

TWO RELATED APPROACHES TO TEACHER PROFESSIONAL LEARNING IN THE ASIA PACIFIC REGION

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This paper examines the similarities and differences between two successful programmes of teacher professional learning. Firstly, Lesson Study developed in Japan over 40 years ago. It examines practice either through direct observation or through classroom artefacts and case studies. It assumes that teacher learning will be more meaningful and effective if embedded in their everyday work. The core of the process involves working on focus lessons, thus providing a meaningful context for non-threatening lesson observation, and promoting greater collaboration within the group and wider mathematics staff. In Australia, the Lesson Study Project was a state-wide government secondary schools initiative conducted by New South Wales Department of Education and Training for mathematics teachers. It began in 2001, and continues to function even after the ending of direct support from the Department. Secondly, the "Active Mathematics in Primary Schools" (AMIC) Project involves Brunei upper-primary teachers in a large-scale professional development project aimed at assisting them to move away from traditional teacher-centred practices towards methods that engage their students actively in the learning process. In the AMIC Project teachers participate in nine workshops whose content, structures, and materials were fully developed by primary teachers in Brunei Darussalam. Each workshop deals with a "basic" topic nominated by primary teachers in Brunei. After participating in an AMIC workshop, teachers are expected to apply associated ideas in their own classrooms and then report their findings at the next workshop. Because the first major application of AMIC in 2004 proved highly successful it has been continued in 2005.

Teacher Professional Learning

Over the last twenty years, while there has been a focus upon the student, there has also been an acknowledgment that student learning was not likely to improve markedly until teachers were given the opportunity and the support to further develop and increase the effectiveness of their skills. In varying degrees educational authorities have provided opportunities to assist this development of teachers. However, what seems a simple aim was far from simple when put it into practice. Authorities were confronted with a choice from a host of available models that reported varying degrees of effectiveness and success. Not all models are successful. For example, a recent New Zealand programme was not successful in spite of using popular current processes and strategies such as: meetings with teachers; mutual peer observations and reflection of each other's teaching styles; mentoring of teachers in their own classroom on a one-to-one basis; and the provision of 'readable' literature from research digests. The evaluation report for the programme stated:

In conclusion, the results indicated that all these teachers believed professional development was important and should encourage them to critique their own teaching, challenge their assumptions, and try out new ideas. In reality, the evidence was contrary to these beliefs. All the professional development strategies proved difficult to implement, and there was no indication that any of them were of significant use in the short term, as no teaching was being critiqued or challenged. Some new ideas were assimilated into the lessons, but as an addend rather than as substantial changes in the teaching (Kensington-Miller, 2004, p. 326).

While the evaluation indicated that the teachers were willing to engage in professional development, it reported a number of implementation difficulties, which needed to be overcome before

significant progress could be made and teacher change accomplished. In particular, the issue of teacher's time commitments was highlighted because of the impact upon the development of the learning community. Earlier researchers such as Campbell (1985) noted four *kinds of time* when discussing professional learning of teachers in schools. They were *group time* (for collaborative planning), *snatched time* (for hurried consultations), *personal time* (out of school time for reading or attending courses) and *other contact time* (preparation or release time). Campbell noted that release time was more frequently used for preparation or marking rather than collaborative planning. So unless the professional teacher learning model focuses upon collaborative planning, it is unlikely to happen.

The issue of community of learners or learning culture is important in the understanding of many current models. It helps distinguish between the current use of the title teacher professional learning rather than professional development because the latter term is too closely aligned to earlier models of training (in the 1950s and 60s); in-service education (1970s and early 80s); and the whole school pupil-free day approaches (1980s and early 90s) (McCrae, Ainsworth, Groves, Rowland, & Zbar, 2001). Generally, the difference is that teacher professional learning concentrates upon the development of a learning community approach that is an on-going process rather than a series of 'top ups' (Hawley, & Valli, 1999), with schools and teachers making their own choices that are aligned with central priorities.

If the focus of this paper is limited to current models of teacher professional learning, then it is important to attempt to ascertain what particular aspects contribute to making a programme a success. And while success is ultimately measured in terms of improvements in student learning outcomes, other measures involving changes in teacher mathematics content knowledge (MCK), mathematics pedagogical content knowledge (MPCK), and

mathematics teaching practices (MTP) may also be used. The two approaches that this paper will examine and discuss are the *Lesson Study* approach that was implemented in Australia and the *Active Mathematics in Classrooms* (hereafter referred to as “AMIC”) that was implemented in Brunei Darussalam.

The New South Wales Lesson Study Programme

The Lesson Study programme belongs to a tradition of teacher professional learning that concentrates upon an examination of practice through the direct observation by colleagues of each others’ practice, through the examination of classroom artefacts, or through case studies of teachers by teachers (Stigler, Gallimore & Hiebert, 2000). The Lesson Study program originated in Japan (Stigler, & Hiebert, 1999) and is a model that has manifested itself in various ways in countries such as USA (Fernandez, 2000), Australia (White & Southwell, 2003), and Malaysia (Chiew & Lim, 2003).

The New South Wales Department of Education and Training in conjunction with the Australian Quality Teaching Programme (QTP) supported the project which began in 2001 and was extended to over two hundred secondary schools from across the state by the end of 2004 when funding for the project was stopped. The program was designed to assist teachers produce quality lesson plans while gaining a better understanding of student learning in mathematics across Years 7 to 12. It had a secondary aim of encouraging the implementation of a new syllabus which contained a more ‘constructivist’ pedagogy. Secondary schools volunteered to join via their District Mathematics Consultant for a six month programme. The process involved a voluntary small group of teachers under the coordination of an elected team leader that met regularly (1-2 periods per week) to plan, design, implement, evaluate and refine lessons for a unit of work that they had selected. The process encouraged classroom observation by team members and collaborative work practices. The team could invite outside expertise

if they so desired and the overall coordination of the project was assigned to one officer within the New South Wales Department of Education and Training. This officer organised an initial introduction session to the program, provided some written material and resources and constructed a website to publicise the work of each team. This allowed schools to share their work and to further publicise the programme. The team was also assisted by the provision of funds to obtain casual relief teachers and to purchase resources for the period of six months.

A key assumption of the programme was that teacher learning would be more meaningful and effective if it was embedded in the teachers' everyday work, or that of their colleagues (Lieberman, 1996). The key principles of the programme have been listed by Stigler and Hiebert (1999), as (a) it is a process based on a long-term continuous improvement model, where change is incremental; (b) it uses a local school context and maintains a constant focus upon student learning; (c) there is a direct focus on the improvement of teaching and not upon the teacher; (d) the process used is collaborative in nature where improvement is the work of the teacher; (e) it builds teacher perceptions of contributing to the development of knowledge as well as their own professional development; (f) the process builds a system that can learn from its own experience.

Thus Lesson Study promotes a process whereby teachers experience gradual and incremental professional growth through the collaborative development of lessons. Teachers and schools could build a bank of valuable resources that could enrich teaching and learning programmes and be shared with other teachers undertaking a Lesson Study project. However, Lesson Study is not aimed at producing a library of tried and tested lessons, but is more concerned with engaging teachers in the process of planning, teaching, observing, discussing, and reflecting upon the lessons.

Summary of Lesson Study Evaluation Results

The programme was evaluated using the five critical levels of professional development evaluation proposed by Guskey (2000) and was initially carried out during 2002 (White & Southwell, 2003) with a follow-up study conducted during November 2003 (White, 2004b). The levels are: Participants' reaction; Participants' learning; Organizational support and change; Participants' use of new knowledge and skills; and, Student learning outcomes. The data collection techniques employed involved questionnaires and a number of telephone interviews. The questionnaires were designed to cover each of the five critical levels of professional development proposed by Guskey (2000) and contained a range of closed questions scored on a four or five point Likert scale and open-ended questions which invited an extended response. The initial evaluation stated:

In summary the *Lesson Study* program was experienced by teachers as a powerful process for guiding them towards new practices and dispositions. The programme united an examination of practice with commonly accepted features of quality teaching and learning to create a well-defined and structured process. The core of the *Lesson Study* programme involved working on focus lessons, a process which was natural, useful and easily sustainable by teachers. The programme provided a comfortable forum for teachers to challenge ideas about their practice and the content that they taught. The programme provided opportunities for the system to learn from its own experience and fitted comfortably into the secondary school structure. The programme was efficiently and effectively supported by the project officer (White & Southwell, 2003, p.3).

White's (2004b) follow-up study dealt only with the 2002 participants, where the support had ended either twelve or eighteen

months previously. He postulated that the success of the scheme would be reflected in the number of schools and teachers who were still using the Lesson Study process after the support had been withdrawn. Although suffering from a poor response rate, he reported that a high number (90%) of the respondents still used what they had learnt during the Lesson Study programme. Their comments reflected the development of learning communities within their staffrooms:

For all groups and across all the surveys, participants continually highlighted and commented on the use of collaborative work, working on common goals, sharing of ideas, team teaching and co-operation among staff as of primary importance. Some reported that the Lesson Study process had been their first experience of collaborative planning and teaching. They found that the discourse in the staff rooms developed a focus directed to a greater extent on issues of teaching and learning. Their colleagues showed more willingness to share ideas. Teams were able to discuss and resolve differences through the focus on the lessons. Teachers expressed in various ways that “teachers getting together and working on a common goal is very satisfying especially when their efforts can later be shared” (White, 2004b, p. 337).

The evaluations reported changes in teacher MCK, MPCK, and MTP as a result of the programme and that the collaborative practices continued beyond the cessation of support.

Background to AMIC

The AMIC programme was a joint initiative between the Ministry of Education (MOE), and staff from the Sultan Hassanal Bolkiah Institute of Education (SHBIE) of the Universiti Brunei Darussalam (UBD). AMIC aimed to provide ongoing professional learning that would generate committed and enthusiastic upper-primary mathematics teachers who would strive to extend their MCK,

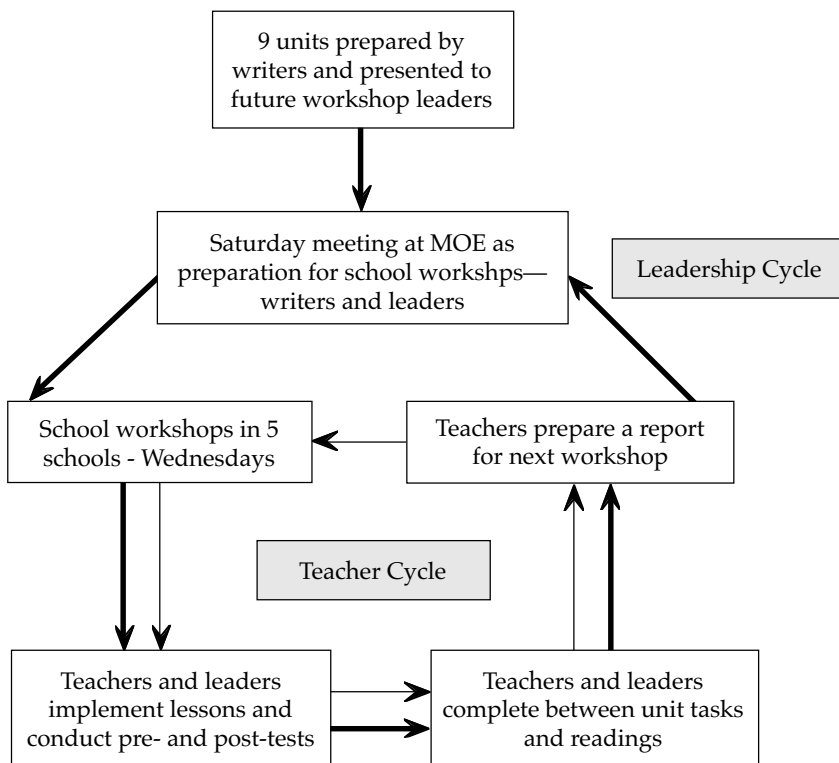
MPCK, and MTP in ways that were consistent with research. The design for AMIC (see Figure 1) was adapted from a successful Australian programme of the middle- and late-1980s called “Exploring Mathematics in Classrooms”, which itself was an adaptation of an “Early Literacy In-service Course”.

The Writing and Leadership Cycle

In July 2003 a group of teachers were identified as prospective workshop leaders. These prospective leaders were all experienced teachers working in government primary schools. They selected eight mathematics content topics, from a list of 14 topics that were prepared by Professor Clements after consultation with 14 practising primary teachers enrolled in a degree programme at UBD. In addition to the eight topics selected, the leaders requested that workshop notes and materials be developed for another content area.

The 14 practising primary teachers who were enrolled for an upgrading B.Ed programme at UBD became the “writers” in this programme. They developed, trialed, and revised AMIC workshop notes and materials for the nine topics, under the supervision of Professor Clements. After completing the workshop units, the writers then trialed them with the workshop leaders. Following the trials, the materials were revised and published by the Ministry of Education (Clements, 2003).

The 10 workshop leaders were divided into 5 pairs, each pair was responsible for the AMIC program at one location. Four schools were selected for each location, usually a school of a leader. It was expected that this pairing of leaders would promote collaboration among the leaders themselves. The MOE organised Saturday afternoon leaders’ meetings between AMIC workshops (held on Wednesdays), which facilitated the distribution of resources and enhanced collaboration between the leaders. At the Saturday



meetings, the leaders took turns in leading discussion sessions on what needed to be done for the next AMIC workshop.

Figure 1. AMIC cycle for leaders and classroom teachers (White & Clements, 2005, p. 152).

The Teacher Cycle

Four teachers from each participating school attended the AMIC workshops which were intended to provide a non-threatening forum. After participating in a 2-hour workshop teachers returned

to their schools to implement the new content, materials and teaching strategies arising out of the workshop. They prepared a brief statement on their findings and gave a "joint school report" of their progress at the following workshop. Since, AMIC teachers within a school team-teach and observe each other teaching. They discuss and interpret data, jointly carry out their "between-unit" tasks and prepare the "joint school report" for the next workshop. The first set of AMIC workshops took place on Wednesday afternoons between July and October, 2004, at five government primary schools. Altogether, 60 upper-primary teachers participated. There were 12 teachers (4 from each of 3 schools) and 2 leaders associated with each particular workshop location. The 12 participating schools were selected by MOE personnel and participating teachers were selected by the heads of participating schools. At the outset it was made clear to participating teachers that they should attend all workshop sessions. In addition, they would be expected to carry out all between-unit activities, including classroom tasks and between-unit readings after each workshop. They would also prepare a school report on the between-unit activities for presentation at the next workshop.

Summary of AMIC Evaluation Results

The evaluation of the key tenets of the AMIC program (White, 2004a) of capacity building, local context based involvement, and collaborative partnerships were identified and reported as being successful by all three groups (writers, leaders and teachers) in the project. However the study found that the commitment of school leaders to the programme was, in some cases, less than whole-hearted.

Within the context of AMIC, the 14 writers, greatly enhanced their confidence, leadership and presentation skills and exhibited a significant development in their MPCK, MTP and MCK. They

reported that their rich exposure to all 14 units enhanced their professionalism, and made them feel that they had become a unique group of experts.

The group of 10 leaders also developed and grew into a strong nucleus of experts and leaders. At first, the 10 workshop leaders were very reticent and hoped to present only one workshop unit, at each of the five school locations. As the project progressed and with the support of the Saturday meetings, the leaders developed an increasing sense of expertise and ownership of the programme. They began to speak highly of the programme and were proud that they were AMIC leaders. This is well supported in the research literature, for example, it has been reported that teachers who “plan together, observe each other, and diagnose and evaluate students together are apparently happier with teaching as a profession than those who do not have such opportunities” (Noddings, 1992, p. 204).

The 60 teachers spoke enthusiastically about their students’ reactions to AMIC workshops, and the improvement in their own understandings. The degree of learning of individual teachers depended on the particular school at which the teacher taught and the teacher’s commitment. Interviews revealed that although they enjoyed the opportunity to experience fresh ideas and to collaborate with other teachers, some had mixed feelings about the value of AMIC. In particular, Primary 6 teachers’ enthusiasm was tempered by the spectre of looming national school examinations. They felt concerned that AMIC activities prevented them from using every available minute of class time for examination practice. The two most common complaints were the lack of time and a concern over the number of activities that had to be completed each week. Classroom observations and interviews with teachers and students suggested that some of the new knowledge and strategies were being integrated into other areas of the primary curriculum. For example, structures of group-work activities at Wednesday

workshops were sometimes adapted to discipline areas other than mathematics. In the Wednesday reports, teachers discussed the use of groups and difficulties (e.g., discipline) they experienced, and their strategies for overcoming these. Collegial professional conversations facilitated the sharing of teachers' assessments of their students' work and also encouraged the growth of these skills (Bryant & Driscoll, 1998).

The effect on student learning was not evaluated, although teachers have conducted their own class pre- and post-teaching assessments for each unit, and the data were incorporated in reports given at Wednesday meetings.

To expect immediate gains was unrealistic for two reasons. First, since the tests comprised skills-based activities, often they did not measure the conceptual understandings that the AMIC Project is hoping students being taught by AMIC teachers will achieve. The teachers who constructed the tests cannot be blamed for this: the national end-of-primary school examination emphasises skills, and since it plays such a crucial part in teachers' thinking, teaching and planning, they can be excused if they employ skills-based teaching that does not generate understanding.

Second, it is unrealistic to think that two hours of engagement in an activity will undo years of a particular pattern of teaching and learning. Time is needed for teachers to develop the MCK, MPCK and MTP that are associated with the workshop units. It is not easy for teachers who have been emphasising the acquisition of skills for many years to begin to want to develop new teaching repertoires, and to be convinced that helping students understand mathematics ultimately "saves time." (White & Clements, 2005, pp. 156-7)

A major reason often overlooked, for poor mathematics learning in secondary school is the limited levels of mathematics knowledge and skill that most primary teachers have. It is important to have a primary class being taught mathematics by a teacher who has some

depth of knowledge, who can stretch the high achiever and yet be clear and focused in developing concepts with a slower child. It will be several years before a well-considered verdict on whether, indeed, AMIC is able to generate this type of teacher.

Conclusion

Zeichner (2003) in a review of professional development research reported that "a 'training model', unconnected to teachers' daily work and disrespectful of teachers' knowledge, continues to persist as the most common form of professional development for teachers in the USA" (p. 301). In contrast is the reported effectiveness of both the Lesson Study and AMIC programmes. They take an alternative view by valuing and empowering the teacher. Both the AMIC programme and the Lesson Study programme were regarded by teachers as effective vehicles for guiding them towards new practices and dispositions. The programmes united an examination of practice with commonly accepted features of quality teaching and learning, and followed well-defined and structured processes. The programmes engaged teachers in weekly sessions, a process that was natural, useful and, in most cases, sustainable by the teachers. The programmes provided comfortable forums for the teachers, to challenge their ideas about classroom practice and the content that they taught. Jaworski (1994) has pointed out, teachers who discuss their thinking with other teachers frequently clarify objectives and teaching practices. Both programmes provided opportunities for the various systems to build capacity and they fitted comfortably within the existing school structures.

Often teachers who are asked to change features of their teaching merely modify the features to fit with pre-existing classroom systems. The system assimilates individual changes and swallows them up so that surface features change but the fundamental nature of the teaching does not and improvements in student learning fail to materialise (Stigler & Hiebert, 1999). Thus, success or failure of

professional learning programmes like AMIC or Lesson Study depend on whether changes in the knowledge, teaching practices, and attitudes of participants are deep or merely surface-level. It is only deep-seated learning that is likely ultimately to transform the manner in which the teacher teaches mathematics and the manner in which the teacher's students learn their mathematics.

Building capacity among teachers and focusing that capacity upon students and their learning is the crucial factor in improved student outcomes. But what is it about AMIC and Lesson Study that sustains the continuous learning of teachers for the purpose of enhancing student learning? While all aspects of the programme are important, there appears to be three key features that are of greater importance. Firstly, both programmes have a solid foundation built on a long history of success. Lesson Study emerged after the second world war from the Japanese reconstruction and has spread around the world whereas AMIC was the child of two highly successful Australian programmes. The second key component is the strong focus on the development of the learning community. This environment of non-threatening, supportive and collaborative relationships was a strong feature of both programmes and is the feature that draws the greatest number of comments from teachers. The third feature is concerned with empowerment and ownership. In the Lesson Study programme this was developed through the voluntary nature of the programme and the focus on the local context where the teachers made the decisions about the direction and content within the process. The AMIC programme yielded further data on this feature. The writers and leaders became 'experts' who were highly committed because they had the opportunity to rehearse, repeat and discuss the material and issues to a much greater extent than the teachers. This form of systematic reflection that is also present in the Lesson Study process through the refinement of lessons helped to build a sense of competence and ownership. The New Zealand program that was not successful

reported interference with the community building due to lack of time (Kensington-Miller, 2004).

Further follow-up evaluations of both Lesson Study and AMIC should provide further understanding of the success of these two teacher professional learning initiatives.

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