

Online Mentoring Of Pre-Service Teachers: Exploring Cognitive Presence

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Abstract: Faculties of education have been criticised as being “ineffective in preparing teachers for their work, unresponsive to new demands, and being remote from practice” (Darling-Hammond, 2000, p. 166). This paper will examine an innovative online mentoring project that extends beyond the traditional educational boundaries to enhance support for pre-service educators while developing partnerships with teachers in the field. An online mentoring environment was established for pre-service teachers to deeply probe in the relationships between experiences they have observed or participated in while on field experience with the theoretical components of pedagogical and curriculum courses. Teachers, final year pre-service teachers and where possible academics joined with beginning pre-service teachers to discuss, debate, give examples and theorize about issues confronting teachers. The asynchronous discussions were analysed to explore the cognitive presence of both the mentors’ and the mentees’ contributions.

Introduction

Many faculties of education have yet to explore the power of asynchronous conferencing tools to facilitate pre-service teacher reflection, sharing of teaching experiences and to communicate with a range of educational professionals.

A secondary-school pedagogic and field course integrated the use of an online discussion area with off campus curriculum experts together with its traditional face-to-face course. This blending of the 2 modes bought about a rich learning environment where professional interaction was not limited by location, time or space online; yet also provided the opportunities for dynamic and quick face to face exchanges.

This blended course used the traditional face to face elements of content distribution, face to face discussion and student presentations, where the online environment was used to disseminate course information and provide online discussion with curriculum mentors. The online mentoring was an attempt to further “foster collaboration amongst pre-service and in-service teachers” (Pawan, Paulus, Yalcin, Chang, 2003, p. 119).

The key roles of the online mentors were to assist pre-service teachers in developing pedagogical content knowledge, expose them to different approaches and definitions of teaching and learning and to welcome them into the profession. The online environment also provided opportunity for interaction between students, student to content, student to academic and student to practising teacher. The asynchronous discussions enabled pre-service teachers to engage in discourse to develop a critical understanding about ways of representing, thinking, writing about and investigating issues of learning and teaching which effect teachers everyday.

The use of online mentoring was an ideal space to emphasise to the pre-service teachers that “good learning is collaborative and that understanding comes through modeling, participation in, and reaction to the behaviors and thoughts of others” (Pawan et al., 2003, p. 119). The online environment provided pre-service teachers the opportunity to collaboratively explore issues; share opinions and feelings; to comment on their field experience, the thoughts of their peers and mentors; and view models of professional online interaction from experienced teachers and academics at a time and space convenient to them.

Garrison, Anderson and Archer (1999, p. 89) explain that learners are able to “construct meaning through sustained communication”. The online mentoring provided the opportunity for ongoing dialogue with educators with a variety

of experiences. Garrison (2003, p. 1) reflects that “dimensions of high-order learning emerge from the concepts of reflective inquiry, self-direction and meta cognition” and these are made explicit in the asynchronous online mentoring.

Twenty-first century technology brings with it the benefit of effective and efficient access to information and experts. Bonk, Angeli, Malikowsk & Supplee (2001, p22) reveal that “(t)echnology tools can now bind students, peers, mentors, instructors, practicing teachers, and experts in an array of resources, discussions and curriculum recommendations.” This technology permitted students to interact with multiple others beyond the teacher-student interaction in the regular classroom context.

The online mentoring provides a forum for collaboration which is not bound by time, place or space. Participants can interact at a time of their choosing, it provides access to supportive, theoretical and practical information along with access to curriculum experts. The various parties involved mediate questions, answers and discussion. The asynchronous online environment enables participants’ time to make considered responses, reading, reacting, responding and reflecting at their own convenience. The impact of context as it affects teachers’ practice can be described and explained for deeper understanding.

Fowler & Mayes (1999, p. 209) advocate that education is “moving the emphasis of learning away from what we learn to who we learn from”. McGee (2001, p. 201) comments that “mentoring education students is not reserved for master mentor teachers but can also be done by more advanced students”. The use of the triad (+1) mentorship embodies these statements, where the expertise and information are gained from mentors who come from the final year pre-service teacher, teachers and academics.

Quality mentoring is generally accepted as a valid means of developing novice educators and is traditionally viewed as transferring experiences and information from expert to novice. However the expert knowledge might come from all parties in the mentoring triad at any one time. The pre-service teachers both mentors and mentees bring with them the current reality of practice teaching within field experience and working with partner teachers in schools. The teacher mentors bring with them knowledge of school contexts, current curriculum, methodologies and contemporary complexities of work in the classroom. Knowledge of education reform through research and theoretical perspectives of education come from the academics.

One of the key aims of the online mentoring is for pre-service teachers to develop a professional identity. McCormick and Titus (1990) suggest "a mentor helps to create within the newcomer a sense of identity as a member of the profession". The mentoring provided them with an opportunity to interact with teachers and for them to begin a think of themselves as teachers and enable them to link theory and practice early in their teacher education program.

“When students engage in social interaction and discourse about real world teaching and learning settings..... they are exposed to the strategies and skills of peers and mentors which should help them internalize new competencies” (Brown, Collins, & Duguid, 1989 cited in Bonk et al., p. 23). Interacting with the mentors enables pre-service teachers to begin their development of reflective practice, increased pedagogical content knowledge, and fosters critical and reflective thinking. It provides them a way to move beyond observing practicing teachers. (Bonk, et al., 2001).

The role of the mentee was to share and critically reflect on experiences which are memorable, inspirational or bothersome. Students might use the conversations to confirm some of their preliminary ideas about teaching or they may re-examine their prior understandings of learning and teaching. The online mentoring is a forum to explore the complexity of learning and teaching, to debate concerns, comment on revelations, viewpoints and paradoxes that can or have occurred during field experiences. It provides a space where knowledge can be shared and interpreted.

The mentors’ role was to assist with provision of information and examples, offer encouragement, negotiate meanings, give feedback, question, share experiences, provide emotional support and to take on the task of professional role model for the early pre-service teachers.

The triad mentorship provided students support to critically analyse their experiences and knowledge development through the use of asynchronous dialogue with other experienced educators. The use of asynchronous dialogue

required students to write considered responses. These written responses should increase the depth of understanding that it is “the reflective and explicit nature of the written word that encourages discipline and rigor in our thinking and communicating” (Garrison, Anderson, & Archer, 1999, p. 90). Hudson (2002) quoted in Kanuka and Garrison (2004, p. 53) explains “that the very basis of thinking is rooted in dialogue, drawing on a socially constructed context to endow ideas with meaning”. The mentees’ active participation within the community of inquiry through written dialogue required them to speak, listen, observe, challenge, support, persuade and be persuaded.

The Community of Inquiry framework developed by Garrison, Anderson and Archer (1999) occurs where interaction and the educational experience reflect social, cognitive and teaching presence. Cognitive presence in online discussions is a key component of high level thinking and interactions. Kanuka and Garrison (2004, p. 33) define cognitive presence as “the extent to which learners are able to construct meaning through sustained communication.” Furthermore Garrison (2003, p. 4) reveals that cognitive presence “concerns the process of both reflection and discourse in the initiation, construction and confirmation of meaningful learning outcomes.”

Cognitive presence within this study is the link between content selection made by pre-service teachers and the supporting discourse between participants. The pre-service teachers’ active and intellectual engagement with other mentees and mentors promotes critical reflection and gives rise to positive educational experiences (Garrison, 2003). The online discourse requires the participants to make public their private thoughts and concerns. It provides pre-service teachers with time to reflect, gives a permanent or semi-permanent record of the discussion and it requires participants to move beyond vague understandings and to make their thinking clear with the use of written language.

The cognitive presence element of Garrison, Anderson and Archer’s (1999) Community of Inquiry framework is indicated by 4 phases of critical thinking. These phases are:

- Triggering: where participants recognize a problem or have a sense of puzzlement;
- Exploration: where information is exchanged and ambiguities are discussed;
- Integration: where participants connect ideas and create solutions; and
- Resolution: where new ideas are applied or solutions are critically assessed.

Category	Indicators	Sociocognitive Processes
1. Triggering	Recognizing the problem Sense of puzzlement	Presenting background information that culminates in a question Asking questions Messages that take discussion in new direction
2. Exploration	Divergence within online community Divergence within single message Information exchange Suggestions for consideration Brainstorming Leaps to conclusions	Unsubstantiated contradiction of previous ideas Many different ideas/themes presenting in one message Offers unsupported opinions Personal narratives/descriptions/facts (not used as evidence) Author explicitly characterizes message as exploration—e.g., “Does that seem right?” Adds to established points but does not systematically defend/justify/develop
3. Integration	Convergence among group members Convergence within a single message Connecting ideas, synthesis Creating solutions	Reference to previous message followed by substantiated agreement, e.g., “I agree because...” Building on, adding to others’ ideas Justified, developed, defensible, yet tentative hypotheses Integrating information from various sources—textbook, articles, personal experience Explicit characterization of message as a

		solution by participant e.g: We also had trouble getting cooperation. Often the use of new tools requires new organizational structures. We addressed these issues when we implemented a systems approach, and I think that's why we were successful.
4. Resolution	Vicarious application to real world Testing solutions Defending solutions	Example: A good test of this solution would be to ... and then assess how ...
5. Other	Posting which do not indicate cognitive presence.	Social or irrelevant postings.

Table 1: Critical Thinking Categories: Garrison et al. (2001, p. 15–16)

Table 1 shows the cognitive presence framework with 5 categories, the 4 phases of critical thinking and a further category is added where postings of a social or non-related context are located. For each category Garrison et al. (2000) has provided indicators of cognitive presence and examples of the content that postings might have in this category.

Context

This study was interested in how online mentoring could provide students the opportunity to develop cognitive presence. The mentees were beginning pre-service teachers and the online mentoring used a triad mentorship of final year pre-service teachers, teachers and where possible academics to improve the connection between theory and practice in specialised curriculum areas; develop higher order thinking; further develop links between the faculty and the field; to provide curriculum specialist information and examples at the classroom level; establish professional identity and authentic professional conversations.

The mentee students were required to contribute to 2 discipline discussion areas as part of their assessment in a pedagogy and field course. It was hoped that this response obligation would move the mentees' thinking beyond initial reaction and responses, engaging them in critical dialogue with others, sharing insights, carrying out research, and reflecting back. Within their course work the assessment of mentees' participation was based around their use of online protocol, grammatical correctness, relevance of post, expression of post, and contributions to the learning community.

All participants initially sent messages to introduce themselves to other group members. The mentees then made follow up posts which described, elaborated, reflected and analyzed experiences or concerns regarding curriculum, pedagogy, learning and teaching. While a description of the context, events, people, places, artefacts was often required it was hoped that the posts would be rich with questions, possibilities and reflections. The mentees were encouraged to take advantage of the mentors to assist them to develop a critical understanding of the complex profession they are entering. As such the content of the discussion was driven by the mentees.

While participating in the online mentoring the mentees were also participating in field experience, pedagogy and curriculum courses.

The key research questions for this study were:

- Can mentoring in an online environment be successful?
- How do pre-service teachers and teachers respond to online mentoring?
- How effective is online mentoring in facilitating intellectual engagement of the mentees?
- Does online mentoring promote cognitive presence?

Methodology

The research within this paper is drawn from a larger study. It represents a case study with a small sample size and a lack of statistical testing. The paper aims to report on the effectiveness of online curriculum mentoring in a secondary teacher education program and to analyse the type of postings made by mentees and mentors to improve future use of online mentoring within the teacher education program.

The beginning secondary pre-service teachers were the primary mentee group. These pre-service teachers were required to participate in online forums as part of their assessment within their field course: TEA2204. This response obligation ensured participation from all members within the mentee group.

Recruitment of teacher mentors was primarily through identifying possible participants who had experience in the field and asking for volunteers. The teachers who volunteered to take on the role of mentor were identified as effective practitioners and curriculum experts by their peers or academics across a range of curriculum areas. The teacher mentors received a small payment for their time from funding gained through an Internal Research Grant.

The final year secondary pre-service teachers also volunteered to take on the role of mentor. These pre-service teachers were initially identified through their academic success within previous courses and their ability to communicate effectively. They received a small credit of time to replace another professional commitment within the program.

The academics who took on the role of mentor and moderator were identified as having curriculum expert knowledge in the secondary education environment and volunteered to be involved in the online mentoring.

The primary data source for this paper was gained from the threaded asynchronous discussion tool as part of a learning management tool i.e. WebCT. The archived postings in the class online discussion area were coded to identify critical thinking indicators from the Garrison et al (2001) framework. The Garrison et al model was selected as a theoretical framework to investigate cognitive presence because it was developed for a similar context: being a higher education context to investigate online discussion, within a semester course which was facilitated by students and instructors. It must be noted that the initial use of the framework was for dialogue within an online course and this paper used it in a blended course for online mentoring.

The students interacted in the online area of 2 different discipline areas. However only the posts in the English curriculum discussion area are analysed and reported for this paper. Within this discussion area there were 3 mentors, (1 final year student, 1 teacher and 1 academic) and 33 mentees.

It was decided to use each message or post as a unit to code. If a message contained evidence of more than 1 category the authors used Garrison et al's (2001) model of *coding down* where it was not clear and *coding up* where there was clear evidence of the higher phase because "higher levels of critical thinking borrow characteristics and processes from previous phases" (Garrison et al., 2001, p. 11).

Findings and Discussion

As stated previously only the posts from the English discipline have been analysed and presented in this paper. The English online mentoring area comprised 249 postings over 12 weeks. These postings were of variable length. Of the 249 total postings, 72 were social or introductions and responses posted within the first week of the mentoring period. These postings were not analysed as the students had been asked to send a message to introduce themselves to the group. The remaining 177 postings were analysed using Garrison et al's categories mentioned above.

Initially the dialogue was dominated by a small number of (6) mentees, however compulsory participation meant that towards the end of the semester, and closer to assessment due dates, all of the beginning pre-service teachers participated.

The topics discussed were both English specific (e.g. literacy skills of school students and pre-service teachers, should Shakespeare be part of the English curriculum?) and about general aspects of teaching. It was noted that a popular general topic was the impact of ICTs within classrooms.

Table 2 below gives a breakdown of the mentees' and mentors' postings within each category. Once coded it was revealed that the mentees' postings were made up of: 19% triggering, 62% exploration, 10% integration and less than 1% resolution. The other 8% of the messages were coded as social, not showing cognitive presence or not relevant to discussion.

	Mentees		Mentors	
	N =	%	N =	%
Trigger	30	19%	4	19%
Explore	97	62%	8	38%
Integration	15	10%	7	33%
Resolution	1	<1%	2	10%
Other	13	8%		
Total	156		21	

Table 2: Mentee and mentor responses within each category

Under the triggering category typical postings concluded with: “Do you think university can challenge us in this way?” “Could there be a connection?” “I feel that, as a teacher.....” “What do you think of these ideas?” “Do you have any feedback or even suggestions of what you would do?”

A significant number of the total posts were the mentees’ seeking input at both the triggering and exploration phases and contributing to the exploration phases. This result was neither unexpected nor uncommon when compared to other studies.

Meyer’s findings (2003) in a similar study indicated 18% triggers, 50% exploration, 22% integration, 6% resolution where Pawan et al. (2003) indicated 66% exploration, 11% integration and no resolution postings. The high levels of exploration postings in all 3 studies reveal that students like to share experiences and question their own thinking.

Unlike Pawan, et al. (2003) who commented that students “interactions were often one-way serial monologues” participants within this study did build on ideas or suggestions made by others. Some pre-service teachers were able to pull together information shared by peers. However there were many interactions where they engaged in sharing their own teaching experiences in relation to trigger question or comments.

A study by Bonk, Angeli, Malikowsk & Supplee (2001) revealed minimal postings that justified comments. Within this study the pre-service teachers regularly acknowledged previous postings, made connections to previous posts and their own experience but very few draw conclusions from this or provided other sources of information to justify comments. This is indicated by the low percentage in both the integration and solution phases. Mayer (2003) suggests that the limited resolution postings may be due to the complex issues under discussion, pre-service teachers inability to test a resolution or that mentors missed opportunities to demand a resolution or an attempt at resolution within the group.

The mentors’ postings appeared to be random and often there was little difference between feedback from the pre-service teacher, teacher and academic mentors. This was surprising for the researchers, who thought that the varied backgrounds and interests would bring a diverse range of responses from the mentors. An analysis of the mentors’ postings indicated: 19% triggering, 38% exploration, 33% integration and 10% resolution postings. The higher level of integration and resolution postings is not surprising when this group of people were required to model appropriate behaviour and responses within an online community and to moderate the discussion. Bonk, Angeli, Malikowsk, & Supplee (2001, p. 33) also found that instructors or mentors’ comments were “more pedagogically focused and diverse than peer comments”. The types of mentor responses within this study align with Bonk et al. (2001) where they included indirect questions and scaffolding, feedback, praise and social acknowledgement, general suggestions, modelling and providing examples.

Garrison (2003, p. 10) reveals that “the teacher must participate in, but not dominate, discussions”. Pawan et al. (2003, p134) comment that “the instructor plays the role of clarifier, challenger and elaborate, perhaps modelling for students the use of outside reference to support her claims and by guiding the discussion”. This study as most online instruction, relies on the mentors to “guide the discussion, diagnose misunderstanding and negotiate meaning” (Garrison, et al., 1999, p. 93). This role of the teacher or teaching presence is one of the pivotal elements with Garrison et al’s community of inquiry.

When the pre-service teachers were asked how they responded to online mentoring the following are indicative of the types of comments received: “I’d have to agree it is a very convenient form of communicating and it does make

me feel more connected to the world.” “..... it doesn't beat the real thing. I guess for me I've usually always known the people I'm communicating with at the other end.” “Participating in this discussion group has been an interesting experience and I have quite enjoyed reading and contributing.”

Conclusion

Using the online environment meant that mentors were not limited to those within the local area. There was flexibility of access in terms of time and place enabled collaboration with experts and greater access to resources and support while creating a community of sharing and problem solving. It also provided collaborative opportunities for pre-service, in-service and academics to exchange ideas, ask questions, and engage in dialogue within a community of learners. As with Bonk et al. (2001, p.37) we found that “students not only were exposed to new ideas and viewpoints, but also were simultaneously getting confirmation of their views and a notice that they were not alone in the various problems they witnessed in schools”. It also enables practicing teachers and academics to model appropriate behaviour and responses within an online community.

The mentees' response obligation gave rise to the sharing of “air time”; unlike both a face to face and online discussion where students may take on the role of lurker rather than contributors. Students were seen as knowledge builders rather than knowledge consumers.

In response to the opening questions we have found that online mentoring can be successful in achieving a number of goals. Positive outcomes for the pre-service teachers which are apparent from this project are:

- an emerging understanding of the culture of schools and classrooms;
- a growing ability to observe, describe and document issues related to learning and teaching;
- a deepening ability to generate questions, insights and conclusion from participant observations in the field experience;
- beginning an understanding of the value of community in learning and
- a growth in the professionalism and quality of writing and thinking.

All participants within the online mentoring enjoyed the experience. The mentors in particular enjoyed the opportunity to interact with a range of educational professionals without having to meet. They also found it interesting to view the hopes and fears of the beginning pre-service teachers. Student comments indicate that they found it a positive learning experience.

It was clear that the mentees were intellectually engaged with the classroom issues, course content, their peers and the mentors. The asynchronous dialogue provided examples where issues were analysed, debated and sometimes resolved, the challenging of assumptions and perspectives, seeing connections, consequences, tensions and related possibilities for practice.

In answer to our last question the online mentoring didn't promote the level of cognitive presence we had hoped with most of the postings exploration in nature. However we believe that the postings showed an increasing depth of pre-service teachers' understandings about the series of complex tasks and issues that will require attention throughout their teaching careers. They also saw that experienced teachers are still facing dilemmas and that there are often contradictory realities at play in classrooms.

We hope to improve the cognitive presence of students next semester by working with mentors to explore their roles prior to beginning the semester. The mentors are pivotal in moving the online group discussion from trivialized comments or a series of monologues where they share experiences and express opinions with limited connection to other comments or research (Klemm & Snel, 1996; Henri, 1991 quoted in Garrison, Anderson and Archer, 2001).

Teacher presence requires an overt and visible role of mentors to assist pre-service teachers to move from declarations to integration and synthesis of the information presented. Garrison et al. (2001, p. 11) suggest that “students will be more comfortable remaining in a continuous exploration mode; therefore teaching presence is essential in moving the process to more advanced stages of critical thinking and cognitive development”, where students are comparing, agreeing to, deconstructing and reconstructing knowledge to come to a resolution.

In future we will consider having pre-service teachers take on roles, as you might in a classroom discussion or activity. For example, in rotation over a semester, different students could take on the role of explorer, integrator, trigger or applicator; linking to the stages within the community of inquiry framework.

Key reasons for wanting students to move to the Integration and Resolution phases within the framework are to assist students in gaining a deep understanding of the complex and often irresolvable nature of learning and teaching and a realisation that theory and practice are not separate but inform each other.

Online professional dialogue is part of the life long learning of the teacher professional. The triad online mentorship has enabled our faculty to provide its pre-service educators with an opportunity to clarify their learning and to forge quality professional relationships while developing their theories of what constitutes effective teaching and learning, asking for advice, voicing concerns, debating, giving and getting examples and gaining feedback.

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