Action Research and Distributed Problem-Based Learning in Continuing Professional Education

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ABSTRACT  In this paper I am concerned with the analysis of the collaborative work and learning experiences of students involved in distributed problem-based learning (dPBL), with a view to beginning to answer the question: “What happens in a dPBL group?” In order to do this I present two related studies. The first study examines the way in which a dPBL group develops over the period of its work. I show that there are three distinct, but often simultaneous phases of group development: A long first phase characterized by negotiation; a second phase where there is division of work and considerable research activity; and a third phase of production. A snap shot of the early negotiation phase is analysed and discussed as a means of indicating some of the dynamics of the group. The second study looks at the ways in which the work of the group implicitly and explicitly helps to develop and sustain it as a “community of learners.” I identify two characteristics of this group which help explain how it sustains itself as a community of learners: The achievement of milestones, and the negotiation of identity and knowledge. The methodological approach adopted in these studies involves examination of the work of a dPBL group as it occurred online, and the analysis of transcripts of their discussions, debates, activities and shared production. In addition, members of the groups were involved in focused, in-depth interviews about their experience of learning in dPBL contexts. Implications for practice are discussed.

Introduction

Distributed problem-based learning (dPBL) events do not occur out of context. They are embedded in the wider context of any educational endeavour where values and beliefs about appropriate forms of learning and teaching are explicitly and implicitly addressed in the design of the course or learning event. This has consequences for tutors and learners.

The focus of this paper is the investigation of problem based learning (PBL) in a new context, with a novel approach. The focus is not on the usual PBL approach (as described, for example, by Colliver, 2000, and Davis et al., 1999) where a problem is defined by the tutor and given to the learner as their starting point for PBL. In this traditional model, students acquire knowledge and skills through staged sequences of problems presented in context, together with associated learning materials and support from teachers (Boud et al., 1997, p. 2). The kind of PBL examined in this paper occurs in an open, adult learning context where learners, who are already professional people, work in small distributed e-learning groups and negotiate amongst themselves the focus of the problem. There are no specific pre-defined learning outcomes. Each group embarks on a learning journey which requires collaboration but
which does not define in exact detail how they should work together or what the outcomes of their learning should be. In this respect, the groups are following a long tradition of adult-learning which supports openness and exploration (Boot & Hodgson, 1987; Cunningham, 1987; Harris, 1987), and which has a history in experiential learning groups (Davis & Denning, 2000; Reynolds, 1994).

The methodological approach adopted in the study has two important elements. First, it is naturalistic rather than experimental. In terms of the frameworks and methodologies used it employs observation, ethnography, textual analysis and in-depth interviews. Data are subjected to a grounded theory approach where theory is developed inductively from empirical sources, rather than existing theory being applied to empirical data. Secondly, it involves the study of groups in natural settings which work in virtual e-learning environments for extended periods of time.

After introducing and discussing the methodological approach, I introduce two related studies in dPBL, both within a continuing professional development context.

In the first study I consider the ways in which dPBL groups develop over time. In particular, I examine the way in which one distributed group negotiates the “problem” it will focus on for its learning, indicating how the group dynamics work and how the outcome of problem definition quickly defines the life of the group thereafter.

The second study is an examination of the ways in which the work of the group implicitly and explicitly helps to develop and sustain it as a community of learners. Two characteristics of the work of this group help explain how it sustains itself as a community of learners: The first is the achievement of milestones which are pivotal points in the life of the group which appear to be central important events shaping its learning. The second is the ways in which the members of the group negotiate identity and knowledge, and how this affects their perception of themselves within the group and within their place of professional work.

Finally, I present some implications for the development of our practice as tutors of dPBL.

The Context of This Study

I start with some background information about the particular context of the work of the dPBL groups examined in this study in order to make clear the underpinning educational values and beliefs.

The dPBL groups which are the focus of this paper exist as part of a larger community of learners on the MEd in E-Learning at the University of Sheffield. The MEd is designed as an action research, dPBL course. It is an advanced part-time “at a distance” programme designed to provide participants with a comprehensive grounding in the theory and application of networked learning. We focus on learning about the new information and communication technologies; the design of online learning; ways of developing learning communities; and ways of working with online groups of collaborative learners.

Currently, the MEd programme is run entirely via the Internet using Web-CT, a Web-based course authoring and electronic communications system. It is taken by a wide variety of professional people who wish to develop their understanding of, and expertise in, this new form of learning. The MEd is a global programme, with students from the United Kingdom, Eire, mainland Europe, South Africa, Hong Kong, Singapore, Japan and Australia. Current participants include:
• professional trainers and developers, self-employed or in public- and private-sector organizations;
• teachers and lecturers in further, higher and open education;
• adult continuing educators;
• people working in libraries and resource centres;
• open and distance learning educators and developers.

We aim to help course participants appreciate and understand the ways in which they can use the Internet and the Web in their professional practice, and how they can design and evaluate learning events which focus on group work and are based on sound principles of active PBL. We emphasize the implementation of innovatory online practice by creating a supportive and creative research learning community where participants feel free to experiment and “learn by doing,” while constantly holding a critical perspective on their practice and the theory underpinning it. The course emphasizes the educational need for learners to work in social learning environments which emphasize both the situated nature of learning (Koschmann, 1996; Lave & Wenger, 1991; Packer & Goicoechea, 2000; Salomon & Perkins, 1998) and the importance of co-production and co-participation (McConnell, 2000).

This is linked to the capability of the Internet and the Web to support group work and provide a virtual environment for learners to work together, share resources and collaborate. Within this virtual research learning community perspective, participants have opportunities to:

• have a wide choice over the content and direction of their learning;
• manage their own learning, and cooperate with others in theirs through processes of negotiation and discussion;
• take a critical perspective on learning and academic issues with strong relationships to their professional practice;
• focus on their own learning and development from a critical, reflective perspective, combined with an understanding of relevant academic ideas and concepts. A means for doing this is exposure to other participants’ development within the learning community;
• participate in developing the research learning community perspective, which is based on participants and tutors taking collective responsibility for the design and evaluation of the programme, via constant review and modification of the design, procedures and ways of working.

The Learning Community and PBL

The course is run both as a learning community (Pedler, 1981; Snell, 1989) in which participants have an interest in sharing, supporting and learning collaboratively in a social context; and as a community of practice (Wenger, 1998) in which members are actively constructing understandings of what it means to be professional “E-Learning” practitioners. In this design, we encourage participants and tutors to engage in meaningful practices through cooperative and collaborative learning processes, and to ensure that knowledge developed is demonstrated in the context of the participant’s professional practice. We develop a climate where commenting on each other’s work, and giving and receiving feedback is an integrated and normal part of the community’s day-to-day work. There is a high degree
of experiential learning (e.g., learning about working in distributed PBL groups by taking part in such groups), and participants are encouraged to be reflective and to use this as a major source of learning (Boud & Feletti, 1997; Moon, 1999).

The place of the tutor in this learning community is complex. The tutor exists between the boundary of the institution, which s/he represents, and that of the learning community. In the learning community the tutor adopts the “role” of tutor-participant. This implies at least two things. The first is a sharing of power with the course participants in which the tutor has to work at ensuring power is transferred to participants in the community, who in turn have to come to trust the tutor in that process. Power is shared along a series of dimensions such as decision making about the focus of PBL, design of learning events, and assessment, which is collaborative involving the learners themselves, their peers and the tutor (McConnell, 2002b). The second aspect which this tutor-participant perspective implies is the view of the tutor as learner. Although the tutor has particular expertise which s/he brings to the learning community as the representative of the institution, the tutor also presents her/himself as a learner, someone who is genuinely interested in learning through participation in the community. The concept of the tutor as “tutor-participant” is important as it signals to the participants that everyone on the course is a member of the learning community, and that the idea of community implies a different kind of learning relationship between tutor and participant. Tutors and participants relate in highly personal ways, and this relationship shapes a great deal of the learning on this course (McConnell, 2002a).

Problem-based learning is carried out through an action research mode of learning, and is based on a philosophy which acknowledges that people learn in different ways. The action learning/research focus allows participants to make choices about the management, focus and direction of their learning. Participants work in small groups where they are encouraged to view their research and learning as “action research” (Carr & Kemmis, 1986; Elden & Chisholm, 1993; Whitehead, 1989; Winter, 1989). They are introduced to the concept of action research early on in the programme in an e-seminar. This provides them with a model of how to work together, which helps guide them in their work. The action research process is not unlike the traditional PBL model, although in this context the problem is defined by the groups of learners themselves.

Problem-based learning is conceptualized as being part of the tradition of adult learning (Boud & Feletti, 1997). It is a form of learning which is little understood in terms of what actually happens within PBL group work (Savin-Baden, 2000). It is believed that course participants learn best when they are allowed to choose the focus of the problem being investigated, which is always in the context in which the knowledge is to be used. In this way, they can work on an issue or problem which has real significance to them in the development of their personal and professional practice, and which can be located within their current understanding of both their practice and their learning. The outcomes of their PBL will be of real benefit to the members in their professional practice.

The problems researched are defined within each group through processes of negotiation. They are usually complex problems which are sometimes difficult to define, but which are fertile ground for the production of mutual understandings and the construction of “shared resolutions” (Schön, 1983).

Problem-based learning is carried out on the understanding that it is a complex and as yet little understood form of distributed learning. Two types of dPBL are supported:
Collaborative distributed PBL: Where course participants work in small learning sets to define a problem relating to the practice of networked learning which is amenable to collaborative group work. The purpose of this is to help participants:

- experientially understand and critically evaluate the nature and complexity of collaborative group work in virtual learning environments. This understanding contributes to the development of their own professional practice in networked learning;
- work collaboratively on a shared problem which will lead to a portfolio outcome which can be shared with other learning sets;
- critically reflect on the experience using a set of self-analysis tools. The outcome of this critical reflection is then made available to the learning set members, who also offer their “assessment” of each participants’ self-analysis.

Cooperative distributed PBL: Where individuals within a learning set define an agenda for carrying out a course assignment chosen by themselves in consultation with their peer learners and tutor. This assignment is designed around a real problem or issue that they face in their professional practice (or which their organization faces) which is amenable to being carried out by action research. The focus of the problem is always around some aspect of networked learning. This form of dPBL is based on principles of self-managed learning, as well as principles of cooperative learning.

Participants work cooperatively in virtual learning environments such as Lotus Notes and Web-CT to help and support each other in:

1. defining the problem and its overall scope;
2. considering its appropriateness as an assignment for the MEd which will both illuminate some aspect of problem-based professional practice and also contribute to an understanding of networked learning;
3. offering each other support in finding resources that may be useful in considering theoretical underpinnings for analysing the problem or issue being researched, and in considering the implications for professional networked learning practice;
4. participating in collaborative (self/peer/tutor) review and assessment procedures where each participant brings a set of criteria which they would like members to use in making judgements about their assignment, in addition to the use of a set of criteria which are offered by the tutor. The review is an opportunity for participants and tutor to read each other’s assignment, critically discuss and examine the issues in them and offer insights into the meaning of the assignment as a method for examining the original problem, suggest additional references and resources that might be useful, and finally offer comment on the extent to which the assignment meets the writer’s set of criteria and those offered by the tutor.

Participants’ work on the course takes place in a series of four e-workshops on different themes, culminating in a research dissertation in year 2 [1]. They are organized into groups of between 6 and 9 members, plus a tutor. They are given a very broad brief to work to in which they have to agree on a particular problem to investigate which is acceptable to all members and which requires collaborative learning within the group. The problem is defined
as anything which is important to the development of the members’ professional practice and which will allow them to use the outcomes in real work settings.

**Focus and Methodology**

The focus of this paper is around the question: How does a group of distributed learners negotiate its way through the problem that it is working on? Additionally, how does it come to define its problem, produce a method for investigating it, and produce a final “product”? What happens to members of the group as they participate in this enterprise? I am interested in the dynamics of groups, the ways in which they communicate, share their ideas and resources, plan their collaborative work and finally produce a product at the conclusion of their task.

I examine the work of one group of seven course participants (five female, two male) and a male tutor. They spent 13 weeks working on a collaborative PBL event, using Web-CT forums and chat rooms as their meeting place. In addition, as part of their particular project, they designed and used an Intranet.com site (a Web-based environment with a set of user-friendly tools which can be used for meetings, learning events and so on) which became the focus of some of their research. In carrying out their distributed work, members of the group produced over 1,000 separate entries in the asynchronous forum, which when printed amount to 240 pages of text. They participated in 15 synchronous chat sessions, each lasting at least 1 hr, which amount to over 100 pages of text.

The purpose of their work is to produce a group “product” on a problem of their choice, which when completed is shared on the Web with members of other MEd groups.

Two sets of data are used in this research: The first set consists of transcripts of the communications and work of the dPBL group, easily available from the Web-CT learning environment. The second set consists of data from face-to-face in-depth interviews between the course participants and me. Both sets of data were analysed using a grounded theory approach (Glaser & Strauss, 1968; Strauss & Corbin, 1998).

Grounded theory is a well-established qualitative research method which helps researchers apply a set of procedures to interpret and organize data:

> These usually consist of conceptualizing and reducing data, elaborating categories in terms of their properties and dimensions, and relating through a series of prepositional statements. Conceptualizing, reducing, elaborating, and relating often are referred to as coding. (Strauss & Corbin, 1998, p. 12)

This qualitative research approach allows the emergence of sensitizing concepts, which are:

> … less specific suggestive ideas about what might be potentially fruitful to examine and consider, an emergent meaningful vocabulary that alerts the researcher to promising avenues of investigation. (Clarke, 1997)

rather than the generation of definitive concepts from data abstracted from their social milieus. The purpose is to remain close to the natural world being researched, and be sensitive to the words and actions of the people who are the focus of the research (Strauss & Corbin, 1998).

In my own case, in analysing the online transcripts, I started by reading them and making annotations in the margins indicating different features of the group’s work. This approach is
rather like that of an ethnographer. In adopting a grounded theory approach, the researcher is not bringing existing theory to the analysis of data, but rather developing theory inductively from the body of data itself. The theory must grow out of the data and be grounded in the data (Moustakis, 1994). It is of course appreciated that the interplay of data and the researcher’s meaning making is a creative one in which “interpretations are the researcher’s abstractions of what is in the data” (Strauss & Corbin, 1998, p. 294). No researcher enters into the process with a completely blank mind. So in my own case, I immersed myself in the data, reading it in detail and trying to understand what was going on, and why, in the dPBL groups. In doing this, I was attempting to unravel the elements of experience and their interrelationships and develop theory that helped me, and hopefully others, to understand the experience of this group of learners (Moustakis, 1994).

This approach to analysis is both scientific and creative:

Analysis is the interplay between researchers and data. It is both science and art. It is science in the sense of maintaining a certain degree of rigor and by grounding analysis in data. Creativity manifests itself in the ability of researchers to aptly name categories, ask stimulating questions, make comparisons, and extract an innovative, integrated, realistic scheme from masses of unorganized raw data. It is a balance between science and creativity that we strive for in doing research. (Strauss & Corbin, 1998, p. 13)

This first reading of the transcripts allowed me to “get a feel” for the group’s work and to immerse myself in the data. By a process of progressive focusing (Parlett, 1981) issues of relevance and potential importance concerning the nature of dPBL became apparent. For example, some of the issues that emerged in the early analysis included such things as shared ideas, disclosure, planning for chat sessions, summaries of chat sessions, the production of documents, discussions of the documents, joking, sharing professional practice, sharing resources, the production of timetables of planned work, reference to stakeholders and so on. The notes accompanying the analysis amounted to some 20 pages of hand-written text with detailed notes on each issue. As part of the procedure I also made analytical notes to myself highlighting possible interesting issues for investigation and analysis.

All the issues represent potential categories. As a category emerged from the analysis, I would make a note of it and proceed with the analysis of the transcript, trying to find evidence that might support or refute each category being included in the final set of categories. I would then look in depth at these emerging categories, re-read the margin annotations and notes to myself, moving back and forward from the text of the transcripts to my notes. A new set of notes was made on the particular category, clarifying, for example, who said what or who did what, how others reacted to that, and how the group worked with members’ ideas and suggestions. Typically, I would then proceed to engage in a new round of analysis in order to illuminate the category in some more detail (Parlett, 1981).

In this way, categories were re-worked and re-conceptualized on the basis of re-readings and analysis of the transcripts in an effort to produce the final explanatory categories. Sometimes new categories emerged as I reduced the data and merged categories. The rigour of this approach is a measure of the “trustworthiness” (Lincoln & Guba, 1985, p. 290) or validity of this kind of research. The development of the categories and emergent theory are grounded in rigorous analysis of the data (Dey, 1993).

At the same time as doing this, I produced a summary flow chart of the work of the group,
Fig. 1. Incomplete example of the flow chart of major stages of the group’s early work.

detailing each important step taken, synchronous chat sessions and their outcomes, asynchronous discussions and group work, milestones, the production of documents and so on (see Fig. 1).

As the entries of each member of the set are numbered in the transcripts (along with dates
and times and other contextual information), I was able to follow the various threads of the discussions with relative ease.

The face-to-face interviews were carried out with British participants after they had completed the MEd. They took the form of an open-ended discussion between the participants and me about their (and at times, my own) experience of networked learning. They were audio recorded and later transcribed for analysis. They were subject to a grounded theory analysis. Together with the online transcripts, they also provided a degree of triangulation of the data (Patton, 1990, p. 464).

Findings

The research reported here is ongoing and forms part of a larger project about e-learning groups and communities [2]. What I would like to do here is present some examples of emergent issues in order to illustrate some aspects of the group’s work and indicate the richness of the data and the possibilities of the methodological approach for analysing dPBL.

The Group’s Development

One of the major issues that emerged from analysing the data was the way in which the group developed over the 13 weeks. In examining the work of the group, three phases of development can be discerned:

(1) A long first phase characterized by considerable negotiation between the members of the group. The work in this phase is highly collaborative and involves all the members working closely together. Several sub-phases are evident in the groups’ work:
   - the negotiation of the particular problem to be investigated;
   - setting a timetable for their work;
   - beginning the work;
   - re-drafting the timetable on the basis of their experience and new evidence;
   - checking course assessment requirements;
   - negotiating the “look” of the final product.

(2) A medium-length second phase characterized by the group organizing itself into three sub-groups, and by the members of the sub-groups busying themselves with particular parts of the research around the particular problem:
   - each sub-group has a particular focus and contribution to make towards the final product;
   - each sub-group subdivides its work amongst its members;
   - members from other sub-groups are invited to contribute to the work of each sub-group.

(3) A short third and final phase, characterized by production:
   - drafts of sections of the product are shared by sub-groups and commented on by everyone;
   - chapter headings are finalized;
   - assurance concerning the assessment requirements is sought;
• a draft of the final product is produced and shared;
• a final chat session is conducted to polish-off the finished product;
• the product is submitted to the wider community for review and discussion.

Although these three phases occur over the 13 weeks during which the group is working together, they are not completely discrete. There is movement within each phase, especially in Phase One where there are many iterations of the negotiations sub-phase, and drafting and re-drafting of the timetable (see Fig. 1). Additionally, as the dPBL work moves from one phase to another, there is a blurring of one phase with another.

The division of labour in Phase Two, where sub-groups are formed in order to carry out particular aspects of the group’s overall work, is a point where collaboration is occurring at two levels: Within the group as a whole, and within the sub-groups. As there is no concern that every participant should learn exactly the same material according to a set curriculum of pre-defined learning objectives, or that they should all research the exact same topic, this does not present a problem in this particular context.

*Negotiating the focus.*

Negotiation is the central driving force of this group. Throughout their work, they make a conscious and collective effort to maintain a climate of support and negotiation. Of particular interest is the way in which the group negotiates the focus for its project. In this group, negotiating the problem to be investigated occurred over a short (1 week) but highly communication-intensive period of time.

After some very positive comments from members about how much they were looking forward to working together, they immediately begin to negotiate the focus of the project.

There is considerable manoeuvring amongst the members to try and establish the focus of their topic. Three brief edited excerpts from the transcripts will serve to illustrate this. I have edited the transcript to make it easier to follow, indicating where edits occur by placing the word “snip” in the text.

*Excerpt One*

Day One
Anne: … [snip] … I am personally interested in exploring the potential for using computer-mediated communications in learning (the second topic mentioned as a possible project for workshop one)—What sort of technology is available? How can we implement it effectively for learning?, etc. [snip]

Frank: [snip] I agree with you that Computer Mediated Communications in Learning offers us an opportunity to move quickly to the main business of this course. There is no shortage of material or issues to be explored. Perhaps the chat session will help us decide on the most suitable topic. [snip]

Betty: [snip] I am certainly happy to go along with Computer Mediated Communication in Learning. [snip]
Day Four
Frank: [snip] perhaps we should prepare for the chat session by attempting, between now and then, to choose [snip] the general topic for our project and, if possible post some ideas as to how we might proceed. Perhaps we could decide in advance how the issues of substance that will arise will be decided on and shortlist the type of issues that can be dealt with in the chat-room. [snip]

Frank: [NEW THREAD] I apologise if I seem to be jumping the gun a bit but I think its easier to focus on the task of formulating a proposal if there is something on the table that can be replaced or amended. That’s the purpose of this draft proposal … [snip—goes on to present his draft proposal].

This excerpt shows how quickly members of the group start negotiating the focus of their problem-solving project. Although Frank acknowledges the need for discussion and collective agreement, he nevertheless starts a new thread to post his detailed proposal. Therefore, within a few days of starting their work, one particular proposal has been given a significant place in their negotiations.

This is followed by a period during which members ask Frank questions about his proposal and offer additional viewpoints on their proposed work. Frank takes considerable time to answer them in detail whilst also taking the opportunity to expand on the details of his proposal.

Excerpt Two
Day Five
Betty: … [snip] … I’ve been thinking about the project and chasing some websites that are incorporating computer mediated learning… [snip] Carol Cooper’s website is interesting. … [snip—she goes on to explain her proposal and how it might relate to her practice]

Frank: [snip]. … Carol Cooper’s site is excellent. … [snip] However, what I’m thinking of is creating a Guide (the product)… [snip] [he goes on to describe in more detail what he is proposing].

Sophie: … [snip]. … I’ve had a quick look at the site you mentioned Betty—it’s brilliant. I’ve immediately got stuff from it that I can use in my teaching. many many thanks. I love the colour/ease of use etc.

I’m still thinking about your proposal Frank. One concern I have is. … [snip—she goes on to discuss her misgivings about Frank’s proposal].

Another member comments:

Day Six
Michael: [snip] … Frank—thank you very much for taking the initiative in this. There are obviously lots of ideas regarding topics to discuss in our chat session on Friday morning. Perhaps one way of helping to agree a topic is for us to think about what topics we would like to look at in the other assignments in phase 2 and 3 of year 1 and the dissertation and how this one might feed into those. [snip—he goes on to offer some suggestions].
Frank: … [snip—*some discussion and elaboration of Michael’s points occurs*. I feel that the end product of the *[his own]* proposed project for this workshop fits with reasonable comfort into what is presently known of the requirements of WS2 [Workshop 2] and WS3 [Workshop 3].] [snip]

Here, Betty elaborates on Anne’s original CMC proposal by incorporating her own research findings to develop a new proposal. Frank acknowledges Betty’s proposal but immediately re-states his own, making a strong case for it being generally more applicable to the group’s proposed work. Sophie acknowledges Betty’s proposal and thanks her for the Web address. She also raises some concerns over Frank’s proposal. This excerpt shows the group managing itself around several proposals.

Michael later intervenes and acknowledges Frank’s hard work at trying to get them started whilst also re-stating that the upcoming chat session might allow them to explore all possible ideas.

**Excerpt Three**

**Day Seven**

Sheena: [snip] … I like Frank’s proposal and the idea of writing a guide at the end. [snip—*she goes on to discuss it*] … Is this the sort of thing you (collectively) had in mind? [snip]

Frank: [snip] … I think that you’ve identified a number of topics in relation to the final product that we could usefully spend some time on in our chat tomorrow.

If the group decides to go ahead with this *[i.e., his own]* project then, perhaps, we should adopt an experiential approach … [snip—*goes on to elaborate in some detail on his proposal*]

Betty: … [snip] … All the proposals so far sound good See you tomorrow in chat.

Here, Sheena acknowledges Frank’s proposal but her concern to ensure everyone has been involved in the discussions and decision making suggest that she is unsure if this is a proposal which has collective support. Frank acknowledges that his proposal has yet to be agreed on by the group, but continues to provide additional details about it. Betty makes the point that all the suggestions are good, and not just Frank’s. Again, I think this suggests a degree of questioning over the emergent accepted status of Frank’s proposal.

The chat session takes place the next day. The group discuss some of the various options suggested earlier in the Forum, but the weight of the meeting is given over to Frank’s proposal. Frank fairly quickly establishes that his proposal is sufficiently generic to allow everyone to be involved, and it also relates well to the theme of the Workshop. He says: “The intranet proposal concerns the ideas of collaboration and learning community,” which are two of the Workshop themes. Frank’s proposal is finally accepted.

Examination of this short sequence shows that Frank is very quick to make his suggestion, and he makes it in sufficient detail and with sufficient eloquence as to make it quite difficult for others not to be drawn into it. The proposals offered by Anne and Betty are made in more conversational language and seem to be inviting others to participate in a discussion about possibilities rather than pushing for one particular proposal [3]. Frank does take pains to ask the others to comment on his proposal, but by providing a good, solid idea (“something on the table”) it can be argued that he is making it quite difficult for others not to accept it. Although,
as he says, it can be “replaced or amended,” the tactic of starting with a proposal rather than starting with a discussion about proposals places his proposal in the limelight and affords it a special status. This could have the effect of inhibiting members proposing, even tentatively, other topics for their project. Perhaps—because the group is new to working together—no one feels able to challenge such a strong proposal by suggesting an alternative way forward, although it may be that Michael is trying to do this in Excerpt Two above.

Frank uses the language of persuasion. He is enthusiastic about this topic and wants the group to adopt it. When he takes part in discussions about other possible projects he is quick to bring discussion back to his own proposal and expand on his own ideas in order to persuade others of their relevance and suitability for producing a good final product in keeping with the assessment requirements of the course [4].

The initial choice of a problem to investigate defines subsequent work of the group and is therefore a central period in the group’s life. Once the problem is defined, the group quickly moves into action. They spend time in the asynchronous forum re-working the proposal, sharing ideas about what it might involve and how they might organize themselves to work on it.

**Developing Community**

The question of what keeps a dPBL group of this kind working together, when there is no physical face-to-face contact, is an intriguing one. It is a central question of concern about education in distributed learning environments. How, then, does this group sustain itself?

The first point to make is that the level and quality of interaction, discussion and collaboration in this group is very high. Some researchers have suggested that this medium is impersonal (e.g., Keisler, 1992; Wegerif, 1998). Others report finding it difficult to engage some students in meaningful and productive work in these environments (Hara & Kling, 1999; Jones, 1998, 2000; Tansley & Bryson, 2000), or find that virtual learning environments make no contribution to learning (Veen et al., 1998). This is not our experience. It is true that textual communication can be misinterpreted and that care, attention and sensitivity has to be given to textual communications. But when time and attention is given to a course design that develops and maintains a learning community, the quality of the experience can be very satisfying and highly acceptable (Haythornthwaite et al., 2000; McConnell, 2000).

Clearly, the particular context in which any virtual or distributed learning course is run will contribute to its success. In the present case, course participants were researching how the Internet and the Web might be used to support learning, especially group learning. They were also using the Internet and the Web as their learning environment and were encouraged to reflect on their experiences as a source of learning. They were therefore positively oriented to participating and working collaboratively.

The design of any learning event and the way in which the technology of distributed learning is used to support the event are important factors. Extrinsic incentives to collaborate and work together—such as assessment systems that reward collaboration—are also central to keeping the group of students together. But in analysing the work of this very effective and highly productive group, it is immediately clear that much of the driving force behind their work derives from intrinsic sources. They themselves take a great deal of responsibility for
managing their focus, processes and production of the final product. They participate fully and prodigiously because they see themselves as something more than a group carrying out some task. They come to view themselves as a community. Their communications come to focus on themselves as a community:

My view of collaborative learning is that we all contribute to the efforts of the others in our “learning community.”

The purpose of the Intranet is to establish ourselves as a learning community.

Concerning the use of the Intranet:

Using an intranet to improve annual monitoring and the development of a learning community amongst tutors.

I certainly think that we have made tremendous strides in the past few weeks in terms of building a learning community.

When reviewing their dPBL work:

As I worked through the analysis of the online conversations it certainly highlighted that as a learning community we were determined to succeed.

In coming to see themselves in this way they engage fully in their project because they identify with each other as members of a community, and realize the need to participate actively in order to sustain the community.

How does this work? I have identified several characteristics of this group which help to explain how it sustains itself as a community of learners, and I will focus on two of them here. The first is about the achievement of milestones throughout their work. The second is the ways in which the members of the group negotiate identity and knowledge as they participate in their work. I will now look at each in turn.

Achievement of milestones. A milestone is a point in the work of the group when something pivotal occurs. Various kinds of milestones can be discerned, such as the group making a decision, members agreeing to adopt it and then proceeding to carry it out. Another kind of milestone is an event which focuses their work on one particular task and which seems to help them understand where they are with their work, and how to proceed beyond this point. Milestones are points in the work of the group when energy rises, and the group members often become excited and highly communicative.

The term “milestone” is used here as an analytical tool, it is a way that the researcher helps to explain the meaning of events taking place in the work of the group. Participants are not aware of these events as “milestones” themselves, although they are probably aware that something important is taking place. Figure 1 indicates at what points in the group’s early work some milestones take place. An example of a milestone may help to illustrate their general importance.

The development of the group’s Intranet site was in itself a milestone. It was the first concrete artefact produced by the group. One of its major purposes was to allow each member the opportunity to explore its many tools and facilities in order to learn experientially about using Intranets. They would then write a “story” about their experience, aimed at “selling” the
idea to colleagues in their place of work who are unlikely to know about Intranets and their potential educational benefits.

This activity—the Intranet Stories—was clearly an important event in the life of the group. It was the first time each member had taken time out to produce a piece of work to be shared with the others. In this respect it was therefore challenging as well as potentially risky. It brought a sense of excitement to their work and was highly motivating. Each story was posted on the Web-CT forum over a 2 week period. Participants commented on the activity as they participated in it:

It seems as if this phase of the project will be a real eye opener.

I do believe we are all actually enjoying the work as it is very applicable to our professional working lives.

The stories help in the development of the emerging identity of the group because:

(1) It is the group who has chosen this particular activity for working on their dPBL. They have not been told to focus on this issue by any external stakeholder (such as a tutor). It is they who “own” it.

(2) In addition, each member has negotiated a particular aspect of the work which they wish to research and which is related in some important way to their professional practice. For example, Anne has chosen to work on the potential of Intranets for supporting language teaching. Betty is researching the ways in which Intranets can be used in nursing education. Michael is interested in the ways in which he can use Intranets to support tutors in a virtual management education course, and so on. This helps to keep their work focused on authentic problems which have real relevance for their practice.

The community is thus forged through processes of self-management, sharing, engagement with each other’s stories and the insights this affords into each other’s practice.

The constant presence and availability of everyone online means that it is possible for them to continue discussing the nature of their work and the different perspectives that can be brought to it. In traditional face-to-face problem-solving situations, time is limited. Decisions are made and people leave. There can be little discussion, and each member has to grapple with making meaning about the decision after the event, on their own. In this distributed learning environment, members continue to communicate about the enterprise. As a milestone in the work of the group, the period of story telling:

- gives them access to new ideas and opportunities;
- helps them understand each other’s professional practice and the different contexts in which each member works;
- helps them “see” the diversity of their group and appreciate the importance and richness of this;
- offers members opportunities to discuss and share ideas, Web and other resources and insights into their practice;
- helps them set new goals for their work;
- allows them to re-draft their stories on the basis of members’ comments and feedback.

The achievement of the work associated with a “milestone” seems to be integral to the group’s
development and to the production of the final collective product. The achievement of milestones frees up the group to be creative, challenging and at times risk taking. With the achievement of a milestone the group often moves into a period of very focused, highly interactive discussion accompanied by a great deal of “off stage” research activity by each member. Achieving a milestone helps move the group forward.

Several kinds of milestone can be discerned, each having a particular purpose and impact on the group:

- **Decisions in chat sessions leading to agreements, which in turn lead to great activity.** Synchronous chat sessions provide an opportunity for the group to “convene,” focus on a specific topic which has been agreed in advance in the asynchronous forum, and forge their identity as a group. The importance of chat sessions is often commented on by members of the group. Missing a chat session appears to lead to feelings of disconnection with the group: “It’s amazing the impact of missing a session like that had on me… for me the feeling was … of being lost and detached from the group.” Another member comments on their importance: “I suppose its because it’s the nearest we get to meeting for real.” Although every chat session did not lead to the group making decisions, their very existence seems to enable the group in some useful way. Chat sessions often lead to increased activity in the asynchronous forum as the group picks up on points covered in the chat, elaborates their meaning and discusses how to operationalize their decisions.

- **The production of artefacts** such as drafts of the product report, the design of an Intranet site. The production of artefacts seem to serve the purpose of letting the group see, in some concrete way, that they are progressing with their project. They are milestones towards the production of the final “product” and useful reminders of the history of the group’s work.

- **Sharing input to the production of documents,** such as the sharing of each member’s story of how they learned to use an intranet; sharing their experiences in completing an online group-dynamics questionnaire. These kinds of milestones galvanize the group and bring them together at one point in their journey. Whereas at other times they are working individually or in diads, triads and other small-group arrangements on specific parts of the project, these events serve to give them a common focus which calls for the full and complete participation of each member.

- **The adoption of new forms of working patterns,** such as working in sub-groups in Phase Two. Although analysis of the transcripts indicates that communications in the group often naturally take place between twos, threes or fours, the formal adoption of new sub-groupings signals a different kind of relationship and focus. Here the focus is on sub-groups taking charge of particular tasks which the group has agreed are necessary in order to meet the requirements of the general, collective task. Adopting new forms of work patterns serves to give sub-groups permission to work alone. They also give permission to these sub-groups to take initiatives such as inviting other members to participate in some activity which they have created in order to gather data or which is designed to facilitate the sharing of members’ experiences on a particular topic or exercise.

**Negotiation, identity and knowledge.** The second theme that I want to use to illustrate how this group develops as a community is the way in which members of the group negotiate identity and knowledge. As was mentioned earlier, the MEd is designed to enable a wide
variety of social interactions. It is therefore not surprising that identity and the issues associated with it become a focus of attention.

In looking at negotiation, identity and knowledge, we move from looking at the group as the object of analysis, to looking at the individual within the social environment of the group.

What is identity? Wenger (1998, chap. 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 practising. 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, p. 152) 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 recognizable 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).

Throughout the life of this dPBL group, negotiation is a central process and can take many forms. The group negotiates around:

- meaning (e.g., of their enterprise, of their identity);
- the focus of the problem;
- who should work on what;
- timescales for producing the final product;
- processes for communicating and working together.

The identity of the members of the group with the group, and the development of their own individual identity within the group, occurs through these complex forms of negotiation.

Problem-based learning, as it occurs in this particular context, has an effect on, and implications for, the identity of course participants. The focus of dPBL is the boundary between the participants’ identity as members of the community and their identity as a practitioners in their own professional fields. The action research approach, which is an important underpinning method supporting learning on the course, helps participants to make links between these two boundaries. They are invited to act within the dPBL group and at the same time act within their practice. The boundary between the two may be distinct on starting the course (see Fig. 2), but becomes blurred and intersects as participants move between the two communities (see Fig. 3).
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, p. 158).

Analysis of the transcripts shows how this works in these dPBL 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 action research approach and problem-solving activities that underpin “learning” on the course focus on the interplay between what they are learning in their group and what they can examine in their practice.

The insights and knowledge gained from this are then brought back into the ongoing work of the dPBL 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 later when they come to review their work collectively 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 socio-cultural 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, p. 229)

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 asynchronous 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 dPBL 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 dPBL groups, identity is presented, challenged and reshaped with respect to:

**Themselves as learners:** As dPBL 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 other’s 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 (i.e., the community of peers and tutors);
- coming to view each other as an important source of expertise and learning;
- coming to realize that they can produce knowledge.

It also has the effect of changing members’ attitude to themselves as learners 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 in a postgraduate 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 particularly to 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; see, for example, 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 realize 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 effects 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 and Implications for Practice

The two themes of this paper—group development in dPBL, and the ways in which dPBL groups develop and sustain themselves as communities of learners—have implications for the practice of dPBL.

Although I describe the development of the group as occurring in phases, each phase is not necessarily completely separate from the others. They are not strict stages where one phase is completed before the group can move onto the next one, as is suggested by group development stages by other authors. For example, Tuckman’s model of group development is presented as
a unitary sequence involving separate stages of forming, storming, norming, performing and adjourning (Gersick, 1988). In this model a group cannot progress to stage three until it has passed through stages one and two.

In the analysis of the work of this dPBL group it is clear that despite there being a strong sense of movement forward from Phase One (characterized by negotiation), to Phase Two (characterized by collaboration and subdivision of work) and on to Phase Three (characterized by production), the development of the group is not quite that simple or clear cut. There is movement forwards and backwards within the phases, involving members in work around such things as forming themselves as a group and making sense of who they are; carrying out work (performing) throughout the different phases; producing artefacts and products at different stages for different purposes. The architecture of asynchronous learning environments such as Web-CT supports different kinds of work carried out at the same time. The interplay between the technology and the processes and procedures of the group support this kind of multi-dimensional group development.

My analysis also shows that each phase takes place over different periods of time. Models of group development do not address the issue of the time devoted to each stage. It seems that dPBL groups may need to use time in different ways in order to carry out their work. The negotiations in the first phase take a great deal of time, so prolonging this phase in relation to the other two phases. The final phase, largely about production, seems to hurry forward as group members work towards meeting their deadline.

Do other similar dPBL groups exhibit similar stages of development to this one? If not, what are the differences in the development of those groups, and how can we account for them? If they are similar (and it must be remembered that even if they are, the constant comparison method of the grounded theory approach is likely to sharpen and re-shape this model of development) what does this suggest about the ways in which tutors might intervene in facilitating the work of any group?

If tutors know how dPBL groups develop they can use that knowledge to help guide them in facilitating the work of the group. For example, in the initial stage when the group is formulating the “problem” the tutor may suggest that each member is given the time and space to suggest a topic if they wish, and that each suggestion is discussed openly and equally until everyone has had a say and a suitable problem has been collectively defined. Additionally, tutors may wish to encourage dPBL groups to use their time effectively in accordance with the findings of this study. They may be encouraged to take time to evaluate their situation at the end of Phase One in order to be clear about how they might work in Phase Two. Phase Three is likely to involve a “rush” towards producing the product. Tutors may assist them at this point by ensuring they fully understand the course requirements and assessment procedures so that they can put their energy and resources into producing the product according to those requirements.

Knowledge of the ways in which dPBL groups develop into learning communities also has implications for our practice. Looking at learners’ experiences of community should help us understand their identity. As the members present themselves in the group and are challenged to re-shape their identities through their collaborative problem-solving activities, they are gradually becoming accountable to the work and purposes of the group. The work of this dPBL group as described in this paper can be seen to exhibit aspects of the three characteristics of accountability to the group that Wenger (1998) describes as
being necessary ingredients for success. Tutors may wish to consider the relevance of helping learners focus explicitly on the way the group is negotiating its work, and how this is affecting the identity of members within the group and within their place of professional practice. Indeed, it may be worthwhile in some contexts deliberately to focus on this and use it as “content” and as a source of learning to help group members in their development. By alerting learners to this, tutors can help them reflect on the choices open to them.

Research of this kind—open ended, exploratory, descriptive, grounded in real learning situations and contexts, addressing both broad themes and micro issues—helps us understand the complexity of learning and teaching in dPBL environments and offers insights which can be useful in developing our practice.

The contents of this paper highlight a variety of issues relating to the work of distributed PBL groups. One theme concerns the development of dPBL groups and the ways in which their work changes over time. Another theme is about the ways in which dPBL groups work towards developing and sustaining themselves as learning communities.

Knowledge of this kind is particularly useful at the moment in helping us understand what happens in a dPBL group. This is a new form of education, and course designers and tutors will need to understand its implications for learning and teaching.

The contents of this paper should, however, be taken as tentative. Studies of this kind are useful in helping practitioners vicariously gain insights into their own practice. However, additional research is required across other groups in order to determine how widespread these interpretations are. The next step is to see whether there are general common patterns of group development, common typologies of important issues (milestones), and general patterns of negotiation of identity and knowledge. Knowledge about the ways in which dPBL groups work should help us in our practice and stimulate discussion and debate about the purpose of asking learners to participate in this form of learning.

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NOTES

[1] More details of the course can be found at: http://www.shef.ac.uk/projects/csnl
[4] In focusing on the role of Frank in the group’s early negotiations I do not wish to suggest that the efforts of Frank were not of benefit to the group. They undoubtedly were and the group appreciated them. The problem he proposed gave them an excellent vehicle for their work.
[5] The work that occurs between these boundaries and the movement between the two communities causes a temporary loss of security as members search for a new sense of self. Giddens (1991, p. 32) talks of the self becoming a reflexive project and I think this
concept can be applied to the situation of these learners. They are involved in a developmental process which is somewhere between education and therapy (Pedler, 1981).

[6] I have written about the complexity of participation in these groups elsewhere (McConnell, 2002a).

REFERENCES


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