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Constructive dialogue in ICT professional development for the transformation of teachers' pedagogical beliefs and practices

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This paper explores the transformative capacity of engaging teachers in constructive dialogue within ICT professional development activity. The paper reports on one aspect of an Australian Research Council funded Linkage project that is concerned with models of teacher Information and Communication Technologies (ICT) professional development that result in multiliterate teaching practices. The industry partners for the project are the Suncoast Cyberschools, a coalition of schools for whom being a 'networked learning community' is fundamental to their purpose. The relationship between Multiliteracies and ICT provides a contentious context around which teachers had the opportunity to engage, through an asynchronised threaded discussion forum. Data reported in this paper are generated from the archived posts to the threaded discussion forum and are analysed qualitatively for evidence of community and quantitatively for different forums of feedback (Mäkitalo, Häkkinen , Leinonen , & Järvelä, 2002) and levels of discussion (Jarvela & Hakkinen, 2002). The findings suggest evidence of both collegial and critical discussion. Collegial discussion was found to be important in developing and maintaining community while critical discussion was vital for its role in transforming teachers' beliefs. The data also revealed a number of practical aspects of online environments that inhibit constructive discussion.

Introduction

In an age where ICT enables a multiplicity of communication channels, where icons, sounds and words together create dynamic texts that are not place or time dependent, where ICT is considered a pervasive part of our work, cultural and private lives, change in what and how we do things is accepted as continual and rapid. With such change has come the realisation that classroom pedagogy needs to be transformed (Lankshear, Snyder, & Green, 2000; Luke, 2000; Millard, 2003; Ramsey, 2000). Transforming pedagogy that effectively infuses ICT indicates movement beyond an 'adaptation' stage (Dwyer, Ringstaff, & Sandholtz, 1991), a 'technologised' approach (Lankshear & Bigum, 1998) and or practices that 'domesticate' the computer (Bigum, 2002). ICT can no longer be made to conform to requirements of the classroom rather ICT should enable teachers' to transform their practice.

ICT professional development is seen as a vehicle to enable transformative change in teachers' practice (Russell, 1999). However, what constitutes effective models of continuing professional development is highly contested (Becher, 1999; Knight, 2002; Schulman, 1987). Long standing perceptions of ICT professional development as ICT skill workshops or training approaches, indicate a 're-tooling' of teachers that tends to augment the existing curriculum by developing teachers' competencies focused on specific types of applications. O'Rourke (2001, p.13) redirects ICT professional development towards helping teachers "to focus on pedagogy than on the technology

itself" which is affirmed by Loveless (2003, p.324) through her premise to build teachers' "confidence in change…rather than evidence of [ICT] competence". If we have any hope of transformative outcomes for our teachers, ICT professional development intentions need to move from 're-tooling' with infrequent curriculum integration to a model that will enable teachers to see the 'transforming' possibilities of ICT.

Background

This paper reports on one aspect of a research project that has as its goal the development of a transformative model of teacher Information and Communication Technology (ICT) professional development that is likely to enable teachers to transform their pedagogical beliefs and practices. The project is supported by funding from the Australian Research Council, an industry partner, and Griffith University. The industry partner, the Suncoast Cyberschools, is a group of regional schools trialing an educational reform project targeted at curriculum, pedagogy and assessment (Education Queensland, 2000). This project enlists ICT as a major platform, both to underwrite the need for reform and as an aid to pedagogy (Queensland Government, 2002). It highlights the need for teachers' ICT professional development on the basis that teachers need "to understand how ICTs promote higher order thinking and deepen understanding"' and that "using ICTs effectively demands new teaching strategies and different approaches to assessment" (Department of Education, 2002, p.5).

The research project has two stages. Stage 1 involved the collection of data to inform the design of ICT professional development activity for implementation and analysis in Stage 2. Semi-structured interviews were the main data collection device in Stage 1. Interviews were held with participants from the Cyberschools. Data were collected on the three distinct areas implicit to ICT professional development in this context, namely ICT in learning, multiliteracies, and ICT professional development. Stage 2 utilised action research methodology to support the collaborative design, implementation and evaluation of an ICT professional development activity over a substantial period of time. Teachers' classroom inquiries were the focal professional development activity. Teams of two teachers from eight schools within the Cyberschool cluster implemented classroom inquiry projects. An asynchronous threaded discussion forum described below was implemented to enhance the development of community amongst all teachers across schools and improve transformative outcomes. All names used in the data reported in this paper have been replaced with pseudonyms and online postings have been copied in full with spelling errors included for authenticity. Corrections are made in brackets to help keep the flow and meaning of the posts.

Constructive Dialogue

Collegial dialogue is one of three professional learning activities that was investigated as a transformative element within a theoretically constructed model for ICT professional development (see Figure 1). The other two professional learning

activities are investigation and reflection. Part of the examination of collegial dialogue, through the vehicle of online communication is reported here. Collegial discussion was renamed constructive dialogue as a result of data analysis. An amended ICT professional development model evolved and will be explained in detail towards the end of this paper.

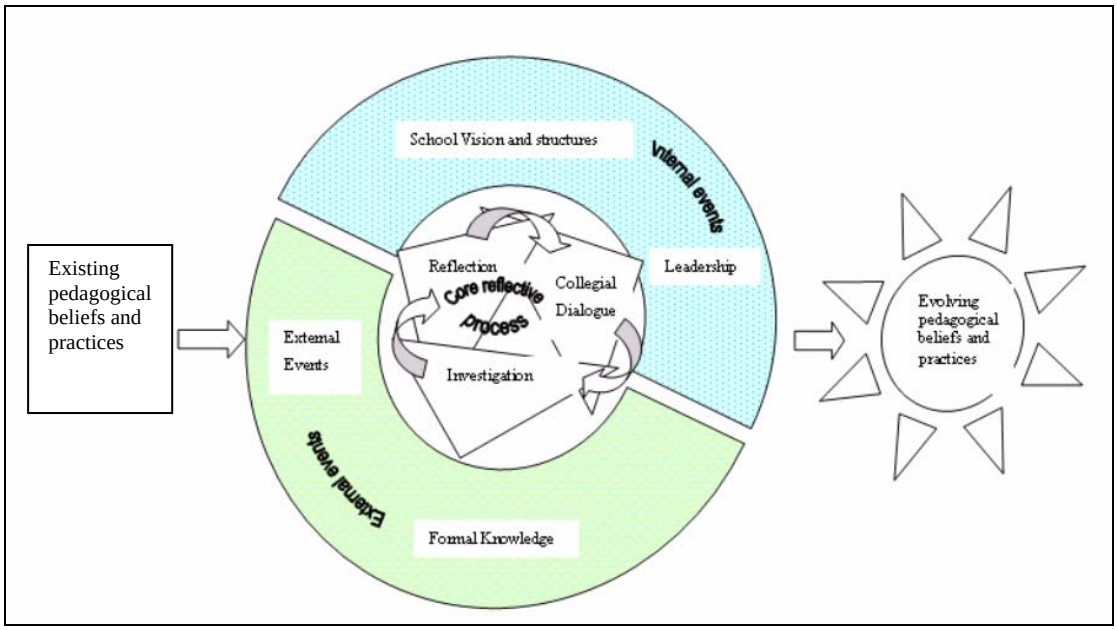

Figure 1 Theoretical ICT professional development model

Collegial dialogue accentuates space for teachers' professional talk about classroom practice. Advocates define collegial dialogue on the basis of sustained interaction by teachers who seek potentially better ideas, indicating critical reflective and inquiring processes (Ball & Cohen, 1999; Fullan, 2003; Guskey, 2003; Smyth, 1987). As the term suggests, collegial dialogue necessitates the formation of a group or 'community' for teacher professional development. Learning communities, teacher networks or collaboratives, provide organised social places for collegial dialogue. The notion of community is explained by Sagor (1997, p.172) as a "critical unit of change within education". In an ICT professional development model, the capacity for teachers' engagement in collegial dialogue is relevant to the development of a learning community.

The promotional material for the Suncoast Cyberschools identify them as a 'networked learning community' dedicated to acting as a catalyst for sharing, building relationships and development within school communities. The stated purpose of the Suncoast Cyberschools Project is to establish an education model for communities of the future. The Cyberschools have some geographical separation from each other and considerable separation from me. However, as they are well supported by ICT infrastructure, and ICT professional development is fundamental to the research project, I sought to engage the participants with electronic communication. An asynchronous threaded discussion structure was seen as the best way to stimulate community within the constraints of the teaching work environment. This was implemented via the forum communication tool in a *Blackboard*© environment.

The rationale for developing a community amongst the school teams was to engender a sense of shared purpose in regard to seeking new knowledge and understanding about multiliteracies and the integration of ICT; to provide opportunity to reflect critically on classroom practices; and to counteract the feeling of isolation that would ensue from independent classroom investigations. These purposes are consistent with the essential characteristics of learning communities (Barab & Duffy, 2000; Lieberman, 2000).

In the discussion section that follows, collegial dialogue is explored through an analysis of the development of a learning community amongst the teachers in the eight schools participating in an online discussion forum. Teachers' postings to the online forum are analysed for evidence of community, forms of feedback and levels of discussion. Implications are drawn for collegial dialogue as an essential professional learning activity in ICT professional development.

Discussion

Communications technologies has been promoted as a platform that can facilitate learning communities as it enables many to many communication that is not place or time dependent (King, 2002; Rovai, 2002). However, Zhop and Rop (2001, p. 11) problematise notions of community in online environments, which are based loosely around being "connected" rather than determining if community actually exists. Dillenbourg (1999) suggests that looking at the collaborations and the learning taking place provides meaning for a learning community. The threaded postings to an online forum are analysed here for evidence of a learning community.

An asynchronised threaded discussion forum was implemented via the forum communication tool in a *Blackboard©* environment. During the implementation phase, mandatory participation was required from each school team. A teacher with the support of their school peer would lead and encourage discussion over a two week period. Implementation occurred over a nine month period with nine different discussion topics posted by school teams. It was decided that I would lead the first discussion to demonstrate the process. This is in keeping with Manning and Payne's (1993, p.364) suggestion that "the mechanism for growth in the zone [Vygotsky's concept of zone of proximal development] is the actual verbal interaction with a more experienced member of society". However, to improve the sustainability of the community this initial leadership was to be redirected amongst the teachers through the leadership of subsequent threads. Generally, the number of posting by a given teacher was found to be more prevalent when it was their turn at leading the threaded discussion.

I opened the online forum with an activity (see Figure 2) connected to specific documentation that each teacher needed to submit, to formalize the beginning of their classroom inquiries:

[Sarah] For the next two weeks we will be supporting one another through the formation of your action plans. These should be emailed to me by the 11th April. You will need to download the form from the Documents section. If you have any questions, thoughts or problems with documenting your existing situation and action plan reply to this message. I encourage everyone to provide support and encouragement.

Figure 2 Activity posting

Discussion of such documentation was intended to direct initial teacher engagement. For many teachers this was their first experience contributing in an online environment and as such, early responses were of a technical 'trialling nature' to 'test' to see if their posting worked, such as in Figure 3:

[Cherry] Hi all
Just a quick test to make sure I am accessing correctly. David has spent some time preparing and planning our Inquiry Project. Back soon with real discussion.

Figure 3 Trial posting

By its address to "*all*", this post suggests some acknowledgement of collegiality. It also acknowledges the potential for "*real discussion*" signifying the purpose for more critical pedagogical postings and having to get the preliminary documentation out the way. The form of address used in the initial postings points to ambiguity with the genre of the forum as a means of communication, between the conversational forms of "*hi*", the verbal greetings of "*g'day*" and the written form of "*Dear*" as would be used in letter format. As the forum progressed the postings tended not to have any form of address, which may have been influenced by familiarity with sequential listings of posts. To keep sense of cross postings, coded names are used in this analysis.

Following this opening for real discussion in Figure 3, I used my 'expert' standing to direct the discussion towards pedagogical issues by replying in Figure 4:

[Sarah] Thanks Cherry. David has a very hot topic. There has been much discussion about how to use the internet effectively and I think that a Multiliteracy focus is what is required. The internet is a dynamic medium where students use different skills and literacies to make meaning. Looking at it through a multiliterate lens will be really interesting for all of us. Is David planning to use the internet in next terms unit of work. If so what are you planning to do to analyse your pedagogy and learning activities?

Figure 4 My response to trial post

In this posting I was trying to engage Cherry [David's peer] in more constructive discussion by providing background information on effective use of the internet to establish common understanding (Di Mauro & Jacobs, 1995) and directing discussion with a question, signifying a cognitive cue (Mäkitalo et al., 2002). From the use of individual names in these posts and the flow of conversation, it would be expected that the following post would come from Cherry or David. However, evidence of a

cross post occurred from Kelly who continued this constructive discourse as in Figure 5:

> [Kelly] Questions to clarify and unpack question: What literacies and skills are already being explicitely [explicitly] taught and learnt in present units of work? (Rich Tasks) What literacies and reportoires [repertoires] of practice are needed to use internet effectively? How do you incorporate these needs into your planning and pedagogy?

Figure 5 Kelly's cross post

I responded with more questions in the following post:

> [Sarah] Great questions Kelly...would stimulate much thought.
> I'll add some:
> Why use the Internet?
> In what way are you using the Internet? Is this the only way? Is this appropriate to the learning outcomes you want achieved?
> Are there more powerful ways that children can get information than by surfing the Net? Could discussions with real people in the appropriate fields be more realistic and educational?
> ...any experiences others want to share re internet use…

Figure 6 My post of questions

Both Kelly and I instigated further discussion by providing questions that were optional forms of direction for David's inquiry. These questions provided a signal for our willingness to continue the interaction (Mäkitalo et al., 2002) as did my final comment in Figure 6, inviting others to participate. The thread ceased at this point. It could be suggested that at this early stage, within the first week of the online forum, that participants had not established enough common understandings about multiliteracies and ICT to respond to these questions or that confidence or experience in pedagogical application of the internet was lacking. Common understandings of terms such as 'multiliteracies', 'repertoires' or 'pedagogy' seem to be required prior to their application in a virtual environment to support critical discourse amongst teachers.

Mäkitalo et al (2002) makes a distinction between feedback and questioning in web based discussion. As found here, questions initiate critical discussion whereas feedback is more oriented towards the establishment of a common understanding and the building of relationships in a learning community. These authors propose six different forms of feedback that include agreement/disagreement, personal, notifying, supporting, comparing and paraphrasing. The first two forms of feedback were found to be more common in what Mäkitalo et al (2002) termed progressive level feedback, while the later four forms of feedback were more typical in deeper level discussion. An initial posting to my orientating activity suggests the building of relationships through a personal more jovial tone by Ivy in Figure 7:

[Ivy] Dear Sarah, and hi to you all. Immogen and I are very high achievers and are sure we will manage to complete our project planning sheet by the 11 April as you requested. We promise not to party, shop, or play with the grandkids for the next seven months. Immogen has even deferred her open heart surgery and face lift until next year so that she can concentrate on her Inquiry Project.
Yours in professional learning development .....

Figure 7 Ivy's jovial posting

Personal feedback by Ivy in her posting conveys positive emotions that set the tone for the development of a learning community. This posting suggests interest and commitment encased in good humour. As an initial posting it supported the development of community.

Di Mauro and Jacobs (1995) suggest that a leader plays a critical role in the building of a cooperative community. In this context I was considered the leader who initially directed the discussion. However, due to the structure of an online forum, where postings and cross postings are unrestricted, this leadership at times devolved into the community. This transfer of responsibility occurred at critical stages where leadership was found to be problematic. An example of this is evident in the following series of postings (Figures 8-14) which I initiated:

[Sarah] Any thoughts or issues associated with monitoring your actions in the first cycle? Has anyone thought about data collection techniques?

Figure 8 My post

The first posting to this question was by Unwin (see Figure 9):

[Unwin] I thought that you might have a checklist of tasks/skills that need to be completed and as this is done you check them off.

Figure 9 Unwin's post

This response is problematic as it is not in keeping with goals of effective integration of ICT for multiliterate outcomes. It places emphasis on teaching about ICT. I am concerned not to alienate Unwin, so I frame my response in the form of questions and seek other comments, removing myself from the expert role (see Figure 10):

[Sarah] Has anyone any experience with skill checklists? Do they work? It depends on what outcomes you want to achieve and what focus you put on the technology? Comments

Figure 10 My removal from expert role post

Mitchell and Mayer (2002, p.15) suggest caution about comments that can be read as regulatory, serving to “stifle or silence” discussion. Fortunately, the thread was picked up by a teacher, Megan, whose response was more in keeping with the goals of the project (see Figure 11):

[Megan] They can work on simple skills such as turning the computer on but they don't always tell you what the children understand. For my self I am going to ask the children to start a learning journal for this term whereby they reflect on their learning and through the journal tell me in words or drawings about what they have learnt and understood as we investigate multi modal presentations.

I think (in regards to earlier thoughts mentioned above) that we all at one time or another get locked into thinking that multiliteracies, particularly when mentioned in the same sentence as ICT is the internet and computers and the like. Sometimes we are so keen to embrace the new we forget the old.

Figure 11 Megan's post

Megan used comparing feedback to explain her personal views on the focus of ICT skills. She validates the use of a learning journal as evidence of student understanding. She then enters into a deeper level discussion, drawing on her understanding of multiliteracies and its relationship to ICT. This opens up the opportunity for richer discussion. The following post by Harvey (see Figure 12), two days later, reverted the focus back to an ICT skills checklist:

[Harvey] Checklists can work effectively but we were going to combine ours with an interview and observations, giving the chn. [children] set tasks to perform e.g. make a thank you card for the groundsman then seeing if chn. [children] can perform necessary skills to achieve this. The only problem may be that chn. [children] may learn computer skills sporatically [sporadically] rather than in a sequential manner so the checklist would have to be wide in scope and may not show all the child knows.

Figure 12 Harvey's post

Harvey describes pedagogical practices and beliefs that limit the effective integration of ICT. Learning about ICT through the sequential development of computer skills indicates a technical approach (O'Rourke, 2001) or a goal of ICT skills development (DEST, 2001). Harvey disregarded Megan's posting, as there was no feedback in Harvey's post. This lack of acknowledgement or loss of thread of discussion is symptomatic of this environment unlike in a face to face environment where a conversation is more easily continued because of notions of time and place. At this point, I wanted to encourage discussion and engage Harvey in exploring his beliefs and practices, so I posed a series of questions in Figure 13:

[Sarah] What is the outcome you want to achieve from a thank you card? How does it relate to the concepts under study in the classroom/unit? Is computer skilling at the forefront? Should we be explicitly teaching computer skills? Think this is an important issue to discuss. Comments please

Figure 13 Questions to stimulate Harvey

Once again a response came from another teacher, Kelly (see Figure 14):

[Kelly] Technology skills need to be embedded where possible with some focus teaching for immediate needs as they arise. Peer mentoring is an apt strategy because it allows for most efficient and effective use of time and expertise.

Figure 14 Kelly's post

Harvey did not engage in critical discussion. This thread ended with Kelly's post that reiterated the theme of a focus on learning with ICT, again enabling me to remove myself from the expert role. Suggested reasons for Harvey's disengagement could include a disagreement with or a lack of understanding of the perception being presented in the postings or a lack of confidence or an unwillingness to engage in critical discourse. The virtual nature of this environment enables participants to engage as 'lurkers' or as 'respondents'.

The transfer of responsibility to lead discussion was also embedded in a design feature for this online forum. As mentioned earlier, each school team was given a two week period to engage and direct discussion on a topic related to the teacher's classroom inquiry. It was found that the quality and level of interaction within topics was dependent upon factors such as interest amongst the community and the generality of the topic. The many to many relationship that exists in this structure enabled an open critical discussion. The following example of a series of postings on the topic 'Is the media the message' started by Unwin enabled critical discussion and a high level of engagement. The number of times that the postings were read also indicates a significant amount of engagement even though it was inactive. The postings within this thread are displayed together in Table 1 to mirror the ebb and flow of discussion:

Table 1 Is the media the message postings

Unwin	If a teacher is using multi-literacies (apropos [speakers name] excellent presentation at Nambour RSL) and is a real aficionado of all things techno that whistle, bang and shout is there a chance that the message will get lost in the media - particularly with young kids involved? (With acknowledgement to Marshall McLuhan)	Read 16 times
Sarah	You see this a lot when children are searching on the Internet- distracted by the advertising, or even when they are making a powerpoint presentation- they are concerned with the animation and sound rather than how powerpoint can enhance the communication of the concept they are presenting. How are teachers getting past this?	Read 17 times
Megan	This is really difficult. For myself i had two different groups operating in the classroom. One group on video, the other using powerpoint. The powerpoint group did get hypnotised by the animation and sound effects and thus some of their message was lost. The other video group did not - why? Upon reflection I believe that it came down to the level of input from myself. As the video group was using expensive equipment I insisted on a huge amount of preplanning, i questioned every thought or idea, asking them to continually reflect on their plans. Was the idea powerful, would it convince the audience or would it be lost in the noise or video effect used? Although I monitored the powerpoint group and made suggestions relating to the use of animation in the presentation i did not deeply question the children in this group. This, for me, is food for thought.	Read 15 times
Megan	In our pursuit to be multiliterate classrooms could we be in danger of 'overkill'? Are we losing the very thing we are trying to achieve due to over saturation? When is enough enough?	Read 15 times
Harry	New skills, new knowledges and new literacies are features of our New Basics Curriculum. The excitement and interest that is generated in our students through the use of multiliteracies is an important enabler for teaching and learning. Many teachers are learning the skills along with the students, which does consume time, energy and thought. As teachers and students become more confident and competent with multiliteracies this will start to balance out. We need to think about how much easier it will be when we have students with the skills required, teachers with the knowledge and expertise needed and working reliable technology at our fingertips. We are all on a	Read 8 times

	journey - I think that multiliteracies integrated into the context of a real student centred curriculum will always be important and integral to the needs of life long learning. Overkill won't be the issue.	
Unwin	At a literal level, I think that we can. We must be explicit with what we really want the students to learn and not get too strung out on the methods of delivery over and above what is necessary (and here you have to make arbitrary decisions) to get the message across. I sometimes think we try too hard to do things which in a lot of cases are easy. I hope that this doesn't sound too flippant in the face of all the stuff at our disposal. regards	Read 15 times

Unwin presents a complex issue in a sociable way. His use of terms such as "*all things techno that whistle, bang and shout*" provides context for the discussion which helps establish and maintain common ground (Mäkitalo et al., 2002). I respond only once in this thread which indicates the move from a leader to a participatory role. My response uses both supporting and comparing feedback as I provide a pedagogical example to what Unwin is theoretically describing. Megan then moves this discussion into her personal realm where she describes a practical example of how her children are "*hypnotised by the animation and sound effects and thus some of their message was lost*". Megan then compares two pedagogical approaches and student learning outcomes. She notes that this reflection on her teaching is informative.

Megan continues this discussion in her second posting by putting a negative twist on the use of multiliteracies with the use of terms such as "*overkill*" and "*over saturation*". This controversial posting brought both agreement and disagreement feedback. Dillenbourg (1999, p.13) suggest that collaborative learning must provide a space for negotiation and a space for misunderstanding. Mitchell and Mayer (2002, p.17) acknowledge that negotiating meaning enables the possibility of taking conflict and different values into account in our understanding of community. Megan did not reply to either of the posts by Harry or Unwin. The meanings of multiliteracies from each of these postings differed. Harry focused on ICT skills while Unwin was not interested in methods of instruction. This suggests that Megan's intention was misunderstood, causing her to disengage in the discussion. Multiliteracies is a complex term that was understood by the teachers in rudimentary form. The thread analysed here indicates some unpacking of multiliteracies through a movement from theory to practice to personal experience. Such unpacking builds common understandings and indicates critical discussion.

This qualitative examination of feedback within postings suggests that an online threaded forum provided an environment where both collegiality and critical discussion existed. Furthermore, in alignment with feedback for lower level and higher level discussion, an examination of the quality of discussion revealed that higher level discussion which involves critique was more prevalent than lower levels of discussion. Using Järvelä's and Häkkinen's (2002) categories of electronic posts, Figure 15 displays the percentage of lower and higher levels of discussions. Järvelä and Häkkinen identify five types of postings that exist on a continuum beginning with comment and suggestion (lower) through to experience, new point/question then theory (higher). It can be seen that 'experience' and 'question' were the most prevalent forms of discussion. This further supports the finding that an online threaded forum provides substantive capacity for critical discussion.

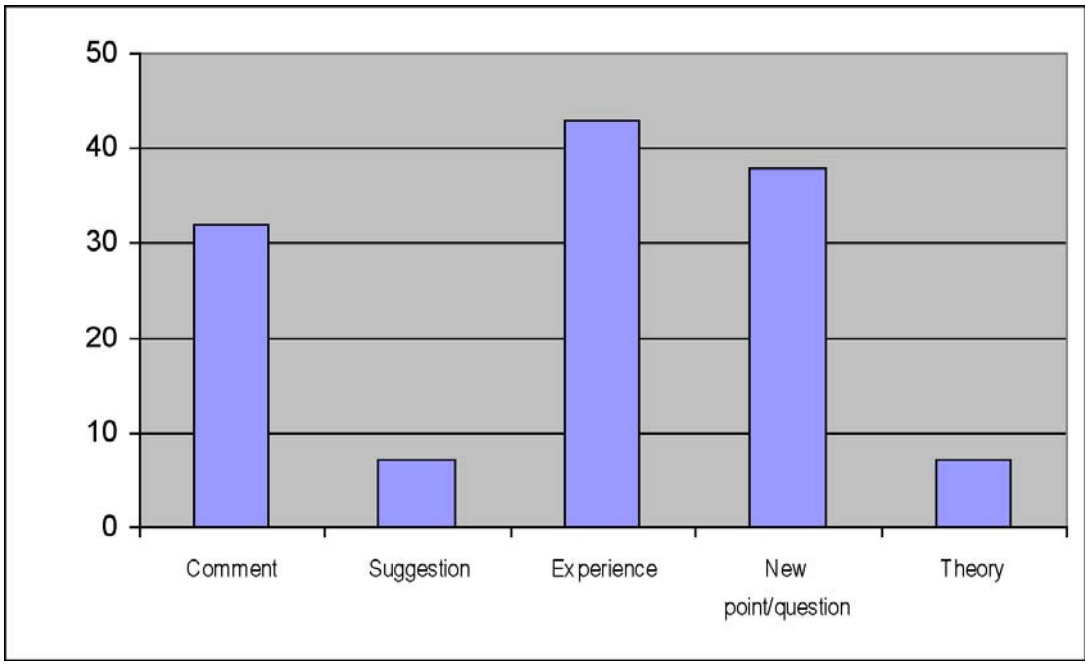

Figure 15 Levels of discussion on threaded forum

Conclusion

Postings to an online forum are analysed for evidence of community and critical discussion. A number of theoretical concepts regarding community and discourse within electronic environments, as identified by Di Mauro and Jacobs (1995) and Mäkitalo, Häkkinen, Leinonen, and Järvelä (2002) discussed in text, are supported by the data presented here. It would appear that teachers' postings within an online forum facilitated the development of community. Controversy, humour, personal experience and positive feedback all played a valuable role in the development of this online community as they do in other enactments of community. Cross posting, inviting comments and sharing the leadership role all served to mirror the dynamics of face to face communication.

Critical discussion was evident in this online forum. Teachers engaged in high levels of discussion where experiences were shared and questions and new points were raised around issues of multiliteracies and ICT. These critical episodes provided a professional learning purpose in the virtual environment. However, it was found that critical discussion was only sustained for a small number of postings by teachers in a given thread. The data reveal a number of practical aspects of online environments that inhibit critical discussion. These include the opportunities for teachers to 'lurk' or disengage at any given time and the ease with which misunderstandings or comments can silence participation. Alternatively, the role of the leader and the change of leadership are found to have a positive impact on discussion. The development of relationships and common understandings and these symptomatic features of online discussion suggest that the more traditional face to face environment serves specific purposes that can enhance discussion online. As teachers gain more experience in online environments, greater participation and critical discourse could occur without the support of developing prior understandings in face to face settings.

Collegial dialogue as a professional learning activity in ICT professional development has been explored for its role in the development of a learning community. Underwriting collegial dialogue is the relationship between critical discussion and development of community. Evident in the virtual environment is the tension that exists between collegial and critical discussion. Tension arises as collegiality is opposed to critique but without critique there is no need for collegiality. In other words, a learning community is built on camaraderie but without the opportunity for learning to occur through critique, there is no point in membership.

In light of the foregrounding analysis, collegial dialogue as a professional learning activity must be renamed to subsume a greater acknowledgement of the transformative capacity of critique. The term 'constructive dialogue' replaces collegial dialogue within ICT professional development to represent this relationship. Teachers' engagement that is collegial establishes a context that enables critique to be formulated and actioned. Consequently, critique becomes a section of collegiality that can be accessed anytime thus impacting on the feeling and purpose of community. The following diagram (Figure 16) builds on the theoretical model for ICT professional development (Figure 1). It illustrates an amended ICT professional model based on these findings in relation to 'constructive' dialogue:

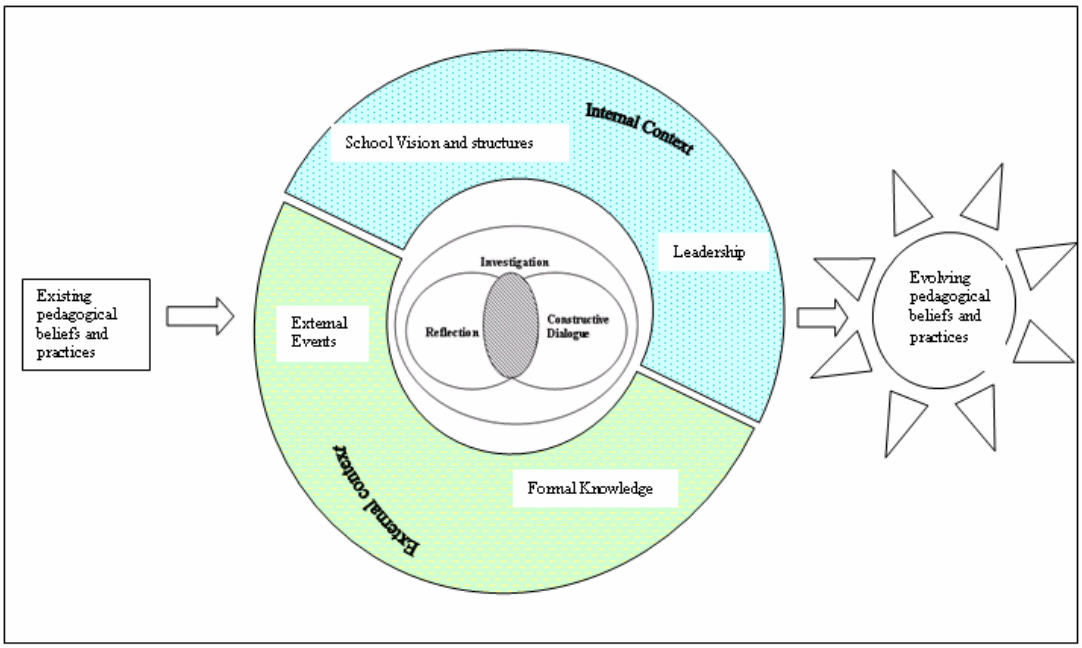

Figure 16 Transformative ICT professional development model

In Figure 16 constructive dialogue is represented in two parts. The unshaded section represents collegiality and the shaded section represents critique. Constructive dialogue plays a fundamental role in enabling teachers' to transform their pedagogical beliefs and practices. This paper has reported on one aspect of a research project focused on the development of a model of ICT professional development. It has examined the professional learning activity of teacher dialogue, highlighting the necessary elements for transformative outcomes. Constructive dialogue plays an important role in ICT professional development and can be facilitated by online communication tools.

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References

Achinstein, B., & Meyer, T. (1997). *The uneasy marriage between friendship and critique: Dilemmas of fostering critical friendship in a novice teacher learning community*. Paper presented at the Annual meeting of the America Educational Research Association, Chicago, IL, March 24-28.

Ball, D., & Cohen, D. (1999). Developing practice, developing practitioners: Towards a practice-based theory of professional education. In L. Darling-Hammond & G. Skyes (Eds.), *Teaching as the learning profession: handbook of policy and practice* (pp. 3-32). San Francisco: Jossey-Bass Publishers.

Barab, S., & Duffy, T. (2000). From practice fields to communities of practice. In D. Jonassen & S. Land (Eds.), *Theoretical foundations of learning environments* (pp. 25-55). Mahwah, NJ: Lawrence Erlbaum Associates.

Becher, T. (1999). *Professional Practices: Commitment and capability in a changing environment*. New Brunswick, NJ: Transaction Publishers.

Bigum, C. (2002). Design sensibilities, schools and the new computing communication technologies. In I. Snyder (Ed.), *Silicon Literacies. Communication, innovation and education in the electronic age* (pp. 130-140). New Fetter Lane, London: Routledge.

Department of Education. (2002). *ICTs for Learning*. Brisbane: Queensland Government, Education Queensland.

DEST. (2001). *Making Better Connections: Models of teacher professional development for the integration of information and communication technology into classroom practice*. Canberra: Department of Education, Science and Training.

Di Mauro, V., & Jacobs, G. (1995). Collaborative electronic network building. *Journal of Computers in Mathematics and Science, 14*, 119-131.

Dillenbourg, P. (1999). Introduction: What do you mean by "collaborative learning"? In P. Dillenbourg (Ed.), *Collaborative learning: Cognitive and computational approaches* (pp. 1-19). Amsterdam: Pergamon.

Dwyer, D., Ringstaff, C., & Sandholtz, J. (1991). Changes in Teachers' Beliefs and Practices in Technology-Rich Classrooms. *Educational Leadership*, 45-52.

Education Queensland. (2000). *New Basics Project Technical Paper*. Retrieved 4/2/2002, from http://education.qld.gov.au

Fullan, M. (2003). *Change Forces with a vengeance*. London: Routledge Falmer.

Graumann, C. (1995). Commonality, mutuality and reciprocity: A conceptual introduction. In I. Markova, C. Graumann & K. Foppa (Eds.), *Mutualities in dialogue* (pp. 1-24). New York: Cambridge University Press.

Guskey, T. (2003). Professional Development that works: What makes professional development effective? *Phi Delta Kappan, 84*(10), 748-751.

Jarvela, S., & Hakkinen, P. (2002). Web-based cases in teaching and learning- The quality of discussion and a stage of perspective taking in asynchronous communication. *Interactive Learning Environments, 10*(1), 1-22.

King, K. (2002). Identifying success in online teacher education and professional development. *The Internet and Higher Education, 5*(3), 231-246.

Knight, P. (2002). A systematic approach to professional development: learning as practice. *Teaching and Teacher Education, 18*(2), 229-241.

Lankshear, C., & Bigum, C. (1998). *Literacies and technologies in school settings: findings from the field.* Paper presented at the Australian Association for the Teaching of English and the Australian Literacy Educators' Association, Canberra, Australia, July.

Lankshear, C., Snyder, I., & Green, B. (2000). *Teachers and Technoliteracy: managing literacy, technology and learning in schools.* St Leonards NSW: Allen & Unwin.

Lieberman, A. (2000). Networks as Learning Communities. *Journal of Teacher Education, 51*(3), 221-227.

Loveless, A. (2003). The interaction between primary teachers' perceptions of ICT and their pedagogy. *Education and Information Technologies, 8*(4), 313-326.

Luke, C. (2000). Cyber-schooling and technological change: multiliteracies for new times. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies. Literacy Learning and the Design of Social Futures* (pp. 69-91). South Yarra: MacMillian Publishers.

Mäkitalo, K., Häkkinen , P., Leinonen , P., & Järvelä, S. (2002). Mechanisms of common ground in case-based web discussions in teacher education. *The Internet and Higher Education, 5*(3), 247-265.

Manning, B., & Payne, B. (1993). A Vygotskian-based theory of teacher cognition: towards the acquisition of mental reflection and self-regulation. *Teaching and Teacher Education, 9*(4), 361-371.

Millard, E. (2003). Towards a literacy of fusion: new times, new teaching and learning? *Reading, literacy and language, 37*(1), 3-8.

Mitchell, J., & Mayer, D. (2002). *Mediating and regulating teacher education discourse: shifting goal posts in an electronic learning community.* Paper presented at the Australian Association for Research in Education, Brisbane, December.

Nystrand, M. (1986). *The structure of written communication: studies in reciprocity between writers and readers*. London: Academic Press.

O'Rourke, M. (2001). Engaging students through ICT: a multiliteracies approach. *Teacher Learning Network Journal: Change, Growth, Innovation, 8*(3), 12-13.

Prensky, M. (2004). *The emerging online life of the digital native: what they do differently because of technology and how they do it.* Retrieved 2/02/07, from http://www.marcprensky.com/writing/default.asp

Queensland Government. (2002). *Queensland the Smart State: Education and Training Reforms for the Future.* Brisbane: Department of the Premier and Cabinet.

Ramsey, G. (2000). *Quality Matters: revitalising teaching: critical times, critical choices*. Sydney: NSW Department of Education and Training.

Rovai, A. (2002). Sense of community, perceived cognitive learning and persistence in asynchronous learning networks. *The Internet and Higher Education, 5*(4), 319-332.

Russell, G. (1999). *Implications of the 1999 DEST Report for Professional Development in Learning Technology.* Paper presented at the ACEC2000, the Australasian Computers in Education Conference, Melbourne, Australia.

Sagor, R. (1997). Collaborative Action Research for Educational Change. In A. Hargreaves (Ed.), *Rethinking Educational change with hearts and minds* (pp. 169-191). Alexandria: Association for Supervision and Curriculum Development.

Schlager, M., Fusco, J., & Schank, P. (1998/99). Cornerstones for an On-line Community of Educational Professionals. *IEEE Technology and Society Magazine, 17*(4), 15-21,40.

Schulman, L. (1987). Knowledge and Teaching: Foundations of the New Reform. *Harvard Educational Review, 57*(1), 1-22.

Smyth, J. (1987). Transforming teaching through intellectualising the work of teachers. In J. Smyth (Ed.), *Educating teachers: Changing the nature of pedagogical knowledge* (pp. 155-168). London: The Falmer Press.

Spender, D. (1995). *Nattering on the net*. North Melbourne, Victoria: Spinifex Press Pty Ltd.

Zhao, Y., & Rop, S. (2001). *A critical review of the literature on electronic networks as reflective discourse communities for inservice teachers.* Paper presented at the Annual meeting of the American Education Research Association, New Orleans, April.