LESSON STUDY AND INSTRUCTIONAL IMPROVEMENT IN SINGAPORE

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A PROJECT ON LESSON STUDY carried out in 2006 and 2007 aimed to find out how it can be used to bring about enhanced teacher learning and instructional improvements. This two-year intensive collaboration between researchers and a local primary school involved planning, teaching and observing research lessons together, as well as studying the processes of school-based curriculum development and teacher learning. The challenges of implementing lesson study in the Singapore context and its evolving local adaptations were carefully documented and analysed. We found that with strong school support, lesson study could bring about continual instructional improvement and a sense of community among the teachers, even though its time-consuming nature may pose numerous challenges for the teachers and schools.

INTRODUCTION

Lesson study has been credited with changing Japan’s classroom practices from being teacher-centred to student-centred, resulting in decades of steady improvement in elementary education. It represented the teachers’ school-based efforts to realize their vision of student learning and long-term development (Lewis, Perry, & Murata, 2006). As recent educational reforms in Singapore call for improved instructional practices and school-based curriculum innovations to nurture engaged learners, lesson study is a potentially powerful tool in achieving this vision.

KEY IMPLICATIONS

- To bring about instructional improvement through lesson study, curriculum specialists, teacher educators and researchers need to work with schools to make knowledge from the different communities available to teachers.

- Lesson study teams can be important sites for inducting and mentoring beginning teachers. In this project, the beginning teachers who taught the research lessons found themselves acquiring deeper learning and faster growth than other team members.

- For lesson study to be scalable and sustainable, schools must move from implementing the surface features of lesson study to enhancing the disciplinary and subject-matter levels of the lessons as well as the observation skills of teachers.
This intensive school-based intervention, funded by the Centre for Research in Pedagogy and Practice at the National Institute of Education (NIE), used lesson study to build a community of practice (Wenger, 1998). We brought together the knowledge residing in different communities—researchers, teacher educators, curriculum specialists from the Ministry of Education (MOE) and teachers—to support the demanding work of designing and implementing research lessons.

Over the 2 years, from 2006 to 2007, we worked in teams in the pilot school and collaboratively designed, taught, observed and reflected on 20 live research lessons in 5 subject areas (Mathematics, English, Science, Social Studies and Physical Education) and the 3 mother tongue languages (Chinese, Malay and Tamil) across all 6 grade levels.

The improved versions of each research lesson were taught and discussed again. Intensive training workshops for teacher participants were provided in both years and sharing sessions with teachers inside and outside the school were conducted at the end of each cycle (semester).

The project allowed us to experiment with and study local adaptations of the Japanese lesson study cycles. It provided us with rich documentation of how different teacher teams navigated the full cycles of lesson study and how the processes impacted on teacher learning.

RESEARCH DESIGN AND METHODOLOGY

We adopted a design-based research model that involved researchers and practitioners collaborating in building a new school-based learning environment for teachers and students (Brown & Campione, 1996).

Research on design and implementation involves documenting change over time. We used a mixed approach in data collection. End-of-cycle surveys and pre- and post-tests of students enabled us to obtain a quantitative view of the implementation patterns. Interviews, observations and video-taped lesson study activities and research lessons, as well as the accumulated tools and artefacts, provided qualitative data to capture the fine details of the processes.

The following analytical tools were used to examine four dimensions of teacher learning:

1. Survey data was analysed using SPSS to capture teachers’ perceptions of learning and constraints during the participation.
2. Coding schemes were built and the analysis was done using NVivio software to tease out the participation structure, power relations, discourse patterns, flow of information, and knowledge emergence in two case studies.
3. A process analysis framework was developed to illustrate the instructional improvements in four math research lessons on equivalent fractions, which were designed and taught across two cycles.
4. A video case was developed to document the learning process involved in one math topic (long division with remainder) in one lesson study team, which was later packaged as a resource for the continual learning of teachers and researchers.

KEY FINDINGS

Survey Findings

The survey study revealed that the teacher participants had conflicting views towards lesson study. While satisfied with their participation and with how lesson study enabled them to improve teaching and building community, many of them did not believe that all teachers should or would be able to participate in lesson study given their heavy teaching loads and the demand on resources. However, as the process continued, the teachers felt more confident in having their colleagues observe their lessons, and more teachers volunteered to teach the lessons designed by their teams.

Most strikingly, lesson study teams became important sites for inducting and mentoring beginning teachers in the pilot school. Beginning teachers who were courageous enough to teach the research lessons found themselves acquiring deeper learning and faster growth than their other team members.

Case Studies

In the case study of a Primary 3 English team, who used fables to teach inference skills, the teachers had a better sense of how to teach comprehension.
using a rich repertoire of skills and materials—such as directed reading-thinking activities; reciprocal teaching; scaffolding; new types of assessment questions; and various genres of text.

Several factors were responsible for producing effective learning for both the teachers and students involved:

1. A good mix of beginning teachers and an experienced senior teacher in the team, facilitated by an MOE curriculum specialist.
2. Affable personalities of team members who were sensitive to and respected each other’s feelings and ideas.
3. Distributed leadership that encouraged equal and active participation and contribution of ideas.

The case study of two math teams focused on analysis of teacher talk and post-lesson discussions within a cycle and across two cycles. The results highlighted the following changes over the 2 years:

1. Lesson planning shifted the focus from honing instructional strategies to creating meaningful learning experiences and supporting students’ conceptual understanding.
2. Beginning teachers made no less a contribution to the process, and both young and more senior teachers were able to learn from each other.
3. The knowledge contribution from the experienced teachers and subject specialists from NIE was significant in developing the pedagogical content knowledge in the community of practice.

Process Analysis Framework

The analysis of the four research lessons (RLs) on equivalent fractions demonstrated two dimensions of instructional improvements:

1. There was a shift from a single focus on lesson representation in the first cycle (manipulative stage in RL1; and pictorial stage in RL2) to a multi-focus in the second cycle (manipulative and pictorial representation in RL3; and manipulative, pictorial and abstract stages in RL4).
2. There was more progress in mathematical meaning construction and lesson orchestration within a cycle, from the first lesson to its improved lesson, and across the two cycles. The improvements were attributed to enhanced learning tools, increased efficiency in using the tools, more logical orchestration of the lessons, more effective use of teaching strategies, and more appropriate scaffolding of students’ knowledge construction of the subject matter.

Video Case

The video case was intended to be a rich self-learning package for math teachers, teacher educators and researchers. The package contains two DVDs, with a 16-minute documentary of the lesson study processes, carefully identified critical incidents accompanied by corresponding video clips, reflection questions and user instructions. Also included are supporting documents such as full videos and transcripts of research lessons, lesson structures, lesson plans, literature review on long division and related research publications.

The case approach in teacher education was adopted in developing the video case. It represents careful research, design and testing that are both highly conceptual and demanding. These are difficult to achieve by teachers without the active and sustained involvement of researchers and teacher educators.

IMPLICATIONS AND RECOMMENDATIONS

Building Professional Learning Communities

This two-year project aligned the school’s activities more closely to the central focus of improving children’s learning and development. The opportunity to plan, teach, observe together, gather data on student learning, review instructional strategies, and collaboratively build knowledge created a conducive environment for teachers to learn together from failures and to make improvements to their lessons.

Teacher participation in lesson study gradually led to an emerging culture of observing each other’s lessons, which had been non-existent prior to the intervention. The teacher educators and researchers involved also gained a deeper understanding of the knowledge and skills required through working with and learning from the teachers in lesson design and intervention.

These efforts have contributed to a growing sense of a community of practice that has brought together the knowledge of members from diverse communities—NIE, MOE and schools—in pursuit of instructional improvements geared towards students’ learning and development on a sustainable basis.
Redesigning for Teacher Learning

Experimenting with and refining models through iterative cycles is intrinsic to lesson study. The qualitative and quantitative analyses of both the planning and research lessons point to the value of the long planning sessions for community building and developing ideas and tools. However, the time-consuming nature of this phase of work has to be redesigned to better adapt to local school situations.

During the 2 years of intervention, issues which arose at the end of each cycle needed to be addressed in the subsequent cycle(s). This non-linear process indicated that MOE, NIE and schools need to work together and pool resources to make the knowledge available to support teachers in bringing about instructional improvement and deep learning.

With an increasing number of schools trying out lesson study—our most recent survey showed that at least 60 schools in Singapore were trying it out in 2009—there is an urgent need to build capacity via training. Training should focus on the essential knowledge and skills that teachers lack and urgently need to sustain their good efforts and initiatives.

Scalability and Sustainability

The tensions and contradictions that we encountered during the intervention have allowed us to consider how we can sustain lesson study to build teacher capacity for curriculum and instructional change and bridge theory and practice (Fang, Lee, & Haron, 2008; Stigler & Hiebert, 1999).

Riding on the success of the first year, the project scaled the intervention up to the whole school and implemented it as a mandate. With the quick scaling up, it was difficult to broker for additional resources, especially the support of subject specialists for each of the lesson study teams.

With an increasing number of schools embarking on lesson study, there is an urgent demand for resources in order to move schools from implementing the surface features of lesson study to enhancing the disciplinary and subject-matter levels of the research lessons as well as the observation skills of teachers.

REFERENCES


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