Effective Strategies for Building a learning community Online Using a Wiki

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Abstract This paper aims to share practitioner experiences of using Wiki technology to develop and build an online community to support ninety-six second year undergraduate students undertaking assignments on a computing programme in higher education over a one-year period.

A Wiki is an online collaborative authoring tool providing learners with an opportunity to create their own learning environment whilst providing a greater range of opportunities for students to interact with each other outside the classroom boundary. Interaction between learners is a vital ingredient in social learning where the emphasis is on collaboration, negotiation, debate and peer review, and is central to the constructivist learning approach. Therefore, setting up an online community takes time and effort, requiring a level of technological competence, an understanding of learning theory and learner needs. This raises a number of pedagogic challenges and opportunities for academics.

Through a practical example of implementing a Wiki, this paper provides guidance for academics rising to these challenges and opportunities. Student motivation, engagement and fostering ownership for a student-directed learning community is a critical success factor to consider in the design of the environment. In this example, this is evident from the 35,599 hits to Wiki over a four week period and 66,122 hits to the Wiki for the duration of the module.

The approach and methodology adopted use both qualitative and quantitative data and consider a practitioner's first-hand experiences, observations and interpretations of student engagement in Wiki-enabled student-student community learning.

Key issues to consider when designing this type of learning experience are the role of the tutor; in this example front-loaded then stepping-back, the type of 'blend', such as the mix of online and face-to-face, assessment mechanisms and the opportunity to enable students to develop in other key areas, for example transferable skills and employability. All of these areas - staff development, skills, personalised student learning, 'embedding' and exploiting the pedagogic potential of new technologies - are core aims for institutions (DfES 2005).

Introduction

The Higher Education Funding Council (HEFCE) released its 10 year e-learning strategy in March 2005. The overall aim is to help HE institutions 'embed' e-learning into all aspects of teaching and learning: 'Our goal is to help the sector use new technology as effectively as they can, so that it becomes a 'normal' or embedded part of their activities.'

The planned implementation of the Department for Education and Skills (DfES) 2005 e-Strategy is in its first phase, with a focus on personalised student learning through the 'harnessing' of new technologies. Becta is charged with implementing the DfES strategy:

> 'An impact that will stimulate the imagination and creativity of learners, that will engage, enthuse and motivate, engender collaboration and promote self-directed personalised approaches to learning. We are also seeking to apply technologies that will transform the way in which our educational institutions operate and are managed and the way they connect with and enable interaction and involvement of learners.' (Becta, Aug 2006)

Therefore, there are many issues for HE institutions to address as they move towards these goals, for example internal structures and processes and staff development. As part of HEFCE's implementation process for the e-learning strategy and led by the Higher Education Academy, all UK HE institutions in November 2005 were invited to participate in a self-assessed internal audit, called a 'Benchmarking Exercise'. Feedback from the eleven pilot institutions identifies key priority areas to address: 'There is an increasing focus across the sector on the 'soft' issues, for example staff attitude's and skills, and a declining emphasis on VLE technology.' (Benchmarking Pilot Evaluation Report, Aug 2006).

It is becoming increasingly important to address the people issues and specifically to support academic staff in developing appropriate skills and expertise. This paper will focus on the academic, their role as tutor and how to create an online learning environment using a Wiki to encourage collaborative task driven student-student interactions.

There are four key aspects to recognise throughout this paper and in relation to the approach adopted. First, concerns the role of the tutor and a need to identify how students will be supported online (JISC 2006). In this study, and using a constructivist approach to teaching, the emphasis is on a self-directed approach with the learner building knowledge through interactions with others and the environment (Vygotsky 1978). Learning involves participation or engagement with others in a community of practice (Wenger, 1999) and through relationships with people (Lave and Wenger 1991). Accordingly, the

tutor approach adopted was front-loaded in terms of tutor time, by setting the learning agenda providing detailed instructions, learning activities, templates, resources and materials for learning and when presented to students the tutor would then step back. This is not the approach normally adopted whereby the tutor acts as 'facilitator or e-moderator' (Salmon, 2002). This stepping-back approach enabled students to engage with each other without tutor intervention, online facilitation, guidance or support. This might seem risky, but the risk is minimised by spending time up-front and through careful design of the student learning experience. Key to this approach is the need to communicate clear expectations to the students from the outset and to ensure that these are fully understood (Chickering and Gamson, 1987). In this example, the result is a high level of student motivation and engagement.

Secondly, the tutor needs to decide on the 'mix' or 'blend of face-to-face and online activities. A commonplace approach is to use compulsory face-to-face teaching with online support materials provided through an institutional VLE. However, the most effective blend is by maximising the pedagogic opportunities afforded by each methodology, often requiring module redesign, including a review of assessment practices. This latter approach requires commitment and an up-front investment in tutor time, but can result in a much more engaging and richer student learning experience (Sharpe and Benfield, 2006). The approach presented in this paper embraces the latter concept.

Thirdly, assessment practices need rethinking to ensure they reflect and support the approach adopted (Nicoll, 2004); for example, online learning activities completed individually and in groups should become an integral part of the overall module assessment. This will motivate students, encourage engagement, foster ownership and collaboration; all helping in the formation and development of a learning community. In this paper, students collaborated in groups and worked on specific learning activities, which involved group and individual assessment.

Fourthly, the approach adopted in this paper encourages the development of employability and transferable skills: collaborative learning lends itself to a problem-based learning approach (Zumbach and Reimann 1999, Doolan et al 2006) and helps students to develop appropriate skills. The students referred to in this paper are future IT professionals who need to develop team working and problem solving skills. This is particularly relevant for the cohort of students referred to in this paper, since there is no work placement element to their module.

The Module and Context

Ninety-six second year undergraduate students studying on a combined modular degree in Information Systems undertook this module. The module is built around information systems case studies, providing an insight into

realistic company environments. The overall aim is for students at all stages to develop their skills in building computer-based, user-friendly information systems. The development of problem-solving skills was encouraged, replacing the current paper-based system with a computer-based system.

This 'real-world' approach included a problem based learning assessment methodology. Students were divided into groups, which were randomly selected from a class list by the tutor to ensure a cross section of learning ability and learning style. Students were required to carry out a thorough analysis and design of a computer system using the Wiki learning environment, to complete individual and group work activities according to the needs of the community. The overall learning objective is for students to apply the principles and techniques of system development in a team environment, thus fostering and developing collaborative working skills. The students are also expected to use appropriate engineering practices to make informed decisions about best approaches to an information system development. This requires students to move from problem identification through to implementation and evaluation processes, requiring decisions to pursue chosen approaches within the context of a collaborative working environment.

Learning Activities: the face-to-face and online blend

Active student engagement requires the chosen activities to be shared equally within and across the group, with an emphasis on learning by doing (Kolb 1984), and an emphasis on understanding and a deep approach to learning (Biggs 2003). Moreover, the activities in this study were set to enhance information sharing within groups and across groups, personalised learning and autonomy (DfES 2005), encouraging learners to create their own learning environment, take control and to feel ownership for their own learning. Therefore, the assessment activities were chosen specifically to be shared and jointly owned within each group. This is an important motivational factor, with the aim of encouraging collaboration between learners to build a learning community. To create a shared responsibility for group learning and to foster individual responsibility, the problem presented needs to involve each leaner with a specific and structured job to complete (Crook 2003). Students were provided with all of the relevant templates required to undertake the activities for the assessed learning activities and all associated activities were based on the case study. By completing the learning activities, this enabled students to complete the assessed report for the module and the Wiki provided an environment to complete the learning activities. The assessed report consisted of solutions to five sets of activities and included: Eliciting and Documenting Requirements and Group Commitment, Support for Project Stakeholders, Evaluation, Reflective Journal and Peer Review.

The face-to-face blend with online learning was carefully designed into the module and maximised the learning opportunities provided by each approach

(Doolan and Barker 2005). To ensure students were adequately briefed and understood the requirements of the learning activities, a lecture provided the most appropriate method for introducing the online Wiki environment, through a live demonstration. A tutorial prepared students for the online group work learning activities, taking students from a familiar face-to-face tutorial situation and leading them into an online collaborative environment through a simulated interactive exercise. Both the importance of team working and need to see this as an important life skill were emphasised; the face-to-face sessions were key factors in fostering student engagement and to prepare them for the online activities. This was achieved by providing a short report from industry outlining skills shortages faced by employers, helping learners to make the connection between this and the syllabus, and to emphasise the importance of teamworking, collaboration and the development of problem solving skills.

The online experience complemented and took forward the initial face-to-face lecture/tutorial approach by providing an environment for students to build a task driven, individual and group owned learning community. This required commitment from each group member to seed the community and to take ownership of the learning. To provide an initial context for the online process, students were required to distribute contact details and confirmation of their membership to the rest of the group, a photo of an animal, object or movie star to represent the group member, three sentences about themselves, an understanding of the ground rules and a brief project plan. Therefore, the design of the learning experience required careful planning and up-front commitment and investment from the tutor. Students who came late into the group or had difficulties were supported by other group members, and no tutor intervention was required. This takes the role of the tutor beyond that of a facilitator or e-moderator (Salmon 2002), as is often the learning context created with group discussions delivered through an institutional VLE. Wiki technology allows the tutor to adopt a different role, exploring new approaches to support personalised student learning.

Methodology

The methodology of collecting data included both qualitative and quantitative methods. The sample of ninety-six students which comprised of sixteen groups of six were requested to complete the reflective group blog (an online logbook), forming part of their group report and submitted by the student for assessment. The logbook responses submitted in this way were coded and analysed for responses based on specific questions, which were then posted on the blog by the tutor to illicit discursive answers and feedback related to student experiences. Quantitative data was derived from these coded responses. In addition, a statistical counter was used as a measure to identify Wiki usage by students and this identified the total number of 'hits' to the Wiki made by individual students.

Results

Quantitative data

Figure 1 details the extent of student engagement with the Wiki, as illustrated by the daily page loads (or 'hits'): 35,599 hits for a student cohort of 96 over a four week period. Students were only required to use the Wiki over the four week period, but their engagement extended throughout the module and resulted in 66,122 'hits' over two semesters. This provides an indication of the students' study pattern and level of engagement with the Wiki over the duration of their first in-module assignment. The spread of activity over this four week period identified in Figure 1 is fairly even, although most activity occurs towards the end of the week. The majority of engagement took place on Thursday when the students were timetabled for this module. It is evident students were working constantly throughout the week, but with higher levels of activity on Sunday than Saturday. While specific conclusions about the depth of engagement cannot be made from this data, it is apparent that students were sufficiently motivated enough to engage with the learning environment and beyond the required four week period, thus supporting the need for a high level of upfront investment from the tutor in terms of carefully designing the learning experience and associated learning activities.

Qualitative data

Group feedback was collected through specific questions via a reflective blog enabling discursive answers and reflections. This provided both quantitative and qualitative data. Questions were collated and grouped around how the technology supported the learning process in relation to two specific aspects; support for collaborative 'people' issues and support for completion of the various learning activities and assessment.

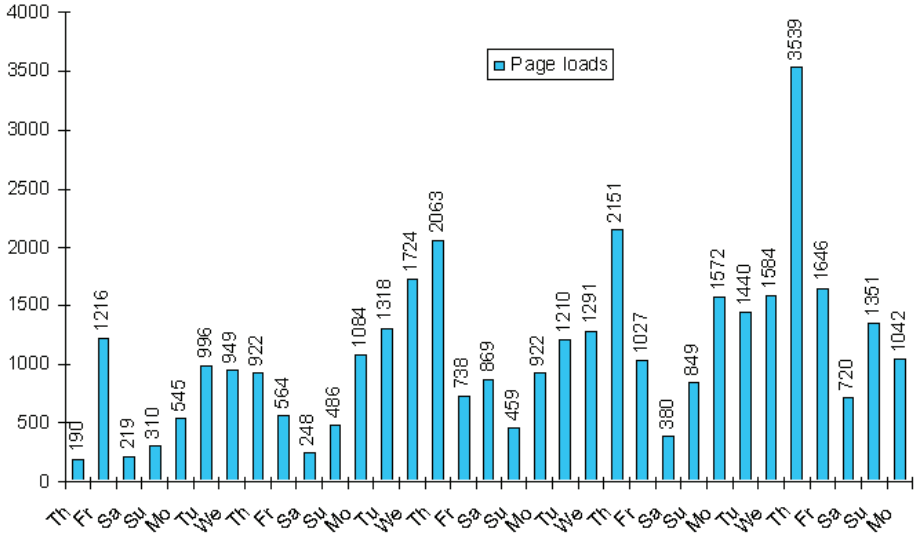

Figure 1 Number of student page loads (hits) over the four week period

Table 1 provides examples of student feedback in relation to the 'people' aspects (note: the group number is specified alongside each response).

"the ability to review who has written what and who has changed" g1
"quickest way each member could express their ideas" *g2*
"we used Wiki to post up the questions we were stuck on" *g2*
"ensure that participation in the project was free from intimidation" *g3*
"gave group members an added sense of confidence and encouraged them to further participate without worrying about making mistakes" *g3*
"able to function as a team" *g10*
"only our group can put all our ideas up" *g12*
"ask members for their opinions" *g13*
"put and share useful ideas, resources, use it to chat to members, solve problems"

Table 1 How did the technology support group assessment – PEOPLE

Table 2 provides examples of student feedback in relation to the learning activities and assessment.

"the most helpful part of Wiki is that someone can work on any task at any time" *g2*
"to help keep up-to-date with the progress of the project" *g3*
"great area to support our assignment" *g4*
"allows user to attach documents, presentations, images, journals and web links" *g7*
"add more detail on the learning activities" *g13*
*"*can post attachments of their own work" g15
" hyperlinks and simple text for creating new pages and cross links between pages" *g16*
*"*keeps track of changes" *g13*
*"*has proven instrumental to the completion of the module work" *g11*

Table 2 – How did the technology support group assessment – LEARNING ACTIVITIES

Analysis

An analysis of the above results is presented in Figures 2 and 3, collating the qualitative feedback and presenting this in terms of quantitative categories. Figure 2 divides the responses from each student group in relation to how they felt the technology, processes and learning experience supported either a 'Task' or 'People Oriented' approach. Each group answered a range of questions and their responses are grouped accordingly. Note that the number of 'People' related answers totals 183, 'Task' related answers much lower at 82 and students identify Wiki technology as supporting the social interaction aspects of this learning environment, rather than the ability to complete the assessed learning activities.

Figure 3 identifies individual group responses. Most groups felt that the assessment was fairly balanced between a 'People Oriented' and 'Task' driven approach, although several groups felt that their was no 'Task' emphasis to the assessment and the focus was totally on the 'People' element and therefore socialisation/collaborative aspects.

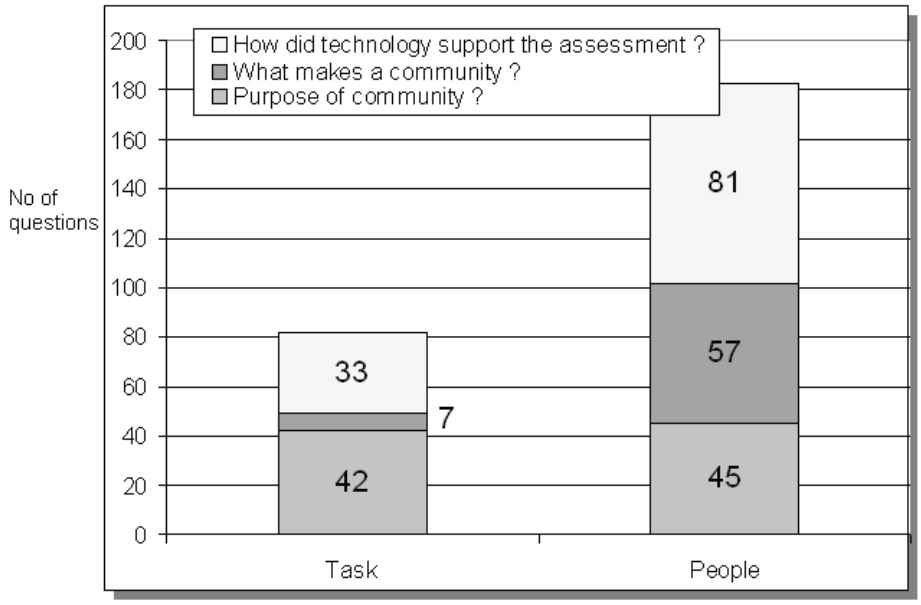

Figure 2 Student feedback by emphasis, i.e. Task or People

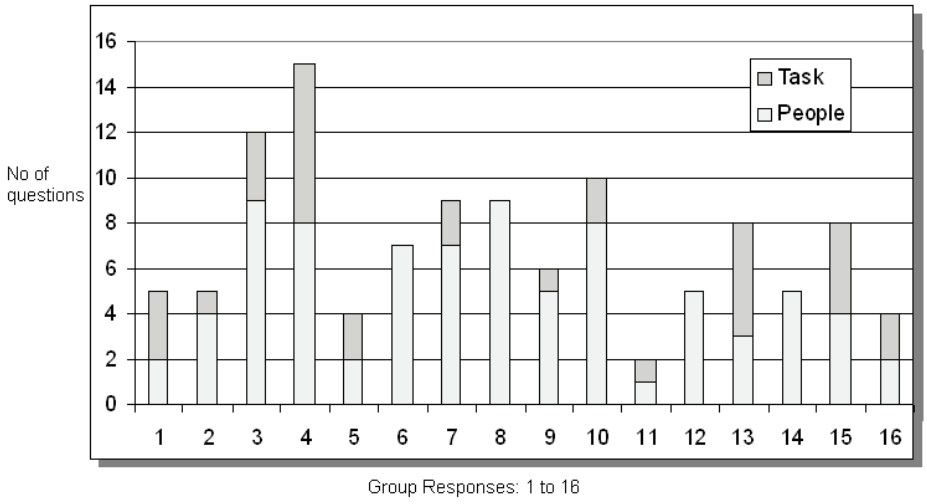

Figure 3 How did the technology support group assessment?

It is apparent from the above analysis that students valued the experience of using Wiki technology to support group learning activities and to foster a learning community. Both aspects are important when considering the design and implementation of a blended face-to-face and online learning experience. Students need to feel ownership for, and engagement with, their learning community and to see the relevance of completing online learning activities through tasks which build towards the module assessment requirements.

Discussion

This study is ongoing and the data presented in this paper is a snapshot of student feedback responses as a means for highlighting the importance of the tutor's role. In the example presented in this paper key aspects to consider are; the careful design and implementation of the Wiki; to ensure students are adequately prepared for the online experience through face-to-face introductory sessions, a lecture and tutorial; and to ensure that students fully understand what is expected of them. It is also important for the tutor to clarify to students from the outset exactly what the tutor role will be in supporting them online; for example, if they are to act as facilitator or to leave the students to interact with each other. In the example presented in this paper, the tutor's role is to step back and allow student-student interaction. This resulted in the building of a learning community, fostering ownership, social interaction and a task driven focus.

Table 3 below suggests strategies for the tutor to address when introducing the use of Wiki technology with students, and identifies what this means in practice. These are very broad areas, but provide a context to consider both in the design and implementation process.

Areas to Address	**In Practice**
Approach Taken	Relationship with students and teaching philosophy
Establishing the culture Preparing students…	Setting and communicating clear directions / expectations
Learning Activities / Learning Tasks	Technology for learning
Supporting social presence	Nurturing student relationships
Student and teacher	Evaluation

Table 3 Strategies for the tutor to consider

On reflection, and for future work, there is a need to test this approach with other groups of students, and possibly for the tutor to adopt different roles, for example, to determine how this affects the student learning experience. There is also the issue of experimenting with the blend between face-to-face

and online learning and how students respond to different mixes and emphases.

Conclusion

This paper has emphasised the need to consider the role of the tutor in designing and implementing an online learning community of undergraduate computing students through the use of Wiki technology. The role of the tutor is key in ensuring student ownership, engagement and in fostering a learning community. Online activities should be considered in terms of the overall student learning experience and blend, combining face-to-face sessions with online learning to maximise on the pedagogic opportunities afforded by both approaches.

Table 4 below summarises the key issues arising from this specific experience of introducing Wiki technology to computer studies students. Although these specifically relate to the context outlined in this paper, many of the issues will apply equally to other disciplines.

Importance of developing a strategy and communicating this to students
Students should be perceived as a community with a focus on both PEOPLE and the LEARNING ACTIVITIES set
The approach should be people oriented, providing the opportunity to interact with others through peer to peer support for learning.
Students value the opportunity to manage their own learning and learning environment citing usefulness of editing, inputting and deleting information collaboratively, ease of use, creating hyperlinks to pages and new pages with cross linking. This was particularly evident in the students whose rationale for community was task orientated.
Students felt SAFE and SHELTERED, reporting that participation in the project was free from intimidation with an added sense of confidence and felt encouraged by their group members to participate. They were not overly concerned about making mistakes and indeed reported they felt that other group members would be willing to correct their mistakes.
Educators/tutors can influence the way a learning community develops and empower students to take ownership of their own learning.
Students are indeed a valuable resource: they are PEOPLE and do amazing things!

Table 4 Summary of key issues for using Wiki technology with students

Wikis offer a major opportunity to personalise the student learning experience in a system of mass higher education. This is one of the key challenges we face (DfES 2005) and technologies such as Wikis not only provide new learning opportunities, they are relatively easy to set up and use.

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Biography

Martina A. Doolan graduated from the University of Hertfordshire in 1996 and joined the University as a member of the academic staff in the School of Computer Science. Martina has been active in the area of Teaching and Learning since joining UH with particular interest in exploring/exploiting alternative technologies to support learning. Martina is a Principal Lecturer in Computer Science and is a BLU teacher.