



2008

# Virtual Problem-based Learning Communities of Practice for Teachers and Academic Developers: An Irish Higher Education Perspective

Roisin Donnelly

Technological University Dublin, roisin.donnelly@dit.ie

Follow this and additional works at: [https://arrow.dit.ie/l\\_tcbk](https://arrow.dit.ie/l_tcbk)

 Part of the [Higher Education and Teaching Commons](#)

## Recommended Citation

Donnelly, R. (2008) Virtual Problem-based Learning Communities of Practice for Teachers and Teacher Educators: An Irish Higher Education Perspective. in C. Kimble & P. Hildreth (Eds.), *Communities of Practice: Creating Learning Environments for Educators*. Vol. 2. Information Age Publishing, Charlotte, N.C: USA.

This Book Chapter is brought to you for free and open access by the Learning, Teaching & Technology Centre at ARROW@TU Dublin. It has been accepted for inclusion in Books/Book Chapters by an authorized administrator of ARROW@TU Dublin. For more information, please contact [yvonne.desmond@dit.ie](mailto:yvonne.desmond@dit.ie), [arrow.admin@dit.ie](mailto:arrow.admin@dit.ie), [brian.widdis@dit.ie](mailto:brian.widdis@dit.ie).



Title = Virtual Problem-based Learning Communities of Practice for Teachers and Academic Developers: An Irish Higher Education Perspective

Author = Roisin Donnelly

Running head = An Irish Higher Education Perspective

Author details = Learning and Teaching Centre, Dublin Institute of Technology, 14 Upper Mount Street, Dublin 2, Ireland. Tel 00 3531 402 7886, Fax 00 3531 6767243, Email roisin.donnelly@dit.ie

Comments

-----

Use " for quotes

## **Abstract**

This chapter presents the results from research and experience in the field of Higher Education (HE) academic development in the Republic of Ireland. The objective of this chapter is to discuss an exploration of how a Problem-based Learning Virtual Community of Practice (vCoP) was developed and supported within the context of academic development.

The chapter is based upon the notion of 'community' - a group of academic staff in HE with a shared interest in designing e-learning courses - and the use of problem-based learning (PBL) as a pedagogical approach supported by learning technologies. As the development and availability of online tools for communication has led to an associated rise in the concept of an online community, inherent in this is a discussion of the consideration of suitable technologies and media choices available. The chapter will describe a case study in which virtual problem-based learning as a Virtual Community of Practice was implemented in a professional development module for academic staff.

It is hoped that through an exploration of the work that has occurred on Virtual Communities of Practice, the experiences shared through this chapter will shed further light on what academics can do when faced with developing virtual communities in the future.

## **Keywords**

Academic Development, Blended Environments, E-Learning, Problem-based Learning, Teacher Development, Virtual Community of Practice

## **1. Introduction**

This chapter aims to address:

- 1) How can technology be used to support problem-based learning (PBL) as a Virtual Community of Practice (vCoP) and how can such a PBL vCoP support teacher-educators and educators in their work with students?
- 2) What problems emerge from participant interactions in the PBL vCoP?

Through an exploration of these questions, the chapter will provide a practical resource for both teachers in the field of Higher Education (HE) and those educators or academic developers who support academic staff in universities and colleges, who have begun or are considering introducing either online or blended problem-based learning (PBL) as a Virtual Community of Practice. The term academic development will be used for the context of this chapter. Whilst the chapter does take into account how theory has informed the development and sustenance of this PBL vCoP, woven throughout is consideration of the practical implications for teachers in HE and academic developers charged with their professional development.

By definition, problem-based learning is an educational strategy that involves the presentation of significant, complex and 'real world' problems to participants, which are structured so that there is not one specific correct answer or predetermined outcome. In this approach, and for the context of this chapter, the vCoP is a group of adult educators who want to learn about designing e-learning courses of their own and the module on which they are participating is run on problem-based learning principles, virtually and face-to-face, in order to negotiate a common understanding of a problem. The chapter refers to the PBL vCoP, and in this case, it is this group of participants in any given year of the module. In order to keep up with rapid change and make the most of learning technologies as aids to this form of vCoP, a series of practical insights will be provided, supplemented with a variety of illustrations of learning technology being integrated into the PBL strategy. What makes this Community of Practice (CoP) virtual is the fact that 25% to 50% of the face-to-face PBL tutorials are replaced by leader-guided e-learning activities. The face-to-face sessions occurred once every two weeks.

The chapter is written from the perspective of an academic developer/teacher-educator, and experiences are shared from the past five years of PBL vCoPs in relation to this module. The role of the academic developer was as a facilitator or tutor of the PBL vCoP.

There is recognition that some authors question the fact that communities can and do exist in a virtual mode, since for them the notion of community cannot be disassociated from a common physical space and from a history shared by its members. There are others who have experienced it, albeit, until this point in an unquestioning and uncritical way, who have since chosen to investigate its pedagogical potential and implementation.

Historically in education, there has been an assumption that learning "*has a beginning and an end; that it is best separated from the rest of our activities; and that it is the result of teaching*" (Wenger 1998, p3). Within academic development, there has been a paradigm shift from models of education where knowledge and skills are transmitted through formal attendance at training sessions, to an approach that encourages groups of practitioners to work together to examine, evaluate and construct knowledge and skills relevant to their current professional practice in the context of their particular workplace (Lewis & Allan, 2005). This trend in professional academic development in teaching indicates a shift from traditional approaches such as presenter-led workshops, to building Communities of Practice (CoPs) where teachers work together to embrace educational change. Heppell (2006) has argued that the main direction that universities can take is to sustain CoPs for learning. It is argued here that teachers in HE need CoPs as they are going to be central to teaching in the future.

For the context of this case study, CoPs are "*groups of people who share a concern, a set of problems or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis*" (Wenger, McDermott and Snyder, 2002, p4). They are understood to operate (and are developed) along three key dimensions: the problem domain to be considered, the community to engage in the problem domain, and the practice by which the community will learn of, and solve, domain problems. Taken together, these three elements make a CoP an ideal knowledge structure, a social structure that can assume responsibility for developing and sharing knowledge (Wenger, McDermott and Snyder, 2002).

The concept of Community of Practice has become a major theme of teacher professional development research and practice (Schlager, Fusco, & Schank, 2002, p129), with the positive outcome being argued that such "*CoPs can be powerful catalysts for enabling teachers to improve their practice*". It is argued that the vCoP model for professional academic development illustrated in this chapter is transformative, sustainable and scalable.

Introducing virtuality to this is through the integration of tools such as discussion boards and chatrooms; Henri & Pudelko (2003) regard these as devices to support the existence of social entities such as various shapes of gatherings, regrouped under the common designation of virtual communities. Bekkers (2004, p194) has argued that the Internet itself can also be seen as an "*archipelago of virtual communities*"; he has built upon Rheingold's illustration that there exists a close relationship between the Internet and the existence of all kinds of virtual communities, each different in nature, orientation, membership and scale.

HE is littered with terminology that often finds its way into our day-to-day conversation without introduction or definition. Whilst the terminology used here is virtual rather than distributed, the learning model encompasses technologies such as video or audio conferencing, and Web-based multimedia formats. Within the CoP, discussed in this chapter, learning is independent of time and place, and different students often absorb the material at different times.

To guide the reader through this chapter, the following sections are included the purpose of the PBL vCoP; the purpose and structure of the PBL vCoP; when the group became a vCoP and exploration of the type of support required and when it is most useful.

## 2. The Purpose and Structure of the PBL vCoP

The PBL vCoP was designed primarily to enable the participants to work and learn together on a specific e-learning design problem, and in doing so, bring them together to develop further understanding of their e-learning knowledge. This was to be achieved by providing a mechanism for the management of knowledge already known and the creation of new knowledge in that field. It was also designed to provide opportunities for them to share good practice, develop skills and acquire technical knowledge. Ultimately, it was to provide an arena for networking and socializing with other participants who share an interest and focus.

As a member of the group, participants were afforded opportunities to develop knowledge about, and solutions for, the innovative use of e-learning technology appropriate to their subject discipline. Benefits of involving participants in the process of programme design have been multi-layered, and these have been perceived through the module evaluations: the learning outcomes were tailored to meeting those of the group, and there was an increased sense of ownership over the module. Whilst there was a clear start date for the module, the learning on the module extended beyond the end date as the participants continued their mutual support of each other as they designed e-learning courses in their own teaching contexts.

The participants were academic staff on a current real-world module in a Postgraduate Diploma in HE entitled 'Designing E-Learning'. This module has been in existence since 2001. It was designed to be 10 weeks in duration, but the continuation of the learning from the module is discussed later in the chapter. The programme is located within a Faculty of Academic Affairs in an Institute of Technology in the Republic of Ireland. Each year, the module participants whilst drawn from very diverse disciplines, have a common background in that they are all lecturers in HE in the Republic of Ireland, and share a common interest in wanting to learn more about designing and integrating e-learning into the curriculum. Their common goal is to design an e-learning component to their courses and this formed the basis of their motivation. Throughout the chapter, quotations from the participants' summative evaluations are included to illustrate issues experienced:

*"Our group worked on the design of a mathematical online module that could be used to support students. This decision was based on the fact that group members felt they had this element in common in their teaching practice. This proved to be an excellent strategy because everyone had a shared interest in the task". (2004-05 participant evaluation)*

*"Once we had agreed on the problem we all saw how our individual contributions could be input into the overall goal of the group". (2005-06 participant evaluations)*

*"Having a group project was instrumental in keeping us collaborating online and maintaining a strong bond". (2005-06 participant evaluations)*

The participants were offered the choice of sharing and working on a common problem or they could take turns in working together on a colleague's workplace problem on integrating e-learning. Through the PBL process, they identified what aspects of e-learning to integrate into their courses, and why. The participants were all at different stages in their professional lives, from newly appointed staff to the institution, to those who had been teaching between 5 and 25 years. Networking with other academics and academic developers internationally has been a strong feature of this module and practice in designing e-learning has been enhanced by the multiple perspectives this collaboration can bring. In recent years, through this module, the participants become part of a wider community of e-learning practitioners and this has been developed and maintained with colleagues in the UK, Europe and Australia. Experienced educators in e-learning and problem-based learning were invited to the vCoP, to visit the participants both synchronously

(two-way communication that requires participants to communicate at the same time, though they may be separated geographically) and asynchronously (participants are not available at the same time in order to communicate) initially for a set period of time. The purpose of this was to introduce specialist knowledge to the discussions and offer an opportunity to explore different perspectives about what was happening in these different countries. It provided a 'breath of fresh air' to the dialogue, alongside additional ideas and experiences on how to integrate e-learning with the HE curriculum.

*"The part of the problem that provided us with an opportunity to collaborate with colleagues both in Finland and Australia in developing and implementing our work were to be the best experiences of the module for me. This was very exciting and when one of the tutors responded to me in the form of a personalised MP3 message. I thought this was truly amazing". (2005-06 participant evaluation)*

*"Having the international guest tutors ignited a brainstorming session with the group members, which showed us the true benefit of this technology". (2004-05 participant evaluation)*

*"Throughout the module we as a group used WebCT as a communication tool. We literally had hundreds of postings many of which included attachments. WebCT proved to be an excellent means of communication not just between the participants but also with our tutor and 'guest lecturers'. These guests were from Scotland, Finland and Australia. It was wonderful to be able to communicate with such knowledgeable academics from halfway round the world". (2004-05 participant evaluation)*

*"It was an excellent idea to involve international guest tutors; every online module should use outside experts to demonstrate different software and perspectives". (2005-06 participant evaluation)*

The type of e-learning facilities to which all the module participants had access were through the virtual environment, WebCT, online conferencing through the Marratech platform, and audio conferencing through MP3 software. All technologies allowed a range of key facets of the PBL CoP to develop, including pedagogical richness, allowing access to knowledge (e.g. international guest speakers), fostering social interaction, giving participants control of what they were doing, and by providing access to easy-to-revise/maintain/update materials. Using different forms of media such as video conferencing made the experience more interesting and exciting.

A wide variety of teachers and lecturers come on the module each year. In terms of their subject disciplines, they are an eclectic mix, with many subject disciplines being represented in the fields of apprentice education, undergraduate and postgraduate education. Participants also included librarians, IT trainers, graduate students, administrators, educational consultants and other academic support staff who have a teaching role. Their common purpose was to problem-solve instructional design issues and through the creation and expansion of knowledge in e-learning, to turn scrutiny onto their professional practice. The small number of participants, ten per module, shared a vivid interest in learning technologies and e-learning, and were held together by this enthusiasm.

What did the PBL vCoP produce in a ten-week period? The participants built up an agreed set of communal resources in e-learning. The participants used the technology for representing and expressing what they knew about e-learning. They themselves functioned as designers, using the technologies as tools for analysing the world, accessing information, interpreting and organising the personal knowledge and representing what they knew to others in the vCoP. The virtual environment seemed to be conducive to enabling the participants to build a project and a body of knowledge in e-learning.

Initially, working collectively on the negotiated PBL problem required the whole group to be involved in a series of brainstorming ideas about what disciplines and contexts would benefit from an e-learning course, pooling these ideas and resources and developing, agreeing and implementing an action plan from week to week. In the first two weeks of the module, individuals were testing out ideas on which e-learning approaches would be best for their course and asking for feedback from the teacher. From week three onwards, whole group synchronous discussions in the WebCT chat facility was introduced with the purpose of producing new knowledge and expanding the collective understanding of what they were doing. The asynchronous discussion boards were used for the production of draft ideas, reports and products, and these were complemented by a series of face-to-face tutorials, where the work was consolidated.

It became clear that e-learning infrastructures could offer CoPs a wide range of benefits: firstly, by offering new possibilities in supporting more flexible channels of communication; secondly, by contributing greater opportunities of information sharing and thirdly, by stimulating collaborative approaches to knowledge construction and management.

### **3. When the group became a vCoP**

The groups of participants who came together on this module to share information, insight, experience and tools about their area of common interest in designing e-learning evolved into a Community of Practice as the module progressed. However, this CoP was not just a celebration of common interest. It focused on practical aspects of the practice of designing e-learning in HE, everyday problems, new tools, developments in the field, things that work and do not work for educators. So the academic staff participated because the community provided value to them. From week four of the module onwards, the community members frequently turned to each other to help solve technical problems, rather than using the tutor.

*"Whilst I knew the tutor was there in the background as a support, I had a security blanket in a way as my peers were with me in the online environment to help me with technical and content queries; they coached me just as much as the tutor". (2004-05 participant evaluation)*

Horan and Wells (2005), in discussing the university campus as the local community, have reported that education is based on mentoring, internalization, identification, role modelling, guidance, socialization, interaction and group activity. They argue that in these processes, physical proximity plays an important role. Whilst acknowledging this, it is argued that if designed carefully and with attention to detail, the lack of physical human contact in a virtual environment can, to some degree, be compensated for by a strong emphasis on online socialization. Salmon's (2000) five stage model was used to support the participants in the module. The first stage of this model relates to access and developing a welcoming and encouraging atmosphere for learners. Figure 1 illustrates how the vCoP integrates the diversity of needs of the participants whilst maintaining the central learning outcomes of the module. Social awareness is a key point here. Online community space needs to support users and their social activities. It was important to provide a safe environment for participation in the online communications and activities. The participants may not engage fully unless the environment is non-threatening and they feel it is safe to do so.

INSERT FIGURE 1 ABOUT HERE.

Figure 1 Diversity of teacher needs integrated with module learning outcomes via a range of activities and resources

Social interaction can contribute to learner satisfaction and frequency of interaction in an online learning environment. Grabinger and Dunlap (2000) argue that without the opportunity actively to interact and exchange ideas with each other and the facilitator, learners' social as well as cognitive

involvement in the Virtual Learning Environment (VLE) is diminished. The importance of increasing the social aspect of learning is a recurring theme in this PBL vCoP. Dialogue, interaction and shared narratives were key for the participants to maximize the learning opportunities available in the CoP:

*"Learning activities that lack social interaction usually fail to evoke emotional involvement from learners and thus deny engagement with culture in the 'community of practice'." (Lave & Wenger, 1991, p24)*

The social interaction that took place between the participants throughout the module was key to their engagement. One example of this was the members taking it upon themselves to organise an online book club to review resources both related to the work they were doing and other fictional texts that they had enjoyed.

The intention was to use the online discussion boards as both a social network and a learning community. This involved the participants interacting frequently and feeling at ease to engage in academic discourse based on their developing understanding of the module readings and tasks. Virtual communities involve a combination of physical and virtual interaction, social imagination, and identity (Renninger & Shumar, 2002). The multilayered quality of the online communication space allowed for the mingling of different conversations about e-learning and PBL and the linking of these conversations through the WebCT site. Online technologies often enable traditionally effective instructional techniques to be used more efficiently. For example, the virtual PBL tutorial discussions were more easily saved to form a knowledge bank or archive for reference in future. The facility to archive the online discussions permitted social exchange around site resources at a future time. At any stage of the module, the participants had access to archived discussions and could revisit the postings if they so wished.

#### **4. Exploration of the Type of Support Required**

The PBL vCoP participants enjoyed the interactive environment that gave them the chance to engage with each other through the electronic tools available, at any time and from any place, work, home or abroad on field trips with their own classes. Through an observation and analysis of activity and learning in the PBL vCoP, a number of key issues emerged for the teacher or academic developer. These are structured under induction, nurturing a conducive learning environment, handling conflict, the blended environment, participation and PBL group efficiency and finally the quality of conversations in the vCoP.

##### **4.1. Nurturing a Conducive Learning Environment**

Through the modelling of behaviour, the teacher also had a role in letting everyone know that the online discussion board, like the face-to-face PBL tutorial, was a non-judgmental, tolerant space. Relationships are a key aspect of any vCoP. They determine the motivation and the legitimization of the members, which in turn determine the identity and trust and confidence of the members. For the healthy growth of the PBL vCoP, specific conditions that were present were commitment and trust, with the participants feeling that their open and honest contributions were valued and accepted. An interesting aspect of the vCoP was the more senior members taking on a mentoring role of the newer members of academic staff when it came to discussions about learning and teaching, and the younger members mentoring the senior participants in using the technology.

*"What I found the most use to me as a teacher of twenty odd years was how willing the younger members of our group were to take me under their wing when any sense of frustration with the technology was setting in, which it did on a regular basis in the first few weeks. Looking back on it now I don't think I would have carried on without this". (2005-06 participant evaluation)*



The acknowledgement of comfort zones both about the content of discussion on e-learning, and on the process of learning through PBL, enabled the participants to take risks and follow learning paths that led them beyond the sanctuary offered by their comfort zone. Embedded with this, a sense of fun enhanced the shared understanding and the good working relationships. However, these conditions were not fixed states for the entire duration of the module. Building the relationships and trust necessary to support shared actionable knowledge creation within the PBL CoP, on occasion proved difficult in the virtual environment. At times, the social processes (trust and relationships) were negatively affected in the virtual environment.

*"The size of the group, 7, instead of working to our advantage, was too large in the virtual environment; I did feel a bit remedial at times, and I held back, but because of the large size if I was not determined I could have easily slipped away". (2005-06 participant evaluations)*

*"The face-to-face sessions were a life-line that was needed to clarify the online experience and to put any feelings of fear into perspective". (2005-06 participant evaluations)*

A number of communication strategies have been tried out for effectiveness in the vCoP. Moore, Winograd, Lange & Moore (2001) stress that first impressions are crucial, and that a timely, personal response that praises the participant is crucial in the first week. Alongside this, making the learning as accessible as possible might mean explaining acronyms, and with non-native English speakers, avoiding complex grammatical sentence structures and idioms.

Trying to make personal connections and easy, informal conversation online is important. Participants were more tolerant of longer messages in the early stages of the module so content was limited to a few paragraphs in later online postings. It is useful to think about how messages might be received by other participants who will not know if you have read their messages, quickly deleted them, laughed aloud or burst into applause. Is silence angry, disinterested, bored or impressed?

Typing skills (or lack of) may prove problematic; it may be necessary to provide extra training outside of the vCoP. To assist with typing at speed, it may be useful to encourage the participant to compose offline and take time to look over and reflect upon their compositions. Other participants should be encouraged to have patience and allow for inaccuracies in written communication. As long as the material makes sense, minor typos and grammatical errors should not detract from the quality of the contribution.

*"Sometimes if you cannot type fast enough your point can get made for you or the discussion moves on". (2005-06 participant evaluation)*

#### **4.2. Handling Conflict**

*"There were difficulties with our group dynamics that mitigated against genuine trusting collaboration". (2004-05 participant evaluation)*

*"Our group was too large, with some members having strong personalities. Some individuals dominated while others were happy to plod along". (2005-06 participant evaluations)*

*"The group project works very well when everyone is committed to it. It is possible for one or two people to feel as if they are being left behind by those who are very competent at the tasks involved". (2005-06 participant evaluations)*

One of the main reasons participants can be disruptive is that they either think they know too much or too little and as a result, usually frustration, panic or boredom sets in. One approach to counter this is to increase or decrease the level of activities with the particular participants. If it is the former, grouping a few individual interactive tutorials helps get them in control and they feel part of the wider vCoP again; if the latter, increasing the online task challenge can help. Again sufficient competency assessment before a group begins helps here in terms of pitching the subject at the right level and knowing some of the participants' backgrounds is extremely helpful. If disruption persists it is important to question their motivation for being on the module and check if learning difficulties, background or peer issues are contributing to the problem.

In identifying valid complaints and responding to them with the vCoP, it was important for all participants to acknowledge negative comments but reformulate them positively and constructively in the virtual space. The teacher also had a role here by constructively showing appreciation of real difficulties participants were experiencing early on in adapting to the virtual environment. Dealing with difficulties amongst participants tactfully, constructively and promptly was a key feature of the teacher's role. It was important to address any key contentious issues by providing rationale for changes. All message postings needed to be well thought out and by adhering to specific, time-limited discussion topics, participant focus could be facilitated.

Those participants that were lacking in confidence as well as time needed some direct reassurance throughout. Rather than forcing the participants to keep pace with the module, it was more a case of trying to pace the module around them. Clearly, there is a balance to be struck in having clear expectations, and by remaining flexible, the needs of most of the group members will be met.

If there are conflicts between members Juwah (2002) suggested dividing these people into different groups, otherwise if possible, let both parties be open and try to iron out their difficulties face-to-face. An option is for the group to revisit the ground rules and if participants are breaking these, it can be helpful to make them aware of their infringement of the rules. In addition, it may be necessary to consider including additional ground rules. It can be worthwhile to relate any conflict in the group to real-life experience and emphasize that not everything in the real world is perfect and compromises may need to be made.

There is little doubt that it can be difficult to assess emotions of participants online and therefore a good interaction in a face-to-face tutorial can be essential. There can be many virtual problems in a PBL CoP but once awareness is created, a face-to-face session can help resolve them.

#### **4.3. Blended Environment**

Lewis and Allan (2005, p11) note that many virtual learning communities do not carry out all of their activities using technology; research has shown "*participants rating a blended learning approach more highly than 'pure' online communications*". In this module, an array of approaches were blended including virtual, face-to-face and resource-based activities. Figure 2 depicts a typical blended interaction in the PBL CoP of the classroom event and the online activities.

INSERT FIGURE 2 ABOUT HERE

Figure 2 An Example of the Virtual PBL CoP Blended with Face-to-face Interaction

Blending a classroom event with relevant online activities can extend the learning experience over a longer period of time for the participants in the CoP. One of the most salient features of e-learning is that it allows learning to be place and time independent (Vrasidas & Mclsaac, 2000). Adult learners, such as the participants on this module, can arrange their learning around their professional lives without being constrained by time and place.

A vCoP can quickly make decisions, or rapidly change course. Having the option of face-to-face discussions offer the benefit that requests and promises made of, and by, participants are less easily ignored than online messages. In stimulating and structuring a meaningful interaction for the group, a certain amount of face-to-face interaction is important, as there are certain communications that the computer cannot interpret. Face-to-face contact contains the familiar 'smiles', 'pats on the back' and other physical manifestations of support, encouragement and approval that are so necessary for an effective CoP to function. These things are far less easy to manifest online than face-to-face, and the participants need help and support in coping with the differences. However, it would be a mistake to assume that because groups can meet face-to-face that they will do so, or that participants will know how to use this ability to good effect. They will need advice about how to 'blend' effectively and efficiently their online and face-to-face meetings.

If face-to-face discussions are not available then synchronous online discussion may serve a similar organisational benefit in group work. However, chat was not without its problems. There were things of importance about expectations, about writing styles, about knowing people and trusting them - not necessarily the same thing - and about feeling watched and judged. Alleviating the trepidations of those participants who feel anxious is another important role for the leader or teacher. Operating in a vCoP can be both inspiring and frustrating. Discussions can be involving and interesting as you read and relate to others' comments. However, enthusiasm can wane quickly when a problem is encountered online (this could be a minor technical difficulty, being unable to add an attachment or more major, such as the computer not working, or could be a personal issue such as feeling daunted by expertise of other participants or just not relating to what they are saying). Participants may not expect to experience highs and lows in this way. They can be motivated by the tasks, and perhaps by wanting to achieve a tangible goal. However, frustration can set in when a group of participants cannot use the chat facility at the same time. Some may try to contribute, but others can find a 'void' - was there anyone out there? It is at this point that they can be surprised that the teacher does not contribute more. Frustration can be magnified by feeling held back at times by the obvious expertise of some peers.

*"Maybe I would have gone in online more deeply if we didn't meet face-to-face every week; I might have been forced to discuss issues even more deeply then". (2004-05 participant evaluations)*

*"I am unsure as to the consistency of depth to which our group used the discussion board to really 'discuss' topics but when debate and discussion was generated it was clear that learning was a strong possibility through this medium". (2004-05 participant evaluations)*

*"The balance between face-to-face and virtual sessions was fine for me. I would not like to go for longer than two weeks without human contact in meetings". (2005-06 participant evaluation)*

#### **4.4. Participation and vCoP Group Efficiency**

How can problems of participation in asynchronous discussions be overcome? Participation will flow if there is a need to impart knowledge through shared experience, or to engage in specific social relations. All CoPs include individuals who participate in different ways and at different rates. Some members participated much more vociferously and more frequently than others both face-to-face and online did. There was a sense that some participants felt that they did not know enough to contribute and this required a discussion on the quality and standard of responses required. Examples of the correct depth of engagement were useful so that expectations could be defined. Private emails to support and guide deeper input helped, provided the participant was responsive.

*"Group work often has a competitive element which, in our situation and context, we harnessed in a positive way". (2004-05 participant evaluation)*

*"The team work was excellent. I learned how to approach group work and, I hope, how to make a team work better together. Some of the very active members promoted critical thinking, which gave confidence to others to do the same. The members were good at solving problems and more importantly, accepting solutions from each other". (2005-06 participant evaluation)*

In terms of participation, as an educator of teachers, it was important to be aware of different approaches to using the technology and the learning material, which may reflect personal preferences rather than real problems, i.e. some participants needed more reflection time, more research, or preferred different presentation formats (drawings rather than text) to understand issues. In addition, mature participants may react differently to the technology than the younger participants. It would be important to have as much background information as possible to help build up an e-personality for each participant. Building up a profile of the participant ages, background, expectations and technical experience can help with understanding why certain behaviour is present.

To encourage participation in the PBL vCoP, it can be useful to ask slow contributors to reply on simple points to 'break the ice' with their peers. Some may require extra time to understand the material. This may result from different learning styles, different material presentation formats, too much text or too few diagrams.

Figure 3 illustrates the structure, context and learning process vital for the efficient operation of the virtual CoP.

INSERT FIGURE 3 ABOUT HERE

Figure 3 Towards Efficiency in a Virtual PBL CoP (Adapted from Schwarz, 1994)

There are a number of requisites for having a clear structure for the vCoP. Firstly, the culture of the group of participants can be significant in how the group will operate. Secondly having clear and common goals and a motivating task, is key to participation; thirdly support needs to be provided to the group in defining individual roles and norms for how the group will function; fourthly sufficient time should be allowed for the group to complete the work and finally, the provision of a blended communal meeting place is important. The context of the vCoP can also have a strong influence on its effectiveness and the group can benefit greatly from having a shared history, clear mission and mutual vision. The facilitator or leader of the vCoP can play a role in its effectiveness by providing a supportive culture in tone and purpose, formative feedback, and a coherent blend of technological and material resources. The process of the PBL vCoP informs the end product or performance of the group. Inherent in this is the administration of boundaries in the group, allowance for conflict management and support in decision-making and problem-solving.

#### **4.5. Quality of Conversations**

The research by Chapman, Raymond & Smiley (2005) has identified elements in online conversations that describe a learning community and these include informality, familiarity, honesty, openness, heart, passion, dialogue, rapport, empathy, trust, authenticity, disclosure, humour and diverse opinions. Bekkers (2004) suggests that it is important to have a clear, rather narrow focus leaving enough room for discussion and deliberation. Involving past participants of a PBL vCoP to comment and post in the module, not just as content but also as part of examples in a discussion, has proved helpful.

One possibility with the online discussions is too much contribution coming from one source, compared with others. As in face-to-face discussions, some people can talk too much at the expense of their peer's contributions. Some may feel 'others are doing so much that it is difficult to keep up'. This can simply result from the flow and ebb of the conversations. For newcomers to the vCoP, a useful idea is to allow participants at the induction stage to work through exercises that are examples of a mock discussion, illustrating what to do. For example, include a title for the message, ensure the messages are in the right conference and ensure that one person is not dominating a discussion. They could reflect on these by exploring how well the messages contribute to the flow of a discussion.

The participants were working with an understanding of diversity in learning style, culture and personal styles of each other. With this in mind, it is important to provide a choice of tasks to stimulate the discussion in order to accommodate different learning styles (Honey and Mumford, 1986). Effective facilitators must feel comfortable using the media and communication tools. Ideally, using a variety of media (text, graphics, audio and video) to present material may accommodate individual learning styles and provide approaches for both visual and auditory learners. Activists should have a range of different activities to keep them engaged, and have the opportunity to brainstorm ideas. Pragmatists need a structure that will allow them to see an obvious link between the discussions and what they are learning, in order to evaluate its practical use and value. Theorists will need sufficient time to explore links between ideas and situations; the asynchronous nature of WebCT and other VLEs will support this. Reflectors, should be given time to reflect and give considered responses.

*"Having people thinking the same way about education/e-learning, as you do, from different parts of the world allows you to break free from your bubble. It is very easy to believe that your educational system and methods are the only ones available". (2005-06 participant evaluation)*

## **5. Potential Problems in a PBL vCoP**

Over the five years of the PG Diploma module and its PBL vCoP being in operation, a number of problems emerged which had implications for the teacher involved:

- Procrastination by participants, which caused them later to experience difficulty in managing their time and requirements
- Problems with technology at the start (and as a result, the teacher overcompensated by trying to do too much). Instead, it is recommended to encourage those participants with good online skills to support those others who are less confident in using the technology
- The vCoP could be overwhelming (involving too much work for the teacher and participants) or it could be too novel an environment
- There could be little thought given to the integration of technology to the CoP or low levels of planning by the teacher which can result in confusion for participants
- Resistance to change by the participants
- Unequal relationships developing; trying to avoid the domination by one or two individuals
- Surface level of learning occurring; important to provide opportunities for reflection on the process of e\*learning and how participants could improve, develop and progress using this type of learning environment
- An un-stimulating environment could occur occasionally; to overcome this it is important to use questions in discussion that will challenge the participants as well as provide interesting material and leave ownership of the problem to the participants

## 6. Conclusion

This final section includes recommendations for teacher-educators wishing to develop a PBL vCoP in the future. Whilst contributing online and working in a community has its recognized problems, detailed induction, practice tasks, formative feedback and ongoing IT and pedagogic support by the teacher has been found to be crucial to success. Participants need to be able to use online techniques properly before they can feel comfortable using it in a real situation. Also, they have to be aware of netiquette and what is acceptable to the teacher and their peers in terms of communicating online. The area of what is expected of them is also key \* they need to know how often they should log on/contribute, what tasks are a requirement, what IT they need, and when/how feedback is available. Any uncertainty or failure to access the vCoP/module can lead to a sense of isolation, which is not helpful in a virtual context.

Participants should reflect on their processes and progress in the vCoP; guidelines should be given to support this. Encouragement of everyone to participate and share their experience in the online discussion board can be very helpful, as participants relate to real life experiences quickly; this can then be combined with the recommended literature in the area. A study guide for each week with recommended materials should be laid out to match the objectives of each week. Evaluation details should be given in soft and hard copy formats, indicating participation and attendance.

Virtual Communities of Practice are being increasingly used in initiatives seeking to enhance teaching in the HE sector (Churchill, 2006). In the Irish context discussed in this chapter, a number of important lessons have been learnt by the academic developer and the participants in the vCoP. Firstly, there is a need to be explicit initially about the purpose of the PBL vCoP, and how vital it is to invest time and effort into planning the structure of the PBL vCoP. Secondly and from a technical perspective, coherence about the e\*learning infrastructure is required and from a pedagogical viewpoint, it is important to take cognizance of the learning process within the PBL vCoP, particularly in how the participants work and learn together. Finally, it is useful to explore the type of support required and when this is most useful.

Having an initial predefined lifespan and a specific problem to mobilize its energies, the PBL vCoP developed well. Given the fact that the module was initially designed for a duration of 10 weeks, as Henri & Pudenko (2003) have noted, the learning community in it is born, grows and dies at the rhythm of the stages of an educational program. However, due to the process of reification occurring, the individual productions and the common achievements of the participants were published on the web site, and the vCoP did not expire at the close of the module. For such a community of professional academic staff, involvement in the vCoP through this module was a means to make practice explicit, to improve and even to transform it. Virtual discussions with each other and the international guest tutors continued many weeks after the close of the module; a testimony to the strength of the CoP.

In a final contemplation of practical implications for teacher\*practitioners and academic developers both now, and for the future, it can be useful to highlight some considerations:

- Educators have a longstanding tradition of pursuing professional academic development through various levels of collaboration within Communities of Practice -the emergence of online versions, such as virtual learning communities, is a natural extension of the strategy.
- By taking a phased approach to community building in virtual asynchronous discussions, traffic can be increased and loyalty built over time: through such a phased approach, community can build naturally, while valuable participant information can be gathered that can be used to increase the relevance of the discussions. With a move towards an active community, participation and engagement grows, resulting in a richer learning experience.
- Both opportunities and challenges arise in this form of problem - based learning community: it is important to induct the participants as part of their professional development as teachers in

HE. Building a virtual learning community involves developing content mastery as well as facilitating interaction amongst the participants to learn and share experiences; emerging technology such as tools, media and virtual environments offer opportunities for creating new types of learning communities for these teachers.

- One of the most satisfying aspects within the PBL virtual community is the nurturing of long - distance professional relationships and local ties.

## 7. References

- Bekkers, V. (2004). Virtual Policy Communities and Responsive Governance: Redesigning Online Debates. *Information Policy*, 9, 193 - 203.
- Chapman, C., Ramondt, L., & Smiley, G. (2005). Strong Community, Deep Learning: Exploring the Link. *Innovations in Education and Teaching International*, 42, 3, 217 - 230.
- Churchill, T. (2006) E - communities of Practice? Paper Presentation at ALT - C, Heriot Watt University, 5 - 7 September 2006.
- Grabinger, R. S., & Dunlap, J. C. (2000). Rich Environments for Active Learning: A Definition. In D. Squires, G. Conole, & G. Jacobs (Eds.) *The Changing Face of Learning Technology* (pp. 8 - 38). Cardiff: University of Wales Press.
- Henri, F., & Pudelko, B. (2003). Understanding and Analysing Activity and Learning in Virtual Communities. *Journal of Computer Assisted Learning*, 19, 474 - 487.
- Heppell, S. (2006) E - Learning in the 21st Century. Keynote Presentation at ALT - C, Heriot - Watt University, Edinburgh, 5 - 7 September 2006.
- Honey, P., & Mumford, A. (1986). Using your Learning Styles. Maidenhead: Peter Honey.
- Horan, T., & Wells, K. (2005). Digital Communities of Practice: Investigation of Actionable Knowledge for Local Information Networks. *Knowledge, Technology & Policy*, 18 , 1, 27 - 42.
- Juwah, C. (2002). *Using Communication and Information Technologies to Support Problem - Based Learning*. RGU: The Robert Gordon University.
- Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge, UK: Cambridge University Press.
- Lewis, D., & Allan, B. (2005). *Virtual Communities of Practice. A Guide for Practitioners*. Maidenhead: The Society for Research into Higher Education & Open University Press.
- Moore, G. S, Winograd, K., Lange, D., & Moore, G. (2001). *You Can Teach Online: The McGraw Hill Guide to Building Creative Learning Environments*. London: McGraw - Hill.
- Renninger, K. and Shumar, W. (Eds.) (2002). *Building Virtual Communities: Learning and Change in Cyberspace*. Cambridge: Cambridge University Press.
- Salmon, G. (2000). *E - moderating: The Key to Teaching and Learning Online*. London: Kogan Page.
- Schlager, M., Fusco, J., & Schank, P. (2002). Evolution of an Online Education Community of Practice. In K.A. Renninger & W. Shumar, (Eds.) *Building Virtual Communities. Learning and Change in Cyberspace*. Cambridge: Cambridge University Press.
- Schwarz, R.M. (1994) *The Skilled Facilitator: Practical Wisdom for Developing Effective Groups*. San Francisco: Jossey Bass Public Administration Series.
- Vrasidas, C. & Mclsaac, M. (2000). Principles of Pedagogy and Evaluation for Web - based Learning. *Education Media International*, 37(2), 105 - 111.
- Wenger, E. (1998). *Communities of Practice*. Cambridge: Cambridge University Press.
- Wenger, E., McDermott, R., and Snyder, W. (2002). *Cultivating Communities of Practice*. Boston, MA: Harvard Business School Press.