

Building a teacher education community: Recognizing the ecological reality of sustainable collaboration

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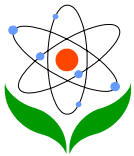
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Received 5 October, 2005

Revised 19 May, 2006

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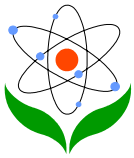


Abstract

This paper reports the implementation of a collaborative pre-service science teacher education program between an Australian university and a collegiate of eight schools. The program was designed to facilitate the transition to teaching of pre-service teachers by reducing the gap between theory and practice while promoting the professional learning of the teachers involved. The community building literature, combined with an ecological perspective, is used to evaluate the strategies adopted to build a learning community across pre-service teacher, in-service teacher and system level interactions. Both pre-service and in-service teachers were interviewed at the beginning and end of the project and field notes made about the community building strategies employed. The learning community was found to operate like any ecosystem, change was slow and the effects were felt in ways remote from the original intention, however, there is evidence that building a teacher education community resulted in gains in professional learning at all levels with some strategies being more effective than others.

Introduction

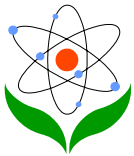
In recent years there have been repeated calls to reform both pre-service and in-service teacher education (Darling Hammond, 1999; Feiman-Nemser, 2001; Korthagen, Kessels, Koster, Lagerwerf & Wubbels, 2001; Russel & McPherson, 2001). Many of the suggested programs have advocated increased collaborations between university, teachers and pre-service teachers, for example in the form of Professional Development Schools (Darling-Hammond, 1994), Internship schemes (Benton, 1990; McIntyre & Hagger, 1992; Furlong, 2000), and Professional Learning Communities (Grossman, 2001). Studies have shown that those reforms that promote a greater degree of collaboration between universities and schools in pre-service teacher education can enhance educational outcomes for pre-service teachers (Wang & Walberg, 2000; Martinez & Coombes, 2001; Ginsberg & Rhodes, 2003; Sherman, 2004). It has also been found that learning communities of teachers are effective in promoting teacher professional development (Newmann & Wehlage, 1995; Bruce & Calhoun, 1996; McLaughlin & Talbert, 2001; Bryk & Schneider, 2002). Overall,



research findings imply that building community is an effective strategy for enhancing educational outcomes for those involved.

Often the effort toward reform has dealt separately with pre-service, beginning teacher and in-service teacher education. Bulajeva (2003), Poom-Valickis, Saarits, Sikka, Talts and Veisson (2003) and Buchberger (2000) have advocated that pre-service teacher education should be repositioned as part of an overall system of teacher education with less identifiable borders and greater interaction at the edges. It was not suggested that teacher education should lose its identity and become part of a blurred picture, but that it should be nested in a larger, more cohesive view of teacher education. Bulajeva (2003) conceptualised teacher education as an open and dynamic system of closely interrelated components such as: pre-service teacher education; induction into the profession; in-service teacher education and professional learning; self-education; school development and improvement and research. This is an ecological view of teacher education, which recognises the interconnectedness of the parts to make the whole. It regards teacher education as multiple, over-layered learning communities, each identifiable yet connected to each other, impacting on each other with each informing the identity of the others.

This recognition of the need for community building within a teacher education continuum is consistent with the argument developed by Renshaw (2002) who saw community building as an ongoing, evolving process that occurred over a long period of time and as having a profound impact on not just learning but on the quality of learning that could take place. Renshaw (2002) saw building a learning community as a way of networking social capital. The success of one member of the community is dependent on the success of other members. Promoting self learning, and promoting the learning of others, becomes networked throughout the community. The result is that the community, as a whole, benefits and individuals also benefit at an enhanced rate through mutual support. Consequently, membership of a learning community provides access to a variety of social capital (Renshaw, 2002). Such capital includes knowledge, skills and 'know-how'. A purposeful dissemination and sharing of such capital can be a useful community-building tool with individuals recognising their increased capital and actively enhancing the community learning process. This cycle of capital enhancement can be powerful in the social learning process, particularly when such processes are acknowledged as being complex and treated with the respect

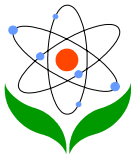


generally accorded such intricate social structures (Renshaw, 2002) and promote enculturated change.

Like Crowther (2001), Renshaw conceptualised the process of learning through building a professional learning community as acting as a change agent, with ecological ripple effects that are difficult to identify, let alone measure. Community building becomes a process that provides a supportive climate that is not only receptive to change and change initiatives, but actively promotes an expectation of change as a consequence of learning. Looking for change and responding to change initiatives becomes enculturated, with the effects of change integrating into many different aspects of the community's world in unidentified, elliptical and convoluted ways. Consequently, a mature learning community is interactive, interdependent, complex and potentially powerful in its capacity to operate at a number of different levels in a number of different ways and actively assimilate change as part of its identity and impart this identity to its members. Thus the underlying principle of the model evaluated by this paper is that the building of a mature teacher education community will stimulate change and result in significant professional learning.

While the formation of learning communities has resulted in demonstrated outcomes, the process is complex and difficult. Grossman, Wineburg and Woolworth (2001) observed the development of a learning community of English and history teachers in a school and university collaboration, and found that many tensions had to be negotiated before a mature learning community was formed. A study of the development of learning communities in 50 NSW schools (Aubusson, Steele, Dinham & Brady, 2006) also highlighted the difficulties, even when funding and a structured model was provided. The nature of school organization and the isolation of teachers inhibited knowledge sharing and the development of the mature community (Hargreaves, 2000; Huberman, 1990; Siskin, 1994). A successful model of teacher learning through community needs to take into account the inhibitory factors inherent in school structure.

At present, reform initiatives incorporating collaboration and community are influencing models of pre-service teacher education, particularly in science. Studies (Stevens, 1996; Wang & Walberg, 2000; Hammrich, 2004; Watson, 2005) highlight the importance of in-school experiences and show that the participation of teacher education faculty staff during in-school experience has a positive influence on the

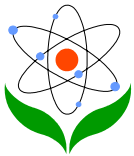


learning outcomes for pre-service teachers (Sherman, 2004). It is also the case that the experience of working with pre-service teachers can generate a sense of community among staff members that have traditionally had few opportunities for collaboration and professional interaction (Hough & Paine, 1997; Hastings & Squires, 2002). Stevens (1996) maintains that as teacher educators strive to reform the pedagogical experiences of science classrooms, they must involve pre-service teachers. In doing so, teacher educators will be promoting an expectation of change and reform as part of the teaching process. In this way pre-service education students can act as agents of change in the reform of science education (Hamrich, 2004). Essentially, the involvement of pre-service teachers is becoming recognized as a pivotal component in the social futures of teacher education (Watson, 2005).

This paper evaluates a model of teacher education that positions pre-service teacher education within a continuum of teacher development. Implicit in the education of the pre-service teachers is the need to encourage these students to see themselves as part of a wider education community, and to act as change agents in that community. Explicit strategies to increase community interactions were incorporated into the teacher education model, with the aim of enhancing professional learning at all levels of the education spectrum (school, university and systems). The operation of the model is elaborated below and the piloted community building strategies are described. The question this paper asks is; how effective is the implementation of this model of pre-service and in-service teacher education in building a sustainable learning community in terms of the strategies employed? The findings are discussed in terms of an ecological approach to teacher education.

The Project Model

The project model has been described in detail elsewhere (Watson, 2005) and will only be summarised briefly here. At the core of the model is a vision that learning communities will be established at a number of different levels (Watson, 2005). At the school department level this will typically involve the school department staff (but perhaps not all), the pre-service teachers and university staff. The next level or layer of community will be across a few schools where there will be interchange of ideas to varying extents. A third tier of community may be all the schools implementing the model within the same district, or within the same educational system. The next level



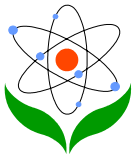
or layer of community may be one which includes professional organisations. As time passes, people will move in and out of communities at different levels as needs determine. Each individual in the system will access and interact with a community or communities as their needs and the needs of communities change. As one aspect of the model is refined, the model as a whole may be changed. This may result in associated changes that may impact on other aspects of the model. In this way the model will continuously evolve - learning will take place constantly and change will follow.

The Teacher education program

The science teacher education program is a pathway through a one year end-on postgraduate Bachelor of Teaching. In addition to two four-week blocks of practicum (professional experience), students spent one day a week in schools, in place of the usual lectures and tutorials for one of their science method subjects. They completed assignments based on their teaching experience with an emphasis on the development of student-centred approaches to teaching and learning.

Pre-service teachers participated in a variety of activities in schools, including: teaching classes or parts of classes; team teaching; helping with administrative tasks; observing lessons; formally seeking advice about teaching and classroom lessons; completing set tasks, for example the preparation and delivery of an 'exemplary' student-centred lesson at least once per semester; and attending formal community activities for example, workshops. These activities were seen as providing pre-service teachers with examples of contemporary 'good practice' in classroom teaching with student learning as a central priority.

Eight pre-service science teachers were involved in the study. They were a cohort of students completing their course exclusively in the science strand rather than those in, for example, science and mathematics or any other combination involving science. Each pre-service teacher spent one semester in a school then transferred to another school for the second half of the year. At all times the pre-service teachers were actively supervised by university staff. The teacher educators moved between schools, coordinating pre-service teacher time and participation, rather than passing this additional responsibility on to head teachers. University staff also organised community building activities and provided support to staff in their role as supervising teachers.

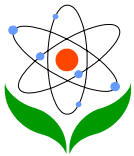


School staff were principal contributors to the overall teaching/learning process. Some of their tasks were to facilitate pre-service teachers in teaching classes or parts of classes; provide opportunities for team teaching; assist pre-service teachers to become familiar with the school environment; provide opportunities for pre-service teachers to observe lessons; provide feedback and advice about teaching and classroom lessons; and participate in community activities. Pre-service teachers were not allocated to one teacher. Rather, they were introduced as a resource for the whole department, to be viewed as a collegial, shared responsibility and so contribute to an environment of building a learning community.

Strategies for building a learning community

As community building was fundamental to the model, the pilot study incorporated a number of strategies intended to foster cooperation and collaboration between members of the partnership. These strategies were focused at both the school level and the collegiate level. Specific activities that were designed to promote community building were:

- weekly visits of university staff to the eight participating schools. This potentially allowed an exchange of views about how the project was progressing and the transmission of ideas between member schools;
- having pre-service teachers work with more than one staff member and be regarded as a responsibility of the entire department. This was intended as a way of building community within the school;
- department wide analysis of pre-service teacher lessons. Within each department the pre-service teacher's exemplary lesson was 'debriefed' by the staff, the pre-service teacher and the university lecturer in a round table discussion. The role of the university staff was to contribute understandings from the education literature and to guide the debriefing process. They actively avoided imposing their own views on the best way to teach the lesson. The science staff members provided feedback for the pre-service teacher based on their experience and re-designed the lesson the way they thought it should be taught. This debriefing process was designed to encourage teaching staff to come together with the express intention of discussing pedagogy. At least one debriefing session was conducted in each school in each semester;



- workshops organised by university staff. Teachers and pre-service teachers were asked to present on various aspects of teaching and learning. These workshops took place out of school hours and included food provided at university expense. Teachers who gave a presentation were remunerated for their time. At least two workshops were held per semester; and
- brown-bag lunchtime discussions. Once each semester university staff organised lunchtime discussions at which pre-service teachers and teachers met to discuss issues of content and pedagogy. These sessions, although organised by university staff were free ranging and directed by the interests of those attending.

Evaluation of the Model - Method

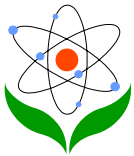
Rationale

The implementation of the model is the subject of ongoing research to evaluate the efficiency and effectiveness of the project in achieving its outcomes and to provide feedback for the ongoing development and refinement of the professional learning process. The main focus of the research presented here is an assessment of the ability of the strategies outlined above to facilitate community building and promote learning.

A qualitative approach to data collection and analysis was used to determine the effectiveness of the community building. As suggested by Denzin and Lincoln (1998) qualitative research involves a variety of data gathering methods so that a tapestry of evidence is pieced together to form a 'bricolage'. The research on the implementation of the model combined data from interviews, observation, collection of documents and questionnaires.

Sample

The project was devised and conducted by two university teacher educators, who were interviewed during the course of the research. Eight schools in a suburban area of an Australian city that were already part of a collegiate agreed to work with the university in implementing the model of teacher education. The schools included four catholic independent secondary schools (two junior and two senior), and four



government secondary schools (three junior and one senior). Eight pre-service science teachers participated in the study. The eight pre-service teachers were the entire cohort of students studying only science as their teaching subject. Each of these pre-service science teachers was supervised by a number of teachers within their allocated schools and all supervising teachers were involved in the research project. A total of 14 teachers were interviewed.

All participants were informed of the nature of the research and gave their written permission for all forms of data collection. At all times it was made clear that participation was voluntary and that participants could withdraw at any time.

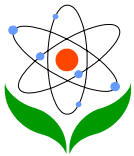
Data collection

By the beginning of the first block teaching practical eight pre-service teachers, six head teachers and five supervising teachers had been interviewed. This sample represented at least one member of staff associated with pre-service teacher supervision in each school except one, where time constraints prevented any staff from participating. The questions asked were:

- tell me about the way you teach;
- how would you describe good teaching and what do you think are the features of good teaching;
- briefly describe the ways you were taught;
- how does student learning influence the way that you teach;
- what do you think is the relationship between teaching and learning; and
- what do you think are the fundamental issues in education?

These interviews were recorded and transcribed.

The eight pre-service teachers, and seven supervising teachers were interviewed a second time by the end of the study. These teachers included one from each of the seven schools still participating in the partnership (one pre-service teacher transferred out of the eighth school because of lack of transport). Four of the teachers had been interviewed in the first round. Initially, it was hoped that the same sample would be interviewed at the beginning and end of the study but due to the flexible nature of the allocation of supervisors within this model, different staff had taken responsibility for



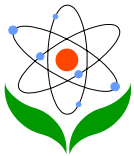
the pre-service teachers at later stages of the project. The questions for the second round of interviews were:

- what do you think the pre-service teacher has learnt about teaching during this project;
- what did the pre-service teacher bring to your school;
- what are your views about teacher training at the end of the project and how have they changed;
- what skills do you think the pre-service teachers have learnt during the project;
- what have been the benefits to your school of being involved in this project;
- have the community workshops contributed to the overall project;
- what are your views of teaching and learning in science; and
- was there a difference in teaching style between your pre-service teacher and you?

Pre-service teachers were asked essentially the same questions as the teachers, with the wording changed as appropriate. All interviews were recorded and transcribed.

At the end of the first semester pre-service teachers were given an open ended questionnaire about what qualities they thought a good teacher needed, how many teachers they had worked with, and how they thought that working with teachers had helped them gain teaching skills.

Formal written feedback was also obtained from debriefing sessions and workshops. In addition, field notes of two debriefing sessions were kept, and all were attended by the researchers. Their recollections from these meetings also inform this study. At the end of each workshop session, participants were asked to record their views of the session in writing. These responses were collected and used as data. Field notes were made at the first workshop. Materials, such as overheads used in presentations, were also collected as data. All data was coded for common themes (Erickson, 1986) and the validity of the assertions derived from these themes was assessed by systematic reference to the original material.



Evaluation of the Model - Findings and Discussion

The question this study posed was how effective is the model of teacher education in building a sustainable learning community? The analysis of the data showed that there were a number of levels on which the strategies incorporated in the model interacted to affect the development of a learning community. These levels were:

- pre-service teacher;
- school department;
- inter school; and
- systems (school, university, departments of education).

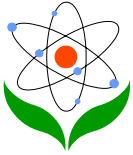
The findings for each level are discussed in relation to the strategies designed to promote the building of community. Interactions between levels are then elaborated upon and a holistic description of the community is offered.

Pre-service teacher level

At the pre-service teacher level two types of community interactions were observed, those between pre-service teachers in the group, and those between pre-service teachers and the teachers in the collegiate.

In the course of the study the researchers observed many instances of pre-service teachers working together to complete assignments, design lessons and develop workshop presentations. This collaboration was facilitated by the proximity of the eight schools, and the closeness generated by working together as part of an experimental cohort. Teachers and pre-service teachers were asked in final interviews about how the workshops had contributed to the project. All believed the workshops were a valuable experience. Three pre-service teachers elaborated on the advantage of being able to get together as a group. One pre-service teacher wrote:

Working in a group was good. It gave the group an opportunity to get together. We could ask how Tuesdays were going ... how the seminar was going? It helped us to get to know each other ... we exchanged numbers and addresses ... we did become close.



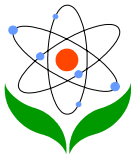
Being part of the group selected for this study, and the associated attendance at and preparation of workshop activities, built a strong sense of community among the eight pre-service teachers. This enabled them to support each other during what was often a stressful time, and potentially provided them with a base of support for entering their first year of teaching.

From the pre-service teachers' perspective, the workshops were less successful at building relationships with other teachers. One pre-service teacher flagged some of the observed problems when she commented:

I didn't put pressure on my teachers (to attend) because you don't want to take up more of their time. Maybe there should have been more group building activities, getting to know each other, so that there was interaction between anyone who came. Schools were separated from each other and from the educators. Even at the last one they still weren't mixing.

At the workshops pre-service teachers sat in friendship groups and their supervising teachers remained in school-based clusters. No formal attempt was made to introduce participants or to exchange names. Very little time was allocated to open discussion, and it is likely that pre-service teachers used whatever time was available to converse with peers rather than introduce themselves to teachers from other schools. Thus, with hindsight, the design of workshops needed to encompass an allocation of time for greater mixing between students and teachers, possibly with the inclusion of 'ice-breaking' strategies. Lack of teacher attendance was a problem. Interviews with teachers indicated that busy lives and the need to find time after school were the main reasons for non-attendance. Given the current constraints on teacher time, it is not easy to identify an 'ideal' time to hold workshops.

Relationships between pre-service teachers and the department could be facilitated in other ways. The model explicitly encouraged pre-service teachers to work with the whole department rather than with one supervising teacher. All pre-service teachers in the study reported that they worked with more than one teacher. Four pre-service teachers worked with three or more. Every pre-service teacher believed that working with more than one teacher was beneficial, and that they learnt more by observing a range of teaching styles. All made comments typified by one pre-service teacher who said "working with the whole department helped me gain many teaching skills." The evidence from the study is that the pre-service teacher sharing component of the



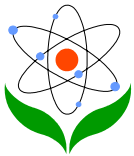
model was adopted by the faculties in the partnership, and enhanced the learning experience for pre-service teachers.

Overall, participating in the pilot study resulted in enhanced outcomes for the pre-service teachers. These students performed well in all assessment tasks undertaken and were regarded as 'superior' compared with other science students who were not part of the pilot study, that is, compared with those who were studying science in conjunction with another teaching discipline. This was the opinion of both the university teachers and potential employers who interviewed the students as part of their graduate teacher recruitment process. A similar improvement in outcomes resulting from participation in a collaborative program was observed elsewhere (Wang & Walberg, 2000; Martinez & Coombes, 2001; Ginsberg & Rhodes, 2003; Sherman 2004; Watson, 2005).

School department level

In an endeavour to facilitate community building, teacher educators visited schools on the weekday when pre-service teachers were present as well as during the block professional experience. Although this represents a large commitment of time, compared with other teacher education professional experience arrangements, in practice the time spent in each school was short. At the time of the visit, teachers and pre-service teachers were often unavailable because they had other obligations. When interviewed, the university staff commented forcefully on how little time the teachers had for anything other than their school duties. When asked in a final interview about whether the interaction with the university was useful, one supervising teacher commented "What interaction? The only interaction was when the university staff came to talk about the pre-service teacher. There hasn't been a tremendous amount of interaction due to how busy we all are." However, another teacher pointed out that "I haven't seen this much interaction before with other pre-service teachers who have gone through".

Direct interaction between university staff and supervising teachers would appear to have had limited impact on the building of a cohesive community. Even though it represented a much larger investment of university staff time than is usual the staff were still spread very thinly.



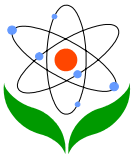
Another strategy designed to increase interaction at the department level were the debriefing sessions. The following example of a debriefing session at one senior secondary school illustrates the way in which these discussions fostered interaction. Four teachers, who are here called Paul (head teacher), Margaret, Vernon and Colin, were present. This represented all the science staff. Both university staff members were participants.

The meeting took place in a café near the school. Discussion centred on the exemplary lesson taught by the pre-service teacher a week earlier. The intention was to develop an improved lesson that Vernon would subsequently teach to his biology class. The pre-service teacher (Sarah) outlined a lesson on photosynthesis that had begun with a concept map of the words heterotroph and autotroph. She had quickly found that the students had little to contribute. The teachers suggested various alternative ways of opening the lesson, until Paul suggested using a drawing of a leaf that students could label in their groups. This, it was decided, would give the students a chance to reveal what they knew, avoiding the mistake Sarah had made of assuming the students knew more than they did.

With some guidance from one university educator, discussion then moved to the next part of the lesson, a handout showing the structure of a leaf. Vernon suggested using a 'colour-in' leaf with a key linking colours to leaf structure. One of the university educators suggested that students would learn more if they constructed their own diagram, and Sarah mentioned that she thought colouring in was too easy and could be done without thinking. Paul quickly cut in, saying that there were times when colouring in was useful and a compromise solution would be to get students to colour in their own diagrams.

Sarah then described the cross-section she had set up on the microscope, and all the teachers discussed changes to this part of the lesson. Colin repeatedly brought the focus back to the purpose of the lesson. Sarah agreed that she had set too many outcomes to meet, and the students were not as familiar with the topic as she had expected. Some time was also devoted to designing an effective wrap-up for the lesson. Vernon took notes throughout and agreed that it would be a good lesson for him to teach.

The outcome of this debriefing session was regarded as positive by the participants. Everyone present exchanged views frankly and all ideas were given a hearing. There



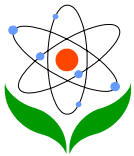
was one potentially awkward moment when the pre-service teacher appeared to criticise the colouring in idea put forward by Vernon, but a tactful intervention by the head teacher prevented any hurt feelings. This incident represented a positive example of community building, but it also highlighted the potential dangers. Handled well, the debriefing sessions could lead to increased department understanding and cooperation. However, there was a need to be vigilant about possible negative effects on staff relations if equity between the contributing members was not maintained.

In a conversation after the debriefing, Paul (head teacher) commented:

... that went really well, mainly because we were ready for it. As a staff we were ready to see how we could make Sarah's lesson better. I think the staff can see working with Sarah will help us all ... we have a common focus.

Paul believed that the timing for professional learning and the desire for professional learning was coming from the staff themselves. It is possible that although Sarah provided a focus for the professional learning, the interaction was successful in this instance because the teachers were ready to learn. Sparks and Hirsh (1997) and Garmston and Wellman (1999) found that successful professional learning was more successful when initiated by staff. It may be the case that in future the teacher education model needs to take account of the readiness of school staff to take on a learning role. This may require improved communication with school staff about the model implementation.

At another school where there were four early-career teachers on staff sharing the load of the pre-service teacher, the staff attending the debriefing session were less amenable to restructuring the exemplary lesson in a student-centred fashion. The head teacher had helped design the lesson the pre-service teacher taught and which was subsequently criticized, by those at the debriefing, as teacher-centred. The young staff were vociferous about the fact that they had no time to develop student-centred lessons. The head teacher's realisation that he had a problem with his own approach and with that of his staff led to his drawing back from supervision of the pre-service teacher. The interaction between participants during this session identified a problem that had to be addressed. Eventually, the head teacher increased his participation in the project and, during the following year, presented a workshop entitled "Moving from a teacher-centred to a more student-centred approach to teaching". This is an example of an action – withdrawal from supervising a pre-service student – having a

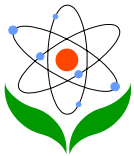


ripple effect resulting in a seemingly unrelated outcome – presenting a workshop – some time later.

The two examples of debriefing as a strategy suggest that it can be effective in increasing pre-service teacher and teacher learning in some circumstances. This illustrates that if teaching staff are willing and ready to learn, participating in a common project, such as the education of pre-service teachers, can offer a focus and an incentive for community interaction. However, if tensions exist they may be highlighted in this forum. Although conflict may occur in a community building process it may be productive if resolved (Fullan, Bertani & Quinn, 2004; Grossman, Wineburg & Woolworth, 2001), and more investigation is needed into the longer term effectiveness of these types of interactions and their contribution to community building. A further example of the equivocal nature of conflict is given below.

Another strategy intended to build community and address the problem of teachers having too little time to interact was the 'brown-bag lunch'. Brown-bag lunches took a variety of forms from cups of tea with principals to coffee shop discussions with pre-service teachers and lunch-table discussions with pre-service teachers, science teachers and teachers from other faculties. The reason for incorporating these discussions was so teachers' ideas could be discussed and personal professional learning experiences shared (Sparks & Hirsh, 1997; Garmston & Wellman, 1999). The discussions were very informal and ranged widely over a variety of topics. However, when possible the topic was brought back to pedagogy and issues of 'best practice' – or what became modified to 'good practice', as one principal argued "there is no such thing as best practice".

An example of such a discussion was initiated by one Head of Science who felt he had been criticised for promoting demonstrations as an alternative to student practical experiences. He argued that in the current climate of classroom practice, teachers could not afford to expose students to the slightest compromise of their safety. He cited examples that indicated student safety was becoming more important than student learning. He reinforced this view by saying that the science syllabus had become so content driven that the only way to get through it was to reduce the number of student experiments and replace them with alternate, shorter activities or by teacher demonstrations.

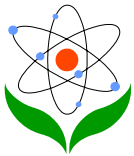


This view was reinforced by another Head of Science at another school who said "the idea of what constitutes an activity is being redefined". He suggested that "an activity is becoming anything that the kids or teachers do that doesn't involve reading, writing or the teacher talking". He went on to ask the question "is a student discussion an activity"? Some people at the discussion were horrified at the idea, but the head teacher went on to explain further and mount an argument for his view. This led to another discussion, on another day, that centred on the idea of what constituted an experiment.

It would appear that 'taken-for-granted' views were being challenged and that traditional pedagogy was being questioned. Tensions were aired, often forcefully. The head teacher who felt his view on student-centred learning and use of demonstrations in place of hands-on activities, was not consistent with others participating in the project, initially withdrew support. However, he later presented a workshop seminar during which he said that his involvement in the project had caused him to rethink some of the views he had taken for granted. He also continued to supervise students in the project and encouraged other science teachers to do so. Although conflict was observed during the pilot study of 'debriefing' and 'brown bag' lunches, the long term commitment of teachers to the teacher education program was not affected. It is postulated that interaction led to gains in teacher learning through shared dialogue, and that these strategies have the potential to assist in the development of a mature learning community (Aubusson et al 2006).

In summary, the findings from this study indicate that facilitated discussions at the school department level can usefully contribute to community learning if the conditions within the department are conducive to cooperation and the sessions are conducted in an equitable and sensitive manner. This is consistent with the findings of Garmston (1998). However, it also became apparent that some relatively experienced senior teachers have firm views about teaching and the pedagogy advocated by this project was not consistent with their practice. Thus the project created tensions that then had to be resolved. The forging of a community requires time (Aubusson et al, 2006; Grossman, Wineburg & Woolworth, 2001), which is in short supply for both teachers and university staff.

Inter-school level



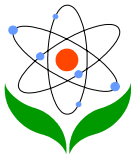
Inter school interactions were promoted by workshops organised by the university staff, with an invitation extended to the entire collegiate community. Twenty teachers and pre-service teachers attended the first workshop, which was held directly after school. Teachers were asked to present on a topic of interest to them. One head teacher combined with a member of his staff to pose the question 'what is a practical?' in terms of the current school syllabus. This topic generated considerable debate, particularly amongst the teachers in the audience. Another head teacher brought in skate boards and toys and engaged the audience in a practical activity she used to teach about inertia. The third session was a PowerPoint presentation (by a head teacher) about activities used to engage students in senior physics. Between presentations there was an opportunity for food and open conversation.

At the end of the workshop those present were asked to record their views about the workshop. All of the written comments were positive, and are represented by one participant who wrote:

Today I was interested in hearing about the experience of other teachers, what things work, what doesn't for them. ... was interesting hearing about the different opinions regarding issues in teaching. ... was reflecting a lot on my classes compared to what others were saying and comparing my lessons with what good lessons or pracs should be.

Similar comments were made on a formal evaluation sheet handed out at the end of the second workshop. Total attendance at this workshop was not as high as in the earlier workshop. On the whole, only teachers responsible for supervising pre-service teachers attended this workshop. Pre-service teachers gave the presentations, on topics including 'misconceptions in science' and 'analogies'. Some comments about the outcomes of the session included "generate discussion and ideas regarding science teaching" and "learning, sharing science teaching ideas". One respondent added "building a community" and another mentioned "interaction with other teachers". Few comments were made in either workshop evaluation about changes or improvements. Two participants noted that more time for interaction between pre-service teachers and teachers should be allowed. Overall, the comments generated suggest that the workshop sessions were regarded as opportunities to learn about specific teaching strategies rather than a chance to get to know their fellow teachers.

Teachers reported a range of views on the workshops. Of seven teachers interviewed at the end of the study only two had attended more than one workshop. Two teachers



had not been to any of the workshops due to pressures on their time. Lack of time and family commitments were given as reasons why teachers were unable to attend workshops unless they were giving a presentation. A teacher who had attended both workshops summed up his views on their contribution to the project:

I enjoyed putting together my presentation and delivering it. Similarly, the two other members of my staff enjoyed preparing and delivering a talk. It took a bit of extra time but it was worth it. It was interesting and good to have the pre-service teachers there and I think it was good for them. The food was good. The disappointing thing is that unless they were presenting, the teachers didn't go. I went to them, I was motivated. The pre-service teachers were there because they had to be and the teachers were there to support them ... It is good to have dialogue across schools about ways of teaching, philosophy of teaching. Any time you can get people together that is fantastic but you don't want to do it for one fifth of the audience.

The workshops provided an opportunity for some exchange of ideas about teaching across the schools. Teachers were pleased to see how other teachers approached lessons and to get ideas about motivating students. One teacher compared the practice in her school with that of others in the project, saying:

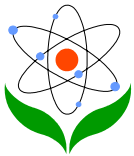
From this project we got to know that some schools actually do an activity as a demonstration. Now, does a demonstration teach you as much or not, or is it better? It made you think about things you had taken for granted before.

Another felt that she had gained some useful ideas on teaching senior chemistry, but added that the only teachers she had interacted with at the workshop were those with whom her school already shared resources.

In general, the evidence suggests that the workshops did offer an opportunity for teachers to get to know what their peers were doing, and to learn from them, but they were only partially successful in enabling the building of a strong, enduring relationship between the schools in the collegiate. As noted above, forming the mature learning community requires time and one strategy will not achieve all.

Systems level

The study spanned one year, which was not long enough for a full analysis at a systems level of community building. However, the following description of an



incident that took place at the beginning of the year following the initial study, illustrates one of the possible outcomes of developing a community of learning.

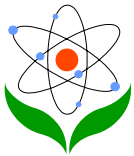
The researchers wished to apply for further funds to expand the community to other subject areas. A meeting was held to discuss possible approaches and was attended by the principals of the eight schools. All agreed that they were not willing to expand the project unless they could guarantee that the graduates from the program, considered by all to be of high quality, would be available to their school. The recruitment procedures currently do not allow a school to employ a graduate directly, because each school must draw from a pool of graduates registered with the state Department of Education and Training. Graduates from the first year of the project were employed before the end of the year by private schools, and the schools that had 'trained' them missed out.

The group of principals asked the university staff members present for their support in overcoming this barrier to the project. The stance taken at this meeting resulted in another meeting being held between management of the university and representatives of the education departments concerned, at which it was decided that the system of appointments of new graduates needed to be reviewed.

This example illustrates both how highly the graduates of the teacher education model were regarded, and how the interactions between schools, and between schools and the university, allowed partners to combine in an area of mutual interest to influence the education community at the systems level.

A holistic view of the learning community

Although it was informative to consider the community building aspects of the project as acting at different levels, in reality each level interacts with other levels and all relationships within the community impact on each other (Senge, 1990). This is exemplified by the debriefing session described above. Although this activity was regarded as principally a department community building exercise, university staff were present and gently guided the process. Pre-service teachers were at the centre of the discussion, and could act as catalysts for change, providing a nucleus around which teachers and university staff created a language related to pedagogy. Thus this debriefing was an interaction at pre-service teacher, department and university/school levels. The fact that the student involved in the debriefing was subsequently a sought



after graduate, is also a link between this aspect of community building and a wider systems impact of the project.

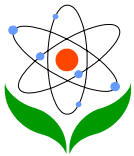
The workshops also acted as multi-faceted community building exercises, operating at the pre-service teacher, school department and inter school-levels to create a wider learning community. They provided a forum in which experiential learning about pedagogy could be shared, both formally and informally. For example, the brown-bag lunch discussions about activities arose independently but were linked to a presentation at a workshop about the nature of a practical. The workshop introduced a framework for dialogue at the inter-school level that was later taken up by department members, and resulted in staff sharing their understanding of this aspect of science teaching.

As recommended by Bulajeva (2003), the pre-service teacher component of the model could be visualised as part of a dynamic system of teacher education where reform is an ongoing process and professional learning is continually occurring. The wider learning community encompassed the eight schools of the collegiate, who were brought together around the common goal of the teacher education program. Following the initial structured meetings there were ongoing interactions, leading to unexpected, but contingent, outcomes such as the effort to influence recruitment policy at the systems level.

While much research remains to be done, and the strategies to assist community formation need to be refined, the model has demonstrated its potential, particularly in improving outcomes for pre-service teachers. There are indications of a fledgling learning community being formed, although time must elapse before this community can be regarded as mature.

Towards a Sustainable Community

This study has illustrated some of the challenges involved in building a sustainable community around teaching and learning. The notion of sustainability is crucial and is central to any ecological view. Interactions and outcomes must be able to be sustained by the system rather than being dependent upon unsustainable external resources.

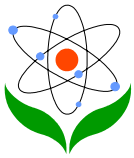


One challenge has been to generate a community identity. The implementation of the model resulted in enhanced learning outcomes for pre-service teachers, and a development of community within the pilot study group. However, this awareness of community did not appear to encompass all members of the teacher education project. Similarly, although every effort was made at the beginning of the pilot study to communicate the holistic nature of the project to principals and head teachers and to encourage the sharing of this vision with all staff, the study subsequently revealed no increased awareness among teachers of the value of a community approach. Teachers continued to see themselves as supervisors of pre-service students and did not view the project as an integrated learning experience. This will need to be addressed as the community matures. Teachers will need to be supported in their efforts to look beyond their supervisory role and see themselves as multifunctional within the dynamics of the maturing community.

As a consequence, it is suggested that the model should continue to evolve, shifting emphasis from actively constructing a community to orienting teachers positively toward the project in a way that encourages them to participate fully in the learning opportunities provided. It is hoped that this will embed the principle of shared learning and encourage teachers to view themselves as part of a broader professional education community and so increase the sustainability of the project.

A second challenge has been the lack of time. Time that is required to establish the views and needs of all participants, allow discussion and resolve conflicts that arise because of firmly held views on teaching and learning. One intention of the model was to operate within the existing university and school structures without a requirement for outside funding. The community was ideally expected to generate learning within an ecological whole, as proposed by Renshaw (2002). The model has not proven to be sustainable in this sense, and in the future outside funding may be required for teacher release time. This would enable community building strategies such as workshops, debriefing sessions and 'brown bag' lunches to be held more frequently or at times more conducive to teacher attendance. Funding may also need to be allocated to university staff to enable them to communicate the aims of the project more fully to participants.

Finally, the implementation of the model highlighted the challenge in developing a truly equitable exchange between members of such a diverse range of people. As



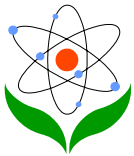
others have shown (Grossman, Wineburg & Woolworth, 2001; Snow-Gerono, 2005) university-school partnerships involve inherently different cultural assumptions. In the pilot study this was evident through the differing approaches to pedagogy. A lesson learned during the study was the importance of not imposing views of teaching and learning, as recommended by Garmston (1998). As Sparks and Hirsch (1997) found, there are dangers associated with learning initiatives that are seen as part of a program, rather than meeting needs emanating from staff. Although the intention of the model was to evolve with the community, in the pilot program there remained a tendency to develop a professional learning agenda with a particular emphasis on student-centred teaching. Thus it is recommended that the model evolve to more effectively take into account teachers needs and views so that they may manifest in a multitude of interconnected ways and eventually generate project outcomes such as teacher professional learning.

Conclusion

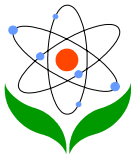
Challenges to a comprehensive learning community that incorporates teaching, pre-service teacher and teacher educators in a holistic continuum are considerable. However, we believe that although further research is needed, particularly into the longer term effects of community building strategies, there are indications that such an endeavour and model of teacher education is worthwhile. In addition, conflict and differences of opinion while building a learning community are consistent with the ongoing dynamics of effective learning. Ecologically, such conflict moments are part of normal system function and have been shown to promote continued learning.

References

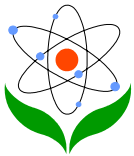
- Aubusson, P., Steele, F., Dinham, S. & Brady, L. (2006). Action learning in teacher learning community formation: Informative or transformative? *Teacher Development*, submitted.
- Aubusson, P. J. & Watson, K. (2002). Packaging constructivist science teaching in a curriculum resource. *Asia-Pacific Forum on Science Teaching and Learning*, 3(2), Article 2. [Online] http://www.ied.edu.hk/apfslt/v3_issue2/aubusson/
- Aubusson, P. J. & Watson, K. (2004). Using a Curriculum Package Combined with Professional Learning to Promote Good Practice in Teaching Secondary Science. *Pacific-Asian Education*, 16(2), 49-64.



- Benton, P. (Ed.). (1990). *The Oxford internship scheme: Integration and partnership in initial teacher education*. London: Calouste Gulbenkian Foundation.
- Bruce, J. & Calhoun, E. (1996). *Learning Experiences in school renewal: An exploration of five successful programs*. University of Oregon: ERIC Clearinghouse on Educational Management.
- Bryk, A. S. & Schneider, B. L. (2002). *Trust in schools: A core resource for improvement*. New York, NY: Russell Sage Foundation.
- Buchberger, Fr. (2000). *Teacher education policies in the European Union. Critical analysis and identification of main issues. General report at the conference Teacher Education Policies in the European Union and Quality of Lifelong Learning*. May: Portugal.
- Bulajeva, T. (2003). Teacher professional development in the context of school reform. *Journal of Teacher Education and Training*, 2, 39-45.
- Crowther, F. (2001). *The teaching profession: The dawn of a new era*. Australian College of Education, Deakin West, ACT.
- Darling-Hammond, L. (1994). Developing professional development schools: Early lessons, challenges and promise. In L. Darling-Hammond (Ed.), *Professional development schools: Schools for developing a profession* (pp. 1-27). Columbia University: Teachers' College Press.
- Darling-Hammond, L. (1999). Educating teachers for the next century: Rethinking practice and policy. In G. Griffin (Ed.), *The education of teachers: 98th NSSE Yearbook*, part 1 (pp 221-255).
- Denzin, N. K. & Lincoln, Y.S. (1998). *The landscape of qualitative research: Theories and issues*. Thousand Oaks: Sage Publications.
- Erickson, F. (1986). Qualitative methods in research on teaching. In M. C. Wittrock (Ed.), *Handbook of research in teaching* (3rd ed. pp 119 -161).
- Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record*, 103(6), 1013-1055.
- Fullan, M., Bertani, A. & Quinn, J. (2004). *New lessons for districtwide reform*. *Educational Leadership*, 61(7), 42-46.
- Furlong, J. (2000). School mentors and university tutors: Lessons from the English experiment. *Theory into Practice*, 39(1), 12-20.
- Garmston, R. J. (1998). Becoming expert teachers (part one). *Journal of Staff Development*, 19(1).
- Garmston, R. J. & Wellman, B. M. (1999). *The adaptive school: A sourcebook for developing collaborative work*. Norwood, MA: Christopher-Gordon.
- Ginsberg, R. & Rhodes, L. K. (2003). University faculty in partner schools. *Journal of Teacher Education*, 54(2).



- Grossman, P., Wineburg, S. & Woolworth, S. (2001). Toward a theory of teacher community. *Teachers College Record*, 103(6), 942-1012.
- Hammrich, P. L. (2004). What the science standards say: Implications for teacher education. *LSS Spotlight on Student Success No 208*.
- Hargreaves, A. (2000). The knowledge creating school, in B. Moon, J. Butcher & E. Bird (Eds) *Leading professional development in education*. London: Routledge Falmer.
- Hastings, W. & Squires, D. (2002). Restructuring and reculturing: Practicum supervision as professional development for teachers. *Asia-Pacific Journal of Teacher Education*, 30(1), 79-91.
- Hilferty, F. (2000). News: Community, curriculum support and collective power: The benefits of subject association membership. *Science Education News*, 49(4), 144.
- Hodson, D. & Bencze, L. (1998), Becoming critical about practical work: changing views and changing practice through action research. *International Journal of Scientific Education*, 20(6), 683-694.
- Hough, M. & Paine, J. (1997). *Creating quality learning communities*. Melbourne: Macmillan Education Australia.
- Huberman, M. (1990). The model of an independent artisan in teachers professional relations, in J. Little & M.W. McLaughlin (Eds) *Teachers' work*. New York: Teachers College Press.
- Korthagen, F. A., Kessels, J., Koster, B., Lagerwerf, B. & Wubbels, T. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- McDonald, J. P. & Klein, E. J. (2003). Networking for Teacher Learning: Toward a Theory of Effective Design. *Teachers College Record*, 105(8).
- Martinez, K. & Coombes, G. (2001). Unsung heroes: Exploring the roles of school-based professional experience co-ordinators in Australian pre-service teacher education. *Asia-pacific Journal of Education*, 29(3).
- McLaughlin, M. & Talbert, J. (2001). *Professional communities and the work of high school teaching*. Chicago: University of Chicago Press.
- McIntyre, D. & Hagger, H. (1992). Professional development through the Oxford Internship model. *British Journal of Education Studies*, 40, 264-283.
- McIntyre, D. & Hagger, H. (1996). *Mentors in schools: Developing the profession of teaching*. London: David Fulton.
- Newman, F. M. & Wehlage, G. G. (1995). *Successful school restructuring*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Poom-Valickis, K., Saarits, U., Sikka, H., Talts L. & Veisson, M. (2003). Professional preparation of teachers – problems and perspectives: The Estonian case. *Journal of Teacher Education and Training*, 3, 18-26.



- Ramsey, G. (2000). *Quality Matters Revitalising teaching: Critical times, critical choices. Report of the Review of Teacher Education*, New South Wales.
- Renshaw, P. (2002). Learning and Community. *Australian Educational Researcher*, 29(2), 1-13.
- Senge, P. (1990). *The fifth discipline*. New York: Doubleday.
- Sherman, S. (2004) Professional development schools: Communities of learners, centers for inquiry, models of collaboration. *LSS Spotlight on Student Success* No. 408.
- Siskin, L. S. (1994). *Realms of knowledge: Academic departments in secondary schools*. London: Falmer.
- Snow-Gerono, J. L. (2005) Professional development in a culture of inquiry: PDS teachers identify the benefits of professional learning communities, *Teaching and Teacher Education*, 2, 241-256.
- Sparks, D. & Hirsh, S. (1997). *A new vision for staff development*. Alexandria, VA: ASCD.
- Stevens, F. I. (1996). Opportunity to Learn Science: Connecting Research Knowledge to Classroom Practices. *LSS Publication Series*, 6, 1-17.
- NSW Teachers' Federation. (2002). *Inquiry into the provision of public education in NSW: Report of the 'Vinson Inquiry'*. Annandale, NSW: Pluto Press.
- Watson, K. (2005). Teacher professional learning and pre-service teacher education: Building a sustainable community. *Journal of Teacher Education and Training*, 5, 3-15.
- Wang, M C. & Walberg, H. J. (2000). New teachers for a New Century: Recommendations from a national invitational conference. *The CEIC Review*, 9(1), 1-27.