Variation in approaches to lesson analysis – alternative tools for the reconstruction of teaching

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Abstract

Purpose – The purpose of this paper is to review the variation in methods used to analyse lessons in order to improve teaching and learning.

Design/methodology/approach – It addresses the question of how observations of lessons can be analysed, and what approaches and methods are applicable in the analysis of collected data in lesson and learning studies.

Findings – In lesson studies, the focus of research varies, the content and context of lessons vary and a variety of qualitative methods are applied in the analysis of lessons. Lesson study is proving to be a versatile research approach to the development of the quality of teaching and learning.

Originality/value – This review provides an overview of some qualitative methods of content analysis used as analytic tools in the studies presented in this issue of the journal.

Keywords Learning study, Lesson study, Human-science pedagogy, Methods analysis of lessons, Qualitative methods of content analysis

Paper type Viewpoint

Lesson study as a methodology for improving student learning and teachers’ professional development includes observations made by teachers which are subsequently analysed. However, the form of lesson analysis varies across countries as well as within national boundaries. In the first paper in this issue of IJLLS, Gruschka (2018) introduces the analysis of lessons observed from the perspective of critical-constructive theory and didactics. He has developed an approach known as sequence analysis which he has based on the analysis of lesson transcriptions.

From the perspective of education sciences, there are several theoretical approaches to the scientific area of qualitative content analysis. It is notable that in research fields like education, pedagogy, didactics and education sciences, there are many different theoretical positions and theoretical approaches. A coarse but frequently occurring division of this research field is: normative pedagogy, empirical pedagogy, and hermeneutic human science pedagogy. For each category there is a number of subcategories, discussion of which is beyond the scope of this article. However, a very brief glimpse of the history of German Pädagogik informs us that in twentieth century the Reformpädagogik gained a strong foothold in German Pedagogik and teacher training, focussed on child-centred activities and theoretically dominated by the human science pedagogy (Geisteswissenschaftschaftliche Pädagogik), developed among others by Wolfgang Klafki (1927-2016) (Klafki, 1995/original 1958, 2002). The human science pedagogy has integrated the theory of contents and curriculum (Didaktik), which originates from Erich Weniger (1894-1961), a German predecessor of human science pedagogy and, as Wolfgang Kafki, a prominent representative of German Didactics in the European Educational Sciences (Kansanen, 1995; Bengtsson, 1997; Uljens, 1997; Månsson and Nordmark, 2015). According to Klafki (1995/1958), human science pedagogy and didactics (Geisteswissenschaftschaftliche Bildungstheorie und Didaktik) was developed into a critical-constructive theory of education from the end of 1960s onwards. This critical-constructive theory of education attracted many subsequent research scholars in Europe.
Critical here signifies an interest in knowledge in so far as it is related to the competence of students and their developing ability to reach self-determination, participation in decision making and solidarity – although it is uncertain if the reality of society corresponds to the objectives of the school curriculum (Uljens, 1997). The concept didactics refers to the theory of contents and curriculum.

Constructive signifies the constitutive character of critical-constructive didactics, which is the general feature of practice-oriented education aligned to an interest in action, formation and transformation (Uljens, 1997). To clarify:

[...] in this didactics constructive means drafts of possible practice, well thought out ideas of changed practice and a practice that is changing the individual, aiming at [values of] a human and democratic school and, at the same time, new ways of integration between practice and theory (Uljens, 1997, p. 220; author’s translation).

Uljens’ (1997, p. 220) understanding corresponds to that of several research scholars in the fields of education sciences and curriculum studies. In order to understand these expressions (in italics), the researcher and the teacher trainer has to explore teaching and learning in a different theoretical tradition, the German critical-constructive theory and critical-constructive didactics. Very few articles and books by the main thinkers and researchers in this tradition are available in English.

In the 1970s, Gruschka (2018) introduced a research-oriented form of practical studies and a requirement that student teachers complete a transcription and an analysis of one entire lesson. By doing that, the intention was that the student teachers would realise and experience “how fragile teaching is, how complex and how uncertain and nevertheless filled with routine” (Gruschka, 2018). In this research-oriented form of practical studies, student teachers are expected to become aware of the inner logics of teaching as a pedagogical project. That is, teaching that leads to the development of students who are active and lifelong learners.

From the perspective of the teacher, three dimensions of teaching exist in pedagogical practice and in the German student teacher training programme: education, formation, and didactics. Gruschka (2018) argues:

Education is totally different from that which is actually called ‘classroom management’, formation is different from ‘literacy’, the OECD-formula for the new worldwide curriculum of measurement, and also didactic is much more than to prepare the best ‘landscape of learning’ by preferring universal methods of using information.

Understanding the inner logic of teaching is the main goal in training of student teachers, as Gruschka (2018) argues. Student teachers have to perceive that “understanding is related to the meaning of teaching and its pedagogical function” (Gruschka, 2018). Each teaching occasion constitutes a unique occasion, a process, carefully planned by the teacher, adapted to the students’ knowledge in the subject matter and the curriculum for the subject and to the level of students, following the set institutional frame. He quotes his teacher, Wolfgang Klafki: “The teacher has to open the world of knowledge for the pupils and the pupil for the world of knowledge, this is reciprocal opening up”. This metaphoric expression of teacher’s work in the classroom can be understood as the meaning of understanding, learning as a process, and developing as a learner.

Lesson study, as a methodology for improving student learning and teachers’ professional development, includes observations made by teachers, subsequently analysed. A similar iterative character of the design of these studies can also be identified in learning study, even though the non-dualistic ontology and a general theory of learning constitute the grounding keystones of the latter. However, the analysis of lessons observed in critical-constructive theory and didactics, represents a different mode, more comparable to ethnographic analysis. Gruschka (2018) is a proponent of sequence analysis.
In the tradition of critical-constructive didactics, each teaching occasion is a unique opportunity, carefully planned by the teacher, adapted to the students’ knowledge of the subject matter and the curriculum and following the institutional frame:

We have to explain how the teacher creates coherent practice. That means to understand the formation of a structure during a lesson, which is realized from the first step onwards like the process of law. We can detect this lawfulness in looking very carefully at the ‘how’ and ‘why’ of the sequence of interventions that take place (sequence analysis) (Gruschka, 2018).

Teaching is sequenced according to the teacher’s contextual knowledge and the factors mentioned above. Every student knows, after a while, that a number of sequences will follow as well as repetitions of some parts of the content. An accurately transcribed manuscript of an entire lesson is the starting point for a sequence analysis, which is a form of content analysis.

Traditional content analysis seeks to reveal what the text is “saying” and can be a quantitative method counting the presence of certain words and expressions in the text. Qualitative content analysis is a mode of coding texts by means of themes or categories used, for instance, in analysis of interviews (Cassell and Symon, 2004; Kvale and Brinkman, 2009). It is comparable with open coding and ethnographic analysis, originally associated with grounded theory analysis (Glaser and Strauss, 1967). Sequence analysis is a mode of content analysis closely related to ethnographic analysis. It is a detailed analysis of actions between teacher and student and between student and student in a transcribed lesson (Gruschka, 2018). In the analysis, the researcher selects sequences from the transcribed lesson. Then possible interpretations of the sequences are discussed by the group of researchers, in order to find the meaning of the sequence beyond the surface of the text. The sequence analysis is a form of content analysis. As the examples in Gruschka’s paper illustrate, it is not only concerned with the subject matter content of the lesson but also education, building and the formation/bildung of the students.

Mårtensson and Hansson’s (2018) paper in this issue of IJLLS reports an investigation of teachers’ professional development in a study of one subject didactic group (SDG). The group consisted of five teachers’ and the aim was to study their collaborative work aiming at improving students’ learning outcomes about decimal numbers in mathematics (grade 4 and 7; aged 10 and 13 years). The design of the study was set out as a combination of lesson study and learning study. The unit of analysis is the SDG. The study uses the activity system originated from Engeström (1987) in order to explore and understand the process that leads to teacher learning in collaborative arrangements such as lesson and learning study. The group of mathematic teachers was observed and their activity and development investigated in the frame of the activity system. The teachers’ joint object was to enhance student learning of decimal numbers in mathematics. The idea of formative interventions (Engeström and Sannino, 2010) means that “the researcher had no intention of controlling different variables or of leading the teachers in a certain direction. The autonomy of the teachers and the facilitator was the determining factor for every decision made” (Mårtensson and Hansson, 2018). Collected data consist of audio recordings of teachers’ meetings and photographic documentation. Data analysis occurred “through the lens of expansive learning within the activity system” (Mårtensson and Hansson, 2018). The researchers analysed, in three steps, teachers’ learning, their questioning and their contradictions in their joint work inside the activity system. They identified the following: questioning and contradictions in teachers’ discussions; “intermediate concepts”, e.g., suggestions, new ideas and tools; and the meaning and sense of outcomes, that is, new ideas and tools used by teachers as solutions to their contradictions (expansive learning).

In a learning study carried out by Runesson Kempe et al. (2018), results from lessons constitute the point of departure for testing a conjecture in the follow up study.
Five teachers in mathematics found in four different lessons in four classes, including 64 students, grade 2 and 3 (aged 8–9 years), that the students needed to be able to find the critical aspects for realizing the existence of negative numbers and to differentiate aspects of negative numbers. In this learning study as with the SDG, teachers use the variation theory of learning for analysis of teaching results. The variation theory asserts that students’ learning is a function of discernment and discernment is a function of variation, and that the learning object, decided by the teacher, has critical aspects the student need to discern. In this study specific critical aspects of negative numbers needed to be differentiated. Therefore the deep analysis of the way the subject was taught and handled by the teachers was scrutinised. Results from lessons indicated that for these students to understand negative numbers they needed to be able to differentiate: the value of two negative numbers; the function of the minuend vs the function of the subtrahend in a subtraction; and the minus sign for negative numbers vs the minus sign for subtraction. Most importantly, this study showed that knowledge of the design of the lesson(s) gained from a learning study in one teaching context could be transferred to another teaching context with similar success.

Calvo Salvador et al. (2018) present a lesson study aimed at improving teachers’ mathematical task knowledge and their knowledge of instructional practice. The target group included 14 higher education lecturers from the Faculty of Education and Teacher Training in two universities, representing seven subjects and three degrees, with varying professional experience. About 350 students were involved in the project. These lecturers planned a lesson study project comprising five phases. Data were collected from observation of classroom practices (lessons), field diary notes, from discussions among teachers, teacher interviews and research lessons, after which each teacher wrote a final report. In each case, subject work teams included a number of students as critical partners, and teachers alternated roles as lecturers and observers. The collected data were analysed using a qualitative methodology, a qualitative content analysis, within the participatory action research tradition (Denzin and Lincoln, 2000; Kemmis and McTaggart, 2000). This is not a common technique used for analysing data collected in a lesson study. This method of analysis is used when the researchers want to emphasise the participation and action of every participant, where collected data are scrutinised, compiled and summarised. In this study, the contribution of the students’ voices emerged as an important stimulus for university teachers’ learning and development.

Barber (2018) has examined how teachers within a lesson study group changed their practices in various modes, how they developed knowledge about mathematical tasks and how they developed as teachers. In the study two fourth grade teachers of mathematics participated in two iterations of the lesson study model. The data collected comprised of observations of lessons, audio recorded semi-structured interviews (before and after lessons), participant observations, lesson-related materials, field notes and video-recordings. In the analysis of data an explorative case study analysis was employed. Two models of analysis were applied. Model 1, Lewis et al. (2006), focussed on: improvement of teachers’ knowledge and instruction; increasing motivation and collaboration; and tools and resources for supporting learning. Model 2, the Interconnected Model of Professional Growth (Clarke and Hollingsworth, 2002) asserts that the iterative analysis of teachers’ learning builds on the development of teachers’ in four domains: the personal domain (knowledge, beliefs and attitudes); the domain of practice (professional investigation and instruction); the domain of consequences (outcomes of teachers’ actions); and the external domain (other sources of information that enhance teachers’ learning). Findings indicate that in order to improve instruction and to enhance students’ knowledge at high levels of thinking and reasoning, the teachers improved their ability to analyse the qualitative differences of mathematical tasks and the
quality of the accompanying instructions. The activities which were found to effect change were teachers' collaboration, reflection and the experience of the selection, modification and implementation of tasks.

The implementation of lesson study in Laos reported in this issue of *IJLLS* was a top-down initiative intended to enhance teachers' professional development and student learning. Shingphachanh (2018) investigated the implementation of lesson study model in a teacher training college using an open-ended questionnaire in order to explore how the lesson study procedure was understood by the participants and to identify any initial concerns that 70 participating teachers had about the implementation of this model of professional development. Data included 11 classroom observations, the use of lesson study guidelines and reports. The analysis of the questionnaire revealed teachers' concerns about the time consuming procedures of lesson study, the format of reports, the time available for collaboration among teachers and the need for facilitators in the work of implementation.

The six lesson and learning studies described here carried out in quite different contexts contribute to our knowledge of the prerequisites for improving and developing students' learning and teachers' knowledge and professional growth. The six papers in this issue exemplify various ways of analysing lessons in order to reconstruct lessons, improve students' learning and develop teachers' instructional practices.

1. **Sequence analysis**

   The framework of sequence analysis consists of the German teacher training tradition based on the critical-constructive theory and the critical-constructive didactics. Sequence analysis is a qualitative method of content analysis, sequencing and integrating the analysis of student learning and teachers' instruction and knowledge development. The analysis of one sequence, for instance of a lesson, embraces the entire student (knowledge, skills and attitudes), the context (school system, curricula, school level, lecture room, social context in the class of students) and the teacher (training, knowledge, skills attitudes, awareness of factors affecting students and instructions). This description is an attempt to capture some of the factors summarised in the three words “education”, “formation/bildung” and “didactics” (Gruschka, 2013, 2018).

2. **Content analysis in variation theory**

   Analysis of students' and teachers' knowledge and learning improvement grounded in a non-dualistic ontology and in the framework of a general learning theory, variation theory (Marton, 2015), can be seen as a form of content analysis of quotations from interviews of students and teachers, classroom observations and sequences of teachers' discussions in groups. However, it must be noted that the primary focus in studies applying variation theory is on the content of teaching (subject matter content), how it is used in instructions, how it is understood by the students and by the teachers and how their understanding is changed over time through learning. The diagnostic pre- and post-analysis of students' knowledge, before and after a lesson, supplemented by a close analysis of video-recordings of the lesson, promote insights into what might be critical for learning and how the content must be used by the teacher to promote learning (Runesson Kempe *et al.*, 2018; Mårtensson and Hansson, 2018).

3. **Analysis as participatory action research**

   This form of qualitative content analysis takes every members' participation and actions in a group or community of learners and researchers' into consideration (Argyris and Schön, 1989). The content focus of the research varies and, for instance, it can be a
phenomenon related to student learning or a change process involving all teachers in one school. This qualitative content analysis technique is not commonly used for analysis of data collected in a lesson study. Researchers apply this method of content analysis when they want to emphasise participation and action of every participant, and when the collected data are scrutinised, compiled and summarised. Calvo Salvador et al. (2018) used the method to bring out the students’ voices. Their opinions and comments were important and provided contributions resulting in teachers’ learning and development. Shingphachanh (2018) reports an initial attempt to inform the development of lesson study practice by exposing the experiences of the participants.

4. Explorative case analysis
A qualitative content analysis often associated with case study analysis (Mirriam, 1998). Case studies can contain quantitative or qualitative data with the research intention to collect a wide variety of data. In the analysis of case studies, Barber (2018) made an explorative analysis of results, relying on two different analytical methods used in previous lesson study research.

The studies reported in this issue of *IJLLS* illustrate the variation in methods used to analyse teaching and learning, and exemplify the versatility of the lesson study model to contribute to knowledge of the many factors influencing learning and teaching processes in different educational contexts.

References


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