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Surfing Semantic Waves: Using Semantic Profiling to Focus on Knowledge in Practicum Lessons

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ABSTRACT

In Sweden, although all teacher education programs require the completion of the practicum, little focus has been placed on consistent evaluation of how content knowledge is included and built during practicum lessons, or how lesson planning and teaching are aligned. This article presents a novel method for teacher educators, mentors, and student teachers to engage in knowledge focused post-lesson conversations as well as for supervisors to understand student teachers' lesson planning and subsequent teaching in the practicum period. This research utilized semantic profiling as a method to provide a knowledge-focus for learning during the practicum period. Semantic profiling provides a visualization of how student teachers' lesson plans and delivered lessons allow for cumulative knowledge-building. The plotting and analysis of 54 semantic profiles, based on lesson plans and in-situ observations, suggest that the more knowledge-driven lesson plans also provided better opportunities for school students to engage in cumulative knowledge-building during delivered lessons. The semantic profiling tool made visible how planned content knowledge was delivered in class to both teacher educator observers and student teachers and stimulated rich practice-focused conversations, suggesting the method to be used across teacher education departments for a shared approach to practicum discussions and evaluations.

Introduction

The practicum, also known as professional experience, student teaching, practice teaching, workplace learning, or school-based experience (among other names), is a foundational component of all pre-service teacher education programs (Rorrison et al., 2018), where student teachers are able to practice teaching and to experience classroom life. The practicum period enables preservice teachers to develop capacities to be able to act like a teacher, to think like a teacher (Wilson & Demetriou, 2007), and to begin to identify with the role of being a teacher (Akkerman & Meijer, 2011). Hence, this preparatory period is highly valued by preservice teachers, teacher educators, and schools alike (Le Cornu, 2016). Even though the practicum is valued by all, it is experienced differently by many and as Jonsson and Mattsson (2011) note student teachers' experiences are often subject to "chance" judgment rather than "subject to proper and systematic assessment" (p.185). This article reports on the introduction and use of a novel observation tool used by teacher educators to facilitate professional conversations about teaching and to contribute to the process of evaluating student teachers' practicum teaching.

In Sweden, where this research took place, the practicum assessment is based on what is observed to occur in a single visit from a teacher educator; a post-lesson conversation about the development of their teaching practice; a reflective written assignment about their teaching experience, and participation in practicum seminars at the university with their peers. The integration of these aspects for

grading is done in different ways and inconsistently, so this research sought to theoretically inform the first two grading processes (observation and discussion) based on a semantic profiling tool (Kirk, 2017). This research also attempts to look closely at how the knowledge content of lessons taught is explicitly linked to that expressed in curriculum, syllabi, and lesson planning. This type of research is still relatively rare in the educational literature on pre-service teaching and the practicum (Jonsson & Mattsson, 2011).

Primarily, though, we sought to understand how semantic profiling could provide evidence of the alignment of lesson planning and lesson delivery and enhance the discursive opportunities between student teachers and teacher educators (Kriewaldt et al., 2018; Windsor et al., 2020) which led us to ask the following research question:

- To what extent does the semantic profiling tool show alignment between knowledge-building in planned and delivered lessons?

This research aimed to understand the benefits of using semantic profiling (Kirk, 2017), a concept and a tool emerging from Legitimation Code Theory (Maton, 2014) which focuses on the knowledge in any given situation, in practicum classes of student teachers.

Literature

In a systematic review of the research on the practicum in teacher education, Lawson et al. (2015) found a trend toward thinking about the school practicum from the perspectives of the main groups of participants. Of the 114 studies included in their systematic review, 70 focused on the perspectives of student teachers during the practicum, and only 2 on university teacher educator's perspectives, and interestingly "pupils did not figure in almost all of the studies in our review" (Lawson et al., 2015, p. 397). None of the studies that Lawson and colleagues reviewed looked specifically at what knowledge (content) was planned for or taught in practicum classes. This corresponds to claims of knowledge-blindness (Maton, 2013) within educational research where knowledge is viewed subjectively. This is evident in much educational research that places more focus on the actors and their actions, thoughts, and feelings, and less focus on "*what* knowledge is being created" (Maton, 2013, 5, emphasis in original).

There is research that suggests that there is a knowledge gap between what is perceived as university-based education and work placement education (Forgasz et al., 2018; Hegender, 2010; Karlsson Lohmander, 2015). Hegender (2010) proposes that this gap is caused by distinctions between propositional knowledge (provided in university-based courses), and procedural knowledge (acquired during school-based learning such as the practicum). This can also be understood as two dimensions that teachers need in their work; research-based knowledge *for* practice, and knowledge *in* practice which is gained through experience (Cochran-Smith & Lytle, 1999). The practicum period provides the opportunity to make "public the knowledge necessary for good practice in the form of symbolic representations (e.g. language statements) within the immediacy of action" (Mena et al., 2016, p. 54) However, a number of studies indicate there are often difficulties in integrating these dimensions in the practicum periods (Hegender, 2010; Shay, 2005; Walton & Rysznyak, 2019).

Locally, research on the Swedish practicum has recently focused on relational aspects of teaching such as being able to interact in the classroom, build relationships with pupils, and being able to "see" the pupils as forming the foundation for being a successful teacher (e.g. Gardesten, 2016). There has been further focus in the research on identifying what makes a student teacher "fail" a practicum placement, which concludes a key indicator for a passing or failing grade is how relationships in the classroom are built (Gardesten & Hegender, 2015). However, assessing these types of relations is a matter of tacit knowledge and understanding of the hidden curriculum, and it has been questioned whether qualities such as "autonomy, interpersonal relations and leadership" (Shay, 2008, p. 526) can even be assessed.

Finally, relevant to this study has been research into the practicum that has focused on professional conversations conducted after the practicum lesson. It is generally understood that when student teachers have opportunities to discuss and reflect upon their teaching practice, their teaching practice is enhanced (e.g. Eckerman Pitton, 2006; James, 2017; Klemp & Nilssen, 2017; Kriewaldt et al., 2018; Timperley & Alton-Lee, 2008; van Kruiningen, 2013). Professional conversations between student teachers and more experienced teachers are crucial and are considered "central to developing student teachers' cognitions that underlie their professional knowledge and performance" (Timperley, 2001, pp. 111–112).

Although we recognize that the assessment of the practicum should include how student teachers demonstrate they have bridged the theory-practice gap, can display tacit knowledge of teaching, and build various relationships in the classroom, there is much research still to be done. Research that looks closely at the content of lessons taught, that explicitly links content knowledge to the curriculum, syllabi, and lesson planning, and that allows cumulative knowledge building to occur has not been extensively conducted in the practicum (Jonsson & Mattsson, 2011).

Theoretical Framework

Legitimation Code Theory, Cumulative Knowledge Building, and Semantic Profiling

Legitimation Code Theory (LCT) is a theoretical and analytical framework that focuses on knowledge practices and that seeks to reveal the underlying principles of knowledge-building. LCT focuses on the knowledge inherent in what is studied or used in a given situation. It involves identifying legitimate knowledge and "enables both the exploration of knowledge-building and the cumulative building of knowledge" (Maton & Chen, 2016, p. 2).

Maton (2009) defines cumulative knowledge-building as occurring when new knowledge is added and integrated with existing knowledge, and where connections between knowledge and contexts are made visible to the learner. Cumulative knowledge-building is enabled and enhanced as a result of effective teaching and requires making knowledge "visible" and ensuring that knowledge is not so strongly linked to one context that it is rendered only meaningful in that particular context (Maton, 2013). When knowledge is decontextualized in this way, moving from simplified context-dependent meanings (and back again) it can be visualized as making "semantic waves" (Maton & Doran, 2017; Maton, 2013). Currently, there are four dimensions described and applied within LCT, exploring different codes of legitimation. One of these dimensions is Semantics, from which the concept of "semantic waves" comes (Maton, 2014).

The LCT dimension of Semantics is concerned with how different practices hold stronger or weaker semantic gravity and semantic density. In this case, we are interested in the semantic gravity and density of teaching practices that the student teachers engage in, during their classroom interactions. The more the meaning of interaction is dependent on the context, the stronger the semantic gravity, and conversely the less interaction is dependent on the context, the weaker the semantic gravity. Semantic density is concerned with the degree to which meaning is condensed; the more meanings that can be found within a practice, the stronger the density, and the fewer the meanings, the weaker the semantic density.

In a lesson or series of lessons, classroom practices will move between displaying stronger and weaker semantic gravity, creating waveforms, known as a semantic profile (Macnaught et al., 2013; Maton, 2013, 2014).

This semantic profile (Figure 1) illustrates an example of the opportunities given to pupils to meet the lesson goals by moving between everyday language use and technical language use or between practical work and the theories informing them. The movement along the waves, the "surfing" that takes place, is an indicator of how pupils get an opportunity to learn, to build, and to show their new knowledge (Clarence, 2017). Maton (2014) and Maton and Doran (2017) suggest that generating semantic waves, i.e. upshifting and downshifting content and language, or unpacking and repacking, is important for cumulative knowledge-building. Thus, studying the content in focus for a lesson allows
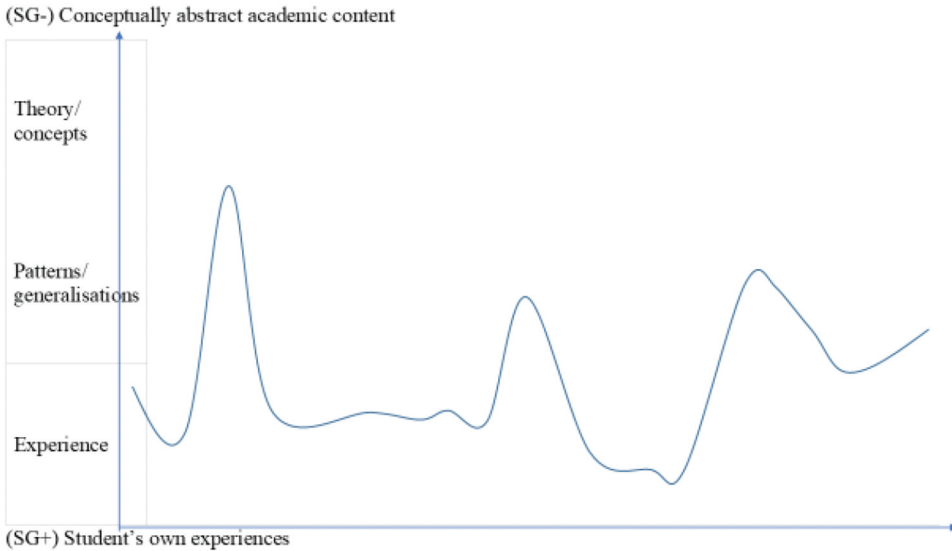
Figure 1. Semantic profile of fictive lesson or series of lessons (inspired by Kirk, 2017).

for studying how well school students are presented with opportunities to surf the semantic waves during practicum lessons. It is also a way of highlighting student teachers' alignment of lesson plan and lesson delivery and of identifying the possible missed opportunities or the "caught in the moment" opportunities of the teaching and learning situation.

Figure 2 illustrates three types of semantic profiles. The two flatlines – A1 and A2, are examples of identified knowledge only being in either an anecdotal or context-dependent field (A1) or in presenting abstractions (A1). The third profile, shown by the B line is, in contrast, an illustration of knowledge shifting between more concrete and more abstract meanings. Furthermore, the three example profiles illuminate the differences between practices with regard to semantic range, i.e. the greater the waveform (height), the greater the movement between context dependence and context independence.

Using an English classroom as an example, at the end of a unit, pupils are often expected to produce written texts based on the literature they have read that display their new knowledge including both decontextualized, condensed meanings and context-dependent, simplified meanings. The older the students, the higher the complexity in both the texts to be read and the texts to be produced, which makes bridging the 'semantic gap' (Maton, 2013, p. 14) between decontextualized condensed meanings and context-dependent simplified meanings, an important aspect of teachers' work.
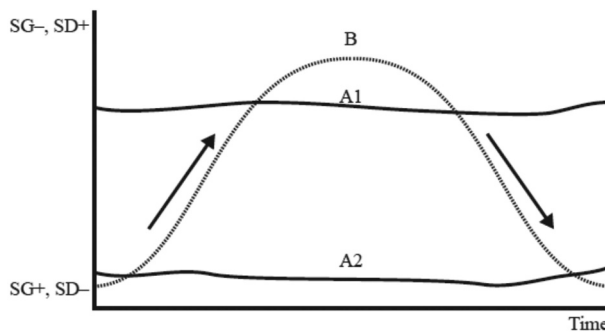

Figure 2. Three semantic profiles (Maton, 2014).

To close the semantic gap, teachers must make the different ways language is used to communicate the knowledge content of a unit or subject visible (c.f. Martin & Rose, 2007). For example, a factorial explanation in the school subject history has different linguistic requirements (grammar, vocabulary, and composition) than classification in biology (e.g. Martin, 2013). And, if students are to be assessed on their abilities to show their knowledge of a field by expressing decontextualized, condensed meanings and context-dependent, simplified meanings they will be more successful in doing so using the subject specific conventions of language. However, pupils are often left alone to interpret the written texts or only meet the teachers' unpacking of textbook terminology or concepts but not repacking them again (Andersson Varga, 2014; Hipkiss, 2014; Macnaught et al., 2013; Martin, 2013).

Methodology

This article draws upon a qualitative study of "teacher education practices" (Loughran et al., 2007) specifically related to the practicum periods for student teachers.

Design

Data for this study was collected by one of the authors, a teacher educator who visited student teachers to observe and assess their practicum courses. Initially, the data was collected as part of a pilot using a variety of novel tools to assess and award a grade to student teachers. What emerged in the pilot was the utility of the approach (i.e. using the semantic profiling tool described below), to guide post-lesson conversations with the "profiled" student teachers that linked cumulative knowledge building in both planning and in different phases of the lessons.

This research retrospectively draws upon data generated in the course of one teacher educator's visits to observe and ultimately grade the student teachers' practicum periods. Student teachers were not actively engaged in this process as research participants at the time of examination visits so did not explicitly consent to participate nor withdraw from the research then. Subsequently, permission to include semantic profiles and snippets of follow-up conversations (from field notes) was sought and only those that consented to participate have been used and de-identified (Appendix). When permission to include the sample semantic profiles and lesson plans in this research was sought, student teachers were also asked to confirm that the conversation notes aligned with their memories and understanding of those conversations and add anything they recalled from the discussion.

Data Collection

The study took place over the course of 27 lessons led by 18 different student teachers in primary and secondary schools, teaching a range of subjects over a period of one and a half years (Table 1). The data consists of 27 semantic profiles of lesson plans and 27 in situ lesson profiles along with field notes taken on post-lesson conversations between a teacher educator and student teachers that occurred within the practicum period. The year level of the classes taught, varied between Year 1 (lower primary) and Year 12 (upper secondary), as did the subject area of the classes. The sample of lessons and student teacher participants was random only in the sense that the researcher/observer/examiner was allocated examination responsibilities by the different practicum course leaders.

The 18 student teachers were in different stages of their teacher education training. Student teachers for year 1–6 took part in the traditional teacher education program lasting 4 years with three practicum periods spread out over the 4 years. These students were visited once within this research. The three student teachers in Years 7–12 (secondary school) were undertaking a special fast track teacher qualification over three semesters as they already possessed a teaching qualification from another country. These student teachers were visited on three occasions within this research. Table 1

Table 1. Summary of Examination Lessons Observed. School Year, Number of Observations, and Student Teachers (ST 1–19), Subject, and Content Focus.

School year	Observations			School subject	Content focus
	Spring 18	Autumn 18	Spring 19		
Year 1–3	3 ST 1-3	1 ST 14	0	Biology, Geography	Bumble bees, water circle, butterflies, north of the polar circle, and the moon
Year 4–6	4 ST 4-8	4 ST 15-18	0	Math, Swedish, Religious studies, English	Negative numbers, Hinduism, types of poetry, parts of speech, Finland, and pronouns
Year 7–9	3 ST 9-11	3 ST10–11, 19	3 ST 10, 19	English	Present tense, nouns, horror, the body, and space
Year 10–12	2 ST 12-13	2 ST 12-13	2 ST 12-13	English	Book review, tenses, language varieties, and current affairs
Total	13	10	4	-	-

summarizes the studied practicum examinations, showing visits spread over school years, number of visited student teachers each term of the project, school subjects that were observed and the content in focus for the lesson.

Steps in Data Collection

Lesson Plan Profiles

Prior to the observed practicum lesson, student teachers were expected to provide the visiting university educator a lesson plan, to show that they had prepared and to allow the visiting teacher to prepare for the visit. There were no strict guidelines nor template for creating lesson plans, but students were expected to include learning goals, a summary of teaching activities, follow-up or assessment, and motivation of the choices made. Before each observation, the teaching activities and the proposed sequence of the lesson plan was plotted onto a graph showing a semantic profile. The different activities were labeled on the semantic profiles using the translation device (Table 2), and based on the expertise of the teacher educator, the waves were heuristically drawn to demonstrate the anticipated progression of the lesson. In the lesson plans, it was possible to identify activities that focused on theoretical concepts or terminology, for example, even if the descriptions of activities did not explicitly specify this, and so these were also noted in the profiles. Finally, the timings of the activities were estimated (some students provided suggestions on how much time they would spend on different tasks and others did not) and plotted along the timeline (x-axis) in the semantic profile. Timing estimates were based on

Table 2. Translation Device Used to Illustrate How the Semantic Gravity Continuum Translates Semantic Profiling (Modified from Kirk, 2017; Meidell Sigsgaard & Jacobsen, 2020).

Semantic gravity continuum	Observed during lessons	Knowledge focus in lesson plans and/or lessons with *examples*
Weaker semantic gravity (SG-)	Theory/concepts	Use of key terminology or key concepts relating to the planned content and activities *reincarnation & karma, negative numbers, ailment*
Neutral	Patterns/ generalizations	Generalized understandings of the concepts or experiences *reincarnation ≈ recycling, illustration of a number line, I feel pain in my foot*
Stronger semantic gravity (SG+)	Experience	Relating to examples from prior lessons or activities or student experiences from outside school *I killed a slug with my bike>bad karma?, The temperature when it's below zero, I can't walk*

the assessor's teaching experiences and understanding of how much time could or would be spent on the specified activities.

In situ or Live Profile Plotting

During the observed lessons, a 'live' semantic profile was plotted and supplemented with notes taken based on teaching that took place. The notes were about key terminology or key concepts used, and whether the pupils or the student teacher contributed with the abstractions or the concretizations. It was also noted when the student teacher or students discussed specified content from the lesson plans. These semantic profiles contained more detail than those drawn from the lesson plans. Ordinarily there would be more waves in the live profiles that indicate sections of the lesson when either the teacher or the teacher and students together moved frequently between dense and simple meanings. Figure 3 is an example of how the two profiles were constructed, the line representing the semantic waves of a lesson plan and the dotted line a "live" profile from the lesson with example notes from lesson plans and/or lessons. Using the semantic profiling observation tool, the observed (in class) and planned-for practices were mapped and analyzed for alignment and coherence.

Professional Conversations

The student teachers were involved in conversations at two points in time, once about their planned lesson and once after the delivered and observed lesson. However, data is drawn only from the post-lesson conversations for this study. The post-lesson conversations between the student teacher, their mentor teacher, and the university teacher would begin as an initial summary of the taught and observed lesson. These three-way professional conversations have been found to be important in developing "horizontal expertise in and for teacher education" (Mtika et al., 2014, p. 67). The mentor teacher would then leave, and the discussion would continue between the university teacher and the student teacher focusing on strengths and weaknesses from the student teacher's point of view. At this stage, the semantic profile would be shared, with an accompanying explanation of the outline and its purpose and how it relates to what the student teacher has just identified as occurring in the lesson. The university teacher would then explain how the two waves were created from the lesson plan and
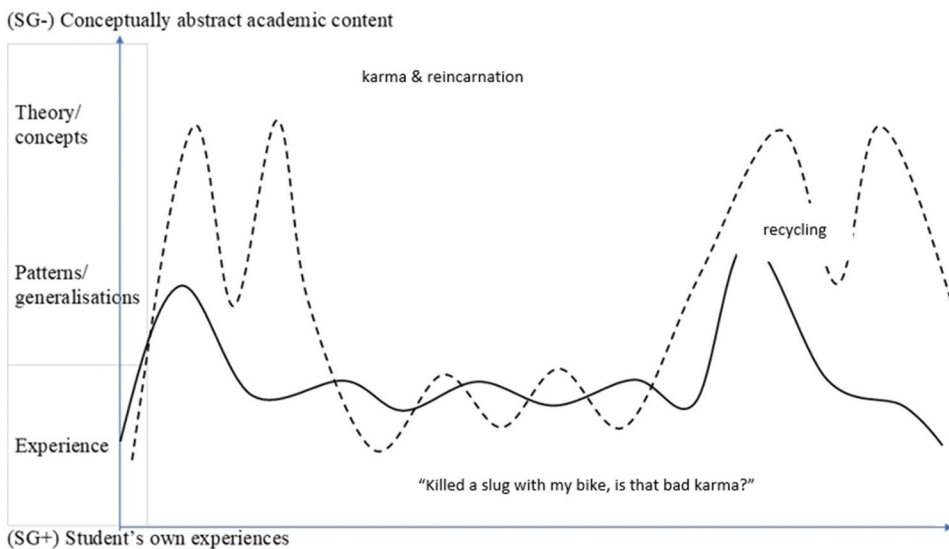

Figure 3. Example of semantic profiles constructed from a lesson plan (line) and a lesson (dotted) based on Kirk (2017) with examples of notes from lesson plans or lessons plotted on the semantic gravity continuum to illustrate.

the enacted lessons became the graphed semantic profile. A conversation including both student teacher and university teacher reflections would then take place focusing on plan and outcome and student responses in the classroom.

Data Analysis

The analytical process involved in the profiling of semantic gravity is based, in part, on the under-standing of cumulative knowledge-building classroom practices (Maton, 2014). Waves showing semantic gravity show teaching and learning opportunities where knowledge is transformed between "relatively decontextualized, condensed meanings and context-dependent, simplified meanings" (Maton, 2013, p. 8). When these opportunities are observed, recorded, and plotted, it is possible to produce and graph semantic waves that show different levels of semantic gravity. Semantic gravity in this study was drawn from identifying decontextualized and context-dependent content, and by observing if lesson content was made concrete or abstract from the perspective of the pupils through linguistic choices. Analysis therefore looked for patterns where decontextualized and condensed, and context-dependent and simplified language is used in lessons.

Semantic profiling was then utilized as a method for identifying cumulative knowledge-building in the lessons. The analytical process combined semantic profiling, and Kirk's (2017) division of stronger and weaker semantic gravity into experience, patterns/generalizations, and theory/concepts. In Kirk's (2017) work on semantic profiling in student reading and writing for English for Academic Purposes, he distinguishes between stronger semantic gravity (SG+) as exemplified by student's own experiences and weaker semantic gravity (SG-) as conceptually abstract academic content.

To illustrate how semantic gravity is translated into the semantic profiles, a translation device (Maton & Doran, 2017) was used (Table 2). Here, the continuum of semantic gravity is distributed over the three categories (see, for example, Kirk, 2017; Meidell Sigsgaard & Jacobsen, 2020); theory/concepts, patterns/generalizations, and experiences further exemplified by how they were enacted either in lesson plans or during lessons.

With the help of the translation device, it was possible to go back and forth between collected data that helped ensure trustworthy characterizations of analyzed instances (Maton & Chen, 2016).

Findings

This research sought to study how semantic profiling can demonstrate alignment between planned and delivered lessons in terms of what content knowledge was in focus and how cumulative knowledge-building opportunities were provided in class and aid discussion of post-observed teacher practicum lessons. It also did, at least at the beginning, aim to see the utility of a semantic profiling tool as an assessment or grading proforma. In the following sections, the findings will be presented in three parts: a) what is identified in the semantic profiles of lesson plans; b) alignment of the combined semantic profiles of the lesson plans and delivered lessons; and finally, c) what responses to this novel profiling came from student teachers in the follow-up conversations.

Semantic Profiles of the Lesson Plans

The student teachers all provided a lesson plan that within a day or two was to be taught as part of the examination of the practicum period. The lesson plans for the observed lesson could be part of a greater lesson unit or a stand-alone lesson. All lesson plans followed a similar structure consisting of an introduction that normally involved student teacher-led instruction, followed by student activities and concluded with a summary by the student teacher. This typical lesson structure has been coined a *curriculum macrogenre* (Christie, 1995) consisting of three readily identified phases, a beginning, a middle, and an end to each period of teaching and learning.

The semantic profiles of the lesson plans were plotted along timelines (the values on the x-axis are units of time) and lesson plans were identified as being either explicit or not explicit with regard to knowledge, concepts, terminology, or theory they contained. In the lesson plans categorized as not explicit, it was possible to see the telling of a "lesson story" with a beginning, a middle, and an end, in line with the typical three-phase structure (cf Christie, 2005). They would not explicitly state the terminology pupils needed to know and use nor the concepts that should be understood by the end of the lesson. Instead, these lesson plans would focus on different activities, they would have students engage in, which worksheets or handouts to provide, and what pages in the textbooks would be referred to. The second category contained more explicit lesson plans and included mention and/or explication of the content, language, and terminology to be used and expected learning outcomes of the lesson. These plans also included activities, the expected time to spend on different activities, and resources needed.

Figure 4 provides examples of three semantic profiles of lesson plans that were chosen because they were representative of the lesson plans handed in before the observed practicum lesson examination. The mathematics class represented by the line and the religious study class represented by the dotted line are both examples of lesson plans that were designed to focus on the activities first and were not explicit in terms of content. The English class, represented by the dot-dash line, is an explicit lesson plan focused on content.

The lesson plan for the mathematics (line) was for a lesson introducing "negative numbers" and was created by a student teacher on their second practicum period, but the first to be examined. The lesson plan was translated to a semantic profile that showed an inclining slope, rather than a waveform as the plan was a general account of what was planned. Only the title of the plan mentioned the introduction of a new concept to the students – negative numbers. In the second half of the lesson plan, during which the students and the student teacher were to engage in (potentially) more complex activities applying the mathematical concept in small groups an incline can be seen. This incline was plotted this way on the assumption that classroom interaction that allows for movement between the context-dependent pupil-centered understandings and the decontextualized teacher communication
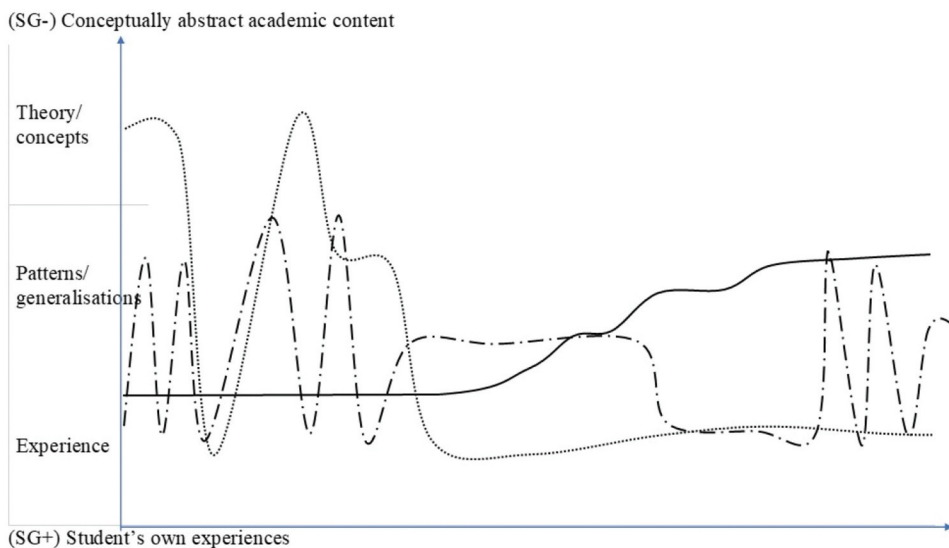

Figure 4. An illustration of some semantic profiles from the lesson plans.
Key: Unbroken line – mathematics lesson plan; dotted line – religious study lesson plan; dot/dash line English lesson plan.

would occur in this phase of the lesson. The semantic range, which is the difference between the lowest and highest points in the profile, is narrow and appears at its greatest toward the end of the planned lesson.

The dotted line shows the plotted semantic profile for a planned upper primary school lesson in religious studies written by a student teacher on their second practicum. The lesson was part of a unit on Hinduism and focused upon the concepts of "karma" and "reincarnation." These two concepts were central in the beginning of the lesson plan and were to be introduced, unpacked with the help of a context embedded image representing reincarnation, and then linked to other Hindu concepts known to the students from earlier in the unit. The lesson plan only includes explicit teacher-led opportunities for decontextualized challenges for the students for the first 20 min and after this clear introduction the lesson plan becomes less explicit as students were to work independently with a writing assignment. The semantic range here, however, is greater than the previous example as there is a movement between the students' abstract and everyday understandings of karma and reincarnation.

The dot/dash line is a semantic profile from a lower secondary school English lesson that was the second practicum examination for this student teacher, who held a teacher qualification from another country, and had some teaching experience. The lesson plan showed that students were to work with "the body," specifically to make use of known vocabulary for body parts and different ailments, work out phrases together for a doctor's visit, and then to practice these in role-plays. The aim of the role-plays was for students to apply context-dependent communication. The lesson plan profile includes anticipated coverage of language content both as knowledge of a generic ailment such as "a cold" or "sprained ankle," and as everyday explanations of symptoms; "when you have a runny nose and a cough." The plan provided examples of how teachers and students would practice learning the content: a warm-up repetition on the floor using their bodies; by collecting and building phrases jointly on the board; making practical use of old and new vocabulary through role-play; and concluding by adding new phrases or vocabulary that appeared while role-playing to the board. This lesson plan did not explicitly cover abstractions such as theory or concepts, it stayed between student experiences and generalizations, which is appropriate for this type of lesson aiming to establish vocabulary and practical mastery of that vocabulary.

The three lesson plans exemplified the differences in preparing for lessons. The student teacher in English had some prior experience from teaching languages and so was able to provide a more comprehensive lesson plan, possibly due to that. The two primary student teachers, on the other hand, were both uncertain as to what to include and how to present it, which became part of the discussions after the practicum lesson.

Semantic Profiles of Combined Plans and in situ Plotting

The lessons, much like the lesson plans, followed the basic tri-phase structure with a beginning, a middle, and an end (Christie, 1995). Most of the observed lessons spent large proportions of the time in "the middle," where it was expected that consolidation of learning would occur through collaborative work or individual activities. The introduction would include reminding, recollecting and repetition of prior learning, and teacher-led introduction of new concepts. The concluding parts of the lessons were most often the shortest and would include a brief follow-up of group work, a check of completed work, or, in some cases, just a "good bye."

Revisiting the three examples from above, and adding the live observation profiles, we find some interesting alignments and differences. In the mathematics lesson (Figure 5), the lesson plan wave and the live wave are distinctly different semantic profiles. The slope of the lesson plan was not repeated in class. The semantic wave plotted in situ turned out to show some high-wave surfing, by both the student teacher and students during whole-class interaction. This difference between the lesson plan and lesson execution confirmed the student teacher's "feeling" that they were unsure how to write a useful lesson plan, yet they had an unarticulated idea of what was central to the lesson. What appears
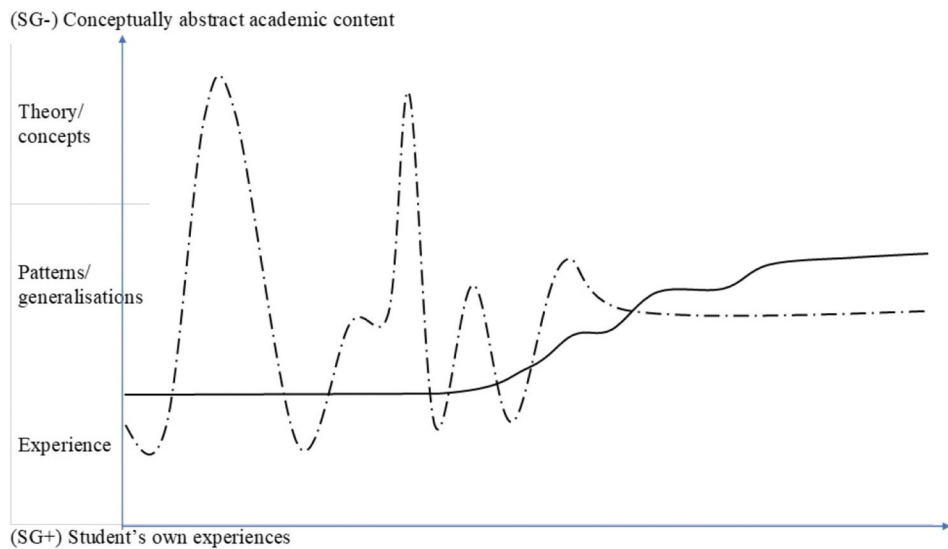
(SG-) Conceptually abstract academic content

Theory/
concepts

Patterns/
generalisations

Experience

(SG+) Student's own experiences

Figure 5. An illustration of a semantic profile from an upper primary school lesson in maths (dotted) with lesson plan (line).

(SG-) Conceptually abstract academic content

Theory/
concepts

Patterns/
generalisations
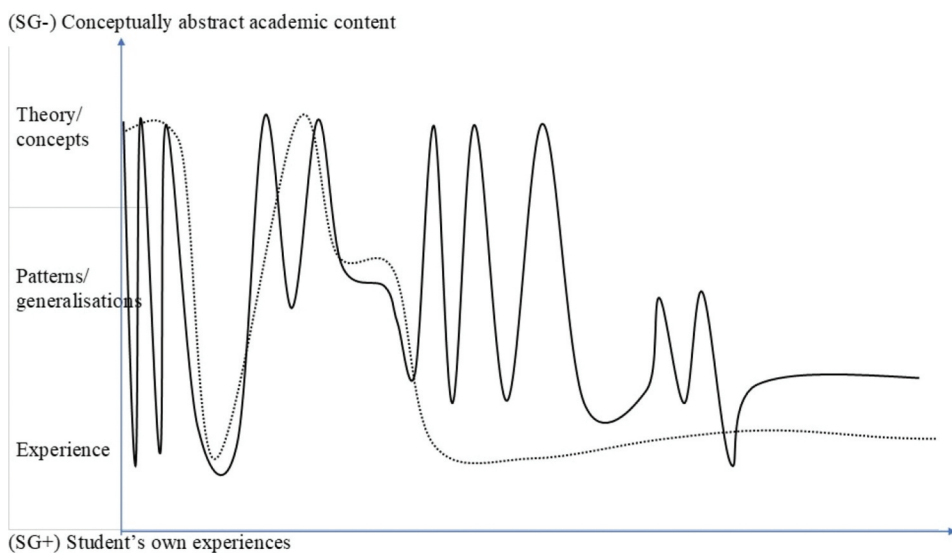
Experience

(SG+) Student's own experiences

Figure 6. An illustration of a semantic profile from an upper primary school lesson in religion (line) with lesson plan (dotted).

in the in-situ plot are more opportunities for students and student teacher to incorporate the negative numbers of decontextualized content and unpack it into more context-dependent examples focusing on student understanding.

The second example of a delivered lesson profile, from the religious study class, did not flatline, as the lesson plan suggested it would (Figure 6). There were more opportunities for students to use the two concepts of karma and reincarnation during class and link them to previous concepts in the unit. The student teacher remained very involved in activities when pupils worked independently, making sure they used and recognized the concepts for their own assignments, which ensured that the semantic range was high. The student teacher would ask different students to use and explain the concepts when speaking to them and would themself repack the concepts as conclusion of the
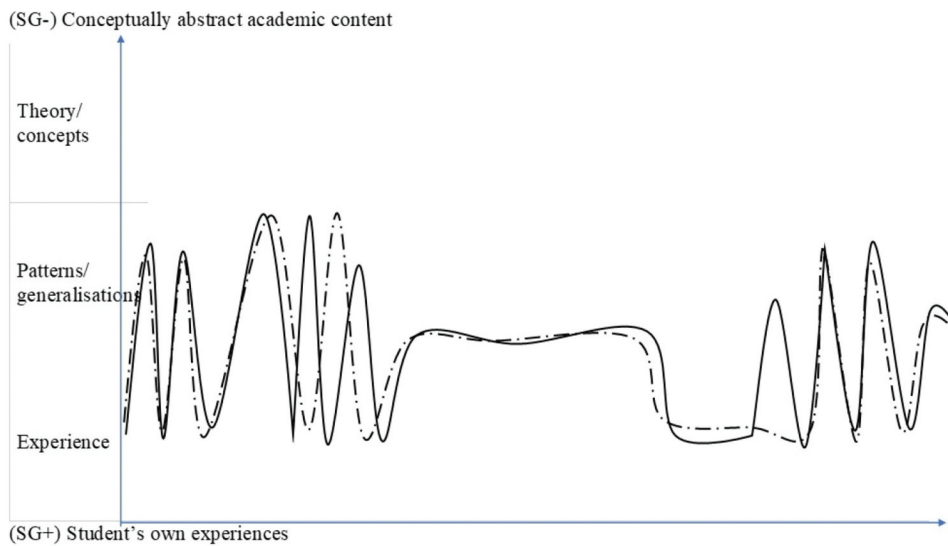
Figure 7. An illustration of a semantic profile from a lower secondary school lesson in English (line) with lesson plan (line & dot).

"middle" section of the lesson. When students were asked to summarize their understanding of the lesson as a concluding task, they were given another opportunity to use the learned concepts in writing.

The third example (Figure 7) from the English lesson in secondary school shows the in-situ semantic profile appears very similar to the lesson plan. This tells us that the student teacher knows how to write a lesson plan and is familiar enough with it to be able to follow it in the moment – the agenda is clearly set and diversions are minimized. It also shows that the strict "adherence" to the plan did not create "in the moment" opportunities for introducing or building conceptual aspects of body parts and ailments, even if the roleplaying situation might have led to that when students alternated the roles.

Student Teacher Responses in the Post Lesson Conversations

The teacher educator's notes taken during post-lesson conversations provide some qualitative data that is included here as anecdotal, rather than empirical, data because the discussions were for the purpose of assessment of the practicum period. We include this as they provide additional information of semantic profiling as a discussion and assessment tool and indicate directions for future research.

The student teachers reacted differently to the semantic profiles during the post-lesson conversations with some maintaining that they found the semantic profiling difficult to grasp. However, they were all able to note the differences and similarities between their lesson plans and the delivered lessons. Most found the profiles and their differences interesting and felt they provided a visual record that aligned with their expressed uncertainties as to how to approach the task of lesson planning (for an assessor or for themselves). Some students saw how the profile could be of use in visualizing focus in parts of their lessons where they had planned something particular, and how it had played out in reality. One student teacher in an upper secondary English class (ST12) described how the semantic profile discussed after the lesson validated what they had planned for the lesson and then was able to engage in the classroom.

During the post-lesson conversations, one student teacher (ST 13) described how they were able to see how the first half of the lesson showed a fluctuating semantic profile, yet toward the end of the lesson the focus and engagement in lesson had ebbed out. They concluded that they had not planned challenging enough tasks to ensure students in the class could surf semantic waves for the whole

lesson. On another occasion, a student teacher (ST 5) concluded that the flatline ending might have been the result of leaving the class to work independently without clear enough instructions. The student teacher on this occasion expressed their ambiguity toward this but explained they wanted to follow the mentor teacher's practices because they had more experience and "it seemed to work for the group of students" (ST 5 post-lesson comment). ST 5 went on to express a preference for more teacher-led activities but saw "letting go" and leaving more control to the pupils as a learning experience in itself. The follow-up conversations with the more experienced teachers (ST10 and ST 12) appeared to verify their intentions with their lessons, creating different affordances and communicative situations, surfing waves. Two "new" student teachers (ST 1 and ST 14) who waved a lot in their lessons seemed more surprised that they had created these knowledge-building opportunities.

Discussion

Using the semantic profiling tool during student teacher practicum periods, as in this study, has demonstrated the possibilities to enhance student teacher understandings of how content is included to provide cumulative knowledge-building opportunities in planned and delivered lessons. The tool itself makes visible the potential planned-for semantic waves and the actual waves in the lesson (Kirk, 2017). It also provides further opportunities to make the knowledge, thinking, and learning visible (Griffin & Care, 2015; Hattie, 2012) in post-lesson conversations between student teacher and visiting teacher.

The strength of the semantic profiling tool is that it highlights explicit content knowledge, student teachers' own knowledge, and the knowledge-building opportunities their teaching affords which makes the tool applicable in relation to assessment (cf. Shay, 2008) and the starting point for this research. Previously, research on how the practicum period is assessed has suggested that grades are subject to "chance" judgment rather than "subject to proper and systematic assessment" (Jonsson & Mattsson, 2011, p. 185). However, the student teachers' responses to the profiling suggest that while using such a tool is useful provided it is known and familiar to them, it is not necessarily a strong or valid assessment tool. It was pointed out that in cases of assessment the plotting of the profile can be subjective depending on what the teacher educator is focusing on and how much understanding they have of the concepts of semantic gravity.

What this tool did allow for is a type of scaffolding for non-judgmental feedback (Kriewaldt et al., 2018) given to student teachers that highlighted the important notion that planning and delivering content-based lessons should align. We found that even though the teacher educator was using semantic profiling in the grading process, the tool helped to support and strengthen student teacher practice because of the dialogic opportunities to develop understanding of the knowledge needed in and for teaching (cf Eckerman Pitton, 2006; James, 2017; Klemp & Nilssen, 2017; Mena et al., 2016; Timperley & Alton-Lee, 2008; van Kruiningen, 2013).

There was variation between the semantic waves of the lesson plans and those created live in the observed lesson. Often lesson plans did not clearly specify the knowledge (concepts and terminology) that was to be introduced and learned. This made the knowledge something the student teachers had to remember in the heat of the moment rather than being able to refer to and align with the common-sense wisdom in teaching that concludes that the less experienced the teacher, the greater the need to be explicit in their planning. It was consistently found that when lesson plans were explicit about both content and activities, the levels of student engagement during these lessons were higher and there were more opportunities for pupils to "surf the waves" by shifting up and down (Clarence, 2017; Maton & Doran, 2017). In this study, the majority of student teachers admitted they did not fully know what was required from them in planning their lessons or how to provide the affordances for pupils to move between context dependence and context independence. They had not acquired the tacit knowledge that would enable this kind of "surfing" for students in their classes. In contrast to the new student teachers on their first or second practicum, the group who presented lesson plans that provided opportunities for the students to consistently surf semantic waves during the lesson each had

some kind of prior teaching experience. These teachers shared their lesson planning that made goals, content, language, and methodology visible and had been provided an optional lesson planning template in their English learning area course, whereas the generalist primary-level student teachers were provided a selection of optional lesson templates.

The lesson plan, to a beginning teacher, is useful to ensure that the content, the terminology and/or concepts, and the content-specific language are made visible and, importantly, used. The lesson plan should, in some manner, justify the different activities included and show how they relate to, meet, and use decontextualized, condensed meanings. It should also include reference to textbooks and lectures and context-specific simplified meanings that are importantly used in the subject for discussions. When the necessary knowledge, concepts, and terminology are planned and included in a lesson plan the likelihood that it is made visible to students in the course of the lesson is greater. Starting from this assumption the assessment of the practicum lessons ought to place a greater focus on student teachers' abilities to both plan and teach content through creating opportunities for moving between decontextualized, condensed meanings and context-dependent, simplified meanings (Clarence, 2017; Maton, 2013).

Maton (2013) warns that semantic waves can show instances when key terminology is unpacked but not repacked means, and these are examples of when cumulative knowledge-building opportunities are missed. When key concepts are not repacked during lessons, it could indicate that the lesson plan may be too unspecific to be useful. The more considered and thorough lesson plans in this study showed greater size waves and more successful engagement with content and knowledge-building of the students in those classes. This suggests that if student teachers can become more explicit in their lesson planning, earlier in teacher education they will be enabled to deliver more engaging and knowledge-focused lessons.

Limitations

This is a small-scale study, based on one teacher educator's visits to 18 student teachers, trialing the semantic profiling tool for assessing, discussing, and illustrating knowledge-building in the practicum. This is a limitation of this study – it only reports on one teacher's use of the semantic profiling tool. In order for it to be considered a consistent tool for assessment and grading further research is needed where teacher educators with other academic backgrounds can make use of concepts such as semantic gravity, and context-dependent/context independent knowledge in their different practicum lessons. Using the profiling tool for this purpose requires a considerable explanation and discussion of semantic profiling, as well as the opportunity to work with the translation device, for example, based on Kirk's (2017) before observing lessons to make judgments in situ.

Another limitation of the study was that the observed lessons, in terms of the grade-level, the subject, and the stage of study of the student teachers was (semi-randomly) allocated to the teacher educator by the course leader. In other words, the teacher educator had no choice in the classrooms they visited and the lessons they observed. Additionally, the student teachers themselves did not always know the teacher educator observer and were free to decide on which type of lesson (e.g., subject and topic) they would conduct for the observation. This meant that the teacher educator did not necessarily have expertise or experience in the lessons being taught.

However, this one teacher educator was part of a research team looking at how different tools/proformas/protocols could be used in the grading and assessment of the practicum periods of teaching. What became apparent when the research team discussed the use and usefulness of the semantic profiling tool (as one among other grading tools) was that its value was in capturing the importance of explicitly focusing on knowledge content in lesson plans. The semantic profiling tool was the only one that clearly demonstrated knowledge alignment between lesson plan and lesson delivery.

Conclusion

Semantic profiling is a novel method for teacher educators, mentors, and student teachers to engage in knowledge-focused post-lesson conversations. It is also a useful method for supervisors to evaluate student teachers' lesson planning and teaching in the practicum period. We have found that the advantage of using semantic profiling as an observation, conversation guide, and assessment tool for teaching practice is that it provides evidence of the importance of lesson planning in clear ways and opens up opportunities for student teachers to understand how planning and delivery of lessons can align more closely. Semantic profiling might help negotiate the discrepancies between teacher educators' different understandings (Ahlström & Jönsson, 1990; Hegender, 2010) of what does and should constitute teacher knowledge and be a way of bridging the practice – theory gap (c.f. Hegender, 2010; Kriewaldt et al., 2018). The semantic profiles that were mapped in this study made decontextualized meanings *and* context-dependent meanings in student teachers' lessons and importantly in their lesson planning clearly visible. Finally, we believe that this small project has planted a seed of understanding about Semantics, highlighting the importance of cumulative knowledge building, and how semantic profiling can make knowledge visible in classrooms of student teachers and beginning teachers. This study of semantic profiling of teaching periods suggests that teacher education programs must (re)focus on the lesson planning aspect of their offering and provide a range of examples and templates for this kind of planning where knowledge becomes the focus. We suggest that the method to be used across teacher education departments for a shared approach to practicum discussions and evaluations and that teacher education programs should also increase communication of this aspect of learning and lesson planning with mentor teachers in schools, so that all teachers share common knowledge.

Disclosure statement

Notes on contributors

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References

Ahlström, K.-G., & Jönsson, M. (1990). Handledning avslöjar lärarutbildarnas dolda pedagogiska åskådningar och privata läroplaner. *KRUT – Kritisk Utbildningstidskrift*, *57*(1), 58–68.

Akkerman, S. F., & Meijer, P. C. (2011). A dialogical approach to conceptualizing teacher identity. *Teaching and Teacher Education*, *27*(2), 308–319. https://doi.org/10.1016/j.tate.2010.08.013

Andersson Varga, P. (2014). *Skrivundervisning i Gymnasieskolan [Elektronisk Resurs] : Svenskämnets Roll I Den Sociala Reproduktionen* [Doctoral thesis]. Göteborgs universitet.

Christie, F. (1995). Pedagogic discourse in the primary school. *Linguistics and Education*, *7*(3), 221–242. https://doi.org/10.1016/0898-5898(95)90024-1

Christie, F. (2005). *Classroom discourse analysis: A functional perspective* (Vol. 4). Continuum.

Clarence, S. (2017). Surfing the waves of learning: Enacting a semantics analysis of teaching in a first year law course. *Higher Education Research & Development*, *36*(5), 920–933. https://doi.org/10.1080/07294360.2016.1263831

Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of knowledge and practice: Teacher learning in communities. *Review of Research in Education*, *24*, 249–305. https://doi.org/10.2307/1167272

Eckerman Pitton, D. (2006). *Mentoring novice teachers: Fostering a dialogue process* (2nded.). Corwin Press.

Forgasz, R., Heck, D., Williams, J., Ambrosetti, A., & Willis, L. D. (2018). Theorising the third space of professional experience partnerships. In A. Ambrosetti, J. Kriewaldt, D. Rorrison, & R. Capeness (Eds.), *Educating future teachers: Innovative perspectives in professional experience* (pp. 33–47). Springer Nature .

Gardesten, J. (2016). *"Den Nödvändiga Grunden": Underkännanden Och Erkännanden under Lärarutbildningens Verksamhetsförlagda Delar* [Doctoral thesis]. Linnaeus University.

Gardesten, J., & Hegender, H. (2015). Underkännanden inom verksamhetsförlagd lärarutbildning: Resultat från en forskningsexpedition i svårframkomlig terräng. *Utbildning Och Lärande/Education and Learning*, *9*(2), 68–85.

Griffin, P., & Care, E. (2015). *Assessment and Teaching of 21st Century Skills: Methods and Approach* (Vol. 142). Springer Netherlands.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.

Hegender, H. (2010). The assessment of student teachers' academic and professional knowledge in school⊡based teacher education. *Scandinavian Journal of Educational Research*, *54*(2), 151–171. https://doi.org/10.1080/00313831003637931

Hipkiss, A. M. (2014). *Klassrummets semiotiska resurser: en språkdidaktisk studie av skolämnena hem- och konsument-kunskap, biologi och kemi: An Applied Linguistics Perspective on the School subjects Home and Consumer Studies, Biology and Chemistry* [Doctoral Thesis]. Umeå University.

James, M. (2017). (Re)viewing assessment: Changing lenses to refocus on learning. *Assessment in Education: Principles, Policy & Practice*, *24*(3), 404–414. https://doi.org/10.1080/0969594X.2017.1318823

Jonsson, A., & Mattsson, M. (2011). Assessing teacher competency during practicum. In M. Mattsson, T. V. Eilertsen, & D. Rorrison (Eds.), *A practicum turn in teacher education* (pp. 169–187). Sense Publishers.

Karlsson Lohmander, M. (2015). Bridging 'the gap' – linking workplace-based and university-based learning in pre-school teacher education in Sweden. *Early Years*, *35*(2), 1–16. https://doi.org/10.1080/09575146.2015.1025712

Kirk, S. (2017). Waves of reflection: Seeing knowledge(s) in academic writing. In Jennifer Kemp (Ed.), *EAP in a Rapidly Changing Landscape: Issues, Challenges and Solutions-Proceedings of the 2015 Baleap Conference* (pp. 109–118). Garnet.

Klemp, T., & Nilssen, V. (2017). Positionings in an immature triad in teacher education. *European Journal of Teacher Education*, *40*(2), 257–270. https://doi.org/10.1080/02619768.2017.1282456

Kriewaldt, J., Nash, M., Windsor, S., Thornton, J., & Reid, C. (2018). Fostering professional learning through evidence-informed mentoring dialogues in school settings. In A. Ambrosetti, J. Kriewaldt, D. Rorrison, & R. Capeness (Eds.), *Educating future teachers: Innovative perspectives in professional experience* (pp. 157–172). Springer Nature.

Lawson, T., Çakmak, M., Gündüz, M., & Busher, H. (2015). Research on teaching practicum – A systematic review. *European Journal of Teacher Education*, *38*(3), 392–407. https://doi.org/10.1080/02619768.2014.994060

Le Cornu, R. (2016). Professional experience: Learning from the past to build the future. *Asia- Pacific Journal of Teacher Education*, *44*(1), 80–101. https://doi.org/10.1080/1359866x.2015.1102200

Loughran, J., Hamilton, M. L., Kubler LaBoskey, V., & Russell, T. L. (Eds.). (2007). *International handbook of self-study of teaching and teacher education practices* (Vol. 12). Springer.

Macnaught, L., Maton, K., Martin, R., & Matruglio, E. (2013). Jointly constructing semantic waves: Implications for teacher training. *Linguistics and Education*, *24*(1), 50–63. https://doi.org/10.1016/j.linged.2012.11.008

Martin, J. R. (2013). Embedded literacy: Knowledge as meaning. *Linguistics and Education*, *24*(1), 23–37. https://doi.org/10.1016/j.linged.2012.11.006

Martin, J. R., & Rose, D. (2007). *Working with discourse : Meaning beyond the clause* (2nd ed.). Continuum.

Maton, K. (2009). Cumulative and segmented learning: Exploring the role of curriculum structures in knowledge-building. *British Journal of Sociology of Education*, *30*(1), 43–57. https://doi.org/10.1080/01425690802514342

Maton, K. (2013). Making semantic waves: A key to cumulative knowledge-building. *Linguistics and Education*, *24*(1), 8–22. https://doi.org/10.1016/j.linged.2012.11.005

Maton, K. (2014). *Knowledge and knowers : Towards a realist sociology of education*. Routledge.

Maton, K., & Chen, R.T. -H. (2016). LCT in qualitative research. Creating a translation device for studying constructivist pedagogy. In K. Maton, S. Hood, & S. Shay (Eds.), *Knowledge-building. Educational studies in Legitimation Code Theory* (pp. 27–48). Routledge.

Maton, K., & Doran, Y. J. (2017). Semantic density: A translation device for revealing complexity of knowledge practices in discourse, part 1—wording. *Onomázein Revista de lingüística filología y traducción*, *35*(2), 46–76. https://doi.org/10.7764/onomazein.sfl.03

Meidell Sigsgaard, A., & Jacobsen, S. (2020). At bølge i en akademisk analyse *Globe. A Journal of Language, Communication and Culture*, *10*(10), 82–101.

Mena, J., García, M., Clarke, A., & Barkatsas, A. (2016). An analysis of three different approaches to student teacher mentoring and their impact on knowledge generation in practicum settings. *European Journal of Teacher Education*, *39*(1), 53–76. https://doi.org/10.1080/02619768.2015.1011269

Mtika, P., Robson, D., & Fitzpatrick, R. (2014). Joint observation of student teaching and related tripartite dialogue during field experience: Partner perspectives. *Teaching and Teacher Education*, *39*(C), 66–76. https://doi.org/10.1016/j.tate.2013.12.006

Rorrison, D., Amrosetti, A., Capeness, R., & Kriewaldt, J. (2018). Introduction: Researching innovative perspectives in professional experience. In J. Kriewaldt, A. Ambrosetti, D. Rorrison, R. Capeness (Eds.), *Educating future teachers: Innovative perspectives in professional experience* (pp. 1–10). Springer Nature.

Shay, S. (2005). Assessment at the boundaries: Service learning as case study. *British Educational Research Journal*, *34*(4), 525–540. https://doi.org/10.1080/01411920701609406

Shay, S. (2008). Researching assessment as social practice: Implications for research methodology. *International Journal of Educational Research*, *47*, 159–164. https://doi.org/10.1016/j.ijer.2008.01.003

Timperley, H. (2001). Mentoring conversations designed to promote student teacher learning. *Asia-Pacific Journal of Teacher Education*, *29*(2), 111–123. https://doi.org/10.1080/13598660120061309

Timperley, H. S., & Alton Lee, A. (2008). Reframing teacher professional learning: An alternative policy approach to strengthening valued outcomes for diverse learners. *Review of Research in Education*, *32*(1), 328–369. https://doi.org/10.3102/0091732X07308968

van Kruiningen, J. F. (2013). Educational design as conversation: A conversation analytical perspective on teacher dialogue. *Teaching and Teacher Education*, *29*, 110–121. https://doi.org/10.1016/j.tate.2012.08.007

Walton, E., & Rysznyak, L. (2019). Cumulative knowledge-building for inclusive education in initial teacher education. *European Journal of Teacher Education*, *43*(1), 18–37. https://doi.org/10.1080/02619768.2019.1686480

Wilson, E., & Demetriou, H. (2007). New teacher learning: Substantive knowledge and contextual factors. *The Curriculum Journal*, *18*(3), 213–229. https://doi.org/10.1080/09585170701589710

Windsor, S., Kriewaldt, J., Nash, M., Lilja, A., & Thornton, J. (2020). Developing teachers: Adopting observation tools that suspend judgement to stimulate evidence-informed dialogue during the teaching practicum to enrich teacher professional development. *Professional Development in Education*, *48*(4), 1–15. https://doi.org/10.1080/19415257.2020.1712452

Appendix – Consent to participate (translated into English)

Subject: consent to participate in research

Hi former students!

I hope all is well with you, wherever you are, as teachers or in the final stages of your training.

You might recall that I visited you during your 1st/2nd/3rd practicum period. For that visit, I used a tool to create a profile of your lesson plan and your lesson. This has now evolved into a manuscript intended for scientific publication. To be able to send it for publication, I wish to request your consent to use both the profiles that I created before and during the visit, and the follow-up conversation notes that related to your "thoughts on using the profiling tool." Below, I have pasted the general description that summarizes your "thoughts on using the profiling tool" so you can see whether you agree to the description or not. Also, I have pasted a table to show the anonymous participation this entails and one example of how the profiles are displayed in the manuscript.

Please, respond in returning mail with a "YES, this is fine by me!" or "NO, thank you!" if you consent or not to the anonymized inclusion of your of profiles and thoughts.

Thanks in advance,
Kindly xxx

School year	Observations			School subject	Content focus
	Spring 18	Autumn 18	Spring 19		
Lower Primary (Y1–3)	3	1	0	Biology, Geography	bumble bees, water circle, butterflies, north of the polar circle, the moon
Upper Primary (Y4–6)	4	4	0	Math, Religious studies, Swedish, English	negative numbers, Hinduism, types of poetry, parts of speech, Finland, pronouns
Secondary (Y7–9)	3	3	3	English	present tense, nouns, horror, the body, space
Upper secondary (1–3)	2	2	2	English	book review, tenses, language varieties, current affairs
Total	12	10	5	-	-