re-learning of information, thus enriching the learning experience. The interactivity that blogs engender has the potential to lead to active learning and higher order thinking.

In contrast to a blog, which tends to be the reflections of one person, a wiki is a website that allows people to upload content, and others to add to and edit that content, thus making them much more collaborative in nature than a blog. A wiki eventually forms an inter-related network of ideas and issues and encourages cross linking that can be altered and built on by any member of the group. Wikis promote collaboration and allow users to interact with it over time (Duffy and Bruns, 2006). Some of the educational uses of a wiki include using it to develop research projects and as a record of their work, using it in distance learning courses for materials to be uploaded and commented on and edited by the students, and even to facilitate a presentation (Duffy and Bruns, 2006).

Paivio's (1986) dual coding theory could also present support for the use of wikis to maximise learning benefits and experiences. Information that is received in different modes is processed more efficiently than information received in a single mode, and as different parts of the brain process different modes this results in more encoding, in turn strengthening long term memory. Wikis commonly comprise of information and ideas in various formats, including video pod casts, written text, pictures, and interactive components. Presenting information in a number of formats also increases accessibility and goes some way to addressing a number of different learning preferences and needs.

Information must be meaningful in order for learning to occur; learning cannot occur in isolation, it must be contextualised. Familiarity can influence meaningfulness, and therefore recapping on what has previously been learned, allowing learners to make links between pieces of information will increase cognitive engagement, and therefore efficient learning.

Continuing in the vein of constructivist principles, it is important to give learners control over their own learning and allow them to choose their own sequence of learning, and to give them the opportunity to reflect on their learning and to internalise the information. This can be achieved through the use of wikis as engagement and collaboration with other learners helps to encourage reflection. Collaborative and cooperative learning should also be encouraged, as working with other learners gives real life experience, and allows learners to share practice and advice. Keeping learners active may also result in a higher level of processing (e.g., deeper engagement, reinforcement of ideas, contextualisation of content, assimilation of information), which in turn may facilitate the creation of personalised meaning. Although there has been little research into the actual (measurable) benefits of using technology in learning, one study carried out by Krentler and Willis-Flurry (2005) revealed that students who engaged with technology benefited from increased learning as measured by stronger performance on their course. Studies by Wheeler and Wheeler (2007) also show that the use of wikis can improve academic writing skills.

This paper only briefly addresses some of the issues surrounding the use of Web 2.0 technologies in teaching and learning in higher education. Technologies are developing rapidly and new tools emerge frequently, which shape the opportunities available to educators. Of course, the exact tools used must always stem from the pedagogical needs of the teaching situation. These tools are social and community based, and depend on the interaction and engagement of the users: blogs offer personalised expressions of ideas and views; wikis offer more collaborative task-oriented developments. Using these wikis and blogs encourages the learner to use and develop their cognitive skills, and the existence of these tools allows the students access to learning environments that are changing and evolving.

These socially established technologies are well placed to support the opinion that learning is a socially constructed concept, which seems fitting given the popular

pedagogical theory of recent times. Although it may seem to some that blogs are somewhat limited in their success, there is some evidence that wikis promote and encourage the social construction of knowledge, and provide a place for students to draw upon resources and make sense out of things in order that they may construct personal and meaningful solutions to given problems.

While the author accepts that technology should be used to enhance and improve learning and teaching in higher education, it should not be used to initiate or drive it. Poorly designed e-learning can be damaging, and the benefits of collaborative learning will only occur if the set up and execution of tasks is carefully planned. Where technology is utilised to help promote enhanced learning, collaboration and communities of practice; it can be a vehicle to enable change, rather than a rationale for change.

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