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Lesson study in teacher education: Learning from a challenging case

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HIGHLIGHTS

- We examine one group of student teachers that struggled with implementing lesson study.
- Four indicators of a challenging case emerged from analysis of empirical data.
- Student teachers had little focus on observing pupils' learning.
- Individual work on tasks prohibited observations of pupils' learning.
- Analysis of a challenging case can inform future implementations of lesson study in teacher education.

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ABSTRACT

Whereas most studies of lesson study in teacher education seem to report on success stories, this article investigates a challenging case. From an implementation of lesson study in Norwegian teacher education, we analyse data from a mathematics group that struggled with implementation. Analysis of data from group interviews, mentoring sessions and teaching the research lesson indicates that several crucial aspects of lesson study were missing. The student teachers did not formulate a research question for their research lesson, they did not focus on observing pupil learning, and their lesson was not organised to make pupil learning visible.

1. Introduction

In this article, we focus on the implementation of lesson study in teacher education in Norway. Lesson study has been used for professional development of teachers in Japan for more than a century, and it has also been commonly used for professional development since it was adopted in other parts of the world (Fernandez, 2002). Although the majority of studies include implementation of lesson study among in-service teachers, some recent attempts have been made to apply a lesson study approach in initial teacher education (Fernández & Zilliox, 2011; Parks, 2008; Sims & Walsh, 2009). Such studies on lesson study seem to mostly report on success stories (e.g., Dudley, 2013) – even studies that go into more critical discussions of the "messiness" of learning from lesson study report on implementations that appear successful (e.g., Parks, 2008) – but this article takes a different approach and investigates a challenging case.

We report from a project where lesson study has been applied across subjects in elementary teacher education in Norway. In this project, we implement an adapted version of lesson study in connection with the school-based part of teacher education (internship/field practice/practicum) – in this article referred to as field practice. Groups of student teachers from four different subject areas participated in the study: mathematics, science, sports science and English as a foreign language. An important part of the data collection consisted of video observations from student teachers' conversations with their mentor teachers during mentoring sessions in field practice in a control group and an intervention group. Based on their analyses of this empirical material, Helgevold, Næsheim-Bjørkvik, and Østrem (2015) found that groups of student teachers in the intervention (24 mentoring sessions) were more focused on subject related matters. They also had a greater focus on pupils and their learning compared to student teachers in the control group (30 mentoring sessions) in which the student teachers were more concerned about practical teaching

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issues, referred to as "doings". In addition, lesson plans and cultural resources were more visible in the lesson study situation, and the student teachers were all more involved in the mentoring conversations compared to the control group situation. According to these authors, however, "Math can also be looked upon as an extreme case, representing a different picture from the other subjects" (Helgevold et al., 2015, p. 133). From this background, we found it interesting to investigate this "extreme case" of mathematics. We follow Helgevold and colleagues when they state that the case of mathematics is interesting "in the sense that they represent information about problematic situations as compared to the general patterns" (p. 134). To supplement the thin descriptions of mentoring conversations conducted by these authors, we focus on a challenging case in depth. We analyse data from group interviews, mentoring sessions as well as teaching of a research lesson in a group of mathematics student teachers.

The purpose of this article is to investigate a challenging case where the lesson study intervention did not work out the way it was expected, in order to identify possible indicators of why the implementation failed. We hypothesise that careful analysis of data from such a challenging case could inform future implementations of lesson study in teacher education – perhaps even more so than yet another success story.

In the following sections, we present the background for the study, and we provide some relevant information about the Norwegian teacher education context. We then review literature on lesson study and previous attempts to implement lesson study in teacher education. Following this, we discuss the methodological considerations and choices that were made in our study, before we present and discuss the results from our analysis of the challenging case. We conclude that such a case can indeed be positive, in that much can be learned from it, and we discuss some particular lessons that can be learned from our challenging case and how these lessons can inform future studies or implementations of this kind.

2. Theoretical background

In Norway, student teachers attend a four-year bachelor program in order to qualify for teaching in primary or lower secondary school, and the National Curriculum Regulation prescribes a total of 20 weeks of field practice spread throughout the four years. There are two teacher education programs that cover grades 1–10; one program prepares for teaching in grades 1–7 (called "Grunnskolelærerutdanning 1–7") and one prepares for teaching in grades 5–10 (called "Grunnskolelærerutdanning 5–10"). During field practice, student teachers are usually organised in groups of three or four, and the mentor teachers serve the role as teacher educators (Nilssen, 2010). In the Norwegian context, the mentor teacher is an experienced practising teacher who has (normally) taken a course in supervision for mentor teachers.

The task of educating teachers for the complex work of teaching in the 21st century constitutes a significant challenge for teacher education. In order to professionally conduct the work of teaching, teachers need compound professional knowledge that includes subject matter knowledge, pedagogical knowledge, curricular knowledge, pedagogical content knowledge (Shulman, 1986), as well as cultural awareness and awareness about individual differences and needs among pupils (Bransford, Brown, & Cocking, 2000). The work of teaching includes subject-specific tasks or challenges, but it also includes "broad cultural competence and relational sensitivity, communication skills, and the combination of rigour and imagination fundamental to effective practice" (Ball & Forzani, 2009, p. 497). Teachers' professional knowledge – including the components and role of it – has been discussed for decades (e.g., Davis & Simmt, 2006). It is generally agreed upon that teachers need a particular kind of knowledge in order to teach effectively (Ball, Lubienski, & Mewborn, 2001), but there is less agreement about how such knowledge develops.

Ball and Cohen (1999) contend that classrooms are complex and unpredictable, and the knowledge needed for teaching must be learned in and from practice. This implies that, "they would have to learn, before they taught and while teaching, how to learn in and from practice" (Ball & Cohen, 1999, p. 10). Development of practice and development of practitioners can thus be regarded as two sides of the same coin. From this position, it can be argued that lesson study has potential to serve as a model for improving teachers' knowledge for teaching (Cerbin & Kropp, 2006; Murata & Pothen, 2011; Stigler & Hiebert, 1999) – in particular what can be referred to as pedagogical content knowledge (Shulman, 1986) – and an implementation of lesson study already in teacher education might thus be feasible. In the following, we first present a discussion of pedagogical content knowledge. Following this, we review literature on lesson study and the implementation of lesson study in teacher education.

2.1. Pedagogical content knowledge

The term "pedagogical content knowledge" was first presented by Shulman (1986) in his attempt to approach the lack of a coherent theoretical framework to describe teachers' professional knowledge. When distinguishing between content knowledge and pedagogical content knowledge, he argued that the latter, "goes beyond knowledge of subject matter per se to the dimension of subject matter knowledge *for teaching*" (Shulman, 1986, p. 9, original emphasis). He further elaborated on this category of teacher knowledge as follows:

> Within the category of pedagogical content knowledge I include, for the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations – in a word, the ways of representing and formulating the subject that make it comprehensible to others (Shulman, 1986, p. 9).

Following Shulman's seminal work, numerous researchers have grasped these ideas – in particular the notion of pedagogical content knowledge – and applied them in their research. Although most studies that investigate pedagogical content knowledge refer to Shulman's ideas, they refer to disparate interpretations from reading different versions of Shulman's framework (e.g., Shulman, 1986, 1987). As a result, definitions of pedagogical content knowledge – and the operationalisation of these definitions – differ across studies (Kaarstein, 2014).

In their systematic review of research on pedagogical content knowledge in mathematics education, Depaepe, Verschaffel, and Kelchtermans (2013) conclude that researchers conceptualise pedagogical content knowledge differently, but they still seem to agree that, "it deals with teachers' knowledge, it connects content and pedagogy, it is specific to teaching particular subject matter, and content knowledge is an important and necessary prerequisite" (p. 22). Depaepe and colleagues also derive that collaborative learning, mentoring, as well as working in a professional community, seem to support the development of pedagogical content knowledge. Implementation of lesson study in teacher education could thus be favourable. Before reviewing previous implementations of lesson study in teacher education, we take a closer look at some foundations of lesson study.