e-learning Groups and Communities of Practice

Organised by David McConnell

Many e-learning (or networked learning) events and courses are designed to encourage the development of groups and communities as the basis for effective learning. E-learning practitioners appear to believe that community is a key factor in the development and maintenance of quality e-learning.

The purpose of this Symposium is to provide an opportunity for the presenters and participants to engage in discussion and debate on the importance – theoretically and practically – of designing e-learning events and courses which aspire to bring learners together as "community".

The presentations in this Symposium engage with the idea of community from various different but related perspectives. This will become clear as each presentation unfolds. This diversity of meanings has implications for the practise of e-learning as well as the understanding of community in e-learning environments. This will be explored in the Symposium.

Developing Communities of Interest in a European Internet School

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ABSTRACT

A European Internet School provided an exploratory online environment in which occupational therapy students could work collaboratively through problem based learning to develop their knowledge of the use of assistive technologies across four countries. Using the SOLO taxonomy, transcripts of group sessions have been analysed to explore the development of deep learning and collaborative work. Results indicate that peer-to-peer meetings using synchronous online communication have an important role to play in the development of deep learning and collaboration. E-learning can be a powerful adjunct to traditional course delivery, especially when students will benefit from direct international discussion and exchange of ideas.

Keywords

Occupational therapy, problem based learning, synchronous communication, SOLO taxonomy, collaboration, assistive technology

INTRODUCTION

In common with other health professionals, occupational therapists are required to work collaboratively in addressing client needs. Resolution of such needs may sometimes be facilitated by high level assistive technology, the application of which varies widely across Europe. The new exploratory Occupational Therapy Internet School (OTIS) united these major themes, as it supported a European collaborative approach to assistive technology learning for occupational therapists and students in Belgium, the Netherlands, Sweden and the UK (Armitt et al, 2001). OTIS adopted a problem based learning style, in which students communicated online with their peers, tutors, patients and experts, in order to propose solutions to carefully designed case studies. The supporting Internet environment is based on the Virtual Campus metaphor and has been specifically developed to promote collaboration and a problem solving approach. A fundamental part of this model was to use Virtual Rooms (Ginsberg et al., 1998) to contain different components of the course materials. In this way it was expected that members of different groups would meet while reviewing the materials, and discuss their interests. It was also possible for both staff and students to book specific meeting rooms for more formal invited meetings, which could be open, so that anyone could attend, or closed, in which case only invited participants could participate.

Students were divided into four tutorial groups of mixed nationalities, each group solving a different case study. The course was designed to promote specialist skills in occupational therapy, while also developing generic core skills. Embedded within this latter skill set is the essential ability to communicate effectively and collaborate with a wide range of clients and allied professionals. In the case of OTIS, the course sought to stimulate synchronous communication and collaboration within international student groups, and also with ‘patients’ (tutors role-playing patients) and experts such as health care specialists or representatives of companies marketing assistive technology devices.

Recent evaluations of both a qualitative and quantitative nature were undertaken during the OTIS pilot course. The data gathered indicate that the course and its associated technologies have provoked some strong reactions. For some students their active learning has been facilitated and learning objectives achieved. Other students however have struggled to understand and achieve the necessary course outcomes. Students who are not self-directed learners at course commencement appear to experience the greatest difficulties. The SOLO taxonomy (Biggs & Collis, 1982, 1989) was used to undertake a more detailed analysis of the transcripts (Armitt et al, 2002).

context

The SOLO taxonomy

The SOLO taxonomy is a well-established technique for establishing the presence of deep learning, and is

becoming widely used in education, including:

allocating a cognitive level to individual course objectives (Australian National University, 2000)

helping students analyse their own work and see how to improve it (University of Alberta, 2001; University of Bradford, 2001)

explanation of assignment grades (University of Sydney, 2001)

assessment (Hoddinott, 1998)

predictor of potential (Crowley & Tall, 2001)

research into education (Anderson & Walker, 1997)

The SOLO taxonomy is based on measuring the complexity of thought processes in the statements, based on a classification into prestructural, unistructural, multistructural, relational and extended abstract, the stages being derived from the work of Piaget and his stages of cognitive development. Statements are expected to show a continuum of learning from initial recognition to reflection and complex understanding (Hewson & Hughes, 1998). As with Piaget's stages, once a student has reached a particular level in SOLO regarding a concept, s/he is now capable of continuing to operate at that level with regard to that concept. However, a student may not always show evidence of being at that level consistently, since SOLO levels are used to "describe a particular performance at a particular time" (Biggs & Collis, 1982; p.23) and not to indicate a student's ability.

Deep learning

It is important for all health care professionals to experience deep learning in their professional training programmes. This not only ensures quality learning but is also a safeguard for the future, in that such health care professionals will display a holistic approach to their clients, with emphasis on quality of care. Clinical education has been shown to be effective in facilitating deep learning (Coles, 1989, 1990) and for students in the academic environment realistic case studies explored via a stimulating problem-solving approach, can form a close approximation to learning from real life.

Educators suggest that students who are personally involved in learning from real life situations are the ones who are most likely to experience deep learning. McAllister et al (1997) suggest that "deep approaches to learning are found in students who are affectively involved in searching for personal meaning and understanding (their own personal practical knowledge), seeing the whole picture or person - not just the isolated features or disembodied problems - drawing on their personal experience to make sense of new ideas and experiences and relating evidence to conclusions. These deep learning approaches are in marked contrast to surface approaches exhibited by students who seek only to memorise and reproduce information or skills, see only the discrete "bits", expect the educator to be in control of their learning, and are largely motivated by the external imperative to pass an assignment or gain their qualification."

The stimulation of reflection is essential for deep learning, as the reflective process includes synthesis of knowledge through re-evaluation of the experience by undertaking association, integration, validation and appropriation (Boud et al., 1985). Reflection may be facilitated through interaction with peers or tutors, or alone through writing (Lincoln et al., 1997). Synchronous on-line courses must answer the question of whether real-time communication with peers and tutors is effective in promoting reflection.

Method

The data

Since the problem-solving approach requires synchronous communication it was appropriate to evaluate evidence of deep learning using the students' own statements in the communication sessions. The OTIS software allowed logging of all user activities, including all communications using the 'Talk' and 'Page' Internet Chat facilities. 'Talk' allows a user to broadcast to everyone present in the same 'meeting room', and 'Page' enables a user to make a private comment to one or more selected users. When registering to use the OTIS system, all users gave their written consent to their personal data being used anonymously for research purposes, including establishing patterns of activity. There was no specific intention until after the course had finished of using primary data from transcripts for evaluation of the course, so the behaviour of participants is unlikely to have been affected by the data collection.

Initial data extraction

The transcripts provided several hundred pages of data, concerning not only the solution of the case study, but also the process of preparing the assignments, social interactions and discussion of how to use the OTIS system and various technical problems. A decision was made to focus on the following published learning outcome for the OTIS course:

Upon successful completion of this course participants who have reached the required educational level will have:

displayed expertise in following a problem-solving process to match technology to individual client need.

A preliminary extraction was performed, in which all statements in which students discuss the solution of the case study were extracted, plus intermediate 'linking' statements required to understand the flow of the conversation. Throughout this study, an utterance has been defined as a sentence or group of sentences which the student sends or broadcasts as a unit (statements from tutors, clients and experts were ignored). At this stage it was established that the client and expert session data largely consisted of students questioning the clients and experts. Such data was largely excluded from the following analysis, except where the students were actively discussing the case solution.

The SOLO taxonomy

Analysis of the transcript data from the preliminary extraction was carried out using the SOLO taxonomy, focusing solely on the statements directly concerned with the learning outcome. The first step was to specify the meaning of each level in the SOLO taxonomy in terms of the selected OTIS learning outcome on matching technology to client need, using the technique, 'Structure of the Observed Learning Outcome'. This method allows the learning outcome to be evaluated in a qualitative way by describing the student's points of learning in a specific task. The levels from 'unistructural' to 'relational' are seen to be the "target mode" (Biggs & Collis, 1989; p.152) of the learning outcome, whereas 'prestructural' indicates that the student has not yet achieved the target mode and 'extended abstract' shows that the target mode has been overshot.

To illustrate the use of this technique with the learning outcome defined above, Figure 1 defines each level in the SOLO taxonomy and gives an example from the OTIS transcripts.

The SOLO taxonomy was then applied to the preliminary extraction. Some of the statements in the preliminary extraction could not be used for SOLO. A problem was encountered whereby most of the students' statements were very short. This is a feature of synchronous communication, because students wished to make their point in a conversation quickly before the thread of the topic moved away. These short statements made the SOLO classification more difficult to interpret and not all statements could be classified. Also, linking statements and other statements not directly relevant to the selected learning outcome were abandoned at this stage.

results

Initial Data Extraction

The simple procedure of performing an initial data extraction of all material concerning the solution of the case study proved a powerful tool in evaluating the course. This showed examples of students interacting with each other as they engaged in reflection and synthesis of knowledge (Figure 2).

The initial data extraction revealed marked differences between the tutorial groups, concerning:

the relative amount of time spent discussing the solution to the case study (the "content"), compared with establishing administrative/mechanical details (what to do and when to do it, the "process").

when discussion of the case study takes place (in tutorials or in peer group meetings).

Figure 1: Structural levels in learning. Examples are from the ‘Esther’ case study, concerning a teenage girl with learning and speech disabilities.

SOLO Level	**Example**
Prestructural	The utterance ignores the client, the client’s need and the technology.
Unistructural	The utterance focuses on one relevant aspect: the client, the need or the technology. *e.g. "that is the problem; we don’t really know what the [Esther’s] cognitive level is"*
Multistructural	The utterance identifies more than one aspect about the client, the need or the technology, but does not integrate them. *e.g. "f.e. [for example] (i think) Tellus [an assistive technology aid], you can put it instead of the wheelchair table, so you can eat, write,… on it, and if you want to communicate, you put the raster on it"*
Relational	The utterance makes a coherent link between the issues related to the client, their need and technology. *e.g. "the thing is that her coputerized [computerised] comm. [communication] aid has to be rather small and not wheigh [weigh] too much and be easy to handle for Esther, but maybe it’s possible with a very small laptop to combine her speech and education."*
Extended abstract	The utterance explores issues relating to the client’s needs and technologies in general, beyond the scope of the case studies. *e.g. "i guess every centre has got several aid[s], so more than one kid can use the computer with an other aid, you just have to change the aid when an other kid uses the pc."* (based on the student’s experience of adapting an aid to Esther’s circumstances)

Figure 2: example of student interaction (names changed)

Week 5, tutorial group B
Ingrid asks "there are some amazing things you can do to adapt the pc, for example running it with infrared light so you just have to be able to move your head slightly etc, have you tried that?" Dirk says, "i did once" Gerhard asks, "me neither, is it easy to do so regarding to Esthers problem?" Ingrid says "I don't hink the infrared is a solution for Esther since she might have some problems in focusing and keep the balance with her head, maybe scanning would be something for her, or pointng as she do now" Dirk says, "that is why i asked to mr vandyk [Esther's father] how she can use her head, he answerd that it s difficult when she is tyred, and i don't know if that is very good for the spastic patern " Dirk says, "i agree with that ingrid"

Figure 3 shows the pattern of extracted data by week of the course and tutorial group during weeks 2-7 when the case study was solved. Tutorial group A spent much more time than the other groups in discussing case study solutions during tutorials. In the other groups, most of the tutorial time was spent on the process rather than the content. Even in group A, the amount of time spent discussing the process during tutorials increased as the course proceeded. However, group A was the only group not to meet outside the tutorial session to discuss the case solution. The other groups undertook the majority of their discussion of content in the peer booked meetings, peer ad-hoc meetings being predominantly social.

Figure 3: Occurrences of data concerning content (number of relevant student statements in brackets)

Week	**Tutorial Group A**	**Tutorial Group B**	**Tutorial Group C**	**Tutorial Group D**
Number of students	6	3	5	4
Week 2	After tutorial (37)	Tutorial (4) Extra tutorial (4)	-	-
Week 3	Before tutorial (26) Tutorial (84)	Client session (32) Tutorial (15)	Peer ad-hoc meeting (6) Peer ad-hoc	-

	After tutorial (18) Peer ad-hoc meeting (19)		meeting (9)	
Week 4	Before client session (13)	-	-	-
Week 5	Before tutorial (6) Tutorial (24)	Client session (25) After tutorial (12) Peer booked meeting (90)	Peer booked meeting (56)	Peer booked meeting (40)
Week 6	Expert session (70)	Peer booked meeting (69)	Tutorial (4) Peer booked meeting (69)	Expert session (8)
Week 7	Tutorial (30)	Expert session (10)	-	Peer ad-hoc meeting (16)

Further to this transcript data, the role of the tutor and the pattern of social exchange (discussing personal matters outside the course or their impressions and feelings about the course) within the groups were examined. This established that:

> Tutor A held "text book" problem-based learning sessions in the early weeks, and did not believe in being proscriptive in directing the students' learning. The fervent hope was that students would collaborate outside the tutorials, but in practice this did not happen except in the peri-tutorial period, when either the tutor arrived to start the session, then 'disappeared' for a period, or after the tutorial (weeks 2 & 3). In week 5, the tutor advised students to send each other emails if they did not meet on-line.
>
> Tutor B strongly encouraged students (weeks 2 & 3) in general terms to meet each other without the tutor being present. They met socially for 64 and 55 minutes in each of weeks 4 & 5, before the working sessions in weeks 5 & 6 recorded above as "peer booked meetings". This student group also used email extensively from week 5, to pass round information acquired on assistive technology devices.
>
> Tutor C strongly encouraged students during the week 5 tutorial to meet to discuss the case study, following a more general comment in week 3: "It is good to show collaboration throughout, rather than just as a conclusion". The group booked working sessions in weeks 5 & 6. Up to this point, they had had little interaction outside the tutorials.
>
> Tutor D strongly encouraged students to share their findings by email (tutor statements in weeks 2, 3 & 5). The email data is not available to the research team. The students booked a peer group meeting in week 5, in which they mostly exchanged information about their individual approaches to the case study (listing references or websites), rather than discussing

the outcome of the case study.

Application of the SOLO taxonomy

Figure 4 shows the results of applying the SOLO taxonomy to the statements concerning the selected course outcome, by group and week, for the weeks during which the case study was 'solved' (weeks 2-7). Statements were only included if there was sufficient information relevant to the learning outcome for them to be categorised to the appropriate SOLO level.

Figure 4: breakdown of raw data by group and week

	SOLO Level	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Tutorial Group A:	**Prestructural**						
	Unistructural	4	24			1	
	Multistructural	3	13	1	1	2	
	Relational		4		1	1	
	Extended abstract						

Tutorial Group B:	**Prestructural**						
	Unistructural	4	7		13		1
	Multistructural		5		7	8	1
	Relational		6		24	5	1
	Extended abstract				2	1	2

Tutorial Group C:	**Prestructural**						
	Unistructural		3		10	3	
	Multistructural		1		3	6	
	Relational		1			17	

	Extended abstract						

Tutorial Group D:	**Prestructural**						
	Unistructural				11		
	Multistructural				1		2
	Relational				2	1	6
	Extended abstract						

Looking at all the groups, the SOLO results offer the following indications:

> the lack of prestructural statements shows that students were aware of the problem domain and were already working in the appropriate mode of the learning cycle.
>
> the decreasing number of unistructural statements show that students were, in the early weeks, establishing the ground for their task. This is borne out by the fact that many of the unistructural statements were in the form of a question.
>
> the highest number of multistructural statements were found in the middle weeks of the course and show that students were exploring more than one aspect of the task, but not yet making links.
>
> most relational statements were also found in the middle weeks of the course when students were linking together the issues of the learning outcome; i.e. the client, the client's need and the assistive technology.
>
> extended abstracts emerged from week 5 onwards. This shows that students were taking the issues of the learning outcome, abstracting and generalising them beyond the confines of the case study.

To understand why there was such a difference both within and between groups, it was necessary to obtain some reasonably objective analysis of the level of learning achieved by each student for each of the intended leaning outcomes. Transcripts of communication sessions showed that in-depth discussions about possible solutions to the case studies were taking place, as well as revealing a variety of tutor styles. The results appear to confirm earlier work, which shows that students who have never met each other do not spontaneously collaborate in peer groups (Chambers, 2000).

further work

Additional areas are also revealed as worthy of further exploration. These include a number of practical problems that can hinder the learning process within an international context. For example students can quickly fall behind if confronted with additional hurdles such as language misunderstandings, timetabling complexities across time zones and term dates which are out of line with local arrangements. This had an effect on the level of ad hoc meetings where students rarely 'met' students from other countries online

except in pre-planned meetings. This was partly explained by the relatively sparse population of the virtual world, that there was only one group working on each case study, and they had already organised a full set of formal meetings. However, there was also the problem of individual schools booking laboratories at set times, and there being little time on the course for private study.

conclusions

Collaboration, although not spontaneous, did occur within the groups, allowing students to achieve what Wenger (1998; p.152) describes as an "accountability to the enterprise". There is an indication from the results that the groups did develop through the course to acquire some measure of deep learning and meet the learning outcome.

Despite the difficulties, which must be addressed in realising courses such as OTIS, e-learning provides a means of bringing together geographically-separated students to work towards a common purpose. As such, e-learning is a powerful adjunct to traditional course delivery whenever there is a learning imperative for students to experience direct international discussion and exchange of ideas concerning best practice.

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Retrofitting theory to practice - a reflection on the development of an e-learning community

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ABSTRACT

This paper relates to a project that worked to establish the Virtual Learning Space (VLS). The intent of the VLS is to provide a collaborative online environment where communities of interest can meet to share experience and understanding of Communication & Information Technology (C&IT) in relation to learning and teaching. The VLS is now an active collection of almost 1900 individuals who share experiences within an online or e-learning community. Having undertaken this development process, it is worth reflecting on how theory has moved forward to address the issues that have arisen during the project. This paper will therefore question what we mean by community, particularly in the online context. Illustrations from a growing e-learning community will link to the theory, and also trial its use for guiding future developments.

Keywords

Online community, Community of practice

INTRODUCTION

This paper relates to a project that worked to establish the Virtual Learning Space (VLS). The intent of the VLS is to provide a collaborative online environment where communities of interest can meet to share experience and understanding of C&IT in relation to learning and teaching. The philosophy underpinning the project was, and is, based on collaboration. The development of the VLS therefore included using focus groups, paper and email questionnaires, online discussion and brainstorming sessions. In other words, methodologies that aimed to engage the potential target audience in the project, as well as aligning the development of the environment with their particular needs.

The project has progressed such that initial implementation, evaluation and second stage implementation have been completed. The VLS is now an active collection of almost 1900 individuals who share experiences within an online or e-learning community. Having undertaken this development process, it is worth reflecting on how theory has moved forward to address the issues that have arisen during the project. The work of authors such as Wenger (1998) in relation to communities of practice, as well as more development oriented approaches that have considered how one might design and support communities online (Preece, 2000) are of particular interest.

This paper will therefore start by questioning what we mean by community, particularly in the online context. A brief overview of two approaches to communities of practice and online communities will be contrasted. Illustrations from a growing e-learning community will then link to the theory, and use it to guide future developments.

What is community?

Traditional views

We need to explore and define what we mean by community in the online setting, before we can undertake properly grounded research into the effects or importance of communities for learning. Questions regarding community are far from new, with 18th century authors such as Ferdinand Tönnies describing the ideal of *Gemeinschaft*, or community, as "social relationships based on locality and neighbourliness, fellowship, a sharing of responsibilities, and a furtherance of mutual good through understanding and the exercise of natural sentiment" (Slevin, 2000). It would seem useful to replicate what is good about these 'real' communities into any online learning community. This may provide an indicator of some of the likely characteristics, yet, the online setting clearly provides the potential to move away from definitions of community that are linked to geographical location. Indeed, there is something about online communities that relates more to Anderson's (1991) concept of 'imagined communities' where "belief in their presence is their only brick and mortar".

Social networks

This still leaves the question of what is central to online communities. It could be interests or hobbies; groups who share resources, provide support and demonstrate reciprocity; but perhaps the most encompassing of definitions would focus simply on social networks of relationships. As Slevin (2000) suggests, it is the latter that we should concentrate on because "modern communication technologies such as the internet are opening up opportunities for new forms of human association".

Wellman and Gulia (1999) do focus on social networks, linking their findings in 'real-life' communities to those online. They pose questions regarding the nature of online relationships, whether they are specialized or broadly supportive, noting that people "maintain differentiated portfolios of ties to obtain a wide variety of resources". These ties may be weak, as demonstrated by the fact that online people provide "information, support, companionship, and a sense of belonging to persons they hardly know offline or who are total strangers" (Wellman and Gulia, 1999). However, the portfolio of ties means online social networks are a potential rich source of information and support. In the context of online learning communities, it may be desirable to encourage stronger ties to develop, as this is likely to increase motivation and therefore likelihood of inputting to the community. One example of how this is achieved in an informal setting, is where communities are set up to enable members to rate others' contributions, thereby playing on and enhancing the status of individuals, and potentially increasing motivation to contribute further.

There is a strong need to fully exploit the potential that online learning communities offer in terms of linking people into social networks that they would not have had access to previously.

Dimensions of practice as community

Wenger describes three dimensions of practice as community – joint enterprise, mutual engagement and shared repertoire, see Figure 1. This paper will report on how these dimensions relate to the communities of practice within this particular learning community. Although the VLS is perhaps better described as an online space that incorporates many evolving communities of practice. Some of these are almost transient, perhaps because they focus on particular topics, and members move on as discussions draw to a close.

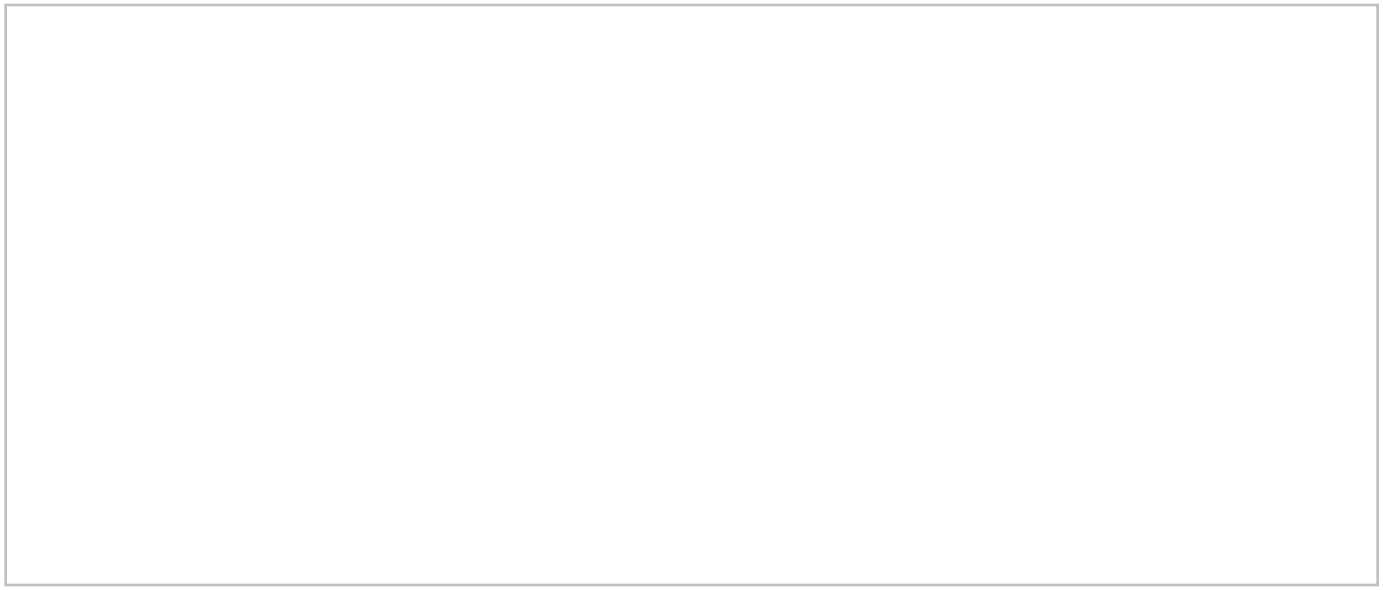

Figure 1 – Wenger's view of dimensions of practice as the property of a community (Wenger, 1998, p73).

What about online community?

Preece (2000) focuses specifically on online communities or e-groups, and cites four key features – shared purpose; people, who interact socially; policies, which guide people's interactions; and computer systems, which should "support social interaction and facilitate a sense of togetherness". The first three relate directly to Wenger's three dimensions, which is interesting as Preece refers to communities that might not consider themselves to be communities of practice. (See Figure 2 and compare with Figure 1.) Finally, the addition of computer systems means that communities can move online. This is essentially the whole reason for the existence of the VLS – it provides a space where people can exchange experience that would not otherwise be possible.

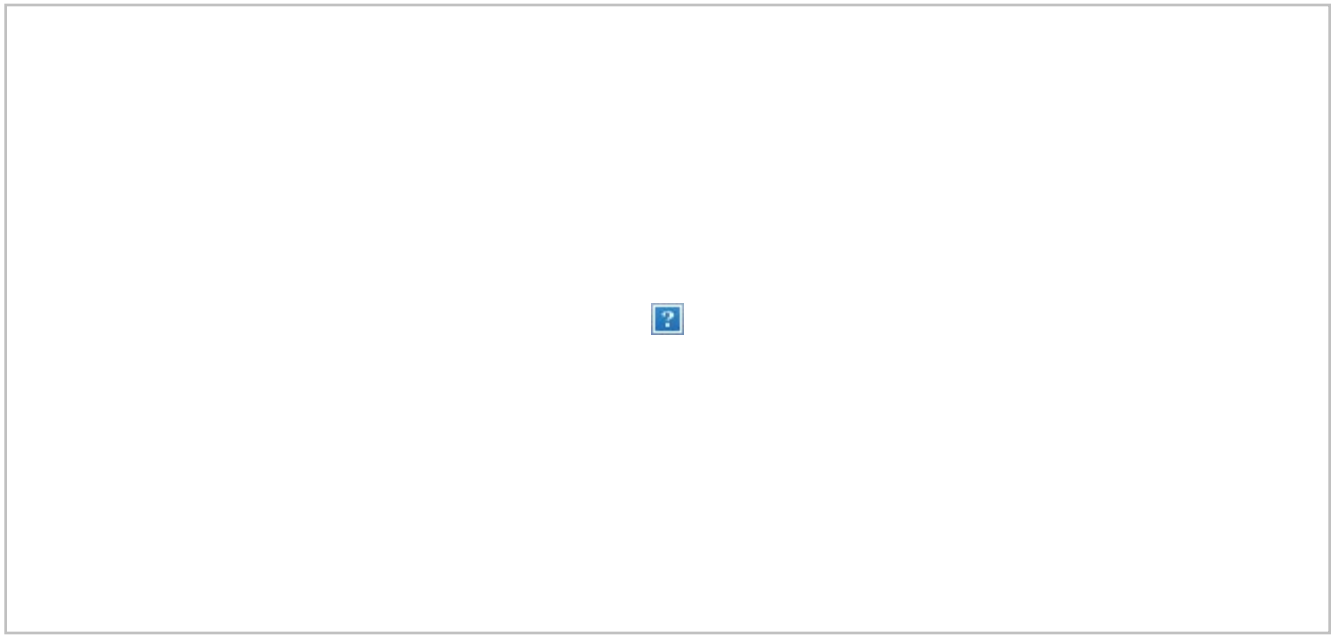

Figure 2 – Key features of an online community, with associated characteristics (Adapted from Preece, 2000)

A SUCCESSFUL ONLINE community?

According to Duggan , a strong or healthy online community enables members to gain access easily, has clear or intuitive navigation, with easy to find and use discussion facilities, and provides some reason to encourage members to return. This is one approach to identifying a successful community. The following will consider how the VLS might be reviewed for success.

As an initial evaluation, the VLS site hosted the OTiS e-workshop, in May 2000, as part of the OTiS project (http://otis.scotcit.ac.uk/). This workshop brought together over 100 experienced online tutors from around the world to share their experiences and reflect on their practice. The workshop itself was held entirely online; the delegates never met. The keynote presentations, case studies, discussions and online chats from the workshop produced a rich and detailed picture of how tutors have adapted and changed their roles to meet the challenge of the online environment. This also enabled participants to develop new skills and reflect on approaches to online tutoring used by their peers. Feedback from participants was used to improve the VLS site, which was re-launched in November 2000. Since the e-workshop, many participants from the workshop have returned to the VLS to take part in a programme of ongoing events.

This provides a broad and yet contained indicator of success for this particular community site, but for other sites, or over the long term, we could evaluate success in terms of membership, or accesses to the community. Slightly more involved measures could include indicators such as the volume of discussion or number of contributions per member. Yet, even these are very superficial indicators, as large numbers of contributions do not necessarily demonstrate value. This leads us to consider the quality or impact of contributing, or otherwise being a part of the community. In relation to online learning, we can refer back to learning theory and analyse interactions for example for evidence of collaboration or shared construction of knowledge (Chappel, McAteer and Harris, 2002; Curtis and Lawson, 2001).

Each of these routes, however, presents a fairly narrow focus for investigating the importance of community in online learning. This paper will now address the broader view by referring to Wenger's (1998) theoretical description of communities of practice and paralleling this with Preece's (2000) practical overview of the key features of online communities. These will be used as a means of identifying to what extent the VLS could be considered to be an online community. Parallels could then be drawn during conference discussion of how this could be applied in more formal learning situations.

Evidence of online communities of practice

Using the dimensions of practice and key features of online community referred to above, Table 1 provides a brief analysis of how these are addressed in the VLS.

Table 1 – Initial overview of how the VLS addresses the dimensions of practice and key features of an online community

Dimension / Feature	**Characteristic**	**Evidence / Potential area for improvement**
Joint enterprise / Shared purpose	Mutual accountability / Shared ownership	The development process of the VLS involved close consultation with the prospective community membership.
	Negotiation	Although the purpose of the VLS is clearly stated as exchanging experience about the application of C&IT to teaching and learning. Other than online polls, there has not been any

		recent formal community negotiation regarding the future direction for the community.
Mutual engagement / People who interact socially	Doing things together	Since the OTiS workshop, shared and open online synchronous chats have been a key feature of the VLS. Some of these have attracted upwards of 30 participants from around the world.
	Relationships / Effective communication - Personal presence	To encourage the development of relationships, the VLS includes facilities for members to post online profiles, and to link with others via shared interests. Communication (via text) is central to the VLS, as this is the main means of exchange.
Shared repertoire / Policies that guide people's interactions	Styles	This is partially achieved through common terminology, but also supported by the informal and supportive stance of community facilitators. Clearly defined privacy and copyright statements also underpinned a shared 'style'.
	Concepts	Over the last 12 months, the VLS has developed an approach to gaining knowledge from experts through a process of online chats and asynchronous discussion events. These focus on particular areas of interest and are known as topics of the month.
	Historical events	The OTiS e-workshop provides a key historical event within the development of the VLS. Even so, only a small proportion (~5%) of the current membership took part in the actual event.

Demonstrations from the VLS (http://itlearningspace-scot.ac.uk/) of the evidence described above will be given during the conference paper presentation.

Applying the theory to future developments

An initial review with the theory, suggests that to be a true community of practice, the VLS needs to place more emphasis on joint enterprise. This brings in questions of negotiation and mutual accountability. The latter clearly relating to responsibility and ownership within the community. A sense of shared ownership will always be difficult to develop amongst a distributed community, but the most obvious start point would be to continue to involve the membership in the development of the community. This can then be enhanced through the other community features outlined in Table 1, but will need to be at the core of any effective online learning community.

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Negotiation, identity and knowledge in e-learning communities

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ABSTRACT

In this paper I wish to illustrate how groups of e-learners in formal, accredited learning contexts develop as a community, and the way in which members of the group negotiate identity and knowledge. In doing this I draw on my experience of working with e-groups on the MEd in E-Learning at the University of Sheffield. Specifically I examine three e-groups who exhibited a variety of collaborative processes, and show how they managed their learning experiences. Additionally I present the findings of a study looking at identity in e-groups and the development of community.

COMMUNITY AND IDENTITY

What is identity? Wenger (Wenger,1998 Ch 6) suggests that we experience identity in practice: it is a lived experience in a specific community. We develop identity by looking at who we are in relation to the community in which we are practicing members. Practically, this occurs through participation in the work of the community.

The process of becoming accountable to the work and purposes of the group has been described by Wenger (1998, p152) as a display of competence, involving three dimensions:

mutual engagement: in which we develop expectations about how to interact, how to treat each other and how to work together.

accountability to the enterprise: the enterprise helps define how we see the world of the community. We develop a shared understanding of it, its culture and how to participate in its values and activities. We know what we are *there* for.

a process of negotiating a repertoire: through constant membership of the community we begin to understand its practices, interpret them and develop a repertoire of practice that is recognisable to members of the community. We make use of what has happened in the community as a way of achieving this.

According to Wenger, these three dimensions are necessary components of identity formation within the community of learners and lead to the development of competence.

Meaning needs to be negotiated through dialogue and discussion. In communities of practice "meaning making" is negotiated through the processes, relations, products and experiences of the community (Wenger, 1998).

In this paper, I will show how this takes place throughout the life of e-groups, and will indicate how negotiation is a central process which can take many forms. In doing this I will present:

An examination of three e-groups and the issues they faced in working collaboratively

An examination of identity in e-groups and the ways in which this helps foster community

WORKING COLLABORATIVELY IN E-GROUPS

The work of three e-learning groups was analysed. Two of the groups (groups one and three) worked harmoniously, and successfully produced a collective end product, which they were happy with. The other group (group two) exhibited extreme anxiety and division, and required extra resources from its members in order to sustain itself and produce it's collective end product. Anxiety became a major inward looking focus for this group, which had the effect of diverting it from effective collective production. It did produce a collaborative product, but one which the group was not entirely happy with. The patterns of work and communication of the three groups can be summarised as:

Harmony, communication and conflict

Groups one and three have a high need to collaborate harmoniously. Their starting point is to make each group a really "good" collaborative group which works harmoniously, and they put considerable time and effort into ensuring this happens. They deliberately address the need to support differences and mutual recognition. They actively involve everyone in decision-making, group processes and production. They work in ways that are open and accessible to all members and make reference to this being an important

requirement for success. They talk of "really wanting the collaborative project to work". They could perhaps be described as being "dutiful".

Group two supports difference but also uses it as a source of conflict. They bring "differences" to the forefront and use them constantly in negotiations and discussions. However, as a group they cannot seem to reconcile some important differences in a way that helps them work together and be productive. They therefore sub-divide to achieve their tasks. They also bring a high degree of closure to their group processes by the sub-groups using faxes, telephone, email and so on within the sub-group rather than conducting their work in the open forums, therefore making it impossible for others to participate and know what is going on. They never talk of "really wanting their collaborative project to work" as the other two groups do. They are perhaps less concerned with "duty" and less likely therefore to collaborate as a group and more likely to diverge, confront and question. Their high introspection causes them to constantly refer inwardly to themselves in a struggle to understand why they are working in the way they do.

All three groups at some point divide their work so that sub-groups can focus on accomplishing particular parts of the overall product. Groups one and three formally and openly divide and come to an agreement about how the sub-tasks relate to the final product. They support each other in their sub-group work, which is open and accessible to all members of the group. Group two works in sub-groups by default – perhaps as a mechanism for avoiding conflict in the large group. They cannot easily find a way of working as a community. It seems people therefore form liaisons in order to deal with the lack of agreement over the focus of their project. Collaboration in the sub-groups is carried out in closed circles, with little communication between sub-groups or, at times, within the large group. There is some evidence of the sub-groups deliberately keeping their work closed from others.

However, group two does see itself *as a group* – there is evidence of them comparing themselves to the other two groups and using them and their work as a reference point for themselves.

Reflexivity within groups

Each group is highly reflective about its work and learning processes, but in group two reflection becomes something of an obsession, and actually becomes a major focus for the group without them collectively agreeing to it being so. It could be argued that in the absence of an agreed focus, this group "naturally" (because of its particular circumstances and dynamics) chooses its focus to be itself.

Considerable time, thought and energy is devoted to this by:

> the group struggling to understand itself. It has resource to communicating about its own dynamics as a way of explaining what is happening to itself, justifying its actions, controlling members actions, comparing itself to the other groups, accusing members about various aspects of their project work and generally ruminating on the sense of distrust within the group.
>
> Sub-groups devoting time in their chat sessions to trying to understand the group as a whole
>
> Individuals choosing to focus their research on finding out about group processes and dynamics

Contemporary psychological thinking about distrust in collaborative groups suggests that rumination and reflection is not always valuable in producing clarity regarding difficult situations or with producing insights into how to cope with them:

"..it seems reasonable to hypothesize that rumination about others' motives and intentions in situations where concerns about trust already loom large will increase individuals' distrust and suspicion of others' behavior. In particular, one might argue that the more individuals ruminate about the intentions and motives underlying the behavior of other actors with whom they are interdependent in a trust dilemma situation, the greater their tendency to make more sinister attributions regarding their behavior." (Kramer, 1999 p172).

The balance between taking time to ruminate and reflect, and that of leaving aside their differences and "moving on" cannot be an easy one to determine when a collaborative learning group is in the middle of a difficult dynamic. This group could have chosen not to spend time ruminating and reflecting. They could just have got on with the "task" of producing a final product. But by focusing on themselves and their struggle to collaborate I think they show a real and genuine concern for each other. To ignore the issues they are facing would be tantamount to saying that they did not care. But there is evidence throughout their discussions that, at the individual level, they do care. They are trying to look after themselves. This is evidenced in part by them continuing to communicate and not give up. They even remark on this themselves, showing that they have a high degree of self-awareness. They do share and discuss, they produce work, and they never talk of splitting up or giving up.

Group identity and self-identity

In his analysis of the self and society, Giddens (1991) suggests that:

"Self-identity (…) is not something that is just given, as a result of the continuities of the individual's action-system, but something that has to be routinely created and sustained in the reflexive activities of the individual" (Giddens, 1991, p52).

Drawing on the work of the psychoanalyst R.D.Laing, Giddens suggests that one way of analysing self-identity is to consider those whose identity is fractured or disabled. From such a viewpoint, the ontologically insecure individual may display one or more of the following characteristics. They

> lack a consistent feeling of biographical continuity; they cannot sustain a continuous narrative about themselves.
>
> are in a constant state of anxiety, which prevents them from carrying out practical actions
>
> fail to develop trust in themselves and their identity, and often subject themselves to constant self-scrutiny

Can the concept of self-identity and the analytical framework provided above be applied at the group level? For example, can a group be described as being "anxious"? The analysis of the work of the three groups shows that they are all highly reflexive: they are aware of themselves as groups and address their histories, development and their future. The anxiety amongst the members of group two may work towards producing a sense of the group that is fractured or disabled. Participants subject their behaviour and thoughts to constant scrutiny, which at times becomes obsessive. This group is obsessed about questioning itself in a way that none of the other groups are. The other groups do reflect on their processes and procedures and use this as a source of learning. But at times group two is very single-minded about this, and it pervades the life of the group. The group never seems to get over its anxiety about itself, and the members constantly discuss and scrutinise themselves and their actions.

What does group two feel in danger of? Not achieving its objectives? Not "working" as a group? Not "fitting" into the required model of an effective group (whatever that is)?

The group doesn't seem to know itself – a condition which Giddens (1991) suggests is necessary for ontological security. It seems to be struggling to find some kind of collective identity: some kind of ongoing narrative (Giddens p54) of itself. In a real sense it does not know who it is or where it is going. This seems to be a major source of anxiety. Members of the sub-groups try to work out how they came to be where they are, and how they can bring about change and development so that they can influence where the group collectively is going. But this is perhaps inevitably doomed to failure as long as it is the work of the sub-groups and not the work of the group as a whole. Factions, no matter how well intentioned and how insightful they are, cannot mend the fractured group. As long as some individual members are not involved in the project of making the group "better", it is probably the case that the group will not function well as a collective. If some members of the group are with-holding their engagement, then the other members of the

group will either

> carry on the group's work without those people, or
>
> spend a lot of time and energy trying to understand why those people are engaging in the way they are, whilst at the same time not functioning as a group. They can function as sub-groups and get some of their work done, but the division will make it impossible for them to achieve a collective group product.

In the other groups there is a high sense of self-identity as a group. They seem to have a strong ongoing narrative, which they keep active throughout the collaborative project. These groups are inclusive and mainly work in harmony. Sub-groups evolve from collective work and discussion as a source of production which feeds into the main group task of producing the final product. Divisions, differences of opinion and so on exist, but the groups want to achieve and be successful, so they are handled with considerable understanding and willingness to be inclusive and supportive. The focus on the well being of the members of the groups seems to ensure this, as well as each group's need to succeed. These two groups work at establishing their identity, constantly creating and sustaining it through reflexive processes.

Control and ontological security

Implicit in the actions of groups one and three is a high degree of "routinised control" (Giddens, 1991 p56) which helps protect the members of these two groups against themselves. Their high need to collaborate and be productive within the agreed parameters of the course requirements may mean that each member monitors themself so as to prevent schism and division within the group. Competition and disagreement do exist, but are supported in subtle ways by processes of negotiation, give and take and reciprocity. Members are willing to "give" so long as that is taken as a criterion for existence in the group and for successful production.

Self-control can be a powerful mechanism in these two "successful" groups. The language used in these two groups is perhaps an indicator of this: it is always positive and the group members tell themselves that they are working well. They say they are collaborating and succeeding in their work. They sustain an ongoing narrative about collaboration and success, which is largely absent in group two. They believe what they say, and it has the effect of sustaining that belief. They trust each other in these circumstances. This helps produce a sense of ease within the group about who they are and how they are working. The effort needed to sustain the group is therefore greatly reduced, and with it any anxiety about the group is reduced. All of this helps the performance of the group.

On the other hand, the members of group two tell themselves they are not doing this and perhaps therefore reduce the chances of it happening? They come to believe that they cannot collaborate successfully. They cannot seem to begin to develop a positive ongoing narrative about themselves, let alone sustain it throughout their time together. This keeps the level of anxiety high within the group, which in turn has the effect of requiring extra resources from the members in their efforts to sustain the group. Their anxiety is a source of constant examination and questioning which diverts them from effective collective production.

There may be a need to control in order to produce harmony and effectiveness. The patterns of the work of the groups may indicate the ways in which control is established and maintained.

The conventionally "successful" groups discuss and support each other. Members do not go off and do their own thing. They do however work as sub-groups, but only after they have been given 'permission' to do so by the whole group. At other times the enthusiasm to achieve and be productive and the interest inherent in their collective work makes it possible for individuals to legitimately go off and work separately and not be punished or ignored for doing so. Group two does not easily perform and has not developed routines conducive to sustaining the group and its work. At the end of the collaborative work, this group is still trying to develop its routines. It is still negotiating with itself.

Guilt, trust and the community

Clearly the emotions of the members of these groups play an important part in shaping the work of the groups. Anxiety is present in all the groups to some extent, but is pervasive in group two. The members of this group talk of their "struggle" to collaborate, and at some time or other they all indicate a certain degree of guilt about the way they are interacting and behaving. Their identity does not match up to the implicit and explicit contract of collaborative learning ie to work together through processes of negotiation and participation. The existence of feelings of guilt pre-supposes people going against norms sanctioned by the group or community (Giddens, 1991). The very presence of guilt therefore suggests the existence of some kind of community.

At times trust is lost in group two between certain individuals. This has the effect of unsettling the group by raising questions about trust generally. Although it is never actually mentioned openly, a reading of the communication transcripts indicates an implicit lack of trust between one particularly strong-minded, and therefore significant, member and the others. Trust is present in the sub-groups, but not across all individuals. Their language and actions are indices of this. In the other two groups, trust does seem to exist across individuals. Members are loyal to each other. They do not abandon decisions made collectively after the event. We have seen that in group two there is a pattern of decisions being made only to be questioned afterwards, or abandoned altogether. To the members of this group, this feels like being betrayed. Groups one and three work hard at developing a sense of trust, and at individuals winning the trust of others in the groups. They are very open about themselves, their interests, worries and concerns. They actively support each other by making every effort to "listen" and respond quickly. They offer to share the workload. They show commitment to the members of the group and to ensuring that the group sustains itself and carries out its job of production. These are all characteristics of people with a well developed senses of identity (Giddens, 1991). These groups could be characterised as being highly sociable.

In group two, being sociable is openly questioned by the significant member. This person says they are not interested in socialising or in getting to know the others. They are only concerned with getting on with the job of producing a collaborative product. This admission has profound effects on the other members of the group, and as we have seen, acts to stop them being productive. At the same time this person says they feel like an outsider, and talks of the group being made up of ‘cliques’ and being apart from her.

Although liking others, socialising and getting on with them is not always a necessary criterion for successful cooperation (Axelrod, 1990), it does seem that in the context of an adult learning environment such as this, there is a real need for a sense of trust and community. Trust is created by people taking time to listen to each other and to nurture an atmosphere of caring (Giddens, 1991). This helps produce feelings of security within the members of the groups. In trustful situations people are more likely to take risks with their learning, to push themselves and others beyond their present boundaries. This can be highly developmental, as well as more likely to produce useful insights into the groups’ learning processes.

IDENTITY AND COMMUNITY

Members of communities of practice are likely to belong to multiple communities at the same time. As they experience this multi-membership, they have to work at maintaining their identity across the boundaries (Wenger, 1998, p158).

Analysis of the CMC transcripts of e-learning groups shows how this works in these communities. Discussion within the group involves reflection on their practice and critical discussion and analysis of theory and concepts. The meaning discerned from these discussions by each participant is taken out of the group and into each participant’s place of professional practice, where it is applied and tested. Focusing on this helps produce "development" in their professional practice (as teacher, lecturer, librarian, consultant or whatever their current practice is).

The insights and knowledge gained from this are then brought back into the ongoing work of the group, where it is used as content for discussion and where it eventually becomes material to be woven into the

various products of the group. This is an important facet of the knowledge building-work which takes place in the group. Sometimes participants are aware as they are doing it that they are developing knowledge in this way. Often they are not and it is only when they come to collectively review their work later in the Workshop that they gain some insight into this process. The weaving together of work around theory and practice becomes almost natural as the members of the group examine the literature, discuss it and relate it to their present group work and to their professional practice "back home". It also works in the other direction, where their practice in the group and their practice as professional educators become the catalyst for finding theory to help explain it.

The construction of identity is a central aspect of learning (Lave & Wenger, 1991; Packer & Goicoechea, 2000). It can be argued that when learning is viewed as social co-participation, the focus is on each individual constructing their identity within the social space of the learning group. This view of identity within learning is one which poses interesting questions about the "hidden" ontology of sociocultural theories of learning:

> *Whereas much psychological research treats identity simply as self-concept, as knowledge of self, that is, as epistemological, the sociocultural conception of identity addresses the fluid character of human being and the way identity is closely linked to participation and learning in the community.* (Packer & Goicoechea, 2000, p229).

This occurs through (amongst other things) processes of social participation (Packer & Goicoechea, 2000; Wenger, 1998)): more precisely in this case through processes of collaborative learning. The textual entries to the various synchronous forums and asynchronous chat sessions are written in the knowledge of who the community is. They are written by individuals who "imagine" themselves to be in this virtual community. They are written both as a way of communicating about 'content', processes and other aspects of the group's work, but also as ways of communicating about who they are as individual participants in this community. They reveal the identity of the writer within the community.

The negotiation of identity is a very reflexive thing. We encourage participants to reflect on their group experiences throughout the course, and provide opportunities when they have to formally stand back and review their own and each other's communications and contributions. This can be a very revealing, challenging and risky thing for them to have to do. Identity – of self and of groups – is something to be creatively worked at in order to be sustained:

> *The altered self has to be explored and constructed as part of a reflexive process of connecting personal and social change*. (Giddens, 1991, p 33).

Identity construction: Within these groups, identity is presented, challenged and re- shaped with respect to:

themselves as learners: as learners they are challenged to change their identity as learners by:

taking responsibility for developing skill in judging the quality of their own and each others work

identifying as a member of a new (MEd) community of practice

understanding that assessment is a learning process and not a unilateral process of judgement

writing for a definite audience ie the community of peers and tutors

coming to view each other as an important source of expertise and learning

coming to realise that they can produce knowledge

It also has the effect of changing members' attitude to themselves as a learner and seems to facilitate the taking of responsibility for their own learning.

their purpose as learners: within this community they are asked to participate in a variety of activities and events which they do not normally associate with the purpose of learning, such as participating in collaborative assessment processes; tasking some responsibility to help others learn; reflecting on their learning and using that as a source of new learning

their relationship with tutors: they are asked to take on some of the traditional responsibilities that they have come to associate with the role of a 'tutor', such as assessing themselves and each other; developing relationships of a qualitatively different kind with their tutor, more akin at times to working with them as a peer than tutor. They are encouraged to talk with tutors as 'friends', to challenge them and their expertise when necessary and to share the power that tutors hold.

their place in the academic world: students often have strong conceptions of what it means to be 'academic' and to participate on a post graduate course. They tend to view the academic world as a place where individuals work alone and produce abstract, theoretical products. Some of them aspire to this. Some think it too detached and unrelated to the 'real' world, and therefore do not wish to particularly aspire to it. Being asked to work as a member of a learning community can produce conflict in their self- identity in a number of ways (this is a phenomenon noted by others eg Lave & Wenger, 1991; Packer & Goicoechea, 2000), not least in their view of themselves in the academic world. It can cause them to question their views on the meaning of learning and scholarship. This is a source of discussion in the group as they come to identify with the meaning of community and realise that it is possible to study as a community rather than solely as individuals.

their professional practice: the boundary between members' work in the group and their professional practice is a major source of change and development, both at a personal and professional level. Group members are challenged to consider their existing practice in the context of their work in the group. They are also challenged to consider their practice as learning members of the group (5).They discuss who they are (implicitly discussing their identity) as professional people (teachers, librarians, lecturers, course designers) and work towards 'developing' their new identity. The work that occurs at the boundary of identity in the two communities can sometimes be highly developmental.

There is a tangible shift during the history of the group from seeing themselves as individual learners to seeing themselves as people learning in a social environment where collaboration and cooperation is expected and rewarded. All of this has affects on each member's identity as they shift from one community to another (6). The ways in which they experience themselves through participation helps them define who they are (Wenger,1998).

DISCUSSION

From the above we can see that negotiation in e-learning communities poses certain problems and issues for participants and tutors. In the groups, members are faced with at least two practical issues relating to their work:

production versus community processes

structure versus negotiation and openness

Looking back at our history of designing for virtual learning communities I can see a move away from completely open, relatively un-structured practices to ones where we have begun to deliberately design for

structured collaborative and cooperative learning.

In the early years of the course we deliberately tried to emulate those community building and sustaining processes which we had been using in face-to-face meetings. These had been largely very open, un-structured processes which attempted to offer opportunities for all members to participate and engage with developing community and in making decisions about the content and design of the course. In these large communities it was possible to "hear" each member's interests and concerns and attempt come to a collective understanding of the personal and collective needs of the community. We felt this was an important aspect of developing community, where time was given to knowing who the members of the community were. Some of this was carried out in face-to-face sessions and then continued online in the learning sets. Initially we had face-to-face meetings at the beginning of each workshop, followed by the online component, which was the major part of the workshop. As we attempted to make the course more widely available across the globe, we moved to face-to-face sessions only at the beginning year one and year two of the programme. This allowed our overseas participants to attend the meetings prior to each year's online work, without obliging them to attend too many face-to-face sessions which was obviously a large travel expense for them. To make the course completely accessible to anyone anywhere in the world eventually forced us to abandon all face-to-face meetings, and re-design the entire course for as a completely virtual one. At this point we attempted to design learning events and processes which could support as much of our values and beliefs about openness, negotiation, self management, personal and collective decision making and so on as was possible.

The community develops through discussion and negotiation. With numbers greater than about 7/8 participants and a tutor, this becomes extremely difficult and at times impossible, to achieve. Discussion and negotiation in large community groups (eg of 20-25 which is often the course intake each year) is cumbersome. The amount of information produced in such large communities when everyone is actively participating is extremely large and burdensome. The possibility for diversity of views is great, but the effort required to follow discussions and negotiate from the many different viewpoints is high.

For example, in one of the workshop reviews where we focused on our experiences of the previous workshop and then moved on to forming new learning sets for working in the next Workshop, we attempted to have a very open process in which participants and tutors could start discussion threads on any review topic they wished. The focus was on encouraging diversity of view and opinion. There was a high degree of negotiation leading to an extended period of discussion. We attempted not to be driven by reaching consensus. But for some participants this caused a high degree of frustration. Not everyone participated, and tutors felt obliged to work "behind the scene", analysing what was happening and trying to make sense of it. The production of views and extremely interesting and innovative ideas about the design of the next Workshop was a great strength of this approach, but the asynchronous communicative process took longer than we had anticipated. We had to at some point attempt to reach some collective view of where we were going and why, but the discussions could have gone on for many additional weeks as participants "listened" to each other, considered each other's views and then added additional viewpoints. It was clear that as an open-ended discussion process it was working very well, but as a method for coming to some collective view on where we might be going, it proved difficult to handle. As a community we had to close the discussions down, and move onto the next Workshop. Finally the tutors intervened by offering an analysis of the emerging issues and concerns which participants seized on. To the tutors this felt like being forced to have to bring closure too early. It was a solution to an increasingly chaotic and diverging process, yet seemed inappropriate for what we were trying to achieve as it made the tutor the final arbiter, rather then the community.

Early closure is sometimes also seen in the smaller groups where, after extensive asynchronous and synchronous discussion and negotiation on the focus of their collaborative work, members sometimes accept the first "good" proposal offered by one of them in order to get them started on their work. It seems their willingness to negotiate and discuss is tempered by their concerns to forge ahead and get the work done. It seems reaching consensus by thorough and extensive negotiation is sometimes difficult and too protracted. Balancing that with their feelings about "doing" the collaborative project sometimes leads them

to accept the first ‘good’ proposal and which relieves them of the continued need for negotiation.

The question arises: does CMC closedown the possibility for negotiation and diversity of opinion in learning communities? The introduction of synchronous CMC has in some ways offered opportunities for the community to come together in small groups to focus on decision making. But even here, on reading some of the transcripts of the chat sessions, consensus making is not easy. That’s partly because the technology of chat rooms is clumsy and discussion processes can be very time consuming when carried out synchronously when the value of ‘hearing’ everyone is a major criterion. Closure is sometimes forced by people having to leave the event. To overcome this, quite often, participants place the transcript in the asynchronous forum so that they can reflect on the chat. They also often summarise the chat outcomes and place these in the forum. They then continue the discussions in the forum itself, sometimes taking part in another chat session to develop their ideas and reach agreement. All of this is, however, very time consuming.

When participants are willing to give time to these processes and negotiations, the outcomes are extremely favourable and the time involved usually provides them with a real sense of engagement and collective identity. Their work together forges a sense of community. Although time consuming, the potential benefits for them developing trustful relationships which in turn will support and foster their collaborative work are enormous. This I think is not always explicitly anticipated by the groups, but in looking at their collective work it is apparent to any outsider. When it does not happen, whether that is by deliberate choice or the circumstances of the social processes of these learning environments, then it is apparent that the members of the groups are less likely to feel engaged with each other or feel that they have been involved in a truly collaborative learning experience.

Does this suggest a trend towards consensus and closure? In the early days of the MEd the course could be characterised as very open; it facilitated huge diversity amongst those involved, was highly engaging and had a high level of negotiation. The price to pay for this was, at times, a huge overload of information.

Now, with the deliberate introduction of formal collaborative and cooperative processes and clear work phases, negotiations are more focused. Discussion is still very high but occurs within well defined time periods after which everyone involved moves onto the next Phase of their work; decisions are sometimes finally made by tutors (with or without clarification); there is perhaps more strategic learning with members of learning sets choosing to address the requirement to produce an end product as a priority over community development and "true" collaborative learning.

Consequences for the tutor: although the differences are not always clear cut, it does seem that the movement towards providing more scaffolding has, in my opinion, provided both positive and negative effects:

> the changes could be causing tutors to become slightly more distant and less personally participatory in bringing their own interests and concerns to the community.
>
> they are more likely to have a presence as an interventionist rather than as a facilitator. They are more likely to ‘step in’ and offer solutions for the set (ie for others) rather than being part of the set and being authentically involved in developing understandings of the set and it’s project and purpose from the perspective of an active member.
>
> this shift in power relations may signal to participants that the tutor is there to intervene and present closure, and they may come to expect that from the tutor.

From the perspective of a community of practice, these possible changes in the tutor’s relationship with the members are bound to have consequences. If they are moving towards a relationship which is peripheral, purely diagnostic and outside the actual productive work of the community, then are they likely to be seen by members as outsiders who exert control and unilateral power?

Consequences for community: communities of practice require considerable time to develop and sustain themselves. They are often in a constant process of change and flux. They do not deliberately set out to focus on their learning. Learning communities (Pedler, 1981), on the other hand, do focus on learning as a community issue. They are deliberately reflective in their practices, looking at themselves and their learning processes. They are therefore often knowledgeable about themselves and what they are trying to achieve. They are largely self-organising through their formal learning processes. In developing communities in e-learning environments, both of these concepts – communities of practice and learning communities – offer strong conceptual models which help us in the design of spaces and events which focus on the social practice of working together.

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POLARIS: A Tool For The Support Of Interactions In Learning Communities

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ABSTRACT

What makes a group of students a learning community, and what can the role of technology be in this? These questions came up in the POLARIS project of the University of Maastricht (UM). The goal of that project is to integrate the use of technology in the curriculum. Problem based learning (PBL) is the context of this project. The POLARIS project is an attempt to redesign and improve the educational process, without changing the underlying educational principles.This paper describes the functionalities of the prototype of a tool that supports active collaborative learning in small groups. .

Keywords

Collaborative learning, learning community, problem based learning

INTRODUCTION

In this paper the process of redesigning education in PBL curricula is described, as well as the reasons for doing that. The first paragraph is a description of the way PBL has been implemented in the UM, followed by a presentation and discussion of some data in the second paragraph that lead to the opinion that new ways are needed for the realization of that principles. In the third paragraph the POLARIS learning tool is presented. In the design of that tool much attention has been given to the possibilities of ICT in facilitating interactions for learning.

Problem based learning

PBL is the main approach in all curricula of the UM (Medicine, Health Sciences, Economics, Law, Psychology, Cultural Sciences, Knowledge Technology). Although every day educational practice varies, a few basic elements are present in all curricula. Twice a week students meet in small groups (10 to 12 persons), coached by a tutor. Students start the learning process with the analysis of a problem. In brainstorm sessions students try to find out what knowledge they need in order to solve the actual problem. An example of a problem that students use in third year of the medical curriculum:

A 60-year-old man visits you in your general practitioner's practice. He is worried. When he was driving home from his work, an insect flew in his left eye. When he tried to wipe it from his eye, he noticed that he could not see well with his right eye.

Discussions in small groups are wrapped up with the definition of some learning issues which then are the basis for self directed learning activities in the following days until the next meeting . Next learning issues were defined in the analysis of the example problem above:

1. *The functional anatomy of the eye.*

2. *What is the differential diagnosis of loss of sight and how can it be examined?*

This PBL scenario in which students start and finish their learning in the *context* of interdisciplinary problems that reflect professional practice (situated cognition), has been unchanged in the past 25 years, and will probably never change. Essential for PBL is the preservation of complexity: problems should not be simplified, remain ill structured and therefore offer learners the possibility to discover that multiple solutions can be found for the same problem. What the name PBL does not reflect is the social dimension of the learning process. However, active and self directed learning, in small groups, oriented to the development of knowledge is of equal importance for PBL. From this perspective many different PBL practices can be found. Variation is possible regarding the number of students that belong to a group, the frequency of meetings, the available time to study in between the meetings, role differentiation, the level of expertise in the group, the availability of information resources, and the support of the tutor. These variables are all important elements that in itself, or in combination, affect the effectiveness of PBL. This will be discussed in the next paragraph.

Frictions in the realization of principles in PBL

Evaluation studies of the curricula show a growing paradox. A rapid growth of the number of first-year students was the consequence of the publication of evaluation studies about the quality and effectiveness of the educational organization. Also the attractive power of a small-scale organization in which students and tutors have many possibilities for personal interaction played an important role in this. Except for Medical schools, Dutch universities cannot restrict enrolment. All potential students who have completed secondary education have the right to register. The success of the innovative start changed slowly for the worse because of the increasing number of new students. In the early years the two group meetings a week could be seen as the starting point for supplementary informal interactions in the time between these meetings. Students were used to work in a "study landscape". Meeting places were especially designed for this. The university facilitated on-campus personal contact. Study guides contained a directory of experts and a list of telephone numbers to consult them. At present, twenty five years later, the study landscapes are overcrowded and experts are and can be rarely approached for an individual consult. Interpersonal

communication is less informal and more complex than in former days . The situation can be described as a massive small-scale organization.

Program evaluations reflect a growing trend of students stating they spend fewer hours a week to individual study. In the design of the curricula 30 hours of study was expected, however this amount is going down. Faculties plan extra activities as seminars and lectures, but, as it appeared in new evaluations, with counterproductive result: there is still a trend of a decreasing number of individual study hours.

When the use of learning technologies became a topic of discussion in curriculum renovations, the university and faculty boards decided to go for a "principled approach" (Koschmann, et al., 1993). In a large survey study all instructional requirements that could serve as design goals for an electronic learning environment to support the interaction between students were made explicit . The requirements were used for the development of a detailed instrument with more than 200 rating scale items. The goal of that survey study was an intensive evaluation of current educational practice at that time (1995). The results of this survey were used in the development of a specification, related to the identified requirements, the limitations of the instructional setting and interpreted in the context of known capabilities of the technology. The following conclusions were drawn after the analysis of the answers by all students and tutors in two faculties:

Not all students report and get personal feedback in their groups

The main topic in the discussions is the solution of the problem.

There is little time for reflection and elaboration of knowledge

Individual contributions are not compared or integrated.

Students say that they learn from articulation

Students see their reports as an informal evaluation in the learning process

It rarely happens that discussions result in defining new learning issues.

The way students learn is not discussed in group meetings

These findings make clear that the regular group meetings have some limitations that make them less optimal in respect to the support of learning. The biggest problem is the combination of group size and the meeting frequency. The mean group size is 10 to 12 students who meet twice a week in a session of 2 hours. It was not a surprise to find that not all students have the possibility to speak about their learning. However, as came out in our survey, it was quite a surprise that this same finding was shared by most of the students themselves.

The meeting is almost completely focused on finding the solution of the problem that triggered the process of learning. Although this seams logic, we should not forget that transfer of learning is an important element of the learning process. From that perspective the finding that students have the opinion that there is not enough time for reflection and elaboration was a serious warning. Individual reports are not compared or integrated. These two findings make clear that the interactions in the meetings remain too superficial. Although students say that they learn from speaking aloud in their group about the matter that was learned, and that they also learn from listening to the rest of the group, these results indicate that the meeting (and the conversation in it) is not enough to mediate learning activities at an optimal level. If defining new learning issues for further study only rarely follows on the initial study, one could say that the meetings are more a platform for the exchange of information than for collaborative learning.

In summary: In the regular face-to-face (F2F) meetings of the PBL groups the analysis of problems is the start of learning. In the second and concluding session the results of individual learning between the two

meetings are discussed and evaluated. The combinations of these group meetings and subsequent learning can be classified as individual study in a collective context, not as an example of a "learning community".

Learning communities

Wilson and Ryder (2001) sum up the following aspects to categorize groups of people who form a learning community as follows:

distributed control (+)

commitment to the generation and sharing of new knowledge (+/-)

flexible and negotiated learning activities (-)

autonomous community members (+)

high levels of dialogue, interaction and collaboration (-)

a shared goal, problem, or project that brings a common focus and incentive to work together (+)

capacity to adapt to local conditions and evolve over time (+)

creativity and innovation (+/-)

crossing of traditional disciplinary and conceptual boundaries (+/-)

appreciation of diversity, multiple perspectives and epistemic issues (-)

community members who are responsible and skilled at diagnosing and addressing their learning needs (-).

When this list is used for the evaluation of our regular F2F group meetings it becomes clear that these groups show shortcomings regarding these criteria for being a learning community. The negative scored categories were marked with the minus sign, an approximation sign indicates that this category needs reinforcement.

With respect to the flexibility of learning activities in a learning community Wilson and Ryder (2001) write:

"Specific learning goals and activities largely happen. There is a sort of natural selection of activities. Those that are successful and lead to learning are repeated and developed and shared, while those that are not supported by the group fall into disuse. This can lead to inefficiences and a meandering process of development, but it can work." It is evident that in our situation where students meet at the start and at the end of the learning process the only negotiated learning activities are problem analysis and solution. The whole process in between is individual, and it interferes with the metacognitive goal of PBL "learning to learn".

Consequently there are no interactions in the main part of the learning process. Wilson and Ryder (2001) state that: "High levels of dialogue, interaction and collaboration are essential to complex systems and to dynamic learning communities in particular. A neighbor may be doing great things, but if that information is not shared via constant communication, then other community members will not be aware of it. Information is what drives the feedback loop that lead to new learning and change in the overall system."

The limited amount of time that is available for interaction conflicts also with other important elements of a learning community: diversity, multiple perspectives and epistemic issues. According to Wilson and Ryder

(2001): "Expertise is inherently multi-perspectival in a dynamic learning community. Members come to respect knowledge that comes from a variety of sources—or people of different backgrounds and information of different types. Likewise, community members develop their own methods for testing proposed knowledge against a variety of standards and codifying that knowledge in a way that can be shared throughout the group and across situations and time. The upshot of this diverse environment is that community members progress in their epistemic understanding, perhaps moving from black-and-white views of knowledge toward more sophisticated views of how we come to know things."

The non-existence of interactions finally conflicts with the category that pays attention to diagnosing and addressing learning needs in community perspective. Again quoting Wilson and Ryder (2001) : "Community members who are responsible and skilled at diagnosing and addressing their learning needs. Here is both a benefit and a challenge to dynamic learning communities. When control is distributed throughout the group, more demands are placed on individual members. Because a teacher is no longer doing the hard work of deciding on goals, methods, and new knowledge, community members must meet the challenge of assuming these roles. Metacognitive knowledge--knowing how to monitor one's learning and how to address ill-defined problems--becomes an essential part of the community, which hopefully can also be shared throughout the group. A systemic analysis may conclude that a given group cannot become a dybanic learning community because of deficiencies in this area. On the other hand, a group may progress incrementally in these skills and move steadily toward more self- (or community-) directed learning."

Also Smith (2002) describes some noticeable criteria that are important in our exploration of the differences between a group of students and a learning community. The following issues are relevant for us:

> The notion of learning communities can be traced back to the idea of a learning organization, a way to bring people together to learn and to improve (themselves).
>
> To collaborate means to work together which implies shared goals to create something new or different through the collaboration, as opposed to simply exchanging information or passing on instructions.
>
> Learning significantly increases when participants elaborate on the material in collaboration with others.
>
> Co-construction or the shared construction of knowledge in groups maintains that learning is viewed as the process of knowledge construction, which is mediated by social interaction and tool use.

These statements give expression to the relevance of the discussion about the architecture and the functionality of the tools that are used in team learning.

Tools as facilitators of collaborative learning

When a learning community is defined as group of people having interactions focused on learning, the function of a tool is to facilitate the vital interactions in this process of collaborative learning. This approach is essential in the analysis of collaborative learning where three levels were allocated (Ronteltap, 2002): learning environment, learning behavior and learning mechanisms. The tools being used in interaction are part of the design of an electronic learning environment in which people come together. The design of this learning environment is concentrated on the actualization of specific activities (writing, co-editing, reacting) that are needed for collaborative learning. In that way specific mechanisms (reflection, comparison, negotiation,etcetera) for collaborative learning are instantiated.

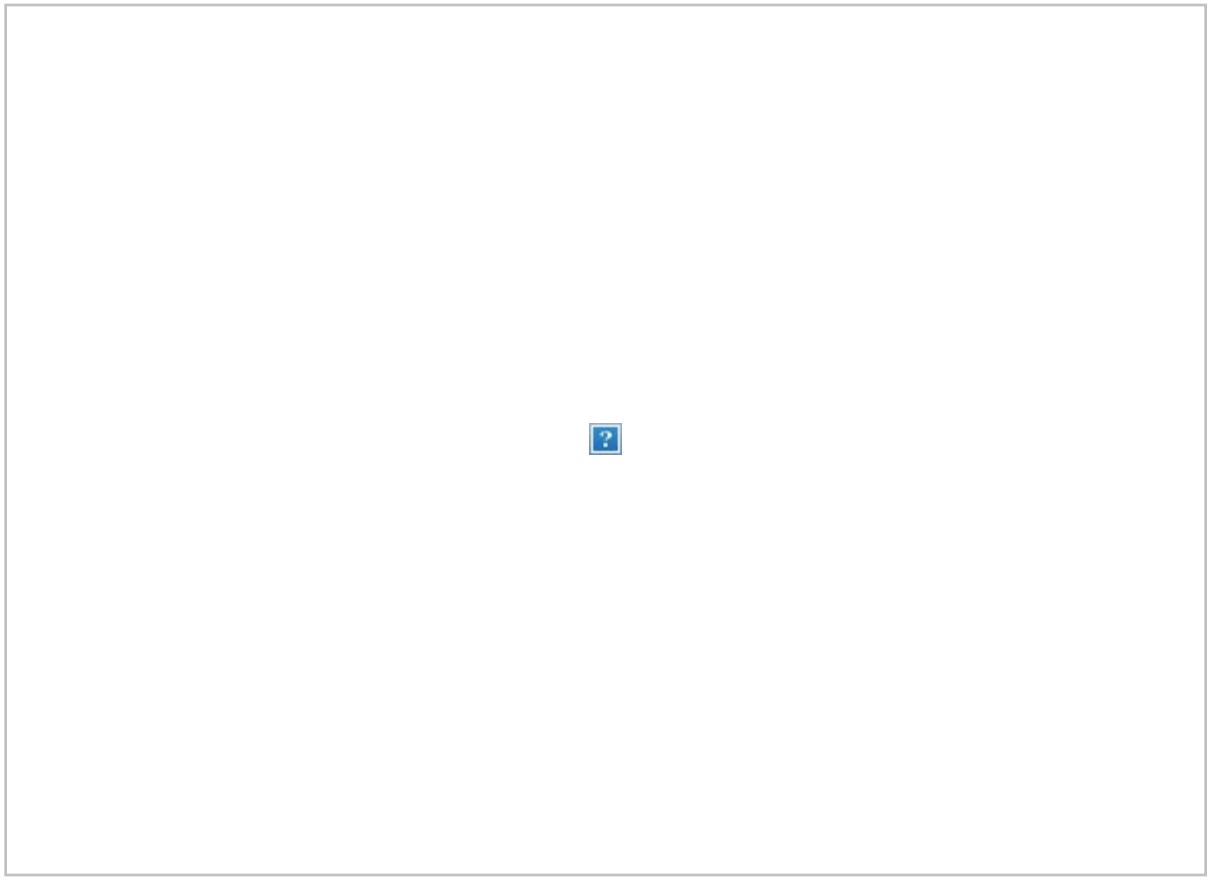
One of the most popular interaction tools is e-mail. Because it facilitates asynchronous collaboration it is usable for complex problem-solving tasks where reflection is necessary for the performance of students.

However, the tool is developed for one-to-one communication, and not for many-to-many as it is used on e-mail listservers for group communication. In that case the functionality for the organization of incoming messages is missed. Next in the evolution of interactive tools were conferencing tools. The possibility to discuss on specific topics, the organization of this discussion in the interface in threads, and the possibility to freeze the content of the discussion by archiving, made these tools a hit for asynchronous learning interactions.

However, these threaded discussion tools have two major limitations:

> When the overload of information, as a result of intensive group work, is not handled adequately, the process diminishes and long-term effects are smaller than they could be. Specific functionality is needed for *orientation and navigation* in an extensive learning environment.
>
> Learning is an *active* process. The functionality in many tools for collaboration is restricted to providing virtual places where information can be exchanged. However, this is the lowest level of interaction. Specific functionality is needed that learners give *individual control* on the distributed process and allow them to *manipulate* the information in the community's workplace and to distribute and *share* the results of these manipulations. In that perspective interactions are focused on distributed knowledge building (Scardamalia et al.,1993; Duffy et al., 1997).

These insights were taken into account when developing this electronic learning environment: POLARIS.



The prototype of POLARIS that is tested in several experiments includes the following functionstools:

Orientation / Navigation

The interface shows what documents were opened, for complete threads but also for separate documents. This means that when a thread is collapsed (or folded) it is still visible when notes at a lower level have been opened or not.

Information on the content of the notes is given by a subject title by the author, as well as by icons automatically assigned by the system when the author chooses a specific text field (e.g. question or comment). The several text fields are based on content analysis of documents in former experiments (Ronteltap et al., 2002) which revealed that learners collaborate in three distinctive ways: 1. asking questions & giving answers, 2. debating and 3. expanding a knowledge base.

Not all documents need to be read for effective collaboration. Personal selection of contributions for later processing is supported by a bookmarking tool.

A goal of attaining convergence in knowledge building is hindered when learners work with regular threaded discussion interfaces that do not support that process of working to convergence. If agreement in the community is growing, learners express that agreement in writing new reactions, that is regularly visualized however as growing divergent threads. POLARIS contains a tool by which learners simply can express their agreement and the number of agreements in the group becomes visible in the interface.

An important step in knowledge development is conceptualization and elaboration. Orientation in that process is fully supported by free text search facilities that cover all material in the community's workplace.

Discussion threads are visual representations of the expansion of material from a time perspective. However, learners also need functions to rearrange these visualizations for content specific interests.

Learning as an active community process with individual control

Group interactions support the organization and reorganization in personal knowledge accretion. For this process learners need tools to organize the content of the shared workplace, options for personal views of the content of the shared knowledge base (overview of initial documents, overview of all documents in one thread, all questions and answers, etcetera).

The active work in collaborative knowledge development is supported by the "collection" tool. Users can collect quotes as well as full documents when they browse the content of the knowledge base, and create a new collection-document for distribution. This extended copy & paste function is a very flexible tool for the reuse of knowledge in the community.

The location of incoming documents in time-oriented threads may hinder personal representations of knowledge. For that reason a "linkage" tool is developed by which learners can link documents that are part of different threads.

All group processes come to an end. The possibility to archive selections from the group workplace in a personal folder (portfolio) supports the reuse of knowledge.

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Exchanging Stories in Learning Circles, an Imaginative Experience

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ABSTRACT

Writing and reflecting on fictional practice-related stories promotes the use of the imagination. This helps to create a sense of identity and community within a group of students who are studying online at a distance – in this case, with the Open University. Fictional stories are found to act as boundary objects (Wenger, 1998), enabling students to synthesize their experience within their professional community and to reflect on it within their academic community. This helps students to broaden the boundaries of their professional experience and contributes towards communication and the exchange of knowledge through different communities. Furthermore, the creative process of writing and reflecting allows students to gain an impression of the lives of their peers. This seems to help students to engage with one another and to develop some aspects of their group identity.

The learning circle is a discursive forum supported through synchronous audio conferencing and file sharing. This combination of media provides the means for tutors and students to write and reflect on their practice within a learning community. The outcome of this research and development project is a pedagogic design for exchanging stories that will be implemented across a range of disciplines (education, design and technology, and human services). The design is intended to provide a non-threatening environment for students who may not have worked online before, and to facilitate exploration of practice and reflection. Students share some aspects of their experience and their imagination to make connections with their peers within their tutor group.

Pilot groups have found that the experiences of participating face-to-face are similar to those participating

synchronously over a computer network, although students have reported enhanced feelings of personal privacy. A sense of connection and community quickly develops, partly an attribute of sharing stories and partly as a result of offering students the opportunity to meet online and talk to one another. Anecdotal evidence from student-led trials with asynchronous text conferencing suggests that this communication mode was less successful, as reflecting on the stories through text comments rather than through speech was perceived as more threatening and judgmental.

http://www.open.ac.uk/vpe

Keywords

reflective practice, community of practice, synchronous audio conferencing

INTRODUCTION

This paper describes our versionable design for exchanging fictional stories in learning circles, and reflects on how this design contributes to the development and experience of learning communities (Lave and Wenger, 1991). The intention is to create an online community of practice to support the exchange between academic learning and the enhancement of practice. The use of stories to creatively explore, reflect on and enhance practice has developed through a number of traditions. Mattingly's (1991) action research into reflective story telling influenced the way that this exchanging stories module (part of a wider Open University initiative) was conceived. She pinpointed two main indicators of the success of story telling to facilitate reflective practice. Primarily, she found that story telling has an existing role and history within an organization, and the existing role influences how professionals respond to using story telling as a reflective tool. There is a shared tradition of story telling in education (Clandinin and Connelly, 2000), nursing (Cope, Cuthbertson, and Stoddart, 2000), health studies (Denshire and Ryan, 2001), and design and technology (Lloyd, 2000). All develop approaches to story telling from Schön's (1991) ideas of reflecting on action. Consultative seminars within the Open University found the design for exchanging stories to be of interest to these disciplines to support students who are studying practice-related courses and are geographically separated. Academics within these disciplines assumed the role of critical readers and contributed to the development of the design at key stages.

Mattingly's research in story telling with project officers at the World Bank found that story telling is a less controlled form of discourse and that, in a written form within organizations, it was perceived as highly threatening and political. This exposed a tension within the project officers. They found the process useful, but the product – the written stories – was worrying to them. Their personal views sometimes contradicted the views of their employer. Also the motives and intentions of the characters in the stories became more transparent. Consideration of this point and of the confidential nature of practice-related stories in the human services, persuaded me to adopt Winter's (1999) approach – *fictional* story telling, developed for students studying in a face-to-face context in Anglia Polytechnic University. The design enables students to use their imagination to compose a short narrative episode that captures an aspect of human experience. As a student's work may be confidential, the use of fiction as the form of writing allows students to write about areas of their practice that may be sensitive to either individuals or organizations. The fiction may be derived from an experience, a group of experiences or an imagined episode – students are not required to disclose any additional aspects to their story, each story is read by the group and interpreted and reflected on through the groups discussions. This provides the basis for an interpretative reflective learning circle. Synchronous audio conferencing is used as the platform for the module, as it maintained the modality and quality of the exchanges that took place in the face-to-face sessions.

CONFERENCE ROOMS

For the synchronous work, each 'room' has audio-conferencing, text-chat and document-sharing facilities. Within the corridor, group members may meet for casual exchanges. Currently, Open University students

use an in-house product Lyceum for synchronous audio conferencing. Asynchronous text conferencing currently takes place through FirstClass® (Centricity Inc) and mirrors the room structure and permissions of the synchronous suite of rooms. It is intended to integrated these two platforms to ease communication. The tutor-group room will accommodate up to 20 students working synchronously online and each subgroup room is intended for group work of up to six students.

Diagram 1: Conference map

DESIGNING A CURRICULUM

Consideration of the newness of the media influenced the design of the module. The students are not expected to be experienced with either online study or fictional story writing, so the tutor introduces them to these forms of study by structuring, facilitating and withdrawing as opportunities and the curriculum allow. It is anticipated that students who are relative newcomers to online learning, or who are less-experienced practitioners, may initially adopt a peripheral participative role. To accommodate this, Session 1 is structured as a whole group session, with the group reading and reflecting on stories written and prepared for the group. It is anticipated that the more experienced practitioners will model the process. During Session 2 the tutor group forms separate subgroups. The module has been designed so that there is some degree of choice in the subgroup a student joins, with the proviso that each subgroup accommodates a maximum of six people. This should ensure that students don't find themselves in a group in which they feel uncomfortable. Within the smaller subgroups there is also more onus on each member to actively contribute. Each group member contributes a story they have written and then listens to the group's interpretations of the story. The tutor joins either the smallest group, or chooses a group to join for the purpose of sharing their story. Students who have not written their stories are asked to leave the group and, along with students who are absent from the session, receive a recording of a group reading and reflecting on their stories. The structure and processes that the community engages in are outlined in Table 1 below.

Table 1: Curriculum – structure and process

	Structure	**Process**
		Tutor group meets and makes introductions. History and purpose of exchanging stories is explored. Nature of fictional writing is described and discussed. Tutor facilitates discussion of the ground rules – they are negotiated and agreed by vote. Assessment of the session's work is discussed.
		Guidance is given through the Student Guide

		for communicating synchronously online. Stories written by previous cohorts are read and reflected on. Discussion is facilitated by the group. Tutor contributes by making connections between the elements of the discussion.
	Tutor leads a review of the discussion. Students take notes of elements of the discussion that are of interest These notes form the basis for a short assignment in which the student synthesizes and reflects on the group's discussion.	
Asynchronous text conferencing		
Assignment: Part 1: Review the group discussion Part 2: Prepare a short fictional story		
	Ground rules negotiated in Session 1 are revised. Each revision is voted on. Students are encouraged to work collaboratively and to assist one another. Group reviews the purposes of reading and reflecting on their stories. Guidance for discussing their stories is given.	
	Subgroups meet and read and reflect on their members' stories. Tutor joins a group when it is time for their story to be read and reflected on, and also monitors progress in all the groups. Author remains silent when their story is reflected on and may write notes on the discussion for use in their assignment. Tutor sends a text message to the subgroups reminding them to draw their discussions to a close and to regroup in the tutor-group room.	
		Tutor group reconvenes and reflects on the process of writing and reading the stories. Discussion is student-led with facilitation by the tutor when required.
	Tutor closes the session, drawing the discussion to a close and prepares the students for the associated assignment.	

	
Asynchronous text conferencing	
Assignment: ***Part 3: Students reflect on the experience of writing and reflecting on their own story***	

The design outlined in Table 1 (above) provides a synopsis for what will be extended into a programme of study, lasting initially up to six weeks, in an undergraduate course. The intention for producing this design is so that, in a minimal form, it can be piloted and evaluated prior to its expansion for a course. The piloting process is an internal collaboration between the Open University's Institute of Educational Technology and myself. It examines the delivery platform, student and tutor experiences, assessment of the learning objectives and how exchanging fictional stories contributes to practice-related learning. Implementations of the exchanging stories module are scheduled for June 2002 through a series of internal seminars and collaborations with prospective course teams.

COMMUNITY EXPERIENCE

Writing and exchanging fictional stories online supports the exchange of knowledge within a community. Furthermore, it facilitates the exchange of experiences across different communities as students' professional and academic worlds meet through the processes of writing and reflecting on fictional stories. This section discusses how students develop a sense of belonging to this online community and includes an analysis of how community boundaries are managed.

Modes of belonging

Engagement

'…doing things together, talking and producing artefacts' (Wenger, 2000: p. 227) are all considered to be prerequisites for engagement between people. Hence, developing collaborative activities in the online world, has been one of the major preoccupations of computer-supported collaborative learning. The success of meeting in an online learning circle to share stories relies on there being a tradition of story telling within the practice-related area and on the shared understanding of the purpose and processes of this form of communication. As the process is fairly familiar to students with a practice base, they don't struggle with it.

Some of our practice-related courses attract people who have an interest in joining a professional group, rather than those who are existing members. To accommodate this, there have been attempts to write into the modules enough contextual history to allow such people to develop an appreciation of the purpose of writing and reflecting on fictional stories. The development of a fictional story gives a non-practitioner student the opportunity to create a story that reflects imagined practice issues. Such a story enables the non-practitioner to ask questions of the practitioners within their learning circle. The artefacts that are created include the fictional stories which, with the permission of the author, may be used as priming stories to seed later learning circles and to allow the experiences of one community to develop within a subsequent group.

Imagination

Imagination is described as 'constructing an image of ourselves, of our communities, and of the world in order to orient ourselves, to reflect on our situation and to explore possibilities.' (Wenger, 2000: pp. 227–8)

This description suggests a strong connection between the imagination and a person's identity. This connection is core to the module and to the practice of fictional reflective writing. Within the module, students initially construct an image of themselves through short informal introductions as icebreakers. This process is similar to many experiences that students have within a face-to-face setting. Students then move on to reading stories that are legacies of previous groups who have the same professional background. They are priming stories – they give the students a flavour of the journey they are about to embark on and offer glimpses into previous groups' working lives. The stories seed the discussion by stimulating thought and reflection on themes that may affect the functioning of their own communities. Examples that came out of piloting include the relationship between the professional and the personal, an organization's responsibility to a person who is finding it difficult to perform well in their role, and how words are used within a professional context to mask emotion and to distance the speaker from the listener. Discussion of these themes helps the group form an identity, and the outcomes of these discussions seems to contribute towards 'alignment' (see below).

Alignment

Alignment is the third aspect that Wenger (2000) associates with a social learning system. He describes alignment as 'making sure that our local activities are sufficiently aligned with other processes so that they can be effective beyond our own engagement[…]'. It is a process of mutually 'co-ordinating perspectives, interpretations and actions so they realize higher goals.' (Wenger, 2000: p. 228). Alignment has been observed occurring within pilots of this module through student discussions of the stories, i.e. one story triggers memories for other students and discussion of these memories often follows. Gradually, the discussion leads back to a position where the group develops interpretations of the original story, integrating the reflections of their related experiences.

Out of the three elements, i.e. the modes of belonging, it is the imagination that forms the currency that is emphasized within the exchanging stories module. It is conceived as the sensory device that heightens students' receptivity to one another and helps them shape a vision of their virtual community and of their practice. Students may initially mistrust use of the imagination, so the module has been designed to introduce students to the role of the imagination within reflective practice. During this initial phase, the tutor initiates discussion of the relationship between fact and fiction, knowledge and human potential, and the potential of the creative imagination. This is then developed through reading and discussing illustrative stories. When students are more comfortable with the form of learning and expression, the imagination assumes an intuitive presence and then has the potential to become the tool through which the group communicates and a community forms. The writer uses imagination and experience to create their story, the reader's imagination then uses the words to create the images that form the perceptual experience for that reader. Interpretations of the story are later formed through discourse, as group members articulate their personal experiences of the story.

These modes of belonging, encompassing engagement, imagination and alignment, interact with the boundaries of the community of practice (Wenger, 2000). Consideration of the influence of boundaries has highlighted the multi-dimensional nature of community life – each student participates in a number of communities through their work and their study. Exploration of these boundaries through writing and reading fictional stories provides the community with the material to explore different communities. This is fascinating to the participants, as it provides a means to discuss and reflect on a range of practices and to consider alternative approaches. It adds to diversity and offers a challenge to the community as members have to extend themselves to understand the story that has been written and to consider how they respond to it.

Community boundaries

Examining how boundaries operate offers insight into the complexity of belonging to an online community. Students sometimes find it difficult to engage with a story that is removed from their own experience. The fictional story may not be transparent to anyone other than the writer, and so meanings are based on

assumption and interpretation. This process is reflective and is experienced as a creative process. Students have found it enjoyable, and playful behaviour, including laughter and jokes, are common. Students who have experienced the face-to-face as well as the online workshop have reported that they find it easier online as their personal responses, often betrayed by body language, are kept hidden.

Table 2 (below) outlines the tensions between modes of belonging and boundary dimensions within the exchanging stories module. The module is co-ordinated through the Tutor Guide and the Student Guide. These booklets provide detailed guidance for the preparation and structure of the sessions. Transparency is encouraged through the exchange of stories, and negotiability is supported through the discursive forum and the use of voting procedures to decide on ground rules.

Table 2: Boundary dimensions (developed from Wenger, 2000: p. 235)

	Co-ordination	**Transparency**	**Negotiability**
Engagement	Students and tutors meet to discuss fictional stories. Ground rules are negotiated and agreed. Time and participation is structured and pre-defined. Catch-up opportunities exist.	Purpose and process of writing fictional stories is explained; coaching is provided; reading and discussing stories provides a window on practice. Meanings are interpreted and may not be transparent.	Discussion of each story allows students to discuss their multiple perspectives and develop an appreciation of one another's competencies.
Imagination	Students reflect on provided stories to stimulate their imagination. Encouragement is given to make connections between interpretations.	Stories provide students with insight into different practices. Reflection on stories allows students to walk in one another's shoes. Listening is encouraged through assessment.	Common interests and needs may be identified through writing and reflecting on fictional stories. These may form the basis for further group work.
Alignment	Action across boundaries is encouraged through assessment – students write and reflect on their own fictional story and their responses to the group discussion of it.	Reflecting on stories raises questions for students about others' practices. These discussions may be followed up asynchronously through text conferencing.	Ground rules are agreed by group discussion of a specimen set. Each sentence is voted on when the wording and detail is finalized.

The table above shows how students broaden the boundaries of their professional experience within this module through an essentially imaginative experience. The process of writing fictional stories, and of reading and reflecting on them, leads the students to try on one another's shoes, to reach across the boundaries between one another's practice, to hear many interpretations of action and experience and, through this, broaden their own. This experience shapes not only how they perceive the world around them, but also how they perceive their ability to interact with that world. Essentially, it may shape the

development of their identity as their sense of self and their sense of community changes.

Time is a further boundary. It may impact on the depth of student learning and the stability of the learning community. A course lasts for up to eight months with the Open University and a programme of study can last six years or more. A reflective community that explores practice within an imaginative framework may explore and seek to enhance practice throughout a person's academic trajectory. This implies that the community becomes decoupled from a course and runs alongside a programme of study, adding to the experience of continuity for students and forming the basis for a reflective account of a person's development through an academic, practice-related programme.

The ideas that persuade me that this slightly problematic approach is worth pursuing come from Wenger (2000), who suggests that connectedness relates to the enduring social relationships through which an identity gains social depth. Perhaps continually fragmenting the learning community through disbanding it at the end of each eight-month course may not only be unnecessary, but may affect how a person's identity as a practitioner develops. Fragmentation and a lack of integration of the ideas that flow through a programme of study may be contributing to the discrete building-block approach to assimilating knowledge that sometimes characterises student learning. The opportunity to add some permanence within their cohort through developing a reflective circle, drawing in students participating on different courses, is attractive. This may enhance student experience as students are encouraged to become members of a variety of groups and to synthesize the experience of learning in a deeper fashion.

Conclusions

The design of the exchanging stories module is a design for sharing experience and enhancing practice. The students draw on the experience from their practice settings to create a fictional story to reflect on in their academic community. This process enables students to synthesize their practice experience and to reflect on it within a fictionalized framework. The fictionalized framework ensures that confidentiality is maintained. It is anticipated that students will find it less threatening and problematic to reflect on theirs and others' practice in this manner. The students use of their imaginations to write and reflect on one another's stories is thought to contribute to the experience and development of a leaning community. The writer's imagination constructs the fictional story, and the reader's imagination creates the impression of the writer from that story. Hence an individual's identity is constructed and, through the discussions of the fictional stories, a sense of group identity and of community forms.

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The Potential for the Use of Computer-Mediated Communication (CMC) in Teacher Professional Development

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ABSTRACT

Studies of CMC have shown that it has many innovatory features that can contribute to professional education, however, its full potential in teacher education might yet be unrealised. This paper explores the use of CMC in teacher professional development within a sociocultural framework. Three hypotheses are posed: a)that the form of CMC within educational contexts is influenced by key context factors, b)that teacher development can be stimulated through developing reflection within communities of practice and c)that the role of the e-conference moderator is crucial in sustaining successful e-conferences. These hypotheses are explored through a case study investigation of an initial teacher education course students' use of e-conferencing. The course is a part-time distance leaning programme and it incorporates the use of e-conferencing as a tool for providing support for the students. The results of the study indicate that the form of CMC within educational contexts is crucially influenced by three key context factors: a)the way in which e-conferencing is organised within the context of a formal course, b)the organisation of e-conferences around different subject domains and c)the length of engagement of the participants in e-conferencing. Within successful e-conferences, teachers' professional development can be stimulated in new ways, in particular through developing communities of practice and creating forms of reflection. Furthermore, the findings suggest that the role of the conference moderator is crucial in stimulating effective e-conferences through structuring the learning resources of the community of practice. On the

basis of these data, conclusions are then drawn as to promoting teacher development through CMC.

Keywords

Computer-mediated communication; e-conferencing; teacher education; professional development; e-conference moderation.

INTRODUCTION

CMC has the potential to contribute in innovatory ways to professional development. Particular examples are seen in the area of teacher education where new opportunities for collaboration among learners can emerge (Shrum, 1992; Singletary and Anderson, 1995; Hall, 1997; Leach, 1997; Lewis et al., 1997; Moon, 1997). It has been suggested that CMC environments can provide forums for discussing aspects of teaching, developing common professional interests and raising concerns with colloeagues (Pearson and Selinger, 1999). CMC however, is still a new form of communication and its full potential is as yet unrealised.

This paper reports on a doctoral study that investigates the use of CMC at the Open University Postgraduate course in Education (OU PGCE). The aims of the paper are:

a)to investigate the key contextual factors that influence the form of CMC in educational settings

b)to explore the new ways in which CMC promotes teacher professional development and

c)to define the role of the moderator in stimulating effective e-conferences.

A socio-cultural approach is adopted for this study based on the claim that it provides certain recommendations for understanding learning that enrich previous research on professional development. These recommendations, in particular, provide a guide about what to pay attention to, in thinking about teacher professional development.

THE CONTEXT

The study focuses on the OU PGCE which is the largest pre-service teacher training programme in Europe and it is provided from the Open University; a distance learning institution that has been a model in providing distance learning programmes and utilising new technologies. The OU PGCE is a part-time course provided for graduates and leads on successful completion to Qualified Teacher Status (QTS). CMC among students and academic staff is enabled by using ‘FirstClass’, an e-conferencing system that has been developed by the Canadian company ‘SoftArc’. Students are loaned a computer, a modem and a printer for the life of the course. They are able to use this equipment from home for all aspects of the course including e-conferencing. The e-conferencing system enabled users to exchange messages and it allows them to sort, organise, store and retrieve the messages sent. Additionally, the environment enables users to visualise the communication organisation of messages in a helpful way. For example, special icons such as ‘flags’, indicate when a user has received a new message. The ‘thread’ feature allows readers to follow an argument through a sequence of messages even when they have been submitted at very different times, while the ‘history’ feature permits one to find out who has read or responded to a message. The ‘resume’ function allows participants to circulate their biographies if they wish to.

This study investigates the use of FirstClass on five e-conferences provided for secondary science, secondary English and primary student teachers. Each e-conference consists of a main subject conference room, a bulletin board, an archive of the older messages and a number of specialist e-conferences.

METHODS

A case study approach has been adopted in order to provide a comprehensive view and a broad insight in CMC (Waggoner, 1992). The methods used for the study were non-participant observation of e-conferencing conversations and analyses of qualitative interviews. The information from the e-conferences was triangulated with interviews of 41 students and 8 moderators. Some of the data were collected from audio logs and these compared favourably with that collected by the telephone. It is noted that the use of self-recorder audio logs in this case study has been very successful since it enabled gathering of substantial data in both quantity and quality that would have otherwise been impossible. The comments of the interviewees that used the audio logs were longer and more insightful than the comments of those who used the telephone.

The study uses an analytical framework in order to illuminate the data collection and analysis steps. Initially, the information derived from the earlier stages of observation, was used as a rudimentary conceptual framework, which provided a notion about message grouping. The scrutiny of the e-conferencing messages enabled classification into five categories depending on the message purpose. The purpose of each message indicates the intention of the person who composed and sent the message to the e-conference:

Asking for support and help

Checking understanding

Giving feedback

Sharing new information

Reflecting

From this analysis, the fifth category: 'reflecting' was picked up. The categorisation of the 'reflecting' messages included an evaluation of the educational quality of the content of electronic messages. Each message falling under the label of 'reflecting' was collected and then rated on a four-point reflection scale based on a previous scale proposed by Bain et al., (1999). The proposed scale was revised and transformed to a scale that fitted with the particularities of electronic communication:

a)responding: the student discusses an incident or discusses an idea and makes judgements without giving reasons for the judgement

b)relating: the student identifies an area in which they have learnt and gives superficial explanation of the reason why something has happened,

c)reasoning: the student seeks a deep understanding of why something has happened, explores or analyses a concept or an event. The student often asks for questions and looks for answers.

d)reconstructing: the student shows a high level of abstract thinking, generalises from their experience, formulates a personal theory of teaching or takes position on an issue.

The establishment of the above categories allowed the systematic analysis of the data. The basic structure of the classified items was brought out through multiple readings and persistent analysis.

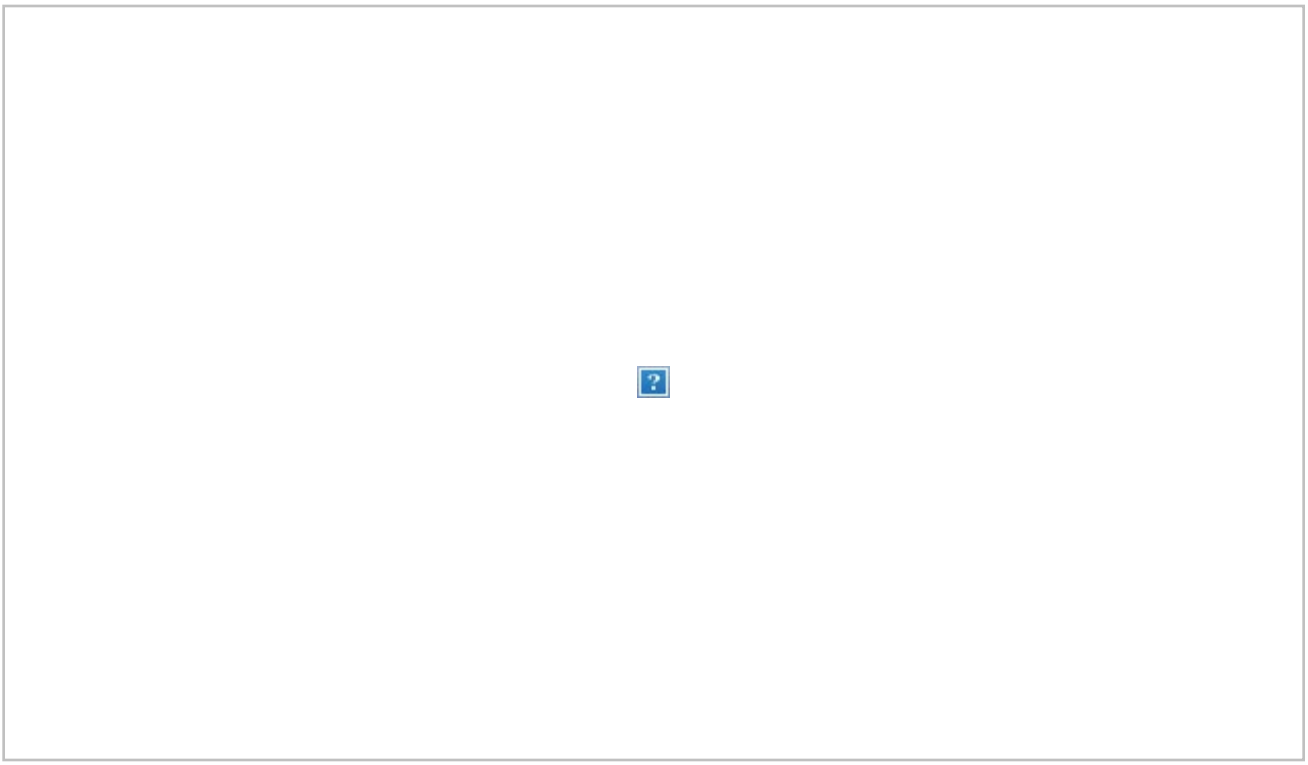
THE FORMS OF CMC IN EDUCATIONAL E-CONFERENCES

In all five e-conferences observed the total number of e-conferencing messages exchanged was 11523. The totality of the data indicated that students used e-conferencing extensively. Evidence has demonstrated that the nature of the course played a strong part in determining the extent to which students used e-

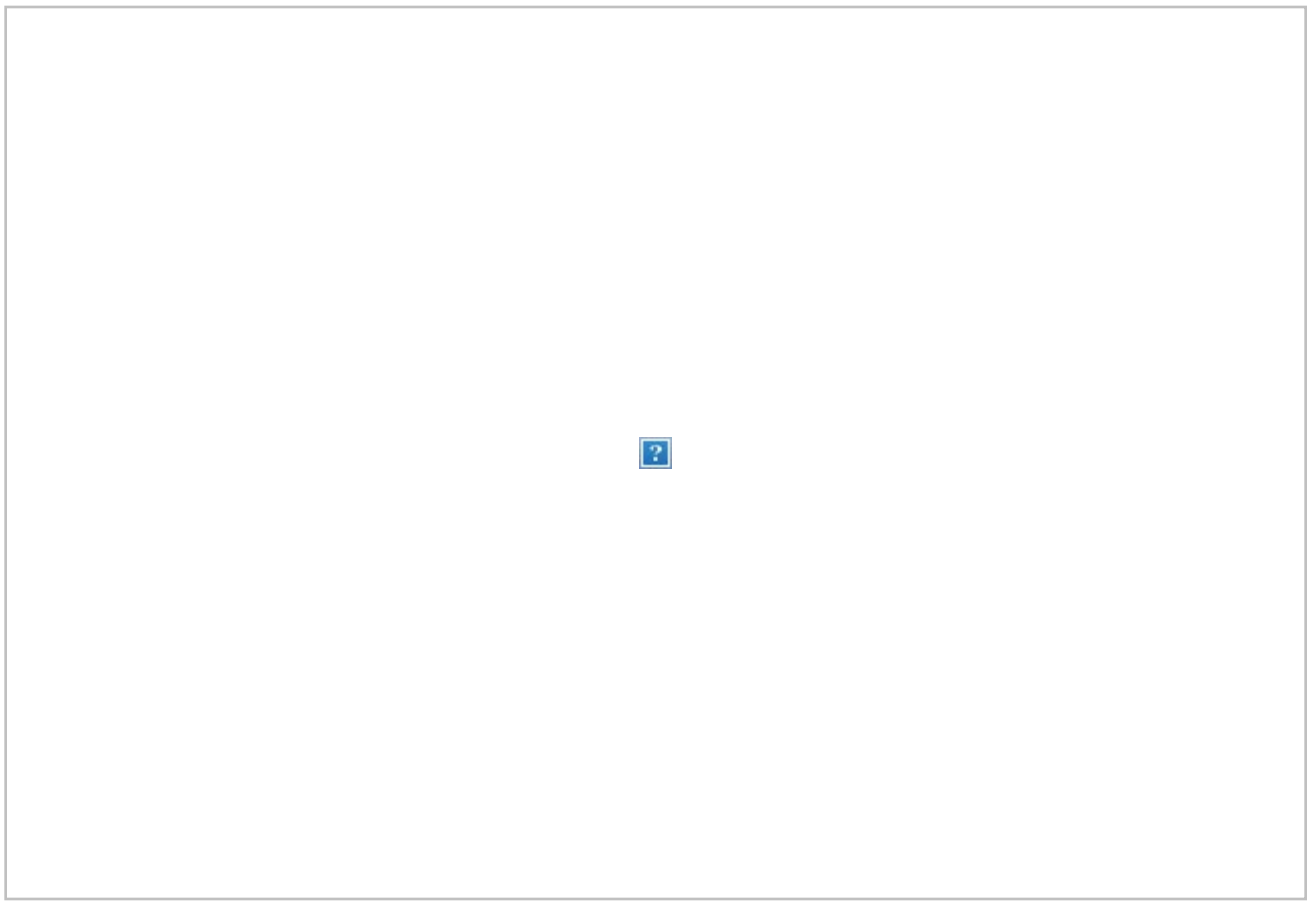
conferencing. Firstly, the distance-learning element of the course generated the need to overcome isolation and to have contact with the other course members. Secondly, the compatibility of the hardware and software used and the provision of technical support online and through the telephone from the university computing services made the use of e-conferencing easier. Thirdly, e-conferencing has been an integral part of the course and the e-conferences performed an important function of providing support for the students.

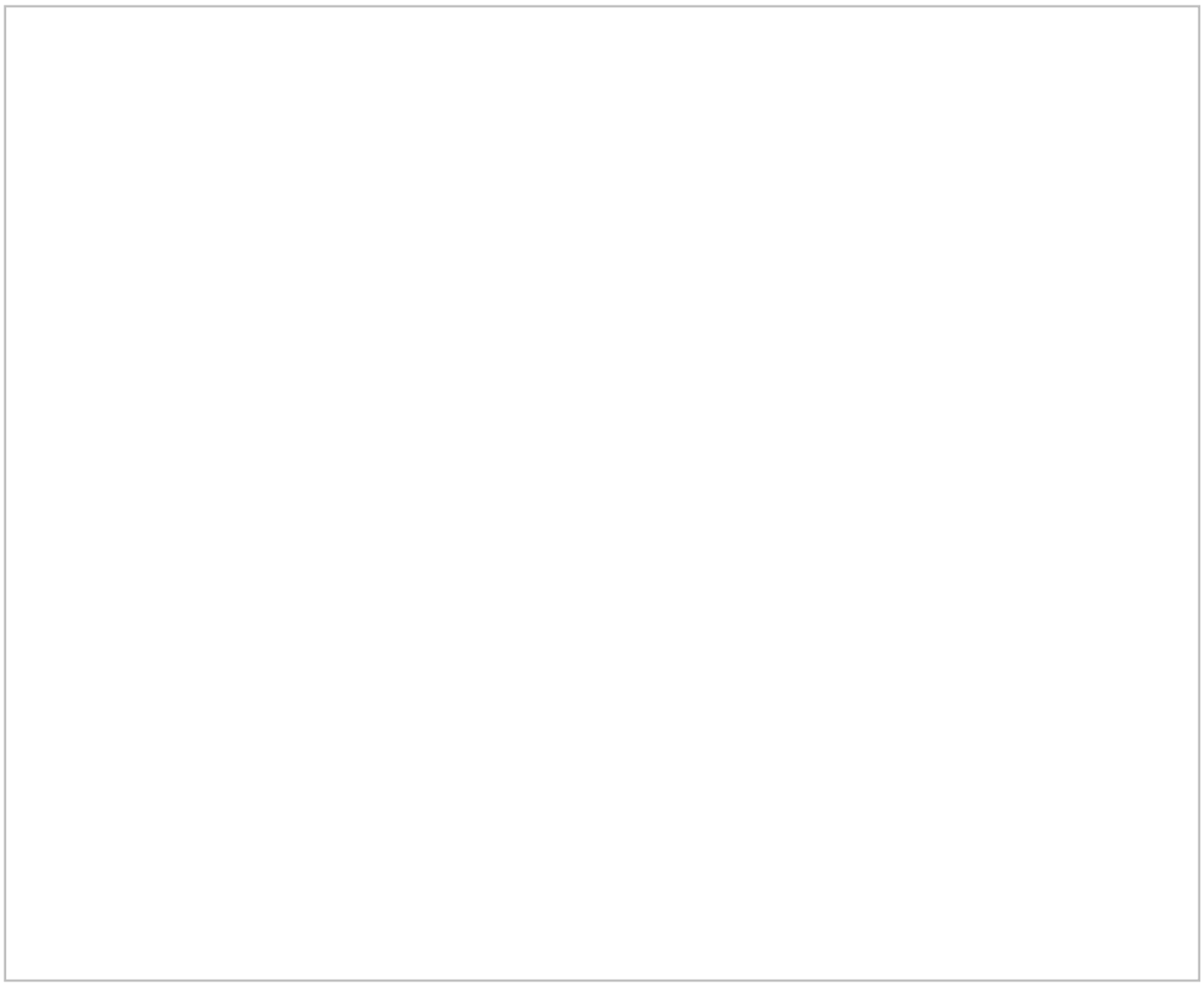
The results gained form this analysis made clear that the use of e-conferencing as a tool for providing support to the students influenced the form of CMC within the e-conferences. The professional discourse within the e-conferences was oriented towards the following areas: processes and structure of the course, course requirements, subject knowledge and teaching practice. The discourse on the course processes and requirements had to do more with transmission of information and clarification of procedures. This discussion, however, was useful because it enhanced students' understanding of the course requirements. Conversely, the discussions that involved subject knowledge and teaching practice were rather more discursive and expansive in nature. The discourse in these threads of messages integrated the experiences and the views of all the e-conference participants and created a coherent shared body of knowledge.

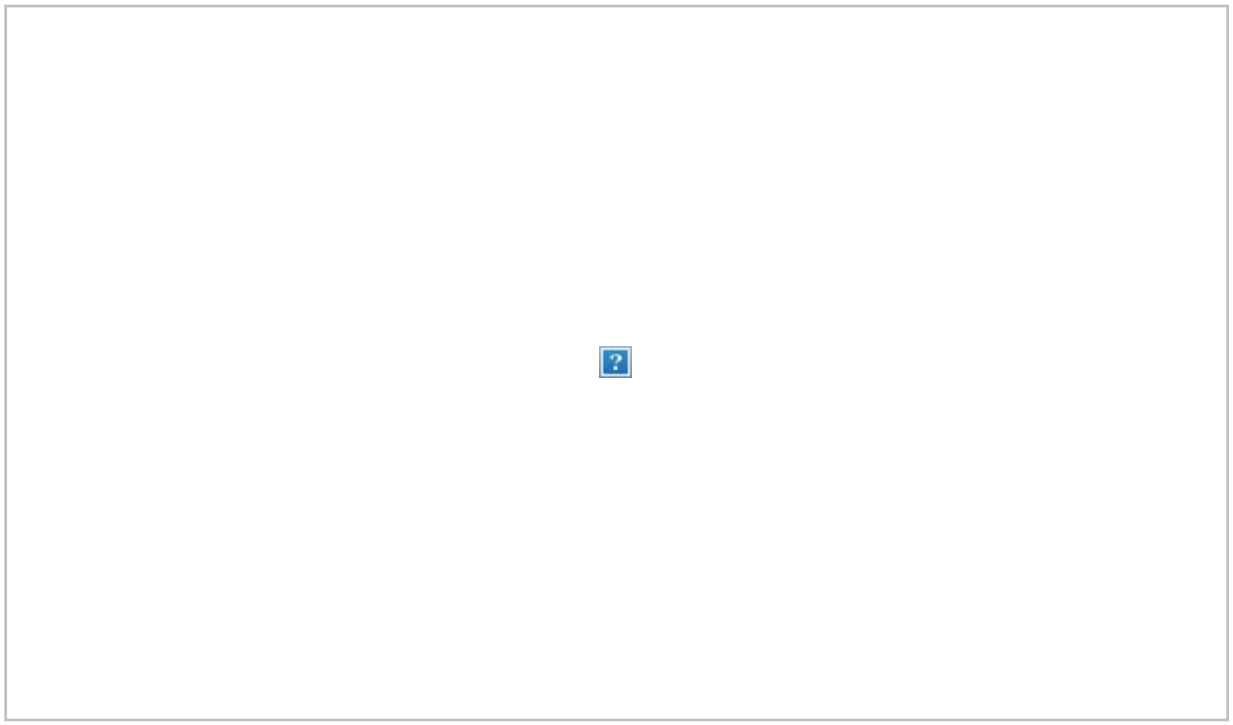
Thirty-six students out of 41 interviewed said that e-conferencing offered them ideas on teaching. Some mentioned that they had taken ideas and adapted them in their teaching practice. The following extract, which is taken from the Science e-conference, is an example of asking for ideas for a particular project:



The evidence from the case study also suggested that the form and the style of discourse within e-conferences differed markedly within e-conferences of different subject domains. The nature and the content of each discipline determined the character of each one of the subject conference examined: science, English and maths. The nature of the problems explored by the students within each discipline and the technical language used provided a different atmosphere within each subject conference. Similarly, the perspectives of the e-conference participants and their notions of practice within their specialities influenced the form and style of discourse within subject e-conferences. The three extracts that follow, taken from the subject e-conferences demonstrate the contrasting character of the discussions:







Lastly, evidence indicated that e-conferencing involved a transition of the e-conference participants from novice users of e-conferencing to more experienced users of the system. This transition was a long process

that occurred gradually over time and it involved change and transformation. Twelve interviewees out of 41 mentioned that they had experienced difficulties at the beginning, which they overcame gradually. One of them mentioned:

> It was really the mechanics to understand it. I had to go through the manual, the leaflets and the booklets that explain how to use it and then to use it in practice. I eventually got into it. (David S.)

All interviewees said that they were feeling confident with the use of e-conferencing and computers towards the end of the course. A few students said they felt confident about utilising the Internet and email within the classroom.

NEW FORMS OF TEACHER PROFESSIONAL DEVELOPMENT THROUGH CMC

The key processes of the communities of practice developed within the OU PGCE e-conferences were a)collaborative learning, b)reflective practice and c)learner autonomy. The e-conference participants were engaged in reading, writing and sharing of information, experience and ideas. The e-conferencing discussions were oriented real problems in real contexts arising from students' study and teaching experience. One of the students mentioned:

> [We discussed] problems we were having with particular curriculum areas, […] ideas about this, that or the other. On the Primary conference, we discussed a huge variety of different issues, depending on what we were doing. If we were teaching then they would be about how to deal with something in teaching and if we were near TMAs [Tutor Marked Assignments] then it would be something to do with that or it would be to do with portfolio activities. So, almost anything really and I used it quite a lot. (Rosemary W.)

The conversations about difficult and problematic cases in particular, were important because they allowed novice members to learn and to become legitimate participants in the community of practice. E-conferencing created an impetus to think deeply and it enabled the participants to engage in reflective thinking. The highest-level reflective messages generally focused around aspects of teaching experience and subject knowledge (see table 1). The student teachers argued about the ways in which they acted during their short teaching experience or imagined the ways in which they would function in the future by considering all the components of a problematic situation.

Table 1. Focus of level 3&4 reflective messages within the e-conferences observed

Science	**Primary**	**English**
Homework	Assessment of pupils	Assessment of pupils
Critique on a book	Classroom management	Critique on a book
Teaching project	Teaching reading skills/ writing skills	Motivating pupils
Achieving continuity and	Teaching grammar (e.g.	Reading

progression	spelling, phonics, syllables)	
Educational resources supply at schools	Guided/ individual reading	Literature
Gender differences in Science Lessons	Maths teaching approaches	Use of films in teaching
ICT in Science lesson	Independent learning activities with infants	Narrative and genre
Dissection of animals' organs	Teaching students of differentiated abilities /needs	Character description/ analysis
Physics subject knowledge	Collaborative work	Dialect/ accent
Subject knowledge (Primary Science)	Literacy hour for special needs children	Shakespeare and racism
	Dealing with difficult pupils	Poetry and picture
	Dealing with pupils from various cultural backgrounds	Nomination for poet laureate
	Dealing with aggressive parents	Skills and knowledge interdependent with English
	Religion in relation to geographical position	

The students participated in e-conferencing had control over the subject of their contributions and over the timing of the discussions and the pacing of their involvement. This approach allowed them to exhibit a substantial degree of autonomy and take responsibility for their own learning. The student teachers participated in different ways, being readers, information seekers and collaborators. However, they changed roles as the e-conferences progressed and as they engaged in processes of learning within the electronic communities.

The central characteristics of a community of practice suggested by Lave and Wenger (1991) existed within the e-conferences studied, namely: a)learning possibilities, b)learning curriculum, c)transparency, d)membership, e)identities and f)increasing participation. E-conferences enabled a forum of learning

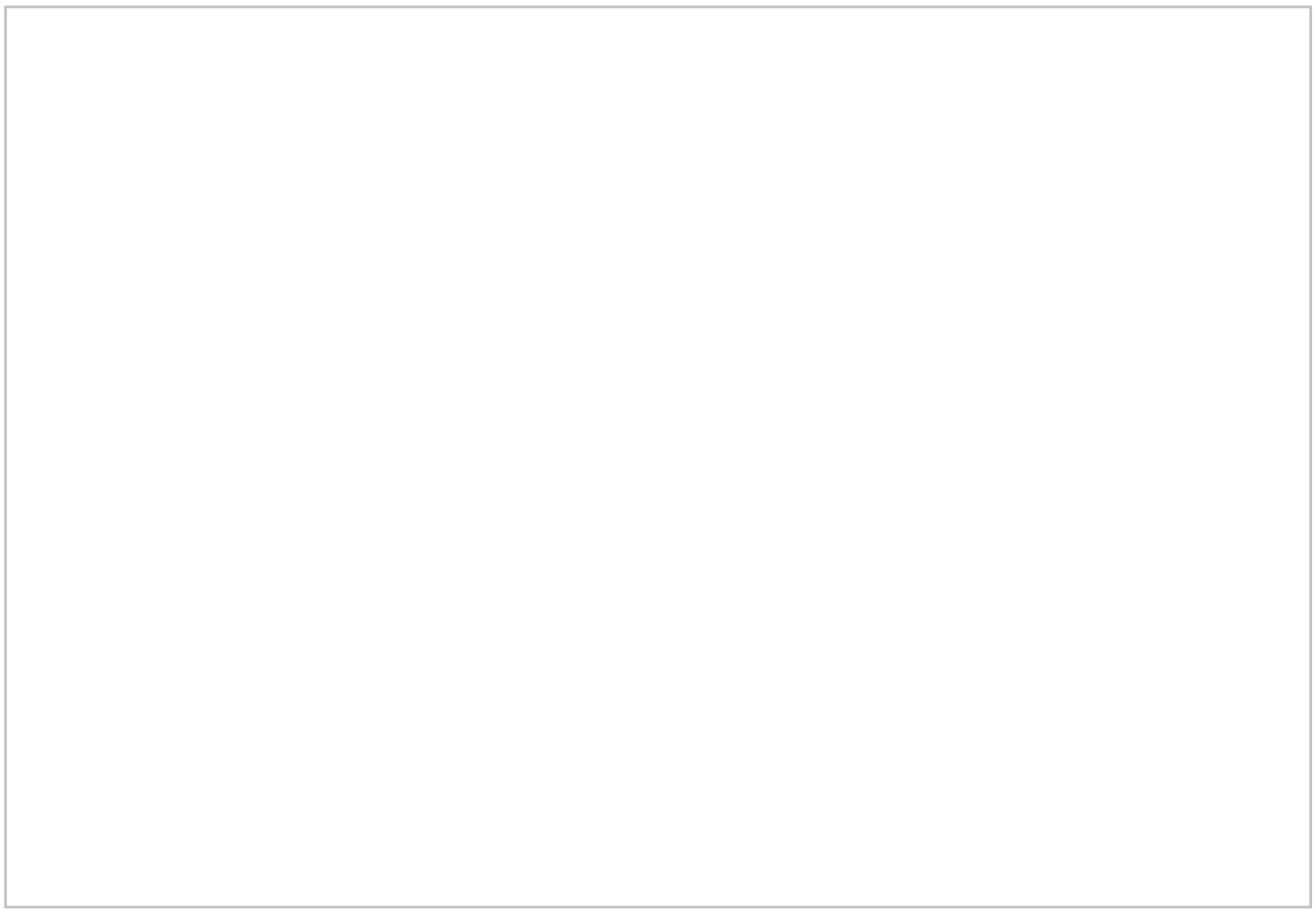
possibilities by enabling participants to access people and resources at any time and to engage in learning opportunities. The learning curriculum, which was designed by the e-conference participants, enabled the exploration of concepts and ideas and reflection on teaching practice. As the e-conferences evolved the use of e-conferencing became more transparent and the use of the technology became fully internalised by the e-conference participants. Therefore, they were able to concentrate on the actual discourse rather than being worried about the use of the system itself. The participants being members of the community had access to the on-going activity. This participation provided students an increasing understanding of what they needed to learn in order to become fully competent teachers. Similarly, the e-communities involved the development of an identity that enabled members to shape new meanings. Increasing participation in the life of the communities of practice has been part of the process of becoming a full practitioner. The proof for the participants' progression was the ideas they shared within the messages they contributed to the electronic discussions. These demonstrate the representations of their imagining about the pedagogy of teaching science, English or any lesson of the primary curriculum.

MODERATING EFFECTIVE E-CONFERENCES

Evidence from the case study suggested that the processes of structuring the learning resources of the e-community had two aspects. These concern a)the building of a sense of a community and b)the promotion of students' involvement in reflective discussion. The following strategies identified within the case study were used, in particular, at the beginning of the activity in order to build a sense of a community among the participants: a)clarifying the aims of the conference, b)setting up the tone, c)establishing the 'netiquette', d)knowing students and e)implementing the face-to-face element. One of the moderators stressed the importance of knowing students:

So, the first skill then [for a moderator] is knowing your students, finding out a bit about them and making sure that you know what they have to contribute to that particular environment and then making that known to everybody else. So, that's one of the first activities in the English e-conference that I set up, and is asking them to introduce themselves and to say why they are interested in the e-conference and what particular strengths they've got in English and I don't know if you remember we have a little section in the e-conference which is Introductions to each other. So, getting to know the students first, getting to know what interests they have and so that you can, if possible draw on that, but most especially so that the whole group knows what the knowledge is and interests and skills that the whole of the group is bringing. (Jenny Leach)

As the e-conferences progressed, the moderators input questions in an attempt to provoke discussions and created new rooms in order to stimulate new discussions that addressed the different needs of the students. The following message was sent by the Primary e-conference moderator in order to inform the students about the creation of a new conference area within the Primary e-conference:



The moderators generally facilitated learning within the electronic network through offering forms of participation to the students and encouraging them to construct an identity of participation. Ideally, the moderators were not the central figure or the dominant participant within the e-conferencing community. Their role was a light touch role but important in terms of listening to the students and creating a space for them to contribute to the discussions. In order to achieve that, the moderators stood back and withhold advice appropriate to later phases of the e-conference. This would often mean that they tried to diminish their authority in order to allow students to participate and to develop through their involvement with the processes of the community.

CONCLUSIONS AND FUTURE RESEARCH

The paper identified some key context factors that influence the form of CMC in educational e-conferences. Evidence suggested that CMC promotes teacher professional development through creating reflection within communities of practice developed within e-conferences. The role of the e-conference moderator is crucial in sustaining effective e-conferences through the structuring of the learning resources of the e-community.

Further research needs to explore the potential of cross-discipline discussions in teacher development. For example, how can forms of collaboration among teachers from different specialities be encouraged through e-conferencing?

Similarly, the creation of communities of practice that enable student teachers to take charge of their own professional development is a task that leads to the following questions. To which extent student teachers apply the knowledge they share in e-conferences during their teaching placement at schools? Is this knowledge used during the first years of teaching? How can teacher educators achieve reflection in the longer term and not only within the range of initial teacher education?

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