Japanese Lesson Study as a Form of Action Research to Improve Discipline Literacy

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Abstract
This mixed-methods study investigated the teachers' perceptions of a year-long Japanese Lesson Study professional development project on improving the teaching of discipline literacy. Analysis of the middle school teachers' reflections, interviews, and survey data suggested that Lesson Study provided specific tools, such as unique strategies to collaborate, constant focus on student learning and repetitive cycles, that differentiate it from other forms of Action Research. Through the thus-defined features of Lesson Study (LS) as a very special form of Action Research (AR), the data supports Lesson Study's potential of becoming a sustainable, context-based form of professional development for teachers to use when implementing local and statewide policy changes.

Introduction
Objectives
The study focused on the characteristics of LS that make it unique among other forms of AR.
- Conceptualization and classification of LS as revealed that it is a very structured form of AR requiring specific team activities, decision making, implementation and reflection.

Theoretical Framework
- The LS model of practitioner inquiry is based on a teacher-generated problem around student learning.
- The ideal attributes of effective professional development are perfectly aligned with the LS model:
  - intensive, ongoing, and connected to practice;
  - focus on student learning and addressing the teaching of specific curriculum context;
  - aligned with school and district improvement priorities and goals;
  - built upon strong working relationships among teachers;
  - engagement in social constructivism and reflection (see figure below).

Lesson Study Cycle

Research Questions
1. What were the teachers' perceptions of professional benefits for participating in a professional development through LS?
2. What are the teachers' perceptions of using LS as a form of practical inquiry and continuous form of professional development?
3. Were there any changes in the teachers' beliefs and perspective on their practice?

Data analysis (continued)
- Data analysis methods:
  - SPSS (2014) to analyze the surveys' quantitative data through a paired sample t-test comparing pre-survey scores to final ones by theme.
  - Qualitative software program MAXQDA for analysis of survey open-ended questions, reflections, and interviews taken together.

Results
The results of both quantitative and qualitative data are grouped by research questions below.

Discussion
- Teachers' instructional beliefs, perceived benefits, and reported effectiveness of their practice changed remarkably after being involved in a well-designed LS form of AR and PD.
- LS fits into the AR category that Sortek and Zechner (2009) described as a "locally-sponsored systemic reform sustained over time" because it is started and organized by teachers at a local level as context-based and teacher-directed form of professional development.
- Our data identified the collaboration aspect of the LS as the most valuable part of the project. The LS stages allow teachers to collaboratively examine and reflect on their beliefs and assumptions about student learning and identify the components of classroom instruction that promote student learning based on the data collected from their own students during the research lesson (Lewis, 2005; Lewis & Hunt, 2011).
- LS requires the team to plan the lesson from the students' perspective, process through which teachers discuss their beliefs and assumptions about what constitutes effective instruction, share knowledge of their participants' beliefs and try to anticipate their responses to various activities.
- Although LS is often a form of AR, the continuous use of LS is for achieving local and district goals, the continuation of LS cycles is necessary for improving teachers' skills and for demonstrating the sustainability of teacher-driven professional research and development.
- LS, more than other forms of practitioner inquiry in education, provides an opportunity to develop a shared vision of high quality instruction among teachers, school and district leaders, as well as policymakers through observations of research lessons (Akiba, Murata, & Wilkinson, 2016, Lewis, 2015). Having a shared vision is an essential condition for designing coherent policy and organizational conditions for promoting a statewide instructional improvement (Bryk, 2015; Lewis, 2015).

Future Research
- Study the implementation of LS for several years to examine the effectiveness of sustainability of such a continuous model of context-based professional development.
- Conduct comparative studies of both LS and other forms of AR to distinguish differences and similarities.
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Abstract
This mixed-methods study investigated the impact of the Japanese Lesson Study on teachers' mathematics and science knowledge and beliefs. The study aimed to determine the effectiveness of the Lesson Study on teachers' instructional practices and the potential for future research. The research questions were as follows:

Q1: What are teachers' perceptions of lesson study and how does it impact their instructional practices?
Q2: How does the Lesson Study impact teachers' knowledge of mathematics and science?

Methods
The study involved a total of 24 teachers from two schools in the United States. The teachers were divided into two groups: the experimental group, which participated in the Lesson Study, and the control group, which did not. Data were collected through pre- and post-lesson study surveys, interviews, and classroom observations.

Results
The results showed significant improvements in teachers' knowledge of mathematics and science, as well as a positive impact on their instructional practices. Teachers reported increased confidence in their ability to implement the Lesson Study in their classrooms.

Conclusion
The results of this study suggest that the Lesson Study can be an effective form of action research to improve teachers' knowledge and instructional practices. Further research is needed to explore the long-term effects of the Lesson Study on teachers' professional development.

References


Appendix

Table 1: Pre- versus post-lesson study survey results

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre-Survey (n=24)</th>
<th>Post-Survey (n=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement with Lesson Study</td>
<td>3.2 (SD=0.7)</td>
<td>4.0 (SD=0.5)</td>
</tr>
<tr>
<td>Confidence in Instructional Practices</td>
<td>3.1 (SD=0.8)</td>
<td>4.2 (SD=0.6)</td>
</tr>
</tbody>
</table>

Figure 1: Lesson Study Cycle

1. Planning: Teachers work together to plan a lesson using a set of criteria.
2. Observation: Teachers observe each other's lesson and provide feedback.
3. Reflection: Teachers discuss the lesson and its outcomes.
4. Revision: Teachers revise their lesson based on feedback.

Figure 2: Comparison of pre- and post-lesson study survey results

Bar graph showing significant improvements in teachers' knowledge and instructional practices after participating in the Lesson Study.