

Against short term professional learning

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A three-year study was conducted involving teacher interviews and observation in one high school in NSW. Initially the contact between teacher and researcher came from an Australian Government Quality Teaching Program that provided 12-month funding to support teachers in professional learning. The role of the academic partner was to facilitate teachers in development of individual learning plans. Such learning plans are designed to return control of the professional learning experience to teachers. This narrative critically explores how allowing individual learning plans to develop freely produced successful outcomes that changed a teacher's pedagogy over a period of three years. However, it also shows that the time frame required to create perceptible improvement is often unrelated to the time frame of the funding available to support professional learning. The evidence is a case study of a teacher's journey – from her initial plan to increase her use of technology in her teaching to its ultimate evolution as a commitment to project-based learning –that benefited not only her own students but also her colleagues. Designing their own research projects led students, to a much greater degree than previously, to actively use the library, search the internet and write to stakeholders in order to solve problems to the questions they themselves created. Teacher colleagues observed the focus teacher's classes, asked for her assistance in their own, and collaboratively planned a showcase for student projects. This case study shows that the time for her pedagogic innovations to evolve to fruition resulted in benefits to the wider school learning community. This finding has implications for policy, as funding provisions that operate in short-term allocations give little encouragement for teachers to persist.

Introduction

Since its establishment in 2005, the New South Wales Institute of Teachers has joined the international movement for a renewed focus on professional learning for teachers (Darling-Hammond, 2001; Ingvarson, 2002; National Board for Professional Teaching Standards, 2002). Research confirms that improved student outcomes are integrally connected with teachers' ongoing learning (Meiers & Ingvarson, 2005). Individual learning plans are a specific approach to professional learning that give a teacher the opportunity to determine the content and purpose of what they will learn (Chng & Coombs, 2001). An individual learning plan (ILP) may be used to set out a program of study, or to set learning targets (LLUK & TDA, 2007). At the same time, the context of these plans needs to be collegial and supportive to achieve a lasting effect within a school. This article, a case study of a teacher who persisted, explores how improved pedagogy in a school community has slowly emerged from the stimulus of individual learning plans. The teacher's focus was always on student learning needs and throughout the research, she has been both a valued member of and a catalyst for the school community.

Through the Australian Government Quality Teaching Program (AGQTP), an academic worked with a group of teachers from a school in Western Sydney as they

adopted the individual learning plans approach to professional learning. The AGQTP was established in 2000 for the purpose of raising the quality, professionalism and status of teachers. The initial stage of working with the teacher at the centre of this narrative was funded by the program for a period of twelve months. Funding timelines such as this give rise to questions about what might reasonably be expected of a professional learning approach like individual learning plans and what is possible to achieve in twelve months. In particular, the evolving nature of the learning plans that were investigated raises questions about the tension that exists between the funded time frame and the possibilities of deep and sustainable change to school culture with regard to professional learning.

Literature

The main sets of literature used in this article address and make connections between the features of effective professional learning, authentic pedagogy and its subsequent strands of Australian educational research, co-construction of knowledge, student 'voice' and the characteristic of a learning community culture. This section begins with effective professional learning.

Self-determination and autonomy are key aspects of professionalism in teaching (Campbell, McNamara & Gilroy, 2004). A defining feature of effective professional learning is that content should focus on how teachers might address the different problems that students have in learning specific content. Furthermore, professional learning should provide teachers with time to process ideas and involve teachers both in identifying what they need to learn and in developing the learning in which they will be involved (Meiers & Ingvarson, 2005). One of the reasons for the group of teachers meeting together to discuss their individual learning plans was to open the possibility of the scope of change, from individual teacher change to school change. The underpinning need was that professional learning should be ongoing and that, in its design, it must provide time to apply new ideas.

Newmann, Marks and Gamoran (1996) identified that general pedagogical characteristics - called authentic - which have meaning in classrooms, can be sustained organisationally by schools and have demonstrated effects on learning outcomes for all students. Authentic pedagogy allows students to construct knowledge and engage in learning that connects to their lives beyond school confines. It aims to nurture individual, critical thinking in students so that they experience the joy of working with cognitively complex problems and it helps students from all social backgrounds including groups that traditionally have been less advantaged (Newmann et al, 1996). Newmann's research had a considerable impact on two strands of Australian educational research: Productive Pedagogies^[1] (Hayes, Lingard & Mills, 2000) in Queensland and the Quality Teaching model (NSW Department of Education and Training, 2003) in New South Wales (NSW). The AGQTP has funded projects in New South Wales that connect with this model.

Quality Teaching is a model for pedagogy that can be used in classrooms from Kindergarten to Year 12 across all key learning areas (KLAs). It supports pedagogy as

a long-term strategic priority and focuses teacher discussion on reflection about their practice. Building on the earlier research (Newmann et al, 1996; Hayes, Lingard & Mills, 2000), the model identifies three key dimensions of pedagogy: that it promotes high levels of intellectual quality, a quality learning environment and makes explicit to students the significance of their work (Amosa, Ladwig, Griffiths & Gore, 2007). Each of these key dimensions subdivides into a number of elements and teachers are encouraged to use the elements as a focus for reflection on what their lesson strategies have as their goal.

The pedagogies within the model include providing opportunities for active co-construction of knowledge both between teacher and student and between student and student; synthesis of prior 'funds of knowledge' (Moll, Amanti, Neff & Gonzalez, 2001) with new knowledge to arrive at a conclusion or interpretation; and engaging discussion of key concepts encountered in the learning experience. Further, pedagogies that draw connections between students' knowledge with contexts outside of the classroom foster the development of positive relationships between teacher and students. They encourage the use of student initiative, expressed in student 'voice' (Munns et al, 2006) while setting high expectations for achieving quality work and drawing on student interests and background knowledge.

Professional learning is more effective when it is collegial and collaborative (DuFour, 2004). Characteristics of a learning community culture during processes of educational reform identify a series of themes in common: 1) they have learning goals around which the group forms; 2) they are groups in which there is emotional and psychological support and commitment; 3) they engage in professional dialogue that can transform a school into a professional learning community; 4) as a team they practise the most authentic and valid ways to assess student mastery; and, 5) they find ways to work together and judge their effectiveness on the basis of results (DuFour, 2004). Learning in networks is often indirect and the result of new commitments, exposure to new ideas. Consequently, when teachers collaborate to develop their own learning, the process is not a short-term one, as all of these activities - of forming goals, supporting each others' endeavours, having professional conversations, practising and refining activities - take time. Moreover, there is more to the network, than the exchange of ideas and the sharing of goals. The often unspoken commitment to the team may operate at a deep level. Successful professional learning has a time component to it. It is not hurried as it takes time to become internalised by the professional who is doing the learning. This is yet another reason to adjust policy to allow for a longer engagement with professional learning opportunities so that they become strongly embedded in teaching practices.

Method: The consultancy

The project developed from a 12-month consultancy in Western Sydney, commencing in 2006. Working in partnership with an academic, eight teachers from 'Tower' school took on a new approach to professional learning. The academic's role was to provide information about professional learning opportunities such as higher degree courses and conferences run by professional teacher associations. It was to help teachers

identify their own paths in professional learning and to suggest links between these choices and the reflective tool of the Quality Teaching model.

'Tower' school is a comprehensive high school with 1190 students. The demographic is culturally diverse but the majority of families have parents with tertiary qualifications and regular employment. At the outset, it was clear that the school executive intended that the teachers' professional learning would progress school plans. Consequently, meetings were held to establish 'shared meanings' of the nature of the project. Indeed, the discussion of shared meanings became a methodological tool in this period. Research work in schools, documenting and analysing what teachers learn, involves establishing shared meanings, specifically affective meanings:

Shared meaning defines a group of people to themselves as well as to others... the 'sharedness' of shared meanings is not an accidental or passive accomplishment (King, 2008, p. 138).

From the time when the group of eight teachers formed, two meetings of the teaching group and the academic partner were devoted to suggesting professional reading related to possible learning plans and checks of the AGQTP website for reports of ways in which other teachers had developed plans. At subsequent consultations in the last four months of 2006, the academic partner presented information to the teacher participants about the Quality Teaching model and encouraged discussion that would facilitate the identification of learning plans. The teachers found connections between their potential plans and there was useful discussion about how the proposed plans articulated with the school's goals.

Discussions of learning plans at Tower School ranged widely as teachers in general want to discuss innovative classroom practices and evaluate assumptions but 'the privacy of teaching has obstructed the development of critical dialogue about practice' (Wilson & Berne, 2000, p.186). The inverse of this is a community of practice that has as its first characteristic 'the mutual engagement of participants' with the potential of 'leading-edge learning' (Wenger, 1998, p. 73, p. 214). The way in which schools improve pedagogy is when teachers 'learn to do the right thing in the settings where they work' (Elmore, 2004, p. 73 in Fullan, 2008). Developing the culture-changing practice of observing other teachers and being observed by others represents a 'deprivatising' of teaching (Fullan, 2008, p. 36). However, there is frequently limited opportunity for teachers to engage in continuous and sustained learning about their practice. This had been the case at Tower school and progress towards setting goals was slow as there was a dormant culture of professional learning.

Method: The case study

Beyond the consultancy, this project became case study research in the two years following the end of consultancy funding, as is shown in Table 1. This study used the instrumental case study approach as the dominant emphasis for two reasons. Firstly, the research is not undertaken primarily as representing other cases (Stake, 2008). Rather, in its particularity and ordinariness, this case itself is of interest as an

evaluation of professional learning (Denzin & Lincoln, 2008). Secondly, it draws attention to an issue, in this instance short-term funding (Stake, 2008).

Table 1: Timeline of consultancy becoming research

2006	Consultation Individual learning plans discussed Decisions
End of 2006	MAV conference for technology e-professional learning Readings on intranet
April 2007	Research commences: First interview Expanding community Technology-based task
November 2007	Research continues: Second interview Work with Regional Office Project in Year 8
June 2008	Research continues: Third interview Statistics project Year 9 Plan for Year 7 in 2009
October 2008	Research continues: Fourth interview Student self direction: Wikis: Head Teacher Learning Support

The academic partner became a researcher whose principal tools were interview and observation. Yin (2009) identifies the main mechanisms for data collection as documentation, archival records, focus group and structured interviews, direct observations, participant observation and physical artefacts. Of these, the researcher has chosen the semistructured interview for individuals and observation of student work samples for the following reasons: Firstly, interviews are insightful and targeted. Secondly, observation of work samples stimulates further discussion concerning the discourse on the why questions related to teaching practice.

The teacher and school were provided with pseudonyms and appropriate ethical processes were completed. The research agenda explored how allowing individual learning plans to develop produced successful outcomes that changed a school's pedagogy over a period of years. The case study focused on one teacher who persisted and followed a vision of what improved pedagogy might be. This teacher, 'Adrienne' was an experienced teacher of 13 years, a member of the mathematics staff and Year 7 Coordinator. The research included personal interviews the researcher conducted with the teacher and observation of work samples from her classes. Over the two-year case study that followed the consultancy, four interviews were conducted in 2007 and 2008, taking place at Tower school. The majority took place after the end of the school day. Interview questions were about setting goals, taking steps to effect change in pedagogy, involving other staff, having executive support, designing projects for students, achieving goals and using research to plan for improved student outcomes. Observations of work samples were of completed student projects uploaded to the

student website and of students' blogs (shared online journals) demonstrated during the interviews.

The data has been analysed in relation to themes that emerged from literature. These themes include: teachers' ongoing learning; self-determination of teachers' learning towards improved practice; constructivist learning for improved student outcomes; teachers' reflection about practice; and, collegial and collaborative planning by teachers in their workplace. In the two years that followed the consultancy, the teacher's goals changed from being involved with more confident use of technology in teaching towards more use of project-based learning and learning journals.

The beginning of the story: 2006

Adrienne was keen to explore innovative pedagogy for mathematics by using technology and was seeking guidance about ways to do that. When the academic partner suggested, in September 2006, that she and another mathematics teacher, 'Ros,' might benefit from attending the Melbourne conference of the Mathematical Association of Victoria (MAV) both jumped at the opportunity. In this, they were supported by funding through the AGQTP. The dual purpose of attending the conference was to examine ways in which technology can enhance teaching in mathematics and to work on creating a 'thinking curriculum' by developing strategies to encourage critical thinking among students.

Professional learning opportunities outside the school setting are frequently designed 'to engage teachers as learners in the area that their students learn in but at a level that is more suited to their own learning' (Wilson & Berne, 1998, p. 194). The Mathematics conference offered the teachers a like-minded teacher community confronting the specific challenges of their discipline and exploring the innovative pedagogies associated with it. Neither Adrienne nor Ros had previously attended the MAV conference. As a pair they were able to decide to attend different presentations, whether to go to the impact of mathematical games on learning attitudes or a session on numeracy coordinators, and then compare notes in the evening. Keynote speakers emphasised research to address 'learners left behind.' Their collaboration was expressed in the decision-making processes of their session attendance and in the discussions afterwards. Thus they engaged in defining specific areas and skills that they wanted to develop as well as learning activities to complete (Chng & Coombs, 2001).

2007

Adrienne finished the conference feeling invigorated and wanting to implement many of the ideas she had seen in action (Adrienne, personal communication, April 2007). Nevertheless she took the time to prioritise what she wanted to attempt at the start of 2007. She began by instigating a visit early in first term by members of Parramatta Regional Office. They were engaged in developing shared learning through an intranet and their visit was to make a presentation to staff about this learning management system, a type of e-learning. In behaviour indicative of working together (DuFour,

2004), Adrienne placed professional readings on the intranet site in March so that conversations between staff members could encourage a community of practice and reflection. Having experienced a range of ideas at the conference, Adrienne saw the benefits of sharing these and brokering opportunities for the whole staff by interacting with each other through the intranet. This aligned with the idea of shared meanings (King, 2008). Moreover, such communication can exemplify Wenger's (1998) idea of a community with the mutual engagement of participants.

In a further step, Adrienne enrolled in an e-learning professional learning workshop during first term of 2007. She accepted the fact that teachers have to find the time to 'make things happen'. However, taking this step, she saw her role as making a link with her staff and the broader community. A small sign of change took place when the initial group of eight staff members welcomed different teachers, interested in developing on-line components to topics and courses. Subsequently a worksheet template on modifying work for students with special needs, developed by Adrienne as a result of an example demonstrated at the conference, was presented to a subject coordinators' meeting and from there, more broadly to the staff. Like the first sign of change, this second one signalled the breaking down of the 'privacy' of teaching. The significance lies in the spread of the learning community beyond the group of eight teachers. A third sign of change appeared when Ros created a topic with journal writing as an assessment, with the purpose of students developing their thinking about mathematics. All the mathematics staff wanted to know how students reacted and what Ros felt about the evidence of learning.

With Year 7, Adrienne moved in small steps, setting a simple technology-based task of finding out an interesting mathematics fact on the internet. She also encouraged students to share their learning in Powerpoint presentations. It was with her Year 12s that she saw great benefits as students used an online discussion board to help each other with problem-solving. She was conscious of the fact that students needed to be stretched whenever questions and problems call for them to extrapolate from one learning experience to another (Adrienne, personal communication, November 2007). When reflection is focused on the needs of students, as in this example on 'mental stretching', it is the driving force behind teachers continuing to engage with professional learning.

The next phase: 2008

From the first engagement with individual learning plans, it took a long time to move things in a positive direction. Initially, the small changes in 'deprivatising' teaching went unrecognised by the school executive. The key to the next phase lay in a change of leadership at the school during 2007. The new leadership was also committed to a focus on professional learning but emphasised new ideas and working in teams. The school restructured the leadership, with teaching and learning teams as part of the Deputy's role. At this time Adrienne became Head Teacher Mathematics. Significantly, it was not until 2008 that the staff as a whole adopted the Quality Teaching Framework. Something that had been on the backburner for two years had finally emerged! All the KLA coordinators underwent training and subsequently ran a

professional day for the whole staff. The school's emphasis had moved to developing individuals, building the capacity of teams and encouraging shared leadership. In June 2008, Adrienne confirmed: "Development of leadership is fundamental to who the Principal is and how he operates. That sits well with where we're going as a staff with our professional learning."

For Adrienne, the post-conference developments were different from her expectations. She had expected to bring back many ideas about technology and mathematics. However, as she recalled in October 2008: "The IT we saw being demonstrated was from a lot of very well funded private schools – they had people with money to develop full programs and lots of equipment. There was a degree of difficulty around trying to implement any of those programs." Rather than being defeated by financial constraints, the ideas from the conference that surfaced in Adrienne's teaching were concerned with project-based learning and learning journals. The project-based idea came from a conference presentation that Adrienne saw. It was not mathematics-related but the idea itself took hold with her as a way of engaging adolescent learners. Adrienne explains her first venture in this way:

With another teacher, Dane, I ran a project in 2007 with Year 8 and shared some outcomes of that with the KLA coordinators. We found Term 4 was not ideal to run projects like these because, in practical terms, there were lots of issues about the availability of equipment such as DVDs and all those sorts of things. On the positive side, the students were very enthusiastic and we saw students realise 'this is what we can do.' The biggest thing for us was in doing something that was authentic – that had real-life aspects.

In curriculum design, project-based learning is a model that organises learning around projects (Thomas & MacGregor, 2005). In line with principles of student self-regulation (from the Quality Teaching model), it has produced change from teacher-centred pedagogies to a social constructivist paradigm where students are encouraged to work collaboratively to solve problems. Project-based learning and collaborative endeavour are not only compatible but also essential to each other for effective implementation in classrooms. After completing this first project, Adrienne sought out research about authentic learning and shared her discoveries, including particularly valuable websites about project-based learning, with other KLA coordinators. Consequently, the school shifted from a direct focus on using Information Technology (IT) across all subject areas to a broader focus on project-based learning that enables students to connect cross-disciplinary learning. That shift in emphasis came directly from Adrienne's going to the conference. It also aligned with pedagogies within the Quality Teaching model that foster the connection of students' knowledge with contexts outside of the classroom. Additionally, when Adrienne came back from the mathematics conference, Parramatta Regional Office was also working with project-based learning and the stars were aligned for these factors to meld.

The progression in Adrienne's professional learning went from individual learning plans to research to project-based learning to cross-curricular work. The newly evolved direction had an impact on the future as one consequence of Adrienne's experiments

with Year 8 was the creation of the school plan for project-based learning for Year 7 in 2009. The research and website information informed that planning. Research about authentic learning, about the central purpose of education, about critical thinking, has moved the pedagogy away from an emphasis on rote learning. Adrienne confirms that she still sees a role for rote learning but adds:

The problem solving skills of our students needed improvement. I was sensing that our students were not doing what they needed to do. To me, this tapped into the idea of applying learning, extrapolating information, using critical thinking skills and learning how to manage a project. It moves from boring textbook mathematics. (Adrienne, October 2008).

The next step in August 2008 was a large one, involving a strong emphasis on student self-direction for Year 9 in a statistics project. Adrienne described the step, saying:

The first idea was to give them the project, tell them what to do and they'd just find the mean, mode, median and so on. On thinking about that, I decided that didn't do much. So we went to the idea of the students developing their own concept. It's really the whole scientific process, of the students coming up with the research question and their survey. (Adrienne, October, 2008).

After developing the question and making a survey, the students' task was to complete calculations on the survey data. In all, there were 210 students in groups with a maximum of four in each. For Adrienne, the development of the question and the conclusions about what a student could do with the information were the most important parts. The process of developing the research question differentiated between ability levels but produced rewarding outcomes in the quality of the work and the collaboration of the members of the team.

Another teacher, Pat, was the initiator of the next step: creating a wiki^[2]. It has been hosted on an external site because the school intranet lacked the flexibility that the staff needed. Consequently, the school technical support began to investigate making the school site more flexible. As Adrienne demonstrated the wiki site (during an interview), she spoke excitedly about the project:

The students had the September holidays to come up with a research question to meet the criteria of having relevance to their lives. Questions varied with examples such as most and least favoured music; or the community impacts of the most attended sporting venues. The range of questions has just been phenomenal. It's just exploded. The things the students are coming up with are so inventive. For me, I have the capacity to be in the discussion and tell the students they've a great idea but get them to think how they would really use their question. On the site there's a guideline, links and information, for example, how data is used and how to do graphing. The rubric took me a lifetime to prepare! (Adrienne, October 2008).

The website helps students create predictions and critically analyse data with the purpose of influencing a group of readers. After designing questions and survey, the students complete mathematical calculations, in the understanding that the task is about how the data is presented. In their folders, Adrienne provides ongoing feedback. Her questions to students were of the type: 'Why would you ask this question? Who might you be able to influence with the results?' She described one of the groups, trying to solve a traffic problem in this way:

There's one group of kids in my class who struggle to pass. Their recent conversations were about getting in touch with the local council about a traffic issue that is the centre of their research question. The group's original survey questions were about crashes but I talked with them about the possibility that this is really about traffic congestion, not about crashing. These students who can barely pass mathematics have come up with a problem area, relevant for them. They've come up with suggestions about the problem of the traffic. It's phenomenal the way they are thinking. They've got pros and cons about solutions: make two lanes, move the traffic lights or move the petrol station.

Their ideas are great. However, as it's all of Year 9, other mathematics teachers are involved and they're a 'bit anxious.' It's very new and our mathematics meetings every three or four weeks support that process. All the teachers need to do is get online but that does not come easy to some. There have been issues about 'what happens if they copy, or what happens if they don't contribute to the group?' Overriding this, the learning experience that students are having is phenomenal. They've discussed more mathematics since the project began than they've discussed in their entire lives. It's changed them. I saw two students this morning running across to the library. I said yesterday that I wanted them to do a task overnight and they probably didn't do it. They were going to the library to catch up and complete it. And I thought 'If it were ordinary homework they probably wouldn't do it.'
(Adrienne, October 2008).

This comment from Adrienne shows her engagement in substantive communication with the students, in the terms outlined by the Quality Teaching model (2003). This is active co-construction of knowledge. There are issues related to other teachers entwined in this comment. However, the overall impact is the strength of the students' learning, with the discussion of mathematics and the desire to complete work that they are enjoying.

Adrienne, and following her lead, Pat, have been in to other teachers' rooms, helping them. The other teachers asked for that, in the process of letting go the direction of the learning. Adrienne and her colleagues have reached a point where they understand the implications of what they are setting in place for students. They have planned to work across classes in 2009, with students in the top class interacting with students in lower streams and each bringing their own skills.

The other idea from the conference was learning journals. Learning journals are explored by teachers so that students might actively construct meaning from reading material (Mills, 2008). The act of writing is itself a problem-solving process, with decisions made about organising and reviewing, applying information to personal experiences and critiquing that information. After Ros' work with her Year 12s in 2007, Adrienne found herself with a Year 12 class that was quite bright but disengaged. Being unable to get the results from them, she decided to change tack away from repetitive learning to learning journals. She set her students the task to write what the prior knowledge was in order to do the day's work. As she discovered, that had implications for her teaching. Adrienne had to ensure that she planned in a similar way in terms of the prior knowledge. The Year 12 students who used the journals said it was really valuable. Since this experience, Adrienne has been reflecting on the broad picture of disengagement in students. Accordingly, she met with the Year 11 teachers and discussed the potential of learning journals. Acting on the momentum from that meeting, the Year 11 teachers planned that the last five minutes of the day would involve journal writing on what the students needed to know to complete the day's work. The implication is that the teachers also will need to make an adjustment in their teaching.

Discussion

One of the most obvious results of this study is the positive benefit of having three years because it allowed time for Adrienne's ideas to change and evolve, initially towards project-based learning and, more recently, to learning journals. Her professional learning was self-determined and the literature confirms the effectiveness of such a direction (Campbell, McNamara & Gilroy, 2004). If momentum had been stopped, it is likely that Adrienne's reflections on her practice would have been hindered. Accordingly, her practice could not have brought about the increased levels of engagement of students and the stimulus to other teachers on staff that aligned with the ideas of de-privatising teaching (Wilson & Berne, 2000) and having shared meanings about what teachers learn (King, 2008).

This case study confirms key points in the literature about professional learning (Meiers & Ingvarson, 2005). Foremost among these principles is that content of professional learning should focus not only on what students are to learn but also on how to attack the different problems that students may have in learning the material. Adrienne identified a need for students to develop critical thinking. Her professional learning journey has been to improve the ways in which she managed this need and her chosen approach has brought significant new directions in pedagogy to the school.

There were other contributing factors, such as the change in school leadership and the system support that encouraged the journey that she had begun. Her original desire to engage her students through the increased use of technology in her pedagogy was directly related to attendance at the MAV conference at the end of 2006. She wanted to tap students' background knowledge, or 'funds of knowledge' (Moll, Amanti, Neff & Gonzalez, 2001). However, the practicalities of her workplace, along with the fact that the conference exposed her to more than just an increased use of technology, prompted

a change in direction. At the conference, the seeds of a pedagogy using project-based learning were sown, and, fortuitously, the Parramatta Regional Office was simultaneously exploring project-based learning.

The lens of *Quality Teaching (2003)* opens several channels for discussion of this data. The impact on student engagement from Year 9 students designing their own research questions has been powerful. Students have responded wholeheartedly to the opportunity to learn what makes a good research question, how to design a survey to draw out responses and how to use the data. The wider implication is that students have found this approach to learning relevant and challenging. On the school website they reflect on what they have learned (observed during interview October 2008). As a consequence, the school has decided to adopt project-based learning for Year 7 students in 2009. This decision represents a major shift in approach as a result of the initial work of one teacher and subsequently her colleagues in the mathematics staff. The proposed plan is for students to engage with projects that have a cross-curricular focus. If the Year 7 students take up the challenge as readily as the Year 9 students have done, the response will be a strong endorsement of the project-based learning approach in terms of the element of engagement.

Conclusion

This study underlines the value of time spent in achieving learning goals (as was found in Meiers & Ingvarson, 2005). Adrienne, first at the conference and then back with the staff, was energised to try new approaches in the classroom and share the results with her colleagues. When she used the intranet for more open communication about lesson strategies and explored ways of engaging students in learning through projects and learning journals, she consciously shared her efforts with teachers on the staff. A learning community emerged. Adrienne acknowledged her own vision but always contextualised it within a learning community. She reflected: "Within teams, it is often an individual's dream. Someone goes away, comes back with an idea and galvanises a team." To a great extent, certain themes are common when observing teachers' practice. One of these is the commitment to one another, (as was also found in DuFour, 2004). Throughout the three years, the learning community grew and changed. When funding ceased at the start of 2007, Adrienne still saw herself as part of a faculty that was attempting to change its pedagogy in the school. As she says: 'We're evolving here.' During 2007, the learning community broadened to include technology support staff. With her appointment as Head Teacher Learning Support, she was in a position to effect change with other KLA coordinators. Consequently, her learning community has also evolved over time.

When pedagogy is openly shared, another impact is on the positive effect on teachers' working environments. The experience of the Year 9 mathematics teachers has been one where they felt comfortable asking other teachers to come into their classrooms to assist them with the wiki technology and to assess responses to the authentic experience. Such requests confirm the growing confidence of the learning community of teachers. Collectively, they are endeavouring to use the element of setting high expectations (from the *Quality Teaching* model) for their students. For the staff as a

whole, other teachers, outside of mathematics, see the outcomes of the actions and discussions of students and teachers. As the staff moves forward, the mathematics staff uploaded some valuable examples from class projects. The teachers working with Adrienne have put links to websites for students' use. Packages of 'need-to-know' information have developed into learning modules. The impact of the staff sharing feedback regularly has been that teachers have observed the ongoing experience in the middle school years. It has raised questions that have led to professional conversations both at organised meetings and informally. The implication is that positive effects follow from teachers freely choosing to collaborate towards the success of project-based learning.

None of these impacts would have occurred if the professional learning had ceased to operate when the funding ceased. A simple timeline in Table 1 shows this. After Adrienne and Ros attended the MAV conference, initial experiments with intranet communication occupied the first three months of the following year. Teachers began to explore online topics and Adrienne modified some work for students with special needs, sharing her approach with others. Ros tried out a learning journal approach. It was not until some seven months into the year that Adrienne tried having her Year 7 class using an online discussion board for her Year 12s. In term 4 2007, three months later, she ran the project with Year 8 that expanded into her journey with Year 9 in 2008. Could progress realistically have been expected within 12 months? The gestation period for the project-based learning approach was almost two years and the fruition only visible in the third year.

The persistence of a teacher in her own learning pathway has had significant effects on the learning community – students and teachers - in her school. Professional learning can be short-changed by inadequate support. Similarly, the professional learning that has taken place could not have proceeded any faster than its natural pace. The practices that have been explored, repeated and refined take time. Moreover, this improvement in pedagogy is not a solo effort. It is a collegial endeavour and, for that to occur, there also has to be time for other teachers to see the effect of the changes on students, ask to go into classroom to see the changes in action and decide to become part of a culture change in teaching practice.

For the initiating teacher, it is clear to see the impact on practice when new decisions are informed by reflection on action. Throughout this journey, Adrienne has been open to change, embracing the possibilities of a learning environment where the Quality Teaching element of student self-regulation is paramount, encouraging student participation in the wiki, valuing the contributions to the discussion that students made. Her mathematics teaching practice focuses strongly on the elements of fostering deep understanding and higher order thinking. The atmosphere she has created in her classroom allows students to take risks as they develop projects relevant to their lives. It is equally clear that short term funding is wasteful. For schools to replicate the successful outcomes of this teacher and the community that has been influenced by her, they must allow the time and extend funding to enable such improved pedagogy to bear fruit.

Endnotes

- [1] Productive pedagogies are effective teaching strategies that support intellectual quality, connectedness, a supportive classroom environment and, recognition of difference.
- [2] A wiki is a website that allows the creation and editing of interlinked web pages via a web browser. Wikis are often used to create collaborative websites, to develop community websites, for personal note taking and in intranets (<http://en.wikipedia.org/wiki/Wikis>).

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