

# Establishing a sense of community within an online learning environment using open source software

Nykvist, Shaun S.

School of Mathematics Science and Technology Education, Queensland University of Technology, Australia.  
[s.nykvist@qut.edu.au](mailto:s.nykvist@qut.edu.au)

## ABSTRACT

This paper will report on the implementation of an open source content management system and communication tools to support an online community of teachers and pre-service teachers at both national and international levels. The content management system has become an essential part of a thriving community of online learners known as oz-teachernet. The implementation of this content management system and use of these communication tools has as its main focus, the notion of online virtual communities and further supports the work of undergraduate education students in their information and communication technologies electives. The elective "Networked Communities" in particular allows a student to explore current trends and practices with communication tools through the use of open source and limited commercial software. During this course students use a combination of these available tools to implement a new or modified online learning environment while undertaking professional experience in a school of their choice. The paper further describes the students' experiences throughout the course and presents recommendations, for educators wishing to espouse a sense of community within online learning environments and pre-service education courses.

## INTRODUCTION

Oz-teachernet (<http://rite.ed.qut.edu.au/oz-teachernet/>) was established in 1995 by the Research in Information Technology Education (RITE) group, to provide teachers and pre-service teachers with an infrastructure for using the Internet to support professional development and curriculum design. It provides a number of free projects such as the popular book raps and travel buddies projects, along with a number of free email lists such as the general oz-teachers email list. While these projects and discussion lists have formed the basis of oz-teachernet, the RITE group have trialled and used a large range of both commercial and open source software to support the oz-teachernet. Oz-teachernet was founded using Unix servers and an open source list server called Majordomo. The server also ran the open source Apache web server to serve basic html web pages to support the oz-teachernet community. Over the following years the RITE group went through a number of changes and found it more and more difficult to support this environment and eventually moved the infrastructure to a Microsoft server platform and used commercial software such as Netscape web server and Lyris List Manager which provided both a mailing list and a discussion forum for its members. As software and hardware changed, further changes were also evident in the supporting software for this growing community which had approximately 1600 list subscribers in 1999. It was at this time that various software applications were implemented for online chat, and the use of Active Server Pages were used to support a range of new and changing oz-teachernet projects where it was necessary for greater user interaction. This also saw the making of a more dynamic, interactive community, however, there were many costs associated with this change and with limited resources and the need to use it within a number of core undergraduate education courses it was necessary to revise the support infrastructure for this active community.

After some extensive research, the RITE group decided to use a LINUX server with an Apache web server, PHP for dynamic web content, MYSQL for database management and Mailman for list management in 2002. While the changeover was quite difficult and tiresome the results have been quite positive in terms of stability and management. Further to this a new modified content management system based on Postnuke was used for web content and managing the projects and phpBB was used as a forum tool. A MOO server was also added for undergraduate and post-graduate education students to explore. The current oz-teachernet community has now become a core component of the Information and Communication Technology (ICT) education elective "Networked Communities".

## ONLINE COMMUNITIES AND OZ-TEACHERNET

There is considerable pressure for teachers to prepare students to be participants of and contribute to the knowledge age society in which we live and work. Students must be able to create and gain advantages from new knowledge (Bereiter, 2002), hence requiring them to learn in new ways. With the advancements in information and communication

technologies (ICT), a number of tools have arisen that allow for new strategies in teaching and learning. In particular, the Internet has opened the door to many new possibilities that overcome the boundaries of traditional teaching methods. However, while the internet has offered many new opportunities, and there is a push to have as many schools connected as possible, there has been mixed results in its successfulness as a teaching tool and as a tool for teacher professional development. A recent study into Internet use by Becker (1999), claims that teachers and students are merely using the internet as an information gathering tool, rather than, for communicating with others, collaborating on projects or publishing work. It is within this context that Brown (1999) claims that the “most promising use of the Internet is where the buoyant partnership of people and technology creates powerful new online learning communities” (p. 19). It is this notion of an online learning community that has been central to the development of the oz-teachernet community.

A learning community or community of practice allows learners to develop skills and knowledge, which they can share with other members of those communities (Jonassen, 1995). Further, when students are “confronted with meaningful, real world problems, learning communities apply sophisticated repertoires of knowledge” (Jonassen, 1995, p. 60). Developing an online learning community involves more than member access to a range of information and technology tools such as a threaded discussion forum, a list server or a chat room. An online learning community goes beyond this to establish a sense of belonging by members, where they depend on each other to achieve the learning outcomes of the course or intended group goals (Reil, 1996 & Palloff & Pratt, 1999). One or two participants who post regular messages on an asynchronous discussion forum does not equate to a successful learning community. When we look outside education to the wider community we are witness to a number of successful learning communities such as the LINUX community or some of the many gaming communities that exist. The LINUX community, in particular, has been seen as a successful community that has led to the development of one of the most popular server operating systems in the world. In this community members have discussed and argued about various ideas using both synchronous and asynchronous tools.

Gauging the successfulness of a community is not seen as an easy task, however, based on the assumptions associated with cognitive apprenticeship and the “social constructivist perspective implied by communities of learners” (Jonassen, 1995, p. 60), Jonassen identifies what he terms as seven qualities of meaningful learning (see Figure 1). These include;

- Active – learners are engaged in by the learning process
- Constructive – Learners accommodate new ideas into prior knowledge in order to make sense, make meaning or reconcile a discrepancy, curiosity, or puzzlement
- Collaborative – learners work in learning and knowledge building communities, exploiting each others skills while providing social support and modelling and observing the contributions of each member
- Intentional – learners are actively and wilfully trying to achieve a cognitive objective
- Conversational – learning is inherently a social dialogical process
- Contextualised – learning tasks are situated in some meaningful real world task or are simulated through some case-based or problem based learning environment
- Reflective – Learners articulate what they have learned and reflect on the processes and decisions that were entailed by the process

While these seven qualities depict meaningful learning, they can also be used as a guide in the development of online learning environments in the education sector. The use of online communities in the education sector for professional development has gained momentum in recent times, thus creating a need for teachers to understand the curriculum implications of online learning communities and to be able to participate in such communities. To respond to such imperatives, teachers must have appropriate knowledge, along with the technical and communications skills to participate creatively and critically in such communities. In turn, there is an expectation that graduating teachers have such skills, and a critical understanding of the educational implications of these communities, so that they are able to take a leadership role in the professional development of peers and in the strategic planning of school resourcing and curriculum activity. Hence, it is within this context that oz-teachernet exists and attempts to respond to the needs of this wider community of educators. Further, the course reported in this paper, also attempts to respond to these needs and is supported by the oz-teachernet community.

## **BACKGROUND TO UNDERGRADUATE COURSE**

The elective that pre-service teachers are involved in is titled “Networked Communities”. It aims to provide practical skills and a cultural understanding of the impact of network communities for students in their role as pre-service teachers, professional peers and lifelong learners. In trying to achieve this, the course looks at the notion of community and what it means to be part of a community. Students are introduced to several communities including, Knowledge Forum, the Web-based Inquiry Science Environment (WISE), Tapped In, Oz Teachernet, Learning Circles and Webquests. They are asked to critique a number of the environments according to what they view as an effective learning environment with particular emphasis being placed on the notion of communities of practice. Further, the

course looks at how students currently use their current Internet connection and how these practices can be likened to that of the various networked communities they explore.

The unit not only presents students with lecture material pertaining to the use of various online virtual community tools, but also immerses the students in the use of these tools as part of the lecture program. This means that students are witness to both face-to-face environments as well as being part of a virtual community. Within this community of practice students use a variety of community tools including instant messaging, chat, threaded discussion, MOO's and streaming video and audio to explore and learn about these knowledge building tools. For example students may use a virtual classroom within a MOO to discuss the issues pertaining to hosting an online event or discuss ways in which the use of video or chat is best used in the classroom. Students may also use the MOO to scaffold their first piece of assessment which looks at the theory pertaining to communities of practice.

The course is designed so that students complete two pieces of assessment based on the notion of communities of practice in education. The first piece of assessment involves reviewing the literature pertaining to this area of study and evaluating a number of communities of practice and their tools. The second piece of assessment looks at the construction of an online learning environment which espouses a sense of community when implemented. Students attend lectures or tutorials in environments that are similar to what they are learning about and designing. For example a tutorial or lecture about video conferencing and the tools used in this medium take place using face to face lectures, chat and video conferencing, while a lecture on MOO's will take place using face to face tutorials and using an actual MOO.

Students were given the option of developing an online environment around the Australian theme "Year of the Outback". They had access to a variety of community building tools and online access to an expert in the field. The expert is the current project officer for the online community Oz TeacherNet. In developing their online community of practice students evaluated their community in terms of Jonassen's seven qualities of meaningful learning (Jonassen, 1995). Likewise, the unit attempts to also take into account these seven qualities during its implementation.

## **DATA COLLECTION & FINDINGS**

The findings presented in this paper were based on student responses to 3 individual questionnaires implemented at the beginning, middle and end of the course. The purpose of the research was to identify what student's understood about online learning communities and their experiences with being immersed within a unit of work that required students to be active participants within an online community. Further, the research also aimed to identify the students' experience's with trying to immerse their students within an online learning environment. The results of this research would then be used to guide the development and growth of the undergraduate elective 'networked communities'. The first questionnaire was used to identify what students thought an online community was, the prior experiences that they had (if any) with online communities and the types of communities they had been involved in (if they had prior experience in a community). The questionnaire also attempted to identify the type of tools students had previously used, if they had been members of an online learning community. The data collection for this research was undertaken during semester 2, 2002 and was used to guide the development of the course over subsequent years. The semester in which this research was conducted consisted of a total number of 13 weeks.

In the responses to the first questionnaire all students (N=23) offered a response that indicated an online community is a group of people who meet together online. While all students offered very similar responses to what an online community was, twenty students indicated in their responses, that they had not been involved in online communities. Where students varied their response to this (n=3), two students indicated that they were regular game players and chatted to a number of people regularly online with one of them having set up their own MSN community (<http://communities.msn.com>, 2004), while the third student had participated in an online education program. These three students indicated that they had used chat rooms, instant messaging and message boards, and in the particular case of the student who had set up their own MSN community, a number of other tools such as file sharing, mail lists and photo albums were utilised. The expectation was that a greater number of students would have been involved in some type of online community.

The second Questionnaire, which was administered during the eighth week of thirteen weeks sought to draw out students current experiences with online communities, the tools used and the benefits of using them in education. Twenty one students (N=23), indicated a positive response to the use of online communities for learning, with responses such as "I wish we could have used this at school" and "this would be great to start a new topic and to see what students already know". This later response indicating that students are beginning to think about the use of these community tools in the classroom to form their own community. Those who offered a less than positive experience (n=2) with online communities indicated that it was "boring" and "very time consuming as compared to traditional teaching". Seven of the students who offered a positive response indicated that the MOO was a great way to scaffold

student responses and for students to express themselves. The use of an online expert in the online learning community was also seen as an important feature by eleven of the twenty one students who offered a positive response.

The third questionnaire was administered in the last week of the course and asked students to describe their experiences with implementing an online environment with their students in the aim to promoting a sense of community. It asked them to recall both their positive and negative experiences during the implementation of this and how they gauged that there was a sense of community amongst its members. Seventeen students (N=23) indicated that their experiences with the implementation of their learning environment was below their expectations and fraught with problems. These students offered a range of reasons as to why their implementation was unsuccessful. These reasons ranged from the lack of adequate support from their supervising teacher, lack of adequate access to a connected computer and a reliable internet connection and lack of interest by students. Three students who had a middle year level indicated that lack of student skills to type at a reasonable speed in a synchronous environment hindered the overall success of including an online guest, while a further six students (n=6) indicated that students were easily “side tracked” when they were chatting or posting responses to a forum.

Those who offered a positive response (n=6), indicated that students appeared “on task” or “engrossed in their work”, however two of these 6 responses indicated that it was at times necessary to keep students on task. These six students indicated that they had a successful community of learners through responses such as “students seemed engaged in the activity”, “the quality of postings to the threaded discussion board was high” and “students had many thoughtful questions to ask the online guest”.

A common theme which seemed to emerge through the responses to the questionnaires was the time and skill it took to construct an online learning environment for a small unit of work. The two students who used a MOO with their classes found that they spent more time constructing the MOO environment than actually using it with their students, however they also indicated that it may be more beneficial if their students were given their own freedom to build their own community within the MOO. Students also indicated that the use of a pre-built online learning environment would allow them to concentrate on promoting a sense of community and adapting it to their particular situation.

## CONCLUSION

The students involved in the course were enthusiastic about the use of online learning communities in education and the many opportunities that they presented. While many students could identify with the benefits of being a member of an online community and the usefulness of the many tools that made up these communities, a large number of students had less than favourable experiences whilst trying to espouse a sense of community within their classrooms. As a result of the findings presented within this paper, it is essential that the support structures, such as adequate access to hardware (including a reliable internet connection), software, and expertise exist within the school for teachers to support the notion of an online learning community. Communities do not just happen; they need support, a realised purpose and at times, much encouragement.

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