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## **A learning architecture framework (LAF) for developing community, engagement and professional identity for pre-service teachers**

### **Abstract**

To support students completing their practicum placements as part of a one-year Graduate Diploma in Education (Secondary), a community of practice (CoP) framework was developed by adopting a Learning Architecture Framework based on the work of Wenger. Through this framework, student interaction and structured dialogue were facilitated that enabled professional conversations and peer-to-peer learning offering mutual engagement, emotional support, feedback and scope for reflection. Data collected in the form of podcast recordings and blog entries of critical incidents created by the students while on practicum, as well as postpracticum focus group discussions, attests strongly to the effectiveness of this approach in developing online communities to support the professional development of preservice teachers.

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## A Learning Architecture Framework (LAF) for developing community, engagement and professional identity for pre-service teachers

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### Abstract:

*To support students completing their practicum placements as part of a one-year Graduate Diploma in Education (Secondary), a community of practice (CoP) framework was developed by adopting a Learning Architecture Framework based on the work of Wenger. Through this framework, student interaction and structured dialogue were facilitated that enabled professional conversations and peer-to-peer learning offering mutual engagement, emotional support, feedback and scope for reflection. Data collected in the form of podcast recordings and blog entries of critical incidents created by the students while on practicum, as well as post-practicum focus group discussions, attests strongly to the effectiveness of this approach in developing online communities to support the professional development of pre-service teachers.*

### Introduction and context of the study

During the one-year Graduate Diploma in Education (Secondary) program at ACU National, students undertake two four-week block practicum placements, during which they have the opportunity to observe exemplary lessons taught by experiencing teachers, as well as commencing teaching themselves. The goals of the practicum are not only to improve the pre-service teachers' access to innovative pedagogy and educational theory, but also to assist them in understanding their own prior knowledge regarding pedagogy, as well as to encourage them to begin reflecting on and critically evaluating their own practice.

In 2007, a new dimension to the practicum was added to facilitate online peer mentoring among the pre-service teachers and provide them with opportunities to reflect on teaching prior to entering full-time teaching. The creation of an online community to enable this mentoring to take effect forms the context for the present study. While on their practicum, students used collaborative web logging (blogging) and threaded voice discussion tools that were integrated into the university's online learning management system (LMS), to share and reflect on their experiences, identify critical incidents and invite comment on their responses and reactions from peers.

The questions that motivated the study were as follows:

1. How can a *Learning Architecture Framework*, based on Wenger's (1998) work be adopted to create a learning community and learning experiences for pre-service teachers?
2. What elements of a community of practice (CoP) were evident in the peer-to-peer mentoring relationships and interactive dialogues that occurred in the online community?

This initiative formed part of an institution-wide strategy to encourage greater ICT integration within teacher education programs, and as part

of the University mission statement, to foster communities of learning and practice that utilise a range of networking tools effectively.

### **Communities of practice and peer-to-peer learning**

A learning community is used to describe a cohesive, effective community that enables learning to occur, in a socially authentic manner through engagement and interaction with others. This form of participatory learning embodies a culture of learning in which “everyone is engaged in a collective effort of understanding” (Bielaczyc & Collins, 1999, p. 5).

Learning from peers is not a new phenomenon, and is often linked to collaborative and cooperative e-learning as it shares features in common, and involves active, reciprocal helping behaviours among groups or matched dyads. In this article we define peer-to-peer (P2P) learning as “the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions” (Topping, 2005, p. 633). Research has found that the forms of interactions that occur between peers are qualitatively different from those occurring between an expert and novice, or between a teacher and student (Aufschnaiter, 2003; Schrum, Burbank, Engle, & Chambers, 2005). Recent research indicates that peer learning and mentorship relationships in which cognitive capabilities are similar can offer both cognitive challenges and support as both parties are more likely to engage in mutual dialogue and shared activities (Grant-Vallone & Ensher, 2000; Paulus & Scherff, 2008). Essentially, in a peer-to-peer mentoring relationship there is agreement on communication and reciprocity, which may involve phone calls, e-mail or other forms of communication in order to facilitate the exchange of ideas and the provision of feedback and support. For both parties this is a developmental relationship with the purpose of supporting the individuals to achieve a goal: In this case, to learn more about the teaching profession and in general, and in particular to develop their skills as classroom teachers.

In recognition of the dearth of peer-to-peer learning arrangements for teachers completing the practicum (field experience), the present project aimed to create a technology supported learning community among a group of postgraduate students completing a one-year teaching qualification. The approach bears similarities to, and combines the concept of a learning community with electronic mentoring processes.

### **Professional development and peer-to-peer mentoring**

Definitions of mentoring abound in the literature. Huang and Lynch (1995) define mentoring as “a process of shared learning and growth that promotes mutual benefit, interaction and support for both parties” (cited in Bierema & Merriam, p. 212). The traditional understanding of mentoring consisted of two main functions: to support career development or task-orientation or to offer psychosocial support. The former would offer support, advice, and information related to task or career or professional development whereas the latter would provide both emotional and psychological support. Terrion and Leonard

(2007) identify the career function as the instrumental and vocational function, while the psychosocial function has been termed the intrinsic function. Several studies have demonstrated that the psychosocial function of mentoring may be more important than to younger students or professional novices than the career-related function (Allen, Russell & Maetzke, 1997; Rose, 2005). In a typical mentoring relationship in teacher education, a veteran or experienced teacher is paired with a novice or beginning teacher, and the former acts a role model, coach and adviser.

There are alternatives to this traditional mentoring approach (which is asymmetric) to a peer-based approach in which there partners of equal status (Colvin, 2007). Some forms of peer mentoring are consistent with the traditional mentoring model where an older more experienced person serves a dual function task of career orientation and psychosocial support. Other forms of peer mentoring provide valuable alternative to traditional mentoring, for example where peers are matched equally in terms of age, experience and power to provide task support, counselling and friendships. As such peer mentoring may be defined as “a helping relationship in which two individuals of similar age and /or experience come together, either informally or through formal mentoring schemes, in the pursuit of fulfilling some combination of functions that are career related (e.g. information sharing, career strategising) and psychosocial (e.g. confirmation, emotional support, personal feedback, friendship)” (Terrion & Leonard, 2007, p. 150).

Professional development for teachers is, in reality a lifelong, career wide context-specific enterprise that is guided by mentors at various stages, grounded in practice and focuses of student learning and teacher pedagogy. It is described by Schlager and Fusco (2003, p. 5) as “a process of learning how to put knowledge into practice through engagement in practice within a community of practitioners”. In other words, professional growth requires engagement and dialogue with a community of like-minded peers, and it is a social and reflective experience. Researchers commonly adopt the phrase “participation in a community of practice” as the key factor and defining quality of professional development (Moule, 2006).

### **Creation of the environment for a P2P learning community**

Novice teachers have the onerous and daunting task of enabling students to develop the knowledge and skills needed for further education and employment. During the critical time while on field practicum, student teachers need someone who can provide feedback, emotional support and advice. In the early stages of their professional careers what is needed is a forum for “the voices of teachers themselves, the questions [they] ask, the ways teachers use writing and intentional talk in their work lives” (Cochran-Smith & Lytle, 1996, p. 93). As part of their enculturation into schools, teachers need to communicate and share ideas and to become part of the school learning community.

In the literature, Lave and Wenger (1991) argued that learning is situated in social contexts and is achieved through interaction and practice with others with similar professional interests (communities).

The term “legitimate peripheral participation” refers to the process by which newcomers become part of a CoP through apprenticeship, or learning with other with greater expertise. This socially-based theory of professional learning implies the following:

- Individuals learn by engaging with, and contributing to their communities;
- Community members learn and refine their practice through engaging in apprenticeship and reciprocity with newcomers.

The most fundamental point is however, that a “community of practice” is not a synonym for a group, a team or random collection of individuals: the key ingredient is mutual engagement and reflection. This happens through dialogue, a common focus and sustained interaction, and is achievable through a peer mentoring process in which dyads communicate, share ideas and support each other dialogue, reciprocity and offering feedback. Thus, the framework of a CoP was deemed to be an appropriate theoretical framework for this study of mentoring as it is characterised by a focus on student learning, peer collaboration and reflective dialogue, and enables social support for teacher professional development.

Drawing on the notion of a CoP and on the associated theories of Lave and Wenger (1991), schools are viewed as sites where there are social groups and social capital dedicated to the transfer of skills and practices from one member to another. Another perspective is offered by Mitchell (2002), as follows:

Communities of practice are groups of staff bound together by common interests and a passion for a cause, and who continually interact. Communities [emphasise] the development of members’ capabilities and the building and exchange of ideas (p. 5)

The relevance and appeal of the CoP framework to teacher professional development is that it presents a theory of learning that is based on the idea that learning is a social phenomenon, and that through dialogical and social engagement with a community, we learn not only about others but also about ourselves. Applied to the present project, where novice teachers were exchanging ideas and using conferencing and podcasting to facilitate sharing of ideas, the framework of a CoP serves to define the practicum where teachers engage in practice, reflection and establishment of professional identity.

Wenger (1998) states that a community of practice can be defined by its several core dimensions: *mutual engagement* (through communication and contribution of ideas), *shared repertoire* (developed through sharing of interest), *joint enterprise* (through learning, and use of shared resources) and *maintaining/establishing identity* (through mutual engagement members provide complementary and overlapping competencies to the group). Finally, Wenger argues that successful apprenticeship learning “transforms identity”, it is “fundamentally experiential... a realignment of experience and competence” (p. 227).

This social framework for learning is achieved through dialogue and participation in a community where there is mutual accountability, as members attempt to seek new meanings. Wenger (1998) formalises the dynamics of the community in his *Learning Architecture*

*Framework* (LAF), which has a number of defining properties and characteristics that were used to design the learning environment for students. Table 1 show how each of these defining characteristics were embedded in design of the online learning community for the teachers involved in the study.

**Table 1.** Wenger's Learning Architecture Framework (LAF) applied to the design of the learning community environment

Dimension	Design question	Implementation
Mutuality	Will the system support the required mutuality?	Interaction and mutual exchange are facilitated through the blog
Competence	Will the system support the desired competencies among participants?	Bloggng and podcasting tools enable sharing, communication and reflection
Continuity	Does the system support continuity?	The blog can be sustained beyond the lifetime of the practicum
Reflection	Does the system allow reflection among participants?	The LMS allows participants to reflect and review their own and others' ideas
Exploration	Does the system allow the exploration of ideas?	The blog and podcasts ensure that students explore convergent and divergent ideas
Coordination	Does the system support the desired coordination to enable the community to function?	The LMS enables feedback, communications, storage and retrieval of ideas and messages
Jurisdiction	Does the environment allow for control, moderation and evaluation?	The online environment allows for mediation, joint control and monitoring by tutors

## Methodology

The research project involved pre-service teachers using asynchronous telecommunications (the Wimba Voice Board) for purposeful dialogue during their student teaching experience (the practicum). Following the design of the environment using the LAF, the study sought to evaluate the impact of the sharing of audio-recorded stories of critical incidents on the development of a learning community among the pre-service teachers who formed mentoring dyads. The study employed a qualitative research methodology by applying Wenger's (1998) conceptual framework and using content analysis of blog postings and podcast recordings. The main objective was to identify the discourse elements of *mutual engagement*, *joint enterprise*, *identity* and *shared repertoire*, which are deemed to be the essential characteristics of a learning community.

## Participants

The study was conducted within the context of a restricted network of pre-service teachers enrolled in the GradDipEd (Secondary) program

at ACU National's Canberra campus. The cohort size was 19 students. The ages of the students ranged from 22 to 43 years, and some had already had teaching experience. The students' expertise and comfort level ranged from those with adequate experience and comfort using the Web for communication to those who felt very comfortable and used telecommunications on a daily basis.

### **Data collection procedures**

During the course of their four-week practicum, each participant was required to reflect and report on a total of three critical incidents that occurred in his/her classroom, in both text and voice formats. Each week, the participants were asked to write a 200 to 300-word report, as well as to produce a 90-second voice recording (containing different content to the written report) about a significant critical incident, issue or problem that occurred during that week. The report was to include a description of the context of the incident, as well as an account of both the actions of the students in the class and the student teacher. In addition, the participants had to identify questions or areas in which he/she required advice or assistance, inviting his/her peers to respond.

On a weekly basis, each participant was also asked to respond to at least one other student teacher in writing as well as orally, commenting constructively on his/her postings and providing helpful comments and support. The author of the original posting in each case was also expected to respond to the feedback received. Two lecturer mentors, including the coordinator of the practicum unit, also provided a limited amount of input into the discussion, particularly during the early stages of the exercise.

At the conclusion of the practicum, the participants completed a capstone task in which they each created a two-minute podcast recording reflecting on the highlights and challenges of the practicum experience. Each recording was shared with the entire student teacher cohort at a face-to-face debriefing session.

### **Technology framework used**

For the text-based components of the learning experience, the participants used a blogging facility within the Blackboard online learning environment. Although blogs were originally designed to allow individuals to maintain their own personal journals or diaries and make them available for public viewing, shared or multi-author group blogs have found numerous uses as computer-mediated communication (CMC) tools to support learning. Such blogs can serve as powerful collaborative and shared publishing applications for generating dialogue and promoting the sharing of ideas (Lee, 2005).

To facilitate voice-based peer-to-peer interaction, the students used the Wimba Voice Board (Wimba Inc., 2007) tool. This tool allows the creation of threaded, asynchronous audio discussions that are also integrated into the Blackboard environment. A major advantage of the Wimba Voice Board is that in addition to standard voice recording and playback equipment, it requires no specialised software other than a Java-enabled web browser. It also simplifies the process for users, by providing an easy-to-use, browser-based recording and playback interface that eliminates the technical overhead of having to use

separate applications to record, edit and upload/download the audio content.

A face-to-face training session was held immediately prior to the start of the practicum, to assist participants in becoming familiar with how to use the Web-based tools to participate in the activity, as well as to provide advice on how to plan and structure their written reports and recordings. At this time, they were also issued with headsets with built-in microphones, for use with the Wimba Voice Board in their respective schools or at home.

### **Data analysis procedures**

Using content analysis, the scripts and discourse produced by students were used to explore issues and patterns that were indicators of a learning community. Content analysis, defined as “a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding” (Berelson, 1952, p. 27) was used to code and analyse the data. Content analysis enabled the researchers to sift through large volumes of data with in a systematic fashion using categories or discourse markers to assign features to data segments. It can be a useful technique for allowing researchers discover and describe the focus of individual, group, institutional, or social attention (Weber, 1990). Today, content analysis techniques are widely used in the analysis of computer conferencing transcripts, and now combine qualitative and quantitative approaches, which involve not merely counting the occurrences of variables, but also interpreting them through a particular theoretical lens. Hara, Bonk and Angeli (2000) endorse this dual approach, noting its capacity to “capture the richness of student interaction” (p. 119).

In content analysis, a fundamental issue for the researcher is the choice of unit of analysis, with a choice of, for example, sentences, messages, propositions or thematic elements. In the case of the present study, the unit of analysis chosen was the message unit, i.e. meaningful phrases or instances in which the participants expressed a view that contained explicit statements of their experience, which were categorised according to the *dimensions* of *mutual engagement*, *joint enterprise*, *identity* and *shared repertoire*, which were taken to be the defining characteristics of a learning community.

### **Results**

The focus of the analysis was on the nature of interaction and forms of participation in supportive and reciprocal dialogue, with opportunities to engage in reflection. By using the key properties of the LAF the methodology attempted to assesses the value of the learning environment and technology-supported activities in supporting community building.

The results of the analysis are depicted in Table 2, which shows the CoP elements that were evident and in the peer-to peer mentoring relationships that were planned, and how they were manifested in the student discourse. A total of 106 messages units were found in all.

**Table 2.** Results showing categories of socio-professional learning

Component	Explanation	Examples from student discourse	Number (and %) of message units
Mutual engagement	Sense of belonging Forming relationships Sharing expertise and mentoring others	<i>"On the first posting I feel that if I did have someone who was doing the same thing as me, they would understand more in depth"</i> <i>"It just sort of helped me when I got home to know that I was not alone"</i>	36 (33.96%)
Shared repertoire	Common understandings established Use of shared objects Negotiated experience	<i>"Just knowing who is teaching what subjects and what levels so you can share things"</i> <i>"It was nice to have that community support while we were going through that experience"</i> <i>"I also see the benefit of having somebody to share ideas"</i>	29 (27.36%)
Joint enterprise	Negotiation of ideas Mutual accountability	<i>"I agree with Tara in relation to advance planning of units of work, but there is more than one way to plan ahead"</i> <i>"I found an example of what Joe referred to in his earlier blog entry..."</i>	17 (16.04%)
Identity	Awareness of professional skills Learning as doing Building and maintaining identity	<i>"The other thing I realised was how many new skills I had to learn"</i> <i>"Teaching is now something I know about in a real sense. I can finally make the links to theory"</i> <i>"Knowing that everybody went through the same thing, more than once on some occasions, helps me and I hope it helps them"</i>	24 (22.64%)
TOTAL:			106 (100%)

**Mutual engagement**

This describes interactions in which participants engage in a common, negotiated activity, where they share common ground and exchange understandings. Without this form of engagement, participants would tend to act as individuals rather than as a community. With 34% of dialogue in this category, there was clearly a strong sense of reciprocity.

**Shared repertoire**

This dimension refers to areas that participants recognise as common ground, that is, the work, planning and processes that are involved in

the activity of teaching. The repertoire refers to the pool of resources that the group shares and can draw upon, thereby supplying points of reference within the dialogue. This category appeared to be quite strong, accounting for 27% of all message units.

### **Joint enterprise**

This dimension allows members of the community to extend their own limits, negotiate understanding and add to the pool of shared knowledge and expertise. With only 16% of dialogue in this category, it appears that participants did not fully engage with or build on others' contributions.

### **Identity**

As participants engage in reflective processes with others through dialogue, they maintain and build their own professional identities as teachers, and provide complementary reflections and commentaries to the discussion. The results showed that 23% of the discourse fell into this category, indicating that students formed and consolidated professional identities while on practicum.

Overall, student comments focussed on the benefits of sharing experiences on their school practicum through the Wimba Voice Board and blog. The majority of comments were related to aspects of established common ground, engagement with others and establishment of rapport. The results showed that students developed some elements of *mutual engagement*, *identity formation*, *joint enterprise* and *shared repertoire*. The categories showing the highest numbers of comments were related to "mutual engagement" and "shared repertoire", indicating that participants shared a common discourse about teaching issues and concerns. Because of this they engaged in dialogues that engendered a sense of connectedness, where mutual support and engagement was significant.

## **Discussion of research findings**

The extracts presented in Table 2 provide a snapshot of the interactions that occurred between participants. Throughout the practicum, lecturers monitored the blog and voice board, but did not intervene directly unless explicitly asked for input. During the project, online resources and communication tools were seen a way to meet the variety of beginning teachers' needs, and proved to be both a catalyst and a support for the development of an online community.

Many students were already familiar with how to transfer podcasts and other files to and from an MP3 player, and were therefore quite comfortable with the process of creating voice recordings of critical episodes during the practicum. The technology framework enabled students to communicate while on practicum, to exchange ideas, reflect on experience and to develop a sense of professional identity. The evidence gathered from the study demonstrates that they understood this transformation of identity, and became more aware of their professional roles as teachers. The voice board in combination with the blog enabled reflection on professional growth experiences, as well as providing a solution to the problem of isolation.

Results show that the highest number of comments and narratives recorded were related to expressions of mutual engagement and

solidarity with others, sharing experiences, establishing common ground and sharing experiences. In addition, participants engaged in roles where they mentored and supported each other and took responsibility for furthering the expertise of the group. However, the category of “joint enterprise”, which allows members of the community to extend beyond the boundaries of the discussion in progress, was the weakest feature of the exchanges. This limitation was evident insofar as most participants sought common ground and shared points of reference, rather than exploring differences in opinion that could have ultimately to new understandings. Perhaps this may be at least partially attributed to the novelty of the task and the initial desire of participants to establish common ground and a support system rather than investigating differences.

## Conclusion

At the outset of this paper, we defined a community of practice (CoP) as a social construct that situates learning in the context of lived experience of participation in the world. The relevance and appeal of the CoP model to teacher professional development is that it provides frameworks within which to view learning as a social phenomenon. The contributions of students (Table 2) show that through dialogue and social engagement with others, they learn not only about the teaching profession, but also about themselves as practitioners. Applied to the present project, where novice teachers exchanged ideas and used ICT to facilitate the sharing of ideas, the framework served to unify the main foci of the practicum where teachers engage in practice, meaning making and identity formation.

This small-scale project provides a sense of the types of supportive relationships that are valued by novice teachers while on practicum, and the extent to which the CoP framework was borne out in the interactions between participants. Wenger (1998) argued that the Learning Architecture Framework (LAF) concepts are essential to the development of a CoP, and this study tends to support this view. However, as novice participants using unfamiliar technology, the students also needed an orientation to the task and assistance in understanding how the activity was worthwhile, particularly during the early stages of the exercise. Participants not only found the collaborative interactions to be supportive, but also acknowledged that the informal learning that occurred consolidated many aspects of theory that they had learnt during their course of study.

Adoption of the LAF in combination with Wenger’s (1998) attributes of *mutual engagement, identity, and joint enterprise* and *shared repertoire* proved to be a productive approach to understanding how novice teachers develop professionally. By engaging with one another, tuning in to one another’s experience and sharing expertise, they become active members of a community and at the same time critically reflect on and refine their own skills. These relationships are likely to endure well beyond the duration of the practicum and provide the foundation of lifelong professional networks. Future research will continue to explore how social networking and other collaborative ICT tools can create informal learning spaces for pre-service teachers to reflect on practice.

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