

LESSON STUDY FOR MATHEMATICS PRE-SERVICE TEACHERS: THE DUAL ROLE OF THE PARTICIPANT OBSERVER

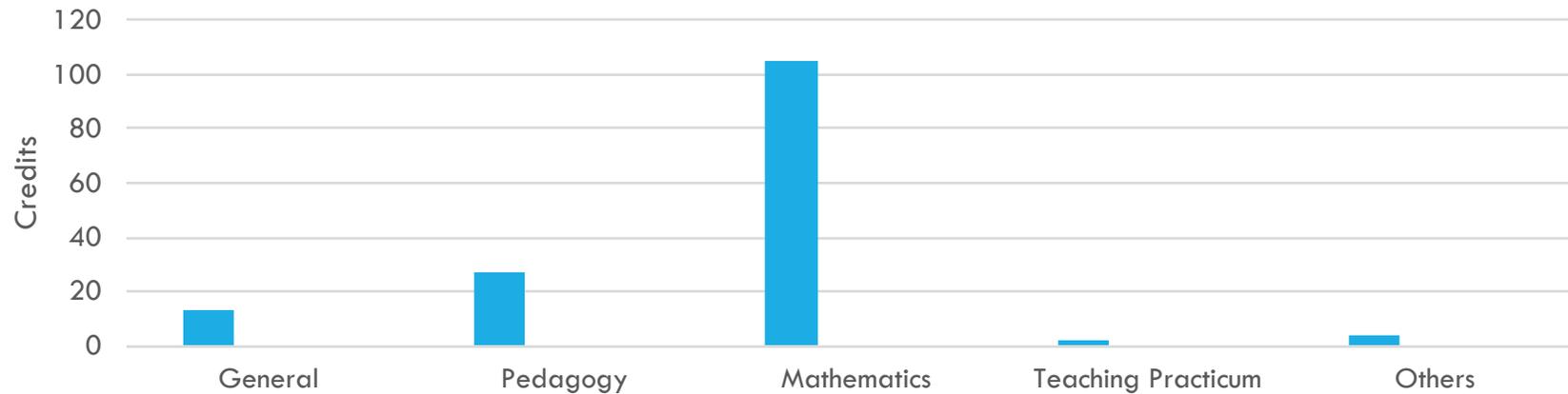
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TEACHER EDUCATION IN INDONESIA

4-year bachelor degree

Curriculum Structure Secondary Mathematics Education Program



LESSON STUDY IN MATHEMATICS TEACHER EDUCATION

Model	Early Childhood	Primary School	Secondary School
On-Campus			Fernandez (2010)
School-based Practicum		Rock (2003) Leavy & Hourigan (2016)	McMohan & Hines (2008) Meiliasari (2013)
Combination	Sims & Walsh (2009)	Corcoran & Pepperell (2011)	Ricks (2011)



LESSON STUDY IN TEACHER EDUCATION

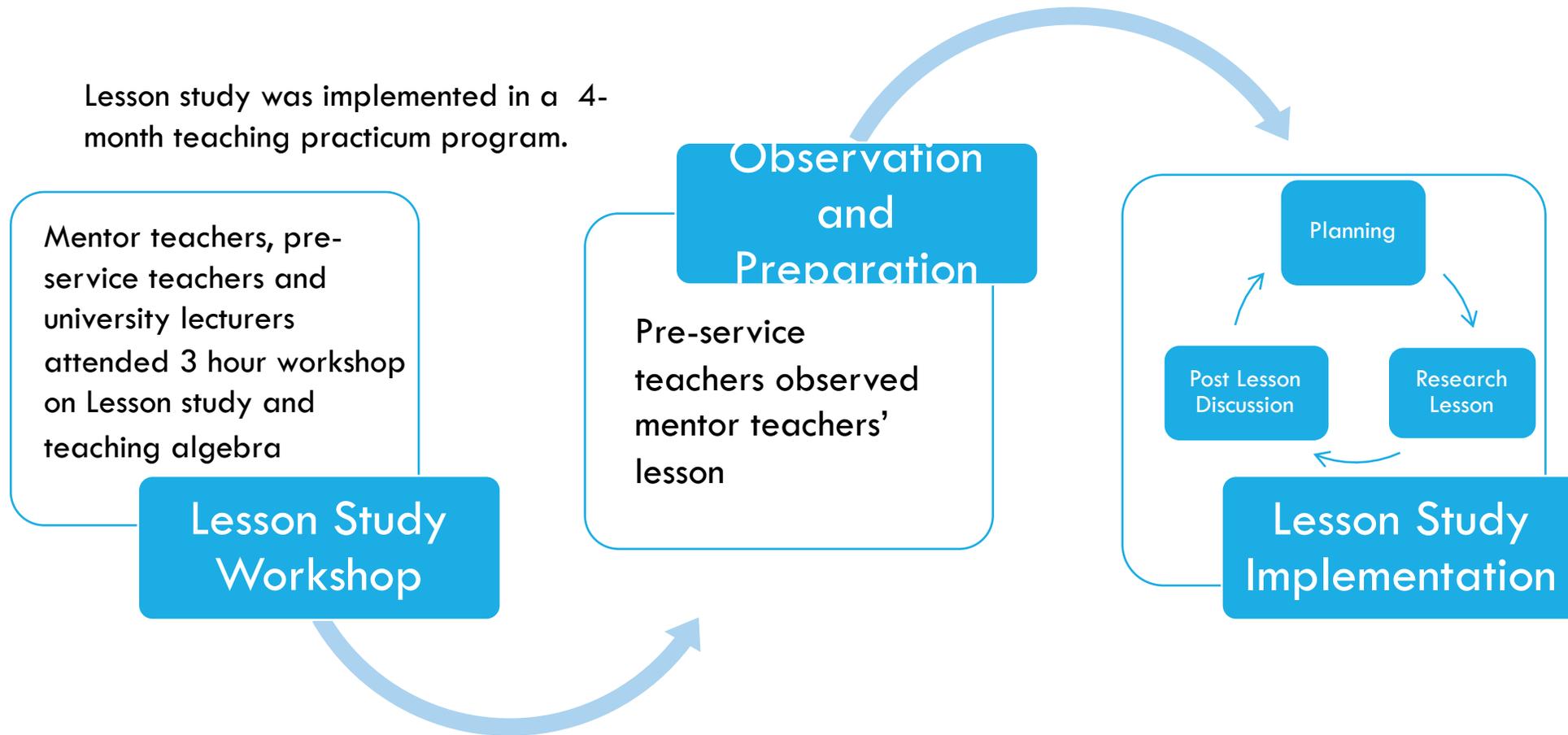
Studies show that the implementation of lesson study in teacher education supported pre-service teachers' focus on the learning process (Fernandez, 2010), students' thinking (Sims & Walsh, 2009), development of pre-service teachers pedagogical content knowledge (PCK) (Leavy & Hourigan, 2016; Fernandez, 2010)

RESEARCH QUESTIONS

1. What changes are evident in pre-service teachers' PCK in algebraic reasoning after participating in a lesson study program while on their school placement?
2. What characteristics of lesson study contribute to the development of pre-service teachers' PCK?
3. What are pre-service teachers', mentor teachers' and university lecturers' views about incorporation of lesson study into pre-service teachers education?
4. What are some of the affordances and constraints relating to the introduction of lesson study into pre-service mathematics teacher education?

RESEARCH DESIGN

Lesson study was implemented in a 4-month teaching practicum program.



PARTICIPANTS

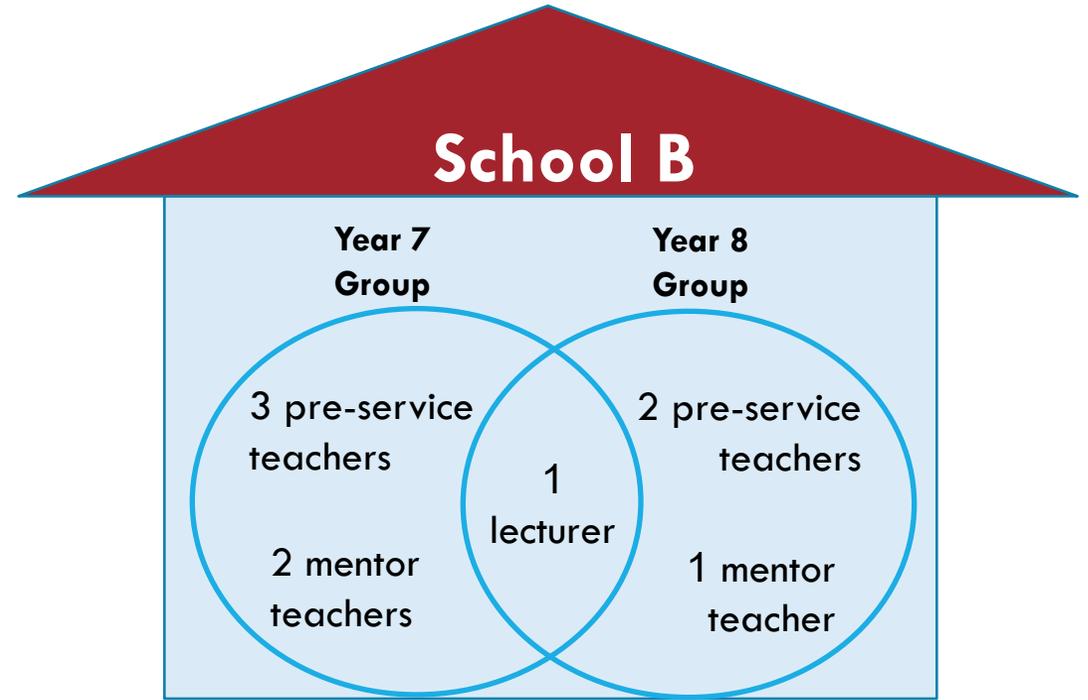
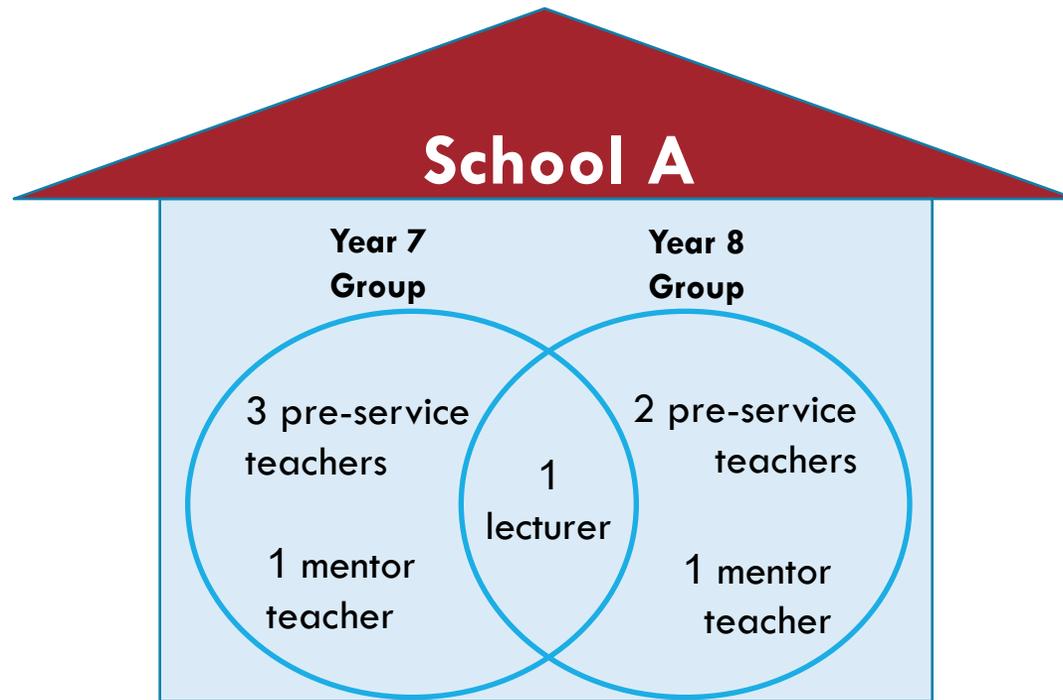
Number of Participants:

Participants	School A	School B	Total
Pre-service teachers	5	5	10
Mentor teachers	2	3	5
University lecturer	1	1	2
The researcher as the knowledgeable other (KO)			

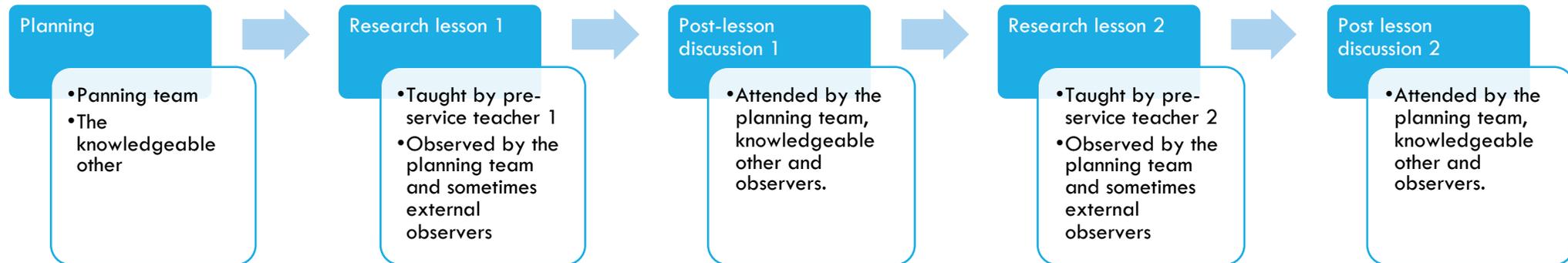
KNOWLEDGEABLE OTHER

The knowledgeable others are sometimes external experts such as outside educators or content specialists who provide feedback on lesson plans, observe research lessons and provide final comments in the post lesson discussions (Lewis, Perry, Hurd, & O'Connell, 2006; Takahashi, 2014).

LESSON STUDY GROUPS



LESSON STUDY CYCLE – 2 LESSON STUDY CYCLES PER GROUP



METHODOLOGY

This study employs *embedded case study design* (Yin, 2014). The case is the implementation of lesson study and a closer look at each lesson study group as the unit of analysis.

DATA COLLECTION

Types of data to answer the research questions

Research Question	Types of Data						
	Written test	Video recording	Interviews	Pre-service teachers' Reflection	Field notes	Lesson plan	Lesson study Artefacts
1	✓	✓	✓	✓	✓	✓	✓
2		✓	✓	✓	✓	✓	✓
3		✓	✓	✓	✓		
4		✓	✓	✓	✓		

PARTICIPANT OBSERVER

	Researcher	Knowledgeable other
Workshop	Conducting the workshop	
Implementation of lesson study	<ul style="list-style-type: none">• Observing the lesson study• Documenting the process• Analysing the data	<ul style="list-style-type: none">• Planning Providing feedback, encouraging pre-service teachers', mentor teachers' and lecturers' active participation <ul style="list-style-type: none">• Research lessons Observing the lessons <ul style="list-style-type: none">• Post-lesson discussions Providing feedback, maintaining the focus of discussions on the student thinking and mathematical content

ESTABLISHING RAPPORT

- Mutual understanding among the pre-service teachers, mentor teachers and lecturer that I would participate in the lesson study as the researcher and knowledgeable other
- The pre-service teachers understood that their participation was voluntarily and would not influence their mark
- During the lesson study, I constantly encouraged pre-service teachers', mentor teachers' and lecturers' active participation

BENEFITS

1. As the knowledgeable other, I directed the focus of the lesson study discussions on students' learning and mathematical content
2. I could capture the “authentic” process which allowed me to improve the data collection and to better interpret the data
3. I learned from one school, and shared the experience with the other school

DILEMMAS

1. Lecturer's role

“I felt helped because you also give them supervision”

2. The knowledgeable other was seen as the “expert” by the pre-service teachers and mentor teachers. With this hierarchical status and cultural norms, the pre-service teachers and mentor teachers tended to be passive participants.
3. Lack of sense of belonging from the pre-service teachers and mentor teachers.
4. To avoid biases in the interpretation of the data, I put on my “outsider” lenses and critiqued my role as the knowledgeable other.

REFLECTION OF THE KNOWLEDGEABLE OTHER

1. The role of the knowledgeable other is very important for the effectiveness of lesson study. the role includes, providing feedback and maintaining the focus of discussions on the student thinking and mathematical content
2. To provide better feedback for the lesson study groups, the knowledgeable other should be informed of the groups' background such as:
 - what resources they use
 - the school's curriculum and academic policy
 - students' prior knowledge

IMPLICATIONS

The knowledgeable other was the key person in this lesson study. For sustainability of lesson study in teacher education, some problems need to be addressed:

1. Can lesson study be successful without the active role of a knowledgeable other?
2. Who can be the knowledgeable other?



THANK YOU

Acknowledgement

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