B-2: Framework-guided research and practice of lesson study

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Fam (formative assessment matrix for lesson design) approach-theory and practice for high-quality learning

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The purpose of this research is to propose FAM (Formation Assessment Matrix for lesson design) approach to support deeper active learning process design as high-quality lesson design and to improve lessons. This research will clarify the advantages and expected effects of this FAM approach.

Big educational methods change is progressing in Japan. The new “Course of study” emphasizes not only the students acquiring knowledge and skills but also the process of learning knowledge and skills. School teachers need to practice the high-quality lessons which foster students’ competency.

This research assumes that authentic creative knowledge work can take place in school classrooms. Students will contribute to building knowledge of organizations and communities.

Emphasis is placed here on the possibility of reconstructing teaching for knowledge building. Qualitative and quantitative research methods were employed for data collection. For qualitative research, a case study method was employed.

We proposed FAM (Formative Assessment Matrix for lesson design) approach and conducted practical training in teachers' workshops and seminars. Many of the participants who created FAM commented, "I could not design deeper learning until now, but by creating this matrix, the image of deeper learning and higher order thinking became clear". In Japan, schools and teachers who participate in this research are found at elementary school, junior high school, high school, and university, and the utilization of FAM approach has been started since 2016. In Mongolia, this research began in 2017.

Teachers should plan lessons so that learners are interested in learning contents and express their thoughts. Before the lesson, the teacher will plan lesson and at the same time write FAM. By writing FAM, teachers will be able to create lesson design while imagining specific students' learning figures. Writing FAM helps the teacher to develop the lesson plans that relate students' knowledge and thoughts and deepen their thoughts.

In lesson, the teacher will distribute FAM printed to the students. Students can recognize the aim of this lesson by reading the FAM. Other teachers who observe the
lesson will also read this FAM and understand the intent of the lesson design. For elementary school students, it is good to rewrite the description of FAM so that the students can easily understand it according to their developmental stage. At the end of the lesson, the students self-evaluate according to the viewpoints of FAM and describe their thoughts and opinions about the lesson.

In the post lesson conference, the teachers will refer to FAM of that lesson and discuss how students' learning was, and how students' learning differed from the teacher's intention. We can obtain useful knowledge about students and improvement of lessons.

The FAM approach has the following features.
1) FAM as not only formative assessment methods, but also tools for the lesson design.
2) FAM as tool of prompting the lesson studies cycle.
3) FAM as basic format for sharing common vision of lessons in the school.

Teachers can learn principles of lesson design by activity of verbalize their viewpoint of evaluation and improve lesson based on results of students’ self-assessment.

By repeating lesson study using FAM which collects thoughts and constructs knowledge from an explicit viewpoint, not only individual teachers professional grow but also a consensus of the image of the lesson as a school is formed.

The FAM approach will assist learning process design for knowledge construction. Teachers can re-examine their concept of teaching and learning. Therefore, the use of FAM approach will be able to lead to the realization of interactive and high-quality learning in your classrooms.

**Keywords:** lesson design, formative assessment matrix, high-quality learning, lesson studies
Recently some attention has been given to ways in which Lesson Study and the Teaching for Robust Understanding (TRU) framework can be interwoven (Schoenfeld et al., in press). The TRU framework was developed to describe ‘equitable and robust learning environments’ (Schoenfeld & the Teaching for Robust Understanding Project, 2016). At its core are five dimensions of classroom activity – content (e.g., mathematics); cognitive demand; equitable access to content; agency, authority and identity; and formative assessment. Schoenfeld and the project team maintain that a focus on these five dimensions in a mathematics classroom underpins powerful mathematical thinking in learners. The TRU framework and Lesson Study (LS) find particular common ground in their focus on students’ experience of mathematics and, according to Schoenfeld et al. (in press), the TRU framework can support each stage of the LS cycle, that is, studying curriculum and formulating goals; planning, conducting research lesson; and reflecting (C. Lewis, 2002). In this paper, I examine the potential affordances of the TRU framework for the Knowledgeable Other (KO) working with a group of teachers in a professional development context.

The role of KO is seen as crucial for the effective implementation of LS (e.g., Takahashi & McDougal, 2016). However, the responsibilities of the KO vary in different contexts. In Japan, where LS originated, the KO is invited to the research lesson and gives a final commentary at the end of the post-lesson discussion (Takahashi, 2014). As LS has spread across the globe, the KO has been described differently. For example, in order to ensure fidelity to the LS cycle described above, Takahashi and McDougal (2016) have proposed the need for two KO’s - one to support the lesson research proposal and another for providing the final comments at the end of the post-lesson discussion. J. Lewis (2016) uses the term ‘facilitator’ rather than ‘KO’, reflecting her concern that teachers lead the LS agenda. Likewise, Corcoran (2011) describes the dilemma of how to pitch her input as KO with pre-service teachers while at the same time giving them voice in the process. It is apparent that the role of the KO varies not only in different cultures but also in different professional learning communities, e.g., pre-service teachers, school community, continuing professional development etc. Part of the issue arises because of the possibly limited length of time that exists for the development of vocabulary to describe aspects of classroom practice that need to be developed (e.g., Kazemi & Hubbard, 2008). In such a situation a framework such as TRU is a means of providing the professional learning community, including the KO, with a shared vision of and language to describe rich mathematical thinking.

I focus on a mathematics lesson on graphical representation that was developed as part of a LS cycle that was conducted with a group of teachers from various schools pursuing a Master’s degree in Mathematics Education. The lesson was taught in a Fourth Class (pupils aged 9-10 years) in Ireland. I, as teacher educator, assumed the role of KO but experienced the dilemma described by Corcoran (2011) above. In this
instance, the TRU framework became a useful means of guiding discussions with the group. As can be seen in planning documents, greater attention was paid to the dimensions of ‘mathematics’ and ‘cognitive demand’ by the teachers after these discussions. However, in post-lesson discussions where they examined pupils’ written artefacts and observed video excerpts of the lesson, they were concerned about equitable access to content. Some implications are discussed, in particular, how the KO might harness the TRU framework to manage facilitation in different professional learning communities.

**Keywords:** Lesson Study, Teaching for Robust Understanding, Knowledgeable Other, Facilitation, Graph construction
The Influence of 7Habits of highly effective people to enhance teacher leadership via lesson study process.

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The challenge in education field these days rises as the cause of society’s expectation for teachers. While the terms and definitions may change with the times, it is important to understand the skills and abilities needed to lead in the 21st century. Teachers should be the leaders who inspire and empower students to lead their own learning. This research serves a purpose to developed teacher leadership skills. Data collection including questionnaire, observation and interviewing. There are consisted of 36 primary teachers in Satitbangna School, Thailand, who teach in several level and different background.

The results of this study found that, after used the concept of 7habits of highly effective people in teacher development activities can help teachers develop their leadership. The results of the study in 4 main points were as follows: 1) All teachers saw the change of teacher relationship in the professional learning community after the activities were performed in the better direction. Everyone agrees that behavior before creating a community learning professional, mostly they work on designing, managing, learning and so on, alone, and believe that they can be accomplished in a faster time than collaborative design or teamwork. After participating in process, creating a professional learning community, everyone had the opportunity to talk and help each other more. 2) Factors that promote good relationships in the community can be classified into two factors: openness of the teacher's mind and executive support. 3) The barriers and problems that affect the relationships in the professional learning community were the culture of work, the unfamiliarity of the process, and the workload of the teacher. 4) Concerning the creation of good and the sustainable relationship, it was classified into two groups: most teachers (71.43%) were unsure about the sustainability of the relationship with the goal to make a better today and leave tomorrow as a future. While the other teachers (28.57%) were confident that continuing their activities in the professional learning community continues, they will be able to create strong, lasting relationships with their colleagues. And 5) The ability to lead effectively is based on a number of skills, including communication, motivation, vision, modeling, demonstrating empathy, confidence, persistence, and integrity.

Keywords: leadership, teacher leadership, lesson study, 7habits, effective people