

Classroom research

– *Methodology, categories and coding*

Editor: Ninni Wahlström



Linnaeus University Press

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ISBN: 978-91-89081-04-8

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2019

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Introduction – Understanding classroom and knowledge discourses from a curriculum theory and didactic perspective

Ninni Wahlström

The purpose of this text is to frame the methodological considerations developed in two research projects focused on classroom research. The first project is titled *Understanding curriculum reforms – A theory-oriented evaluation of the Swedish curriculum reform Lgr 11* (years 2014–2017), and the second project has the title *Exploring the elusive teaching gap – Equity and knowledge segregation in teaching processes* (years 2018–2020). Both projects are financed by the Swedish Research Council.

The past two decades of classroom research have been characterised by the concepts of learning and interaction in accordance with the notion of “lifelong learning”, where research has adopted an approach to student learning and socialisation as constituted in students’ actions (e.g., Liljestrand 2002; Sahlström 2008; Säljö 2000). When participation in social interactions is understood as the actual base for learning, everyday learning is often viewed as a more interesting learning environment than the classroom setting from a research perspective (Lave 1993; Rogoff 2003). Furthermore, conversation analysis has been a preferred tool for analysing participation in interaction from a social constructionist perspective (Sacks et al. 1974; Sahlström 1999). In research focused on a sociocultural approach to learning, interest has shifted from the teacher to the learner (Säljö 2005); likewise, the mediating role of teachers and their teaching is usually absent from social psychology research on classroom-peer effects (Gottfried 2014).

Although sharing a basic understanding of learning as socially constructed, the two projects that constitute the basis for this text shift the focus from learning alone to address teaching and learning in terms of the transformation of curriculum content; that is, different versions of curricula and different versions of teaching repertoires. Based on international analyses of curricula, there is substantial coherence and agreement across nations that teaching content should contribute to shaping autonomous citizens, improving national welfare, and linking nation states with global development (Benavot & Braslavsky 2006). The Europe 2020 program marks a new step in European Union (EU) cooperation, with stronger governance in terms of country surveillance and quantitative targets and an increasing interest in the member states’ compulsory schooling and assessment systems (European Commission 2010; Lawn & Grek 2012; Wahlström 2016; Lundahl et al. 2016). These

efforts have led to streamlined curricula based on performance and standards (Sundberg & Wahlström 2012; Wahlström & Sundberg 2015). We know, for example, that grades and assessment have certain effects on students' learning and motivation (see Lundahl et al. 2015; Klapp et al. 2014) and that the simultaneous increase of the standardisation and individualisation of teaching and assessment also implies an increased need for concretisation and explication from the students' point of view (Vogt 2017). In addition, teachers also, to some extent, report difficulties in interpreting the knowledge requirements (NAE 2016; Wahlström & Sundberg 2015) and state that assessment has to balance the often contradictory tasks of supporting learning on the one hand and grading in relation to standards on the other (Falkenberg et al. 2017). However, we still do not know enough about how the application of the "knowledge requirements" in the curriculum for compulsory schooling, Lgr 11, affects teaching strategies in everyday classroom activities. It is exactly on this point there is an innovative potential in combining a comprehensive theoretical framework from curriculum theory with more linguistically oriented classroom research that often includes a focus on the micro-processes in students' learning activities.

Bellack et al. (1966) proposed a hierarchical system comprising four related units for analysing lessons. Two of the units were defined pedagogically, and two were defined in discourse terms. In this way, the researchers could combine the teaching content with teaching repertoires; that is, the *what* and the *how* in teaching. Drawing on Bellack et al. (1966), Sinclair and Coulthard (1975) identified a triad of moves: an opening move, an answering move, and a follow-up move. They termed the structure of the moves as initiation (I), response (R), and follow-up (F), or IRF. Mehan (1979) shared the view that the unit of analysis must be changed from linguistic units of individual utterances to socially constructed "events" in interactional classroom settings. Based on his classroom analyses, Mehan (1979) suggested that the common communication moves in classrooms should be understood in terms of IRE(Initiation, Response and Evaluation). These discourse patterns have been viewed as tools that allow the teacher to almost comprehensively encompass classroom communication (e.g., Alexander 2001; see also Bernstein 1990).

More recent classroom studies have questioned such a conclusion by highlighting the potential of student participation depending on the character of the third turn (i.e., the teacher's "follow-up" or "evaluation"). Nassaji and Wells (2000) note in their study that students met with an evaluative follow-up often tend to subdue their participation. In contrast, when evaluation is avoided and the teacher instead chooses to respond with requests, arguments, and justifications, the students are more encouraged to participate. Molinari et al. (2013) argue that even inspiring dialogues between students and teacher are governed by the triadic pattern. Thus, Molinari et al. strive to go beyond the one-sided idea of IRF and monologism or recitation and instead understand the triadic pattern as a means of opening up a variety of different discourse meanings. Wells and Arauz

(2006) argue that the most effective way to shift towards dialogic sequences in relation to topics arising from the curriculum is to ask questions to which there are multiple possible answers. However, it is also possible to open up dialogic sequences of conversation from a starting point of focused, more predetermined, questions (Wells & Arauz 2006).

There are reasons to believe that a standards-based curriculum focused on equity in terms of the right of all students to reach the (same) knowledge requirements promotes whole-class teaching (Wahlström & Sundberg 2018). Previous research has suggested that accountability pressures on fixed performance standards tend to foster processes of educational triage in the classroom where assumptions about students' abilities and potentials are patterned according to "those students who are out of danger in reaching the standards", "those who can possibly reach the standards", and those "who cannot be saved" because the standards are out of reach (Gillborn & Youdell 2000).

Lessons understood as "curriculum events"

The two projects of comparative classroom research build on classic classroom studies related to curriculum research (Bellack et al. 1966; Hansen 1996; Jackson 1968/1990; Gustafsson 1977; Lundgren 1981). Drawing on Doyle (1992), two interdependent relationships become important. *First*, it is not possible to draw any definite boundary between curriculum content and pedagogy. To understand the complexity of teaching fully, there is a need to understand these two aspects as intertwined, as it is not possible to distinguish between the *what* and the *how* of teaching in a clear-cut way; instead, the content and the teaching repertoires are interdependent. *Second*, teachers and students are interdependent actors in the formation of curriculum content. The multifaceted transformation from the curriculum's text content to the actual teaching content is understood as constituting "curriculum events." Lessons represent communicated "texts" that are interpreted and acted upon by the students towards a certain purpose. The teacher "authors" curriculum events to facilitate the students' learning; simultaneously, the students contribute to shaping the "texts" through their participation and, thus, become co-authors of the events (Doyle 1992). A major task for curriculum theory is to identify the constraints that limit curriculum choices and to explore the pedagogic implications that follow (Biesta 2014; Young 2013). Drawing on Young (2013), we use the term 'powerful knowledge' to denote the kind of knowledge that is highly valued in school and thus leads to the high-level achievement of objectives. This means that throughout the study, we keep open the empirical question of what forms of knowledge can be considered powerful.

In our research projects, empirical data are collected from curriculum events in the classroom. The data is analysed from a discourse-analytical perspective.

The task is therefore about developing an analytical framework to investigate various organisational repertoires (frame factors) that are actualised with a curriculum; for example, factors such as content-orientation, teaching space and temporal organisation of the teaching. It is also about how a curriculum takes shape in the classroom and which different communicative repertoires (teaching talk including listening and learning talk including listening) are activated in relation to different content focuses, as well as how such repertoires can be described based on comparative typologies/categories. Data on frame factors and classroom discourses can be understood as basic data. However, the focus of the research is the coding of data relating to knowledge perceptions and forms of knowledge, which is a more challenging task. All the recorded lessons relate to teaching in a full class. The coding scheme can be found in the last chapter in this anthology.

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Understanding classroom discourses – Methodological aspects of empirical curriculum and teaching studies in classrooms

Daniel Sundberg

This chapter describes and discusses methodological research issues related to investigating curricula in relation to teaching and teachers in a classroom context. Curriculum research, in spite of a rich history of theoretical and empirical teaching research, has in many cases lost its strong connection to didactics and classroom research. However, there are clear signs that several different tendencies in the present period are working to breach the historically established walls between macro- and micro-perspectives on intended, mediated and enacted curricula.

The text addresses some central methodological issues in contemporary discourse and communicative understanding of *curriculum events* in the classroom (Doyle, 1992). Some problems that are addressed include how the content issue is handled, entailing considerations such as students as co-constructors of the content of the curriculum, the importance of the context, and the question of the generalisability of results. The following overarching question guides the text: What research approaches and which analytical framework could be important resources for empirically studying and analysing curricula and communication in teaching?

What does it mean to study classroom communication as curriculum events?

Research on teaching and instruction is a wide and multifaceted field of different knowledge traditions and disciplinary anchoring. Some of the recent empirical research strands include process-product-research, cognitive/socio-cognitive approaches, interaction research (including conversation analysis), ethnographic classroom research, postmodern emancipatory studies and discourse analysis (“classroom discourse analysis”).

However, when it comes to curriculum perspectives on teaching, the plurality is somehow narrowed. Generally, curriculum issues are thought of as separate from teaching issues. One potentially fruitful way of conceptualising teaching from a curriculum perspective is to employ Walter Doyle’s concepts of “curriculum tasks” and “curriculum events” (1992). The analysis unit within theoretical classroom research of the curriculum is accordingly the “theme” (“task”). Content topics are defined as a broad interpretation framework that

includes all or parts of lessons that can contain several different elements on the same theme and extend over different occasions in terms of time. A theme, rather than a task, implies a larger context that frames and links together events, texts and episodes with the common content as their base. Tasks could then instead be interpreted in this context as delimited tasks within the theme (Wahlström & Sundberg 2018).

In studying classroom communication from a curriculum perspective, teaching is understood as a curricular process rather than more limited interpersonal communication. Communication is always about something – whether well aligned to the formal curriculum/syllabus or only loosely coupled to any formal plan for teaching. The analysis unit is therefore interpreted in terms of “curriculum events”. This means that the classroom is regarded as the environment or context in which the students meet the curriculum in practice. The complex transformation between curriculum text and actual teaching is understood as written, oral or behavioural “text” that needs to be interpreted and addressed in the direction of a certain purpose. Teachers “author” curriculum events to reach and influence students in various directions. Unlike an ordinary author, the teacher-author is present when his or her texts become “read”. The teacher can therefore shape his or her text during the actual implementation by guiding the students through the text, facilitating interpretation and creating tasks that aim to deepen the understanding of the text. At the same time, the students contribute to the writing of curriculum events because they participate in the design. Creating curriculum events is therefore, in this project, seen as a dynamic process in which content is continuously produced and transformed as teachers and students work to create meaning. As in reader-response theory, the interpretation of the curriculum event lies with the students, and the analysis of the event also includes the codes and conventions that make the curriculum event understandable to the students. Thus, the interpretation takes place within a community of norms, expectations and attitudes that the “readers” share with one another and are familiar with.

The purpose of the two analysis units (i.e., curriculum themes and events) is to avoid following a more behavioural track with a focus on results and instead to concentrate research on issues of interpretation and knowledge by directing attention to the meaning and the frame of interpretation that the students bring to the situation, thereby seeing how these co-vary with the current curriculum event. The students’ experience and understanding of curriculum events are rooted in the classroom environment itself, with classroom culture and routine forming a common reference framework. Curriculum events can thus be said to emerge locally through teachers’ and students’ joint work with themes in institutionalised classroom environments. This approach also has consequences for how we look at the relationship between research and practice. Instead of trying to expose specific variables or relationships to

improve the results of school practice, interest is shifted towards descriptive and theorising explanations of curriculum events.

What does it mean to frame students as co-authors of the enacted curriculum?

The complexity of the teaching situation has often been highlighted. Jackson (1990) has specifically linked this complexity to the teacher always having a group of students to consider, i.e., a teacher perspective is taken for granted. From a curriculum perspective, however, curriculum events are delimited via themes, i.e., sequential events framed by a common content theme. Rather than taking a teacher perspective or disciplinary school subjects as given points of departure, the enactment of context is the focus. In short, this means, that

- the classroom is the primary environment in which students meet the curriculum in action;
- the complex transformation between curriculum text and actual teaching is understood as a co-authored “text”;
- teachers “write” curriculum events by their planning, execution and evaluation of their teaching;
- teachers shape their texts during the actual implementation of the formal curriculum in communication with students and the specific context;
- the selection of content is influenced by different frame factors (time, groups, settings, etc.) and resources (subjects, workbooks, assessment systems, etc.); and
- teaching is a dynamic process where content is continuously produced and transformed yet always delimited by specific institutional rules and norms.

But studying teaching solely from a teacher’s perspective does not say anything about how or what the students have learned. The teacher’s perspective must therefore be placed in relation to a broader context in which students’ roles, actions and attitudes are also included. The teacher-student perspective forms part of a broader context in which factors such as student motivation, a supportive institutional and social environment and opportunities to focus on teaching content play a role. The student is not a mere recipient. There are rather two ways of thinking of student learning: student-centred didactics (“learner-sensitive”) that centre on students’ responses to the teaching (whether they seem to understand the content, are engaged, etc.) and a results-centred pedagogy (“learning-dependent”) that has as its focus the content in relation to standards in the curriculum (Fenstermacher & Richardson 2005). The latter tends to disregard students as

co-authors of curriculum events and the discursive features of teaching practices.

Conducting discourse analysis of classroom communication

By studying classroom communication from a curriculum perspective, discourse analyses provide useful concepts and methodological tools. Three basic assumptions are crucial for analysing the recontextualisation of curricula into teaching practices. *First*, education is an open and nested system – how different levels and arenas are linked together is an open empirical question. The formal, written curriculum is not the same as the teacher-enacted curriculum, the taught curriculum or the assessed curriculum. *Second*, there are no simple sender-receiver or push-pull relationships in how the curriculum is delivered, transmitted or implemented in classrooms; rather, the curriculum is part of a classroom discourse which involves different communicative repertoires and selective content factors that are both structurally and contextually dependent. *Third*, teaching in formal schooling involves a deep institutional inertia of path dependency (e.g., I-R-E or I-R-F patterns, i.e., initiation-response-evaluation/feedback). The roles and rules for classroom communication are culturally and socially embedded in different education traditions and curriculum ideologies that require analysis to grasp not only the micro-contexts of teaching practices but also the macro conditions, i.e., wider sociocultural and sociopolitical contexts.

Previous empirical curriculum research has highlighted external and internal frameworks at various levels as well as the linguistic interaction and the form and content of the communication (Lundgren, 1972, 1981). What needs to be further achieved is to relate content issues to the citizen-formation perspective (a test of its why), to examine teaching frames as emergent frames (i.e., they are not taken for granted but are studied as they are expressed in classroom communication), and to investigate the content of teaching in relation to the wider questions of knowledge. Alexander has, in his comparative classroom studies, elaborated a theoretical and methodological conceptual scheme that includes wider education contexts as well as the classroom context; this scheme has also been proven valid across different cultural-national barriers and political systems (Alexander, 2001):

<i>Specification</i>	National, state or local curriculum (1)	<i>Content</i>
<i>Translation</i>	School curriculum (2) Curriculum task	<i>Frame</i>
<i>Transposition</i>	Class curriculum and timetable (3) Lesson plan 4	
<i>Transformation</i>	Lesson (5) Lesson task (6) Activity (7) Interaction (8) Assessment (9)	<i>Form</i> <i>Act</i>

Adapted and modified from Alexander (2001, p. 552).

The framework elaborated by Alexander (2001) provides possibilities to grasp various classroom discourses and repertoires of “teaching talk” and “learning talk” in a multi-layered analysis. The repertoires are based on comparative studies of teaching in different countries and, thus, internationally validated. There seems to be a general need to take up the rather lost thread of classroom research within a curriculum-theoretical framework of understanding and to conduct classroom research in line with international comparative methodology. From a curriculum theory perspective, there is a need for a renewal of the understanding of classroom discourse and classroom communication that extends beyond the I-R-E or I-R-F triptychs, which have come to be regarded as specific features of the school as institutional practice and have been interpreted in terms of domination, subordination and inaction. The presented framework is instead oriented towards how curriculum events are categorised in different repertoires in order to be able to compare variations of lessons not only in the same class and between different classes but also within an overall analytical framework that is international in scope.

Setting up empirical studies

In setting up empirical studies in the proposed framework, video and audio recordings and observations of lessons will be crucial. The classroom research should include in-depth case studies on classes in various education contexts (for example, in high and low SES areas). The wider contexts of the schools in a study in, for example, urban and rural areas with differences in socio-economic and ethnic backgrounds and traditional and alternatively organised teaching should also be addressed accordingly.

The data collection period should be extensive in order to capture different curriculum topics and tasks in long series of lessons (ultimately over one full school year). The main unit of analysis is a “task”, which represents a longer sequence of lessons united by the same content theme. Within each task, the lessons at the beginning, the middle and the end are analysed as different categories since previous classroom research has shown that the pattern of communication and the student and teacher activities change depending on which phase of the task they are actually in (Wahlström & Sundberg, 2018). Based on the prescribed content in the curriculum/subject syllabus, teachers author curriculum tasks around themes that generally cross individual subjects and extend over a range of time periods. Curriculum decisions regarding the planning, conducting and evaluating of these themes are important since they indicate levels of teachers’ curriculum agency along with aspects of curriculum enactment, frame factors, professional experience, the students’ needs, etc.

As complementary data material, stimulated recall by post-video analysis with teachers and with focus groups of students is valuable; it is suggested that it be conducted with at least every second instance of recorded video observations (Calderhead, 1981). The classroom studies should also be accompanied by data collection at each school, including the initial interview with the principal comprising questions on teaching policy at the school level and ending with a concluding interview with the principal comprising feedback on some aspects of the research findings presented by the researcher. The data collection period preferably needs to cover a school year to make it also possible to place the classroom studies contextually within the structure, organisation and culture of the school and in the context of the local authority. The data collection should also include school curriculum documents (i.e., regulations, guidelines, working plans, etc.), interviews with the school leader and the head (or superintendent) of the local school administration (official level) about local curriculum development in order to understand how any national curriculum is enacted and translated into local preconditions.

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Classroom observations through video recordings – Methodological approaches and ethical considerations

Catarina Schmidt

Within the project *Exploring the elusive teaching gap*, qualitative methods consisting of focus group interviews, individual interviews, field notes and the collection of various teaching resources and pedagogical documents are used for the purpose of studying the ways in which curricula are enacted in classrooms and the classroom discourses this creates. In addition, video and audio recordings of classroom teaching and learning are carried out for the same purpose. In this chapter, the focus is on the methodological approaches and ethical considerations of video recording as a method of data collection carried out in classrooms among teachers and students. The chapter addresses central methodological issues regarding what is actually accomplished and gained when observing classroom interaction and communication through the lens of a video camera. In addition, issues of selection regarding which sequences to video record will be described, and the possibility of a shared and comparative analytical process will be elaborated on. Lastly, ethical considerations and the reasons for related actions will be presented and discussed.

Video recording – A research method

Video recording is an often-used research method that makes it possible to document and capture social interactions and patterns of communication within educational settings. Through the use of video cameras, life in classrooms, including events, actions, movements and spatiality as well as verbal and non-verbal communication, may be captured. Further, these video- and audio-recorded observations can be returned to again and again within the research process. Also, selected parts of recorded classroom teaching and learning can be used in order to stimulate reflections retrospectively among the participants. In this project, video recordings are conducted over one school year in Grade 8 in the subjects of Swedish, Biology, Chemistry and Physics. We use one stationed video camera with a wide-angle lens and an external microphone, which is placed at the back of each classroom. In addition, one extra microphone is placed at the front of the classroom. The video recording starts when the lesson starts and ends when the lessons ends. The content and the structure of each specific lesson are the focus, together with the chosen repertoires for pedagogical communication. It is to serve the

purposes of this focus that we use just one stationed camera and two microphones. In total, 16 lessons are recorded in each classroom. In sum, the use of video recordings makes it possible to systematically document, capture and thereby understand the different ways in which the curriculum is organised and communicated in concrete classroom situations (Wahlström & Sundberg 2018).

Methodological aspects

Some well-known challenges of video recording as a method for data collection concern the risk of having a body of data that is either too large or too narrowly focused. When excerpts from an overly large body of data are gathered, this might result in only fragments of the context being studied; conversely, analyses of episodes of “just a few minutes” in classrooms might entail the risk of losing sight of the context. Dalland et al. (2019) argue that “selecting the data and time scale is a concern that often occurs in the later stages of the research process” (p. 12). They stress the significance of determining these aspects in good time before the start of actual video recording. Crucial aspects to be considered when video recording include, naturally, the issue of selection, i.e., what, why, for how long and how often to video record elements of classroom practice. Another crucial aspect is how this empirical material will be analysed.

As noted above, the selections, and hence the units of analysis, consist of 16 recorded lessons in each classroom that fall within specific subject areas of the Natural Sciences and Swedish. Drawing on the curriculum, teachers design ongoing themes that stretch over a sequence of lessons and are linked by their subject content; these lesson sequences are defined by Doyle (1992, p. 505) as *curriculum tasks*. In this project, each recorded lesson is defined within such a curriculum task. An example would be the curriculum task *Energy*, which draws on one or various subjects within the Natural Sciences, or the possible curriculum task *Factual and fictional genres*, which draws on the subject of Swedish. In our analysis of the teaching and learning repertoires within the video-recorded lessons, we draw on Alexander’s (2001, 2008) indicators of teacher talk and student talk and listening, complemented by the coding tools developed by Klette et al. (2005), in line with the coding scheme presented in the final part of this anthology.

A shared and comparative analysis process

An essential aspect of video recording as a method of data collection is the possibility of a shared analysis process. A shared analysis process means that we, as researchers in this project, can watch video recordings from various classrooms that draw on the same curriculum content and are placed within

similar or different curriculum tasks. In classrooms where the same overarching content goals are addressed, explicit comparisons can be made as to how the curriculum is enacted. In addition, this means that teachers' teaching talk (e.g., recitation, instruction or discussion) as well as students' learning talk (e.g., their opportunities to discuss, listen to others and to argue) (Alexander 2008; Schmidt & Skoog 2018) can be part of the comparative analysis of the classroom practices. This means that we in this project are able not only to carry out comparative analyses but also to discuss our analytical framework constantly and in depth while adjusting it as appropriate. In addition, the video-recorded lessons make it possible for us as researchers to revisit the classrooms over and over again to view them from different perspectives.

Another essential aspect of using video recording, which is also the case in this project, is that parts of the recordings can be shown in order to stimulate retrospective reflections from teachers' and students' perspectives. The total of 16 video- and audio-recorded lessons from each classroom constitute one selected unit of analysis in this project. The organisation and the chosen content of the lesson as well as the teacher's chosen repertoires for classroom teaching and learning constitute the selected unit of the analysis. Hence, the focus is not on the more informal aspects of classroom teaching and learning, such as the course of events that take place before a lesson starts or events take place afterwards.

Ethical considerations

To place a video camera within a classroom and press the play button brings up several ethical considerations with regard to the individual student participants and their feelings and thoughts about being video recorded. When entering a certain classroom, the researcher also enters various educational contexts connected to different socio-economic and ethnic backgrounds. In relation to increased curriculum standardisation (Wahlström & Sundberg 2018), some schools, and their teachers and students, may view themselves as part of successful classroom practices, while others may be aware that they are part of a context in which many students do not pass all the subjects and where the self-image regarding school success can be said to be far more vulnerable. This research project covers classrooms placed in relatively unfavourable socioeconomic conditions and classrooms in relatively affluent areas, circumstances which might have an impact on how students react to and think of being part of a research process and being video recorded. This study is carried out in accordance with the general requirements for research ethics (Swedish Research Council 2011) with regard to information, consent, confidentiality and data usage, and the research project has been ethically approved by the Swedish Ethical Review Authority. Since the project involves

minors, it is of great importance to pay thorough attention to ethics in all the steps of the research process and, hence, also during the research process and in relation to video recording. Self-evidently, ethical aspects regarding video recording also concern the participating teachers. For this reason, ongoing communication and respect for those teachers as professionals are crucial cornerstones within the research process.

Video recordings can be carried out with the use of several cameras and microphones so that more angles can be captured and high-quality sound and video are guaranteed. At the same time, too many cameras or microphones might distract or even disturb the participants. As mentioned before, the focus of the research project dictates that one stationed video camera and one extra microphone are sufficient. However, even one camera might mean that one or several students could express hesitation or outspoken dissatisfaction regarding the situation of being “filmed”, something which has been the case in this project for some of the participating students. Depending on the students’ expressed thoughts and feelings about being video recorded, the researchers of this project have handled the camera in somewhat different ways. When students have expressed not wanting to be part of the video recording, this has been accepted and the practical solution applied of placing the video camera in such a way that this student or group of students were not part of the video recording. In order to ensure that those students who do not want to be part of the video recordings are excluded, some of the researchers have remained within the classroom. In one of the classrooms, the camera lens was covered due to unexpected occurrences and movements in order to protect one or more students from being filmed against their expressed will.

On each new occasion of video recording, agreed solutions are checked again so that all students are able to feel secure and comfortable about the situation. Time and effort have been invested in conversations with all the students about the conditions of the project, for example, to explain that all the participants are anonymous, that the video recordings will not be spread beyond the research team and that it is voluntary to be part of the project. Also, those students that have expressed not wanting to be part of the video recordings have been informed that it will not affect their grades or in any other way result in any disadvantage for them. In addition, the students have been informed that it is the content of the classroom teaching and learning as well as the organisation and patterns of communication that are at the centre of the research project and not individual students.

Concluding words

Classroom observations through audio and video recording serve in this project as a methodological cornerstone. When studying the ways in which the curriculum is enacted and transformed into classroom teaching and learning,

and the classroom discourses this creates, it is clear that video recordings make comparative and in-depth classroom analysis of such complex phenomena possible. Through comparative and in-depth analyses, it is possible to reach a deeper understanding of how different pedagogical communicative repertoires are activated in relation to different content and focuses and how the teaching and learning is organised. At the same time, this chapter sheds light on the fact that video recording brings up several ethical aspects that must be taken into consideration before, during and after the research process. It is clear that the ethical and practical choices researchers make when handling the camera and when interacting with the participating students and teachers have an impact on the participants and their experiences of being part of the research project. The lens of the video camera does not always and completely reveal a totally objective reality; however, it does provide the means for selected units of analysis to be compared and analysed in depth. Systematic observations of classroom practices through video and audio recordings can therefore support the research process in terms of gradually understanding more of the micro- and macro-aspects of classroom practices in institutional and educational settings that, at present, are characterised by knowledge segregation.

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To catch the forms of knowledge in teaching

Daniel Alvunger

Imagine yourself standing outside of a school looking into a classroom with students. Through an open window, you hear the teacher asking a question; hands are raised into the air, a student replies, which is followed by a comment from the teacher. The teacher poses another question, and the process is repeated. Sometimes there is a longer buzz of students' voices. In classroom studies, it is common to categorise such activities based on the cognitive operations of learning tasks, e.g., memorisation, reasoning and critical evaluation (Alexander, 2001). However, classroom research is generally not very much concerned with studying "knowledge" as an object in itself (Maton & Doran, 2017), that is, *what* is being said in classroom interaction, how it is related to different knowledge structures and contexts of meaning and what the dominating conceptions of knowledge are.

The knowledge question – or the question of what can be considered worthwhile knowledge – is at the heart of curriculum theory (Deng, 2015; Young & Muller, 2015). It is also a multi-dimensional question because it includes not only epistemological aspects but also normative and practical ones (Nordin & Sundberg, 2018). Recent research in curriculum theory has shown the importance of bringing the question of knowledge back into the field of classroom studies (Adolfsson, 2018; Alvunger, 2018; Wahlström, 2018; Wahlström & Sundberg, 2017). In light of how transnational curriculum standards are reshaping national curricula, Wahlström (2018) calls for a revision of the "classical" initiation-response-follow-up (I-R-F) sequence as a description of the interaction between teacher and students. Through posing new questions in the third turn of the sequence, teachers explore what students know in order to assure themselves that the students have acquired knowledge and understanding of common and shared content prescribed in the curriculum. According to Wahlström, this is a teaching repertoire of "teaching as directed exploration" (p. 666) with a sequence of initiation, response and exploration (I-R-EX). Other studies have pointed to how teachers in classroom discourse build on the students' everyday experiences and connect them to concepts and phenomena in the subjects' horizontal knowledge structures (see Alvunger, 2018).

This chapter is engaged with the question of how different forms of knowledge within classroom practice can be identified, conceptualised and coded from the perspective of discourse analysis. The purpose is to discuss methodological and analytical aspects of the coding of empirical data that concern dominant knowledge conceptions and teachers' professional understanding of content

and forms of knowledge in teaching. Thus, the chapter serves as a background for the coding scheme presented in the final part of this anthology. The unit of analysis follows what Doyle (1992) has referred to as “curriculum events”, meaning that the teacher “authors” segments and events in the transformation from curriculum text content to actual teaching content in the classroom (Doyle, 1992). The first section of this chapter includes a general discussion on knowledge conceptions, ways of organising knowledge and curriculum models. The second part describes the curricular elements and forms of knowledge in the Swedish national curriculum for compulsory schooling, *Läroplan för grundskolan (Lgr11)*.

Knowledge conceptions, the (re)production of knowledge and curriculum models

A long-standing debate throughout the course of human history centres on what knowledge is. Most theories of knowledge today are founded on and relate to the different forms of knowledge that were defined by Aristotle. The first form he called *episteme*; this is theoretical knowledge, that is, facts and propositions of the world based on certainty, what we know. *Techne* – the second form – represents practical knowledge in terms of crafts and the arts: knowledge of how to produce or do practical things. The third and final form is *phronesis* – practical wisdom, good judgment and knowledge of what needs to be done and why. Both *techne* and *phronesis* require judgment, but of a different character (Carlgren, Forsberg, & Lindberg, 2009; Gustafsson, 2002). Aristotle’s three forms of knowledge can be compared with a knowledge classification scheme and three knowledge conceptions for understanding curriculum content developed by Deng and Luke (2008):

- If curriculum content is influenced by an “academic disciplinary knowledge conception”, it will be distinctly framed and characterised by facts, concepts and methods that stem from academic disciplines. The notion of “good knowledge” is based on an objective and external view of knowledge as essentialist and existing outside of the subject. There is a notion of a knowledge hierarchy – from specific/detailed to more advanced, abstract and generalised levels – which determines the structure and composition of the curriculum.
- In the “practical conception of knowledge”, knowledge is seen as subjective, contingent, contextual and impossible to derivate into separate components. It is not about true or false and hierarchical structures of knowledge but rather different qualities such as solving practical problems, what is useful and applicable in a certain context and making just decisions on ethical-moral deliberations. Thus, Deng and Luke (2008) include good judgment in this conception of knowledge.

- The “experiential conception of knowledge” is about meaning-making through an interactive process between the subject and his or her environment, that is, how the actor experiences phenomena and relations to other actors. Knowledge is thus social and created in the transaction between the subject as an agent and the outer world. From this follows that knowledge is not a product but an ongoing construction which cannot be separated from human interaction (Deng & Luke, 2008).

The three conceptions of Deng and Luke (2008) are analytical categories that are helpful for discerning different knowledge emphases. However, in teaching practice, they merge and are rarely found as distinct entities. Thus, they need to be complemented with perspectives that help us to see particular qualities of how knowledge is organised within teaching. In the following, the discussion will draw from Bernstein’s (2000) concepts of “hierarchical knowledge structure” and “horizontal knowledge structure” and from Wahlström’s (2009) distinctions of different knowledge conceptions in teaching. These two perspectives will serve as a foundation for the coding scheme.

In order to understand the production and re-production of pedagogic texts and meanings, Bernstein (2000) has developed a theoretical framework for characterising the realisation of different discourses of knowledge in education. According to Bernstein, *horizontal discourse* is characterised by common and context-bound knowledge. This is knowledge for social interaction, codes of behaviour and performing actions, e.g., riding a bike or knowing how to operate a dishwasher. *Vertical discourse*, on the other hand, is knowledge that is theoretical, general, abstract and context-independent. It can be integrated into and give potential meaning to different systems and contexts (Bernstein, 2000). Within vertical discourse, there is a hierarchical knowledge structure that functions as “a coherent, explicit and systematically principled structure” (p. 160). This knowledge structure seeks to integrate propositions, concepts and theories from lower levels (2000). In teaching, this could be compared with Einstein’s theory of relativity. Wahlström (2009) characterises this view on teaching as an “essentialist knowledge conception” in which knowledge is confined to knowledge-generation and systematically structured knowledge within an academic discipline.

Bernstein (2000) also distinguishes horizontal knowledge structures as “languages with specialised modes of interrogation and criteria” (p. 161). Horizontal knowledge structures are characterised by competing theories and modes of inquiry that are rooted in an, e.g., academic discipline, but its claims for generalisation and possibilities for integrating knowledge are weaker. This makes the structure more context-bound, dependent on experience and, in order to create meaning, inclined to relate to other interpretations and concepts

in horizontal knowledge structures (Bernstein, 2000; cf. Alvunger, 2018). According to Wahlström (2009), teaching that is inclusive and connects to individual experiences, the surrounding society and concepts and phenomena in other subjects is framed by a “meaning-making knowledge conception”. Knowledge is complex, multi-dimensional and horizontally organised. Wahlström identifies a third conception related to the education system that is important for understanding how knowledge-formation in teaching has different purposes: a “result-oriented knowledge conception”. In this conception, curriculum standards and assessment criteria serve as overarching principles for the organisation of teaching and the knowledge that students should acquire.

Some of the most fundamental questions in teaching are *what is to be taught* and *why*. A curriculum represents a selection of knowledge, skills and values that are considered essential to society (Scott, 2014). It is a pedagogic text produced within a specific pedagogic discourse (Singh, Thomas, & Harris, 2013). Bernstein (2000) has described the production and re-production of pedagogic texts as subject to the recontextualising rules and processes of “de-coding” and “re-coding”. The recontextualising rules concern the translation and justification of the values of society, power relations, the transmission of knowledge – the *how* of teaching – and the knowledge and skills that are to be (re)produced – the *what* and the content of teaching (Bernstein, 2000). In brief, recontextualisation is about generating meanings by translating and recasting concepts in pedagogic practice on different levels – from elaborated policy codes to codes of teaching and interaction in the classroom (Bernstein, 2000; Singh et al., 2013). Recontextualisation also explains why it is a mistake to equate academic disciplinary knowledge with school subject knowledge (e.g., Dewey spoke of “psychologisation” and Schwab about “translation” of disciplines when it concerned the transformation of content for educational purposes). There are substantial differences between the organisation and production of knowledge in the curriculum compared with how knowledge is produced and reproduced in a university context (Deng & Luke, 2008; Muller, 2009).

To use the words of Scott (2014), the curriculum is “a knowledge-forming activity” (p. 14), and from that follows that teaching represents the realisation of a particular discourse in which certain forms of knowledge are brought in the foreground. From the perspective of the curriculum as an activity of knowledge-formation follows that a curriculum may be modelled and shaped in line with various epistemological, ideological, social, cultural and ethical conceptions. Kelly (1999) refers to three different curriculum models, where each model is founded on a certain rationale and purpose of education. The model curriculum of content and teaching as transmission builds on the idea that the culture of society should be passed on to future generations. In brief, it is concerned with selecting worthwhile knowledge, and even if such

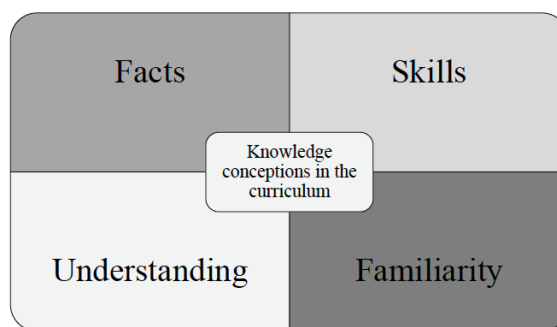
knowledge is believed to be emancipatory and to enable students to thrive in society, it is problematic because it stands on the assumption of an existing canon and a lack of recognition of the dynamics of modern societies in terms of cultural change and pluralism.

Similar to the content model, the model curriculum of product and teaching as instrumentalism puts the question of selecting content at the heart of curriculum planning. The main difference is that the product model is highly concerned with the issue of educational objectives and targets. These are formulated from what is considered most useful and conducive for economic growth and the needs of society from a social efficacy perspective. An intrinsic dimension is an instrumentalist approach to curriculum planning and teaching in terms of the most efficient techniques and methods for achieving educational objectives. The third curriculum model of process and teaching as development builds on the notion that aims, principles, values and processes of education cannot be held apart. There is a complex and vibrant interplay between the knower and the known and between the teacher and the autonomous learning individual. Curriculum planning must be based on making sense of aims and underlying principles of education rather than using them as an extrinsic framework for formulating objectives. At the heart of this curriculum model is the idea that students should be enabled to develop as individuals, to foster critical thinking and awareness and to pursue active democratic citizenship and empowerment (Kelly, 1999).

Curricula have evolved over time. In this respect, they are to be considered hybrids in terms of different emphases regarding knowledge and values. Kelly's (1999) three different curriculum models help us to see different emphases as well as recognise the complexity of how knowledge is represented and organised in the curriculum. In the concluding section of this chapter, the main features of the Swedish curriculum for compulsory schooling, Lgr11, will be presented and discussed.

The knowledge forms and the curricular elements of the Swedish curriculum for compulsory schooling, Lgr11

The first two chapters of the Lgr11 curriculum concern the overall mission and value-base of Swedish compulsory schooling and its overarching aims and principles. In the introductory section, there is a brief discussion on knowledge where the claim is made that the conception of knowledge that underpins the curriculum is comprised by four interrelated and complementary forms of knowledge. Knowledge is described as facts, understanding, skills and knowledge of familiarity:



The Knowledge Conceptions in the Curriculum for Compulsory Schooling, Lgr11.

Facts is considered to be the informative aspect of knowledge (knowing that) while *understanding* is connected to interpretation and explanation (knowing why). *Skills* are the procedural aspects that are applicable in practice (knowing how) and the fourth and final form of knowledge, *familiarity*, corresponds to Aristotle’s concept of *phronesis* (see above): judgment and the ability to make informed and ethical decisions (knowing what) (Carlgren, Forsberg, & Lindberg, 2009).

The first chapters are followed by a section where every subject syllabus is presented. The subject presentation consists of three main elements, which are described in the table below:

Element	Description
<i>Aims</i>	The Aims section is a general presentation of the subject, abilities to be developed and the main themes and topics.
<i>Core content</i>	The Core content is divided into three parts with specified content for years 1–3, 4–6 and 7–9. Within each part, the detailed content is described and ordered in <i>curriculum tasks</i> . A curriculum task is similar to a coherent area of study, e.g., in civics, Individuals and communities, Information and communication, Law and justice. (NAE, 2011).
<i>Knowledge requirements</i>	The Knowledge requirements are defined for Years 3, 6 and 9 (from Year 6, the students receive grades and are graded in each subject). They contain a combination of core content and the “abilities” that the students must acquire, e.g., analytical ability, critical examination, argumentation, application of concepts, drawing conclusions.

The Curricular Elements of the Curriculum for Compulsory Schooling, Lgr11, as cited in Alvunger (2018), p. 4.

The elements have equal status, but since the core content and the knowledge requirements are standards for assessment and grading, they are of particular importance. The core content in the school subjects consists of facts (e.g.,

events, processes, names and places) and concepts (e.g., ideologies, historical periods, mathematical concepts, judicial and economic terms, physical laws, axioms, systems of governance and procedural terms). Thus, it is related to theoretical/propositional knowledge and the academic disciplines, that is, a structural and vertical view of knowledge in line with an “essentialist knowledge conception” (Wahlström, 2009). The core content is combined with the abilities – which, to some extent, can be compared to competences – which it is possible to categorise as analytical, meta-cognitive, communicative, procedural and conceptual abilities. They are transversal and formulated as verbs in a taxonomy, e.g., *name, describe, comprehend, apply, analyse, compare* and *discuss*, and combined with descriptive attributes such as *basic, nuanced, elaborated* and *advanced* to express progression and increasing complexity. Since the abilities open up to create horizontal connections between subjects and areas of content, to some extent, they can be considered representations of curriculum-as-process and development (Kelly, 1999) and built on a “meaning-making knowledge conception” (Wahlström, 2009). In line with the idea of a standards-based curriculum, the abilities are part of the knowledge requirements in all subjects and integrated with the prescribed content. The curriculum standards in terms of knowledge requirements are, in this respect, an expression of the “result-oriented knowledge conception” (Wahlström, 2009) embedded in the curriculum.

This chapter has dealt with the complex and multi-layered character of different knowledge structures and contexts of meaning that take shape in teaching. In the final chapter of this anthology, the discourse analysis of the characteristics of the lesson content in teaching, the curricular elements in terms of facts, concepts and genres/competences and the framing of the dominant knowledge form of the lesson are presented under *D* in the coding scheme.

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The presence of assessment in classroom activities – Heuristic conceptualisations for classroom research

Bettina Vogt

When exploring the elusive teaching gap – that is, the pedagogical dimensions of knowledge segregation in classrooms – one has to take into account aspects that are related to how this knowledge is assessed. Here, the focus of the present research project is less on assessment in terms of the measurement and the evaluation of students' knowledge as such and the usually hereto related questions of reliability and validity, equivalence and equity in teachers evaluative judgements. Rather, what we focus on in the research project can be said to be the pedagogical implications of assessment in the context of a standards-based curriculum. Thus, our emphasis is on exploring in what ways assessment is present and takes shape in the teaching and learning in different classroom contexts.

In order to illuminate our particular perspective on assessment in the present classroom study, we will therefore, in what follows, address two main categories that are related to assessment and relevant for exploring the elusive teaching gap. These categories work as a kind of analytical frame characterised by heuristic concepts that are central to this study. In doing so, we outline first how the relations of assessment and the curriculum are understood. This also includes a contextualisation of assessment in relation to the Swedish curriculum for compulsory schooling, Lgr11 (NAE, 2018). In a second step, we then take a closer look at the different forms and purposes of assessment and what they mean for classroom activities. Horizontal to these categories, we interweave heuristic concepts in relation to the situation- and context-bound character of assessment and its implications for exploring the pedagogical side of knowledge segregation.

Assessment in a standards-based curricular context – The case of Sweden

In the present study, assessment is understood as an integral part of the curriculum. This applies to both the curriculum as a sort of document that guides teaching content as well as to the curriculum understood as negotiated, made and translated into pedagogical practices of different actors in educational settings.

Regarding the curriculum as a sort of document guiding teaching content, assessment essentially becomes an integral part of the curriculum with regard

to the evaluation of students' knowledge. In standards-based curricula, this evaluation is intended to be oriented towards prescribed learning objectives. Additionally, in some national contexts, these prescribed learning objectives are complemented by assessment criteria specifying quality indicators for students' learning outcomes. These criteria, or performance standards, can also widely differ in diverse contexts regarding the logics they follow and the ways in which they are designed (Lundahl, Hultén, & Tveit, 2016). In the Swedish curriculum for compulsory schooling, Lgr 11 (NAE, 2011 rev. 2018), and in the subject-specific syllabuses, the performance standards describing the expected learning outcomes, are called "knowledge requirements". These knowledge requirements describe in detail what knowledge students are required to demonstrate in order to provide the teacher with evidence for assessment. For each subject, the standards are formulated in relation to certain temporal stages in the compulsory schooling system (Years 1, 3, 6 and 9), focusing on the progression of knowledge over time. Additionally and in contrast to many other countries' curricula, the knowledge requirements in Sweden also prescribe the knowledge to be shown in relation to different levels of quality and, in extension of this, in relation to the grading scale F–A. This means that while the knowledge requirements for the grade E, which is the lowest passing grade, characterise a form of minimal standard for a certain age-cohort of students, there are also additional criteria for the other grading levels. Grading levels are expressed by certain quality indicators, the so-called "value words". Short excerpts from the syllabi in the subjects of Swedish and Biology at the end of Year 9 will exemplify this:

Pupils can write different kinds of texts with *some/relatively good/good variation* in language, *simple/developed/well-developed* text linking and also *basically/relatively good/good* functional adaptation to type of text, language norms and structures (Lgr 11, syllabus for Swedish, pp. 271–273, orig. emph.)

Pupils have *basic/good/very good* knowledge of the theory of evolution and other biological contexts, and show this by *giving examples and describing/explaining and showing relationships/explaining and showing relationships and some general characteristics* between these with *some/relatively good/good* use of the concepts, models and theories of biology (Lgr 11, syllabus for Biology, pp. 173–176, orig. emph.)

What becomes obvious in the excerpts above is that the content remains the same while the way in which students are required to demonstrate their content knowledge differs with regard to quality. Here, the indicated knowledge progression is described by adjectives and adverbs such as *basically, relatively well* and *well* as well as by verbs such as *giving examples*

and *explaining*. The design standard for all syllabi follows the progression of the Swedish grading scale F–A. In the criteria though, the grading levels follow a three-step logic describing in detail the increasing quality in students’ learning outcomes necessary for the grading levels of E, C and A. For the grades D and B, there are no explicit criteria; they are allocated when the knowledge requirement of the next grade level is reached for the most part.

In Sweden, students’ grades are mostly based on teachers’ grade assignments since there are no forms of external examinations. Hence, the continuous assessment in the classroom is the most important source of evidence when it comes to grades. Consequently, classroom assessment and teacher-assigned grades are also decisive for students’ further education at the upper secondary level and the educational tracking linked to this. When grading at the end of the term, teachers have to use all the available evidence of students’ knowledge and compare this evidence to the knowledge requirements (NAE, 2018). On the basis of the previously outlined examples for knowledge requirements, it is obvious that the process of assessment and grading, albeit articulated with a relatively higher degree of detail, is linked to comprehensive interpretation. This interpretation has to be made in relation to the stipulated subject-specific purpose as well as the teaching content specified in the syllabus (NAE, 2018). Moreover, the interpretation requires a concretisation of the curriculum text with regard to the particular teaching undertaken in the classroom. The number of references and dimensions to take into account when assessing and allocating grades creates a complexity that teachers as well as students need to handle – for example, by using matrices and checklists where knowledge content is presented in fragments of knowledge that are easily “ticked off” (Falkenberg, 2017; Vogt, 2017). From a students’ perspective, this might entail the risk that learning as well as knowledge could be perceived as quite instrumental (Vogt, 2017).

Even if the idea of standardisation in the educational sphere is not a completely new phenomenon (Waldow, 2015) that is solely related to neoliberal waves of educational steering, the transnational trend towards standards-based curricula has nevertheless become a guiding norm for curriculum change in the Swedish context. Moreover, with the implementation of the recent curriculum in the year 2011, it became obvious that another shift had taken place, whereby the steering by objectives had been complemented with a strong focus on educational performance and learning outcomes (Sundberg & Wahlström, 2012). This shift is, among others, also characterised by an increased emphasis on assessment. This increase applies, for example, with regard to national tests being conducted earlier and in more subjects; earlier grade assignment from Year 6 instead of Year 8; earlier mandatory screening tests starting in preschool classes; a new grading scale with an increased number of grading levels; the previously outlined

knowledge requirements, which are the dominant part of the syllabus; as well as an increase in guidelines, commentary material and video courses on assessment and grading provided by the NAE and intended to direct teachers' assessment in accordance with established rules (Vogt, 2017). From a political point of view, this increased focus on assessment has been justified by the need for more educational equivalence as well as a greater efficacy with regard to the earlier detection of students in need of individualised support in order to enhance the achievement of the standards (Prop. 2008/09:87; Prop. 2008/09:66). Seen from a normative angle, the results of previous studies show that the aim of equivalence is a challenging and many-faceted one, both in terms of validity as well as reliability issues (e.g., Vlachos, 2018; Gustafsson & Erickson, 2013; Johansson, 2015; Jönsson & Balan, 2018). Moreover, research on students' conceptions suggests that a high degree of standardisation does not per se lead to assessment being perceived as fairer, more equitable or equivalent if compared to students' conceptions in less standardised assessment contexts (Vogt, 2017).

The ways assessment becomes intertwined with classroom discourse and how the curriculum and knowledge requirements are "authored" (Doyle, 1992) in the concrete classroom situation are two areas that we will explore in our study. The research focuses on the nature and implications of the presence of assessment in the concrete teaching and learning that goes on in classroom activities and what this can tell us about what knowledge is seen to be of the most value – or as Young (2013) puts it, "powerful".

Having outlined the curricular context of assessment and how this is understood in our study, we now turn to the different forms of assessment as well as the purposes that matter for classroom activities.

Assessment – Different forms and purposes that matter for classroom activities

In this section, we will take a closer look at the different forms and purposes of assessment, showing their role in and implications for classroom activities. We will do this by structuring the section around three thematic foci in accordance with the terminological distinction between *formative* and *summative* assessment, two concepts which characterise our heuristic starting points.

In the assessment literature, the concept of assessment is usually characterised by a differentiation between the terms *summative* and *formative* assessment (e.g., Sadler, 1989). While the former typically tends to be associated with high-stakes testing and measurement of students' knowledge, thereby highlighting the administrative aspects of assessment, the latter represents the pedagogical dimension of assessment aimed at supporting students' further

learning, often associated with different forms of feedback and feed-forward. Thus, summative assessment is also described as “assessment *of* learning”, while formative assessment is expressed as “assessment *for* learning” (Black, Harrison, Lee, Marshall, & Wiliam, 2003).

However, the extent to which the summative-formative dichotomy may be conceptually helpful can be questioned, and this is especially the case when analysing classroom activities related to assessment practices. The discussion of the challenges and limitations related to this conceptual differentiation is also present in recent assessment research (e.g., Bennett, 2011; Taras, 2005; Black & Wiliam, 2009, 2018).

First, every assessment, regardless of its form, is primarily related to some sort of learning diagnosis with a result that is ascribed a certain value. This means that the students’ learning, per se inferential in character, has to be made visible. The visualisation of learning can be realised through different forms of assessment, such as written tests, oral presentations, the production of creative artefacts, discussions, etc. The results of such diagnoses can then be used for different purposes. When the results are used in order to sum up what a student knows about certain learning content, the assessment is used in a summative way. Such summations also form, in one way or another, the basis for later grade allocation. When the results are used in order to guide and form the student’s further learning process, the assessment is used for formative purposes. Hence, the purposes of assessment must not be confused with different forms of diagnostic artefacts, and the qualifiers *summative* and *formative* focus more on different purposes than on different kinds or forms of assessment.

Second, in concrete classroom situations, both purposes are intertwined in manifold ways, making it hard to draw a clear-cut differentiation. For instance, to be able to initiate the first formative steps in directing the student’s further learning at all, teachers first have to produce a summation of a student’s knowledge. Here, a written test might be used to render the strengths and weaknesses in students’ learning process visible, which, in turn, can be used to improve further learning – provided that the test contains valuable feedback. Hence, the extent to which a certain diagnostic artefact might provide possibilities to direct further learning becomes mainly a question of how well it provides students with valuable information, making their own learning visible to themselves (Bennett, 2011) and, in extension to this, supporting the regulation of learning (Andrade & Brookhart, 2019).

In recent years, emphasis has been placed on the need to ground formative assessment theoretically. Accordingly, it has been highlighted that the classroom level must be central to this theoretical foundation, and efforts have been made to locate formative assessment within the sphere of pedagogy theoretically, thereby also including classroom discourses (Perrenoud, 1998;

Black & Wiliam, 2009, 2018). Since teachers are the main actors with regard to grade allocation in Sweden and since there are no final external examinations, the issue of classroom assessment and its interrelations with pedagogy are also of high relevance to our study. This also implies our dedicated attention to the kinds of knowledge different groups of students are given access to as well the different ways that assessment becomes intertwined with teaching and learning in the observed classroom activities.

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Coding scheme for analysing classroom discourse and conceptualisations of knowledge

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In this section, we present the coding scheme developed within the two research projects *Understanding curriculum reforms – A theory-oriented evaluation of the Swedish curriculum reform Lgr 11* (2014– 2017) and *Exploring the elusive gap – Equity and knowledge segregation in teaching processes* (2018–2020).

The inspiration and starting point for the work with the coding indicators is primarily the work of Robin Alexander in the project *Culture and pedagogy: International comparisons in primary education* (Alexander, 2001). The concepts of teaching and learning repertoires, as well as organisational repertoires, have been guiding principles for the structure of the coding scheme. Moreover, Kirsti Klette and colleagues (Klette et al., 2005) have been an important source of inspiration for creating a more detailed network of data. However, both Alexander and Klette have focused on classroom discourses rather than trying to capture knowledge content and forms of knowledge (see Ch. 1). The purpose of the present classroom research projects is thus to develop a coding scheme suitable for comprising all the three perspectives of knowledge, discourse and organisation.

Coding scheme for classroom research

A. Elements of the lesson in which the teacher is the central actor

A.1. Monologue form of lecture/narration/reading aloud/watching movies, etc.

A.2. Recitation. Question/answer sequences; i.e., systematic use of questions to explore students' knowledge or gain new knowledge

A.3. Dialogue. Whole class conversation as teacher-led dialogue to use/develop students' knowledge for educational purposes

A.4. Discussion. Whole class discussion as free exchange of ideas between teachers and students where at least three students actively participate with comments

A.5. Rote. Homework enquiry and the like in which the focus is on students' learning of some facts

A.6. Instruction

A.6.a. The teacher provides verbal/non-verbal instructions on tasks and class projects (task content, grouping, resources, texts, etc.)

A.6.b. Teacher instructs on the board/screen, etc., what/how students should write, draw, note on their computers/tablets/paper

A.6.c. Comments on behaviour

A.6.d. The teacher provides information of a general nature

A.7. The lesson's gaps. (Waiting for the class to be quiet, waiting for some students to leave the classroom, someone entering the classroom for leaving information, etc.)

A.8. Teachers' listening

Can apply to part of the lesson or the lesson as a whole

A.8.a. Attentive (prepared to draw attention to what the student wants to express)

A.8.b. Patient (patient listening, ready to let the speaker speak to the point)

A.8.c. Distracted

A.8.d. Discriminating (a sharpened listening that leads to further thought)

B. Elements of the lesson in which the student/s are central actors

B.1. Students reading aloud from textbooks or other texts

B.2. Student presentations in which students report on tasks

B.3. Discussion. Open pair/group discussion as a free exchange of ideas between at least two students based on a given theme

B.4. Group or pair work tasks that are also reported to the class by the groups or pairs

B.4.a. Task-controlled pair/group work

B.4.b. Project-oriented group work with relatively freely formulated content

B.4. Teacher's activities during group work

B.4.c Teachers provide guidance in the groups

B.4.d Teachers are engaged in own activities; no interaction

B.5. Students' listening

Can apply to all or part of the lesson and the whole class or groups of students

B.5.a. Dutifully

B.5.b. Interested

B.5.c. Patiently

B.5.d. Reflect on what they hear

B.5.e. Hardly listen at all

B.6.f. Are not given the opportunity to listen because of circumstances in the classroom environment

C. Individual work as a clear element of the teaching organisation

C.1. Individual work in the classroom, for example, individually conducted writing, reading or searching for information tasks

C.2. Individual work organised as working in pairs in which the tasks are reported individually

C.3. Teachers' activities during individual benchwork

C.3.a. The teachers provide individual guidance

C.3.b. The teachers involve the whole class based on a student's question

C.3.c. The teachers deal with their own activities; no interaction

The lesson content and knowledge approach – What is considered important knowledge?

D. Teacher's professional understanding of the content

D.1. The teacher explicitly relates to the curriculum

D.2. The teacher relates to facts

D.2.a. Facts are treated as stand-alone (question-answer, enumeration)

D.2.b. Facts are integrated into a subject context

D.2.c. Facts are integrated into a social/experience-based context

D.2.d. Facts are related to consequences and alternatives

D.2.e. Facts are related to the knowledge requirements in the curriculum

D.3. Concepts

D.3.a. Concepts are treated as stand-alone (definition, meaning)

D.3.b. Concepts are integrated into a subject context

D.3.c. Concepts are integrated into a social/experience-based context

D.3.d. Concepts are related to consequences and alternatives

D.3.e. Concepts are related to the knowledge requirements in the curriculum

D.4. Genres and competences (especially in the subject of Swedish)

D.4.a. Work with text/assignment (oral, written, pictorial) as isolated skill training, e.g., when critical/analytical/argumentative competence in itself is central instead of the actual topic to be analysed/critically examined/argued for

D.4.b. Work with text (oral, written, pictorial) with functional use of text/language and critical/analytical skills linked to content and direct use

D.4.c. Work with text (oral, written, pictorial) that is directly linked to and motivated by content and knowledge requirements in the curriculum

Comment: In D.4.a, the content of the teaching is motivated by subject-disciplinary needs; in D.4.b, it is based on functional needs for society and the individual; and in D.4.c, it is based on instrumental needs that the curriculum places on teaching and students' achievement

D.5. Teaching materials

D.5.a. Content/own work/pair or group work is mainly related to digital text

D.5.b. Content/own work/pair or group work is mainly related to text in textbook

D.5.c. Content/own work/pair or group work is mainly related to own experiences

The lesson's dominant forms of knowledge

- A conception of knowledge as meaning-making: horizontal knowledge approach; frequent references to other subjects, own experiences, society; knowledge is presented as multifaceted
- A conception of knowledge as essentialistic: vertical knowledge approach; frequent references to the actual subject and knowledge building within the subject; knowledge is presented as unambiguous
- A conception of knowledge as result-oriented: content and abilities are strongly linked to the content and knowledge requirements in the syllabus

Knowledge concepts from Wahlström, Ninni (2009): *Mellan leverans och utbildning. Om lärande i en mål- och resultatstyrd skola* [*Between delivery and education: On learning in a school managed by objectives and results*]. Göteborg: Daidalos.