

Abstract Number: 20069

## Successes and Challenges of Texas USA Lesson Study Initiative: Geographical Influences

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The concept of collaboration to improve student learning is a relatively new concept in the United States, and for teachers especially, it can be a difficult change (DuFour, Dufour, & Eaker, 2008). Texas Education Agency Commissioner Mike Morath identified teachers as the most important in-school factor affecting student outcomes (Senate Committee on Finance, 2016). Morath identified one key initiative that can raise the bar of support offered to teachers and principals as Lesson Study. In August 2016, a state-wide initiative was implemented to incorporate lesson study as a professional development model for teachers in Texas schools. The idea was for teachers to experience a professional development that was research-based and would enhance their craft similar to how doctors in teaching hospitals do. A targeted outcome was for teachers in all public schools in Texas to participate in Lesson Study within the next five years. Goals for the initiative included increasing teacher effectiveness, increasing public perception of teaching, and disseminating teachers' lesson study work by compiling a repository of lessons. The two-year initiative started with the implementation of lesson study in six of twenty education service center regions of Texas. School districts involved included those from rural, town, suburb, and cities. The Texas Education Agency provided training in the initial year of implementation for facilitators who would guide teachers through the lesson study process. The intent is for the initiative to spread to all of the state's education service center regions during the second year. Initial data received about the initiative provided insight into the successes and challenges of the state-wide implementation. Much of the data from the pilot year revealed outcomes that can be linked to the state's geography and its affect on cultural norms and the state's educational system. The purpose of the proposed presentation is to provide information on Texas' geography and the Texas Lesson Study Initiative, including its rationale, goals, implementation strategy, and facilitation strategies. In addition, geographic and cultural considerations based on the results of data collected from school districts, schools, administrators, and teachers will be shared. The presentation will include a question and answer session to clarify content. In addition, session attendees will be asked to participate in a discussion on the outcomes of the pilot year's implementation and to provide recommendations for future implementation. The objectives of the presentation are 1) to describe the geography of Texas and how it affects the state's educational system, 2) to describe the Texas Lesson Study Initiative, 3) to note the initiative's successes and challenges related to the state's geography and resulting cultural norms, and 4) to provide a forum for recommendations on how to further support lesson study within Texas' cultural context.

Abstract Number: 20402

## A Comparative Study of Teaching Practice in Lesson Study Incorporating Open Approach

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Developing innovations in teaching and learning mathematics by focusing on the process of developing and sharing good practices was more important than importing good practice from other places (Inprasitha, Isoda, Wang-Iverson & Yeap, 2015). Similarly, the Lesson Study project in Khon Kaen University and the (CO) 2MP Elementary project in the United States seeks to engage practicing teachers in developing their instruction of mathematics through Lesson Study incorporating Open Approach (Inprasitha, 2003; 2006; 2010; 2016) rather than giving them prescribed sets of curriculum to teach. Teachers in the project are prompted to make-sense of their beliefs, their students' learning and their curriculums by engaging in a professional learning community meant to improve and share ideas with the larger teaching community. The similar nature of these projects, in the context of two different countries makes exploration of the teaching and practice and teacher beliefs a unit of interest for research.

The study examines the teaching practices in Thailand and the United States as they participated in Lesson Study incorporating Open Approach within their respective schools. Participants included teachers and students in the Lesson Study Project conducted by Center for Research in Mathematics Education, Khon Kaen University, Thailand, and teachers and students in the Lesson Study Project conducted through the (CO)2MP Elementary grant, Bowling Green State University, the United States. Method: a qualitative research design was used in this study. Data were collected by observations, questionnaire, and interviews. Analysis: interviews were recorded and transcribed. The text from the observation notes, questionnaire and the interviews were considered together and coded for teaching practices.

Findings 1) The preparation and adaptation of teaching practice in Lesson Study incorporating Open Approach in each context was very important. In CRME Project, Thailand, there were weekly, 16 cycles per semester, plans taught & revised each day of the week, and lesson not retaught until next year. In (CO)2MP Elementary grant, the United States, there were 2-days, 1 cycle per semester, plans revised several times on LS day, and lessons are revised and retaught on same day. 2) Social context liked lesson study supported teachers to feel confidence and appreciate when they taught and had another teacher or researcher observed the classroom, and also reflected about the classroom. 3) Lesson Study is not only beneficial for in-service teacher but also for pre-service teacher. It provided the opportunities for the pre-service teachers and in-service teachers to work together and learn together. This way prepared and encouraged the pre-service teachers to be the better teachers for their career path.

Keywords: In-service teacher, Lesson Study, Open Approach, Pre-service teacher, Teaching practice

## Learning Processes in Heterogeneous Collaborative Lesson Study

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As society is rapidly changing, MEXT (2012) has proposed the statue of teachers who continue to learn new ways to teach thereby promoting continuous and voluntary learning throughout one's teaching life. Workshops organized by the Board of Education, re-education program at university, lesson study in school, and lesson study outside of school are among the opportunities for teacher education as continuing professional development (CPD). However, teacher education has many problems. For example, teacher training currently practiced, bears little relation to the practical tasks of working at a school. Teacher training courses are compartmentalized within a scheduled pre-arranged curriculum, there are inconsistencies of expertise and level of cooperation among the university faculty who train teachers, and there is gap between teacher education in the university and the recruitment conducted by the Board of Education.

Suzuki et al. (2015) developed opportunities for teacher education in which university students and in-service teachers collaborate in participation in lesson study. Therefore, on the one hand, this has led to a positive effect for in-service teachers and university students (Suzuki et al., 2015). On the other hand, it remains unclear what precisely led to these effects. It is important that attention be paid to this process so that its results can be applied to future teacher education.

The purpose of this study is to clarify what factors influence learning process among in-service teachers, university students, and graduate students in heterogeneous collaborative lesson study. Semi-structured interviews were conducted for in-service teachers participating in the lesson study. Analysis was performed using the Modified Grounded Theory Approach (M-GTA) method to generate concepts, categories, and relationship diagrams. The theme of the analysis was 'transformation of relationships among in-service teachers and university students in a heterogeneous collaborative lesson study.' As a result, the following three points were clarified.

1) In the early stages of the lesson study, teachers reported interpersonal conflicts, such as a feeling of distance, gaps in understanding, and dilemmas in relation to the university students.

2) There were factors that changed the relationships between in-service teachers and university students; for example, due to the compromise on the part of the teachers, breakthroughs due to the influence of third parties, and stimulation from the university students.

3) Mutual involvement was settled through the sharing of concrete items that became central topics for discussion in the lesson study, such as a confirmation of teaching materials in the lesson study and children's reactions in the advance lessons. As a result, a flat community with less hierarchical relation was fostered.

Opportunities for in-service teachers and university students to collaborate in a lesson study are rare. In the early stages of the lesson study, differences in position resulted in a relationship between the teaching and learning sides as in pre-service teaching practice. However, through collaborating with teachers and university students in different learning situations so as to break up such relationships, heterogeneous

collaborative lesson study can become a meeting ground for diverse ideas wherein participants will be able to recognize each other. It is clear that this is an opportunity for the emergence of new ideas related to the lesson.

In this study, it was found that organizations can become better communities for learning through the removal of hierarchical relationships in a heterogeneous collaborative lesson study, and clues were found to help these turn into interactive relationships. In future study, it will be important to concretize the form of teacher education using the results of this study.