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## Blending technology with pedagogy

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## **Blending technology with pedagogy**

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**Abstract** The speed at which internet and web platform technologies, including software and hardware development, fast outstrips the speed at which the potential for pedagogic innovation can be, and is being, fully evaluated. Often new technologies are not specifically developed for use within a pedagogic purpose. We also see that development is often rooted in the entertainment businesses. This drives the customer to become familiar with the technology ahead of the educational innovators, making the task of blending them into teaching and learning all the more difficult. The use of a specific technology by a lecturer in higher education for use within their teaching practice is then determined more by what is available rather than using a technology to match the pedagogy. The question is whether to allow the technology to drive the pedagogy or vice versa. Ultimately the masses dictate the take up of new technologies and leave the lecturer and its potential pedagogic use playing catch-up as students move on to the next exciting piece of communication technology. This makes evaluation almost impossible. In this paper the authors have considered some educational frameworks which have helped to inform their choice of technology for pedagogic intent. Although the authors and their experience is based mainly in distance education this paper is aimed at assisting lecturers in higher education generally with a view to selecting appropriate technologies to support their pedagogy. It may therefore be possible to take a different approach, notwithstanding how quickly technologies are adopted and then abandoned.

### **Introduction**

There has always been a fascination for new technology. Novelty is a key factor in any new form of learning environment or innovative use of technology. Bates (2005) lists 'novelty' as one of the key factors in his ACTIONS framework for the adoption of new technology. It is implied that implementation of a technology in education is enhanced if novelty is present. The trouble with this is that it doesn't take long for new technology to become old technology and the innovators move on without properly evaluating what they have done.

In Table 1, below, we show how we perceive technology to have evolved from the pre-digital (analogue) era, through digital, to the current virtual era centred on the Internet. The final row in the table gives our own view of the approximate timescales in which these have featured (particularly in distance education). It does perhaps indicate we still have some time left to make our mark on the virtual pedagogy.

Table 1. The evolution of teaching tools and environments

Analogue →	Digital →	Web / VLE
Face to face →	CMCs →	Virtual
Telephone →	Email Mobile phone →	Skype Text / SMS / MMS
Cassette and video tape →	CD / DVD →	Podcast RSS
Tutorial →	Chat room → Instant messaging →	Virtual classroom Virtual world
Discussion & debate →	Conferencing → Forum →	Social networking Blogging / Twitter
Handout →	File transfer →	Wiki
1960s / 1970s →	1980s / 1990s →	2000s / Blended era

We discuss below two brief case studies (Web 2.0 and Tablet PC) which exemplify the extent to which Open University tutors are able to engage with new technology and tools to support their teaching.

Garrison and Anderson (2003) state that the 'purpose of innovation must be the enhancement of the quality of the learning environment and learning outcomes'. What we need to prove is that we are indeed affecting the quality, and not just playing at innovating. We need to blend the technology with the pedagogy.

## Educational Theory and Practice

According to Mayes and de Freitas (2004) there are three broad approaches to understanding how people learn. Of these the situative approach leans more towards developing practice, and therefore learning, within a community. This idea of a community is also promoted by Garrison and Anderson (2003) in their community of inquiry and their model which integrates cognitive, social and teaching presence. It is the last of these three, teaching presence, that we will highlight as a key feature for an effective blend of online and traditional forms of teaching and learning.

The educational framework of Gibbs and Simpson (2003) identified eleven conditions including the following five themes which support student learning;

- Quantity and distribution of student effort
- Quality and level of student effort
- Quantity and timing of feedback
- Quality of feedback
- Student response to feedback

In the tablet PC case study, it was the quality and timing of feedback and quantity of feedback that was evaluated when lecturers used a tablet PC to provide feedback on paperless assignments. This resulted from the move towards paperless assessment at The Open University, with around 63% of all assessment being submitted over the internet in 2008.

## Web 2.0

Since Web 2.0 was first coined as a popular phrase by Tim O'Reilly (2005) educators have been keen to exploit the potential of interactive web tools to support their teaching. However, have they sought to improve their students' learning? The Open University introduced a new course in 2005 called 'Networked Living' which explores the abundance of ICT networks in everyday life. The teaching approach has used a blend of online material and traditional course content (text books) while also encouraging the tutors to engage with the web in support of students. The authors of this document have been actively involved with the course and in a study of one tutor's student groups we have observed a steady increase in retention of students as shown in Table 2 below. This tutor has utilised a variety of proactive and innovative methods of engaging with students.

Table 2. Retention rates for one tutor providing proactive online support

Year	2004	2005	2006	2007	2008
Initial group size	11	17	15	13	19
Retention	64%	71%	73%	85%	89%

Methods used to engage with students include podcasts to provide generic feedback to the whole group, social bookmarking to highlight web articles and sites of interest, creating a web site from student activities, instant messaging, and a weekly forum message which contains what some students regarded as the tutor's blog.

Using the FirstClass conferencing system this weekly 'Tutor News' message (Figure 1) was used as a portal to all other online activity and became the focus of student activity. The 'History' feature of the system allowed easy interrogation of useful management information such as the time and date the messages were read by members of the student group. Readership numbers were found to average around 95% for the duration of a course, proving that this was a key resource for the students. This proactive use of the online forum integrates the teaching and social presence that are two of the vital factors in Garrison and Anderson's (2003) community of inquiry.

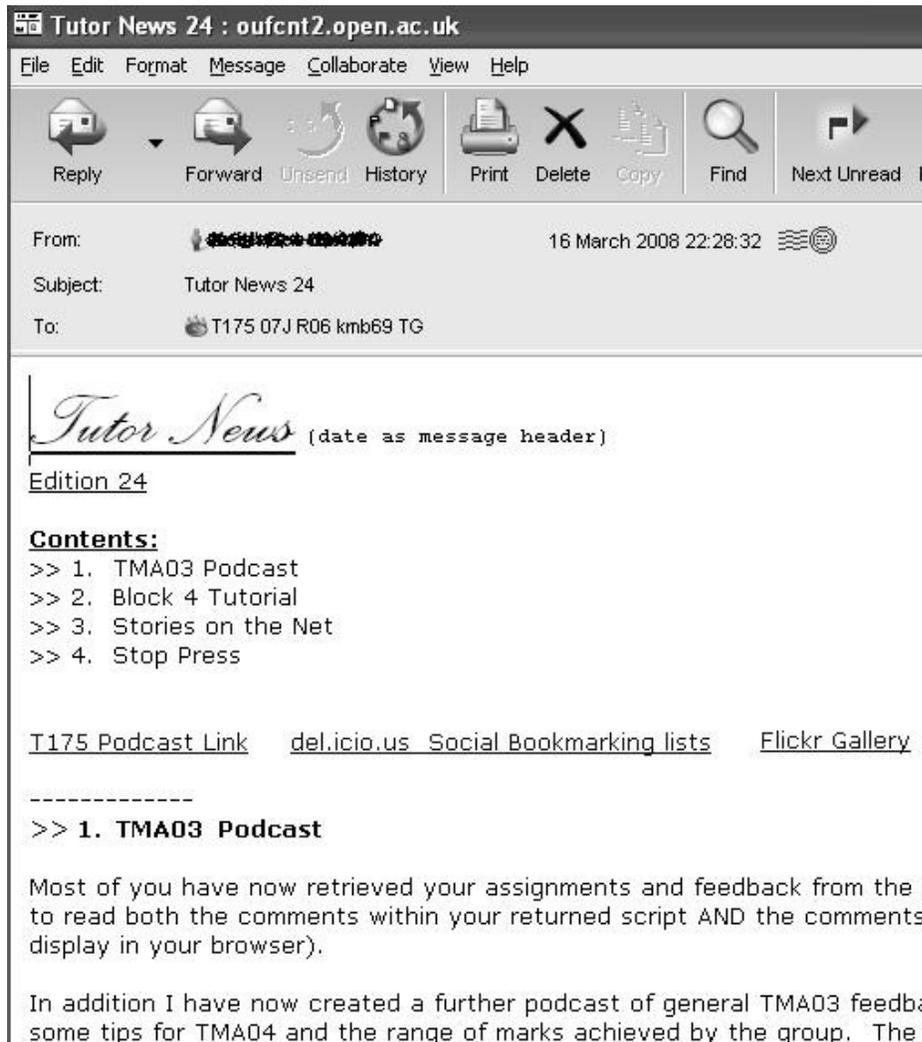


Figure 1. Example 'Tutor News' forum message

The degree to which cognitive presence is achieved is perhaps evident in the amount and quality of student activity in the forum environment. Continuing studies are taking place to evaluate this element and to align all of these aspects with an assessment of student achievement.

### **Tablet PC**

The use of tablet personal computers (PC) to mark paperless assignments was designed to support lecturers in writing quality feedback to engage students in learning, positioned at the point of learning (Figure 2). The project ran over eighteen months and a perceptual evaluation evaluated lecturers' and students' attitudes to the use of technology in the assessment process.

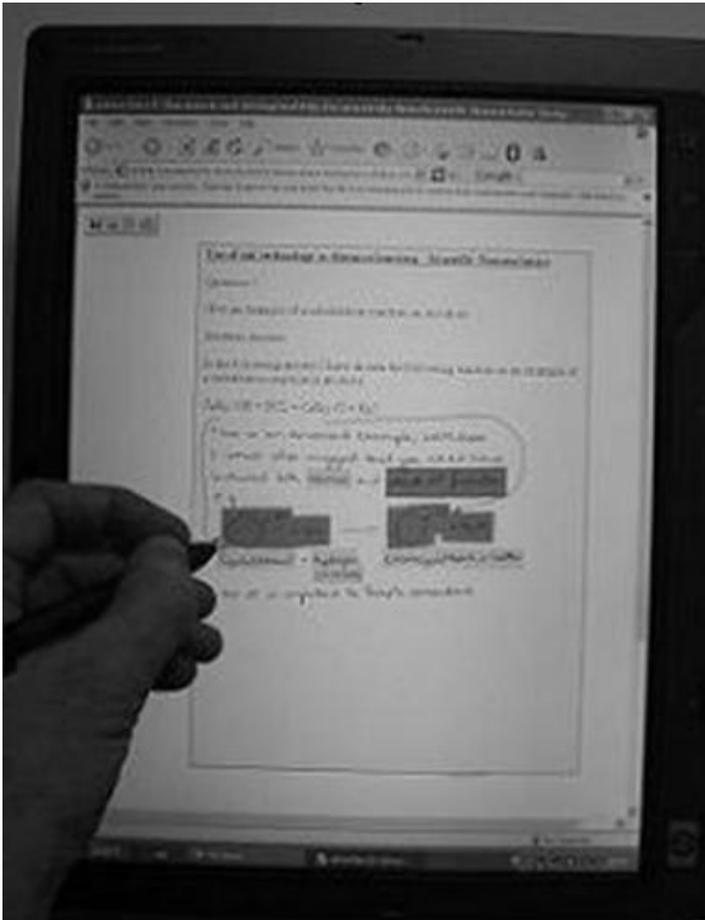


Figure 2. Tablet PC interface

This study was comparative and designed to look at what the pedagogical challenges were for lecturers when marking paperless assessment. The OU is a distance learning organisation and correspondence tuition is where the main teaching of the subject is provided by a lecturer providing the student with feedback on their assignments.

For many lecturers they recorded a symbiotic relationship with tablet PCs, a very significant finding. This may have led to lecturers giving less feedback using a tablet PC, but provided teaching comments that were more appropriate to support student learning than achieved with a desktop PC.

### **Discussion and Conclusions**

The use of educational frameworks such as Garrison and Anderson (2003) and Gibbs and Simpson (2003) do appear to provide a way for a lecturer to articulate a particular pedagogic need or desire and help a lecturer in making decisions in identifying an appropriate and useful technology.

The Tablet PC study has added to the educational framework of Gibbs and Simpson (2003), which lacked any reference to the media that a lecturer would use in their teaching, and by attaching significance to where feedback should be located on an assignment. In the Web 2.0 case study the framework of Garrison and Anderson (2003) has proved to be a good fit to the proactive methods employed and further work should help to validate the success of the methods.

There is a potential issue with the speed of technological development, its take up and use, and eventual demise of a technology before its full pedagogic potential may ever be realised. There may also be the situation that the technology does not exist for a pedagogic purpose, such as being able to annotate fully on-line.

In both case studies we have illustrated the potential benefit of teaching presence via blogs, podcasts or directed assessment feedback. In all these cases the lecturers are able to project themselves into the presence of the student by virtue of the choice of technology and medium being used.

Do we actually think about how we are blending the technology before we start out on innovation and novelty, or do we find a convenient model or framework that seems to fit our circumstances when we feel we have achieved something? We believe we have demonstrated benefits to both the teacher and the learner and the challenge now is to provide a sound evaluation of the results.

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**Biography** Keith Beechener (k.m.beechener@open.ac.uk) is a Staff Tutor in Mathematics, Computing and Technology at The Open University in the East of England, and an Associate Teaching Fellow with the Centre for Open Learning in Mathematics, Science, Computing and Technology (COLMSCT), a Centre for Excellence in Teaching and Learning (CETL) at The Open University. Wendy Fisher (w.a.fisher@open.ac.uk) is a Staff Tutor in the Faculty of Mathematics, Computing and Technology at The Open University in Yorkshire and the Humber, and a Teaching Fellow with the Centre for Open Learning in Mathematics, Science, Computing and Technology (COLMSCT).