CHAPTER 9

Teaching represented: a study of student-teachers' representations of the professional practice of teaching

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ABSTRACT

This paper explores student-teachers' representations of what is considered teachers' professional knowledge. Acknowledging the gap between theory and practice in teacher education, the current study investigates what this gap might mean in terms of how student-teachers represent knowledge of the profession. The study maps students' representations of knowledge in a double dichotomy that spans between the universal and local and the theoretical and procedural. The knowledge landscape mapped questions what epistemologies students encounter both in and outside of campus during their education. A discussion follows on how the traditional gap between theory and practice can be understood when the representations of professional knowledge are made by teacher-students themselves.

INTRODUCTION

Most teacher education programs include a theoretical as well as a practical component. This combination of a practical and a scientific-oriented route into the profession is also grounded in the Norwegian framework plan: "Teacher education institutions offer integrated, profession-orientated primary and lower

secondary teacher education […] rooted in research and experience-based knowledge (Ministry of Education and Research, 2016)". A benefit of this model is that students may become better qualified to teach during their preservice years. However, integrating disparate domains such as theory and practice on the one hand and experience and research-based knowledge on the other can be a complex undertaking.

The Ministry of Education and Research claims that the programs offered by educational institutions are "integrated". The current study acknowledges the idea of a program being "integrated" as a reference to how the program succeeds in merging the academic disciplines disseminated on campus with the practical aspects of the profession encountered during practicum placement. Presumably, an integrated approach strives to create coherence between the disparate domains of the educational institution and the field of practice. The Ministry of Education and Research claims that the programs are rooted in both "research and experience-based knowledge". Hence, teacher education is facing a challenge in integrating knowledge from varying, sometimes opposite, epistemological positions. It is important to note here that research-based knowledge may be abstract and theoretical, whereas experience-based knowledge may remain unarticulated.

Researchers studying education claim there is a "gap" between what is taught on campus and what skills are required to succeed in the classroom. This perceived gap between theory and practice is not unique for Norwegian teacher education; instead, it seems to be a challenge shared globally. Critique stems from the assumption that knowledge and practices taught within preservice programs will enable professional practice in the workplace. However, there is a disparity between the types of skills and knowledge taught in educational institutions and the reality of the workplace (Allen & Wright, 2014).

The current study aims to investigate how professional knowledge is represented by student-teachers. The study departs from the assumption that throughout their preservice years, student-teachers encounter the teaching profession in various epistemological disguises that influence students' perceptions of what a teacher's professional knowledge is. The abovementioned gap can then be investigated by exploring the epistemological positions that are represented by the student-teachers participating in this study.

The research question posed is as follows:

What epistemological positions can be inferred from the student-teachers' own representations of professional teacher knowledge as experienced on campus and in practicum?

In the current study, a class of first-year student-teachers were observed as they shared with their peer students the interpretations of chapters of a handbook on classroom management (Bergkastet, 2009). The same group of students were observed when they shared their experiences from the first practicum placement. In both settings, the students conveyed their messages by presenting them using PowerPoint. Video recordings of the presentations were transcribed and analyzed slide-by-slide. A model, designed as a double dichotomy, was created to capture a variety of different epistemological positions expressed by the students. The foundations for the discussion were four representative samples from the data collection; these illustrate the extremes of a double dichotomy that situates the student-teachers' representations of professional knowledge between local or global and between theoretical or procedural.

BACKGROUND

In 1904, Dewey identified two approaches to combining theoretical knowledge and practical skills in teacher education (Dewey, 1904). *The apprenticeship approach* encompasses teaching the practical skills to do the job proficiently. The apprentice learns from observing demonstrations and best practices that are encountered in practicum and on campus. *The laboratory view* advocates the need to design practical experiences to "inform and make real and vital the two components of theoretical work – subject matter knowledge and educational principles and theory". Dewey claimed that the apprenticeship approach looks backward because it is based on imitating the local, particular and situated and the "hard-won gains of past tradition and practice". The laboratory view looks forward because it generates transferable, general knowledge. A similar conception of knowledge is conceived of by Bruner (1986) who referred to "paradigmatic knowledge", which is the finite, certain and objective, and "narrative knowledge", which is socially constructed and embedded in a certain context (Bruner, 1986).

For decades, debates have centered on the relationship between professional knowledge and its application. Referring to the "indeterminate zones of practice", Donald Schön (Schön, 1992) illustrated how the theoretical foundations

of professions fail to capture the complexity of practice. The grittiness of reality escapes ready-made models derived from theory, and accordingly, questions arise as to what constitutes competent practice. A mode of professional knowledge is one embedded in action. Metaphors such as "the artistry of teaching" (Eisner & Reinharz, 1984) and "pedagogical tact" (Van Manen, 2008) reflect ideas of professional knowledge tacitly expressed in the action of teaching, or doing.

Schön (1983) introduced the terms "knowing-in-action" and "reflection-in-action" to capture the tacit knowledge embedded in action and to place a focus on the on-the-spot decision-making of professional practitioners (Schön, 1983). The reflexive approach is echoed by Shulman's (1998) view that the exercise of *judgement* is what negotiates the ground between theory and practice, and knowledge and its application (Shulman, 1998).

Traditionally, academic knowledge from an educational institution has preceded over the practical knowledge and expertise that resides in the schools (Zeichner, 2010) and curricula in Teacher Education leans toward the "paradigmatic" type (Burnett, 2006). The "action-guiding" knowledge required in practicum differs from the "abstract, systemized expert knowledge" that resides in teacher education (Korthagen & Kessels, 1999, p. 5). Students perceive in-the-field experience as practical, real and immediate, whereas on-campus work is considered theoretical, remote and of "little value in becoming a teacher" (Allen, 2009, p. 653).

Literature, thus, refers to knowledge pertaining to the teaching profession along opposing positions. Theoretical knowledge that resides in educational institutions is contrasted by the practical and action-oriented skills required in practicum. Knowledge can be universal and transferrable on the one hand, or it can be local and context bound. These observations will be addressed when discussing the findings of the current study further below.

TEACHER EDUCATION – SITUATED BETWEEN PRESENCE AND REPRESENTATION

The goal of the current study is to explore what epistemological positions are expressed when student-teachers report on knowledge practices on campus and in practicum. To pursue this goal, some clarification is needed on the ontological basis of the study. A key question is the following. In what way is the teaching

profession itself present in the activities in which the student-teachers take part, both on campus and during practicum placement?

Traditionally, educational institutions present knowledge about the world "outside" and for that very reason they rely upon a representational epistemology. This is an epistemology that says that our knowledge "stands for" or represents a world that is separate from our knowledge itself (Osberg & Biesta, 2003, p. 84). This quote originally aimed at explaining how the evolution of a world of education has led to a split between the "world outside" in which pupils learn, and a separate world of institutional, educational practices. The world outside needs to be represented in the school classroom, something which has become a realm of its own. The statement may also hold true for activities in teacher education; the outside world of the teaching profession is brought into the classrooms and lecture halls on campus by means of mediating tools and artefacts. That is, handbooks on classroom management convey aspects of the profession by representing it in terms of text, graphics and images.

However, a representation is not a reflection of the real world or a mirror of reality. It should be considered a version of people, places, things, objects or concepts. In educational settings, words and images are combined to represent ideas, make meanings and represent versions of the world. Therefore, student-teachers' representations of professional knowledge do not *re-present* some pre-existing reality, but actively construct it (Unsworth, 2011). Representations "produce" and "create" the object they assume to represent, that is, objects gain their meaning in and within representations. Such representations are always influenced or mediated by ways of thinking about the world; therefore, they are not fixed (Miller & Colwill, 2010).

The teaching profession is also sometimes *present* for the student-teachers since they participate in the very practice of teaching during practicum placement. Then, the profession is not "re-presented" in a remote institutional context; instead the profession itself is being *present* in the situated context of the school environment.

The current study puts the student-teachers' agency at the center of the process of learning and emphasizes the transformative and agentive action performed by the students when making their own representations of curricular knowledge and representations of their experiences from practicum. Fundamentally, the approach grounds the study in a constructivist worldview to approach the problem of a gap between theory and practice as an issue of

representation, where representation cannot be an isomorph with "reality", instead it is evidence of the student-teachers' engagement with certain aspects of the teaching profession. Borrowing a social semiotic perspective on the act of making meaning, representation ultimately becomes a *sign-making* activity. Representation is defined in the following.

> …process in which the makers of signs (…) seek to make a representation of some object or entity, whether physical or semiotic, and in which their interest in the object, at the point of making the representation, is a complex one, arising out of the cultural, social and psychological history of the sign-maker, and focused by the specific context in which the sign-maker produces the sign (Kress, 2006, p. 7).

To pursue the intention of the study, access to observing the student-teachers' representational practices and sign-making activities is essential.

EMPIRICAL SETTING

By informally surveying teacher educators' plans for the current term, it became apparent that using PowerPoint would be an established method for making students share their assignments. The current study is based on data retrieved from observing on two separate occasions a full class of first-year student-teachers (N = 17) in a class on pedagogy.

The first setting centered on the outcome of a compulsory assignment. As a means for preparing the student-teachers' forthcoming practicum placement, a book from the syllabus on classroom management and relational competence (Bergkastet, 2009) was the subject for analysis by the students. The various book chapters were distributed among the student-teachers, and the student-teachers were responsible for presenting to their peers an interpretation of the chapters. The student-teachers were told to pay attention to what tools and methods for classroom management were introduced by the handbook. They were asked to promote what aspects of the text they liked and what challenges the methods and approaches of the handbook introduced.

The second session took place a month later. The subjects of the presentations were the student-teachers' reports on their recent practicum placement. The purpose of the assignment was to link the student-teachers' experiences

with the curricular topics, such as a teacher's role, classroom management and didactic planning. The student-teachers were told to report on their systematic observations on their pupils' learning activities, on the practicum regarding a teacher's ways of managing a class, means of organizing learning activities and means of developing supportive conditions for learning.

DESIGN

The study design is an instrumental case study, which uses a particular case to examine an issue for insights (Stake, 1995). The instrumental case study is an appropriate tool because it facilitates an understanding of a particular phenomenon other than the case itself. In the present study, the cases comprise presentations performed by the student–teachers. However, the phenomenon external to the situation is that of *student-teachers' epistemological positioning,* which is expected to be observed in the student-teachers' representations of professional practice.

The empirical material was collected by observing and video recording both sessions in which the full class of first-year student-teachers (N = 17) used PowerPoint to present the outcomes of compulsory assignments. The class was organized into five groups of three-to-four members. Each presentation lasted 8-12 minutes and comprised from 6 (min.) to 17 (max.) slides. The total number of slides presented was 75.

Because of the multimodal nature of communication in instructional communication (Mishra, 2008, p. 363), video was considered the best tool for capturing data in the field. A single HD camera was positioned at the back of the classroom to capture the student-teachers' actions and speech and the visual content projected on screen. During the presentations, field notes were taken using an observation template to capture thoughts and ideas evoked in session.

The video recordings were turned into data by transcribing speech and incorporating into the transcripts other meaning-making resources such as text, graphics and images. Segments of speech and the corresponding PowerPoint slides were first coded and categorized using HyperResearch software (Hesse-Biber, Kinder & Dupuis). A code book of 51 codes was established across all data sources. Some codes were defined close to the data-reflecting aspects of professional knowledge thought to be represented by the data segments. A priori codes were derived from the theoretical backdrop and applied where appropriate.

To achieve further abstraction, code categories were labelled *universal domain* and *local domain,* depending on the context of the expression of knowledge implicit in the allocated code segment. Further diversification was achieved by sorting the codes according to the segments, producing *propositional* knowledge or *procedural* knowledge. For this paper, a selection of samples, representing the variation width along the two dichotomies, is used as an illustration.

To obtain a more in-depth understanding of the phenomena of representation of professional knowledge, a multimodal analysis was conducted on candidate samples. Analysis was carried out by studying the slides and their constituent elements alone and studying the interactions between the presenter's speech and the meaning-making resources embedded in the slide, such as text, images and photos. Drawing on a recent study on PowerPoint presentations (Zhao, Djonov & Van Leeuwen, 2014), transcripts for publication featured the overarching heading *semantic integration,* which spans across transcribed speech, and *visual information,* which encompasses the elements projected as slides.

Analytical framework

To support the analysis of the data from the field, the study adopted the amended Learning Design Sequence (LDS) as an analytical framework. The original model is aimed at mapping "the design activity in learning sequences, the formation and transformation of knowledge" (S. Selander, 2008; S. Selander & Kress, 2010). In the current context, this corresponds to the student-teachers' learning process as they make representations by giving shape to the chapters from the handbook on classroom management and by giving shape to their experiences from practicum. Essential to this is the notion that the sign maker, guided by his or her interest, selects from the available resources to make an apt representation, or sign, of the aspect of the world that is in focus. The student-teachers apply semiotic software (PowerPoint) to make a representation of the issue at stake, drawing on the software's affordances in terms of applying fonts, layout, colors, tables, images and so forth. In the context of initial teacher education, the student-teachers' sign-making activities are thought to be pedagogically motivated.

A mode is a socially organized set of semiotic resources for making meaning. Examples of modes include image, writing, layout and speech (Jewitt, Bezemer & O'Halloran, 2016). Fundamental to the multimodal social-semiotic approach

is an understanding that where several modes are involved in a communicative event, all the modes can be combined to represent a message's meaning (Kress & Van Leeuwen, 2001). The meaning of any message is, however, distributed across all these modes and not necessarily evenly. Therefore, each mode is partial in relation to the whole of the meaning, and speech and text are no exceptions (Kress & Jewitt, 2003). Therefore, multimodal research attends to the interplay between modes and looks at the specific work of each mode and how each mode interacts with and contributes to the others in the multimodal ensemble. In the current setting, such a multimodal interplay occurs across meaning-making devices within the *pre-formed* PowerPoint slide and between the *pre-formed* slides and the presenter during *performance* (Van Leeuwen, 2016).

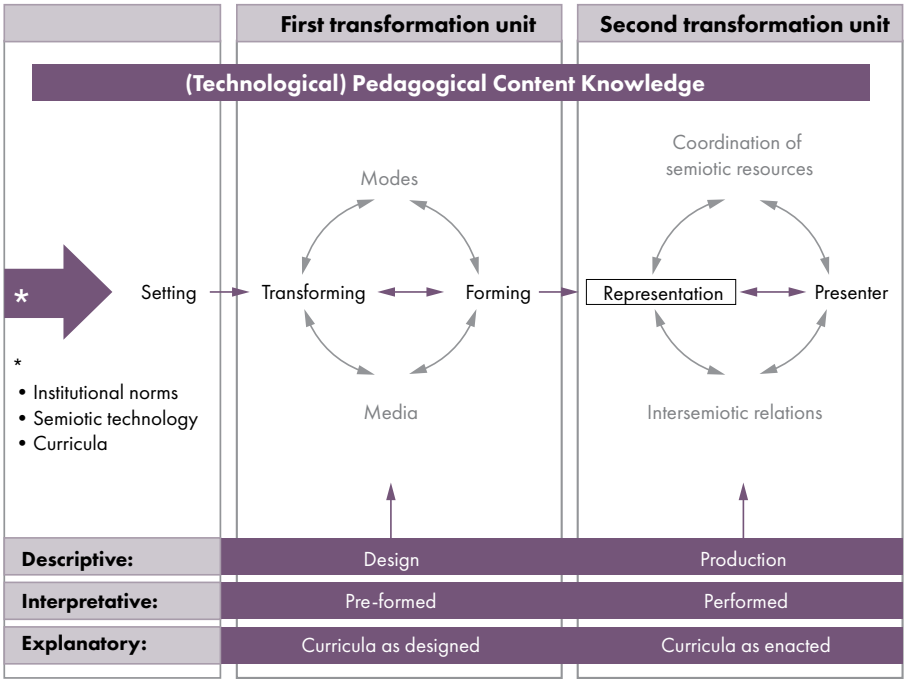


Figure 9.1 Learning design sequence amended (Kvinge, 2017 (in press)).

In the two settings observed in the current study, the student-teachers engage by creating a representation of the issue at stake in two stages; these correspond

to the first and second transformation units of the LDS. In the first unit, the student-teacher directs his or her transformative engagement toward the assignment issued by the teacher educator, toward his or her own recent experiences from practicum and toward aspects of the designated chapter. The semiotic software permits the student to design a multimodal representation of the issue at stake. In material terms, the outcome of the first cycle is a set of PowerPoint slides. The first transformation unit maps the part of the process where the *representation* is *pre-formed*.

In correspondence with the LDS model's second transformation unit, the student-teacher's representation is performed for the instructor and peer student-teachers for discussion, feedback and assessment. The settings observed and video recorded for the current study show numerous instances of the second transformation unit. Although the transformation this time takes place in real time, the presenter's agency and interest are also considered to be guiding the transformative processes across the modes available in the situation. The researcher's focus is directed at the multimodal interplay that occurs between the *pre-formed* semiotic artefact and the student-teacher who performs the presentation.

FINDINGS

The following section presents four transcripts that constitute different epistemological positions regarding how they represent a teacher's professional knowledge. The transcript template features both the pre-formed slides, which are referred to as *visual information* in the left column, and the accompanying student–teacher's performance, which is represented as speech in the right column. Combined, the modes in the slides and the presenter's speech constitute a *semantic unit*, where meaning is distributed between the resources at play. This is thought to be in accordance with a multimodal social-semiotic view on how meaning is made and influenced by the norms prevalent in the current setting. A motivation for doing so is to gain insight into the transformative principles that underpin a student's representation of what may be interpreted as an epistemological position.

Curricular theory – procedural knowledge as universal theory

The first empirical example is taken from the dataset where student-teachers' presentations are responding to an assignment on pedagogy. Chapters of a book were

distributed among the student-teachers for peer presentations. The book itself was referred to by one student-teacher as a "practical handbook for teachers in primary school which proposes ideas for efficient teaching, and which illustrates the importance of the teacher". The current slide was presented as one in a series of eight, and it sums up a section of the handbook that discusses the logistics of the classroom and principles for effective communication. The transcript below represents the slide (left) and the presenter's full spoken comments about this slide (right).

Table 9.1 ex. 1.

Semantic integration	
Visual information:	**Presenter's speech:**
Three principles of organizing **1. eye contact with pupils** **2. move about quickly and efficiently** **3. movement without disturbance or "traffic jam"**	Then, there are three specific principles mentioned in the book, and the first is that the teacher should be able to have eye contact with all pupils when teaching and when giving messages for all. The second is that the teacher must be able to get to the pupils in a quick and efficient manner to assist, encourage and correct. And the third is that the teacher should be able to move about to do what is required without making disturbance or causing a traffic jam.

The slide displays how a student-teacher has engaged with the original text and transformed a chapter of a book on the logistics of a classroom into three principles. The affordance of the software is used to format the principles into three numbered bullet points. The formatting makes the principles appear as a set of rules governing good classroom practices. The sentences do not have a subject clause, yet it is apparent from the context that the principles are meant to apply to teachers. The missing subject clause, however, makes the second principle appear imperative and takes it in the direction of becoming a "commandment". The absence of images or illustrations of any sort emphasizes the context independence and universality of the principles. The presenter elaborates on the bullet points in her talk by specifying on what occasions the teacher should observe the principles. However, the principles still emerge as a normative theory of universal applicability.

The example is typical of a category of data where what is represented is primarily practical knowledge that resides in the teacher's actions in a classroom setting. The book is a representation of a teacher's reality. At its core, such knowledge can be considered experiential and "narrative" because it usually is embedded in a context. The author of the textbook transforms the practical wisdom of classroom management by selecting what aspects of "the reality of it" to present and how to represent it. Being a curricular entity, the handbook serves as a medium for bringing the practical knowledge, which resides in the classroom context, to the student-teachers' attention. The student-teachers, however, engage with the book as theoretical knowledge of the "paradigmatic" kind, and their transformation turns the textbook chapter into normative rules which are context independent.

Curricular theory – applied to the local

The second empirical example is taken from a session where a group of students reported on their experiences in practicum. Throughout their presentations, the group reported on observations made on a teacher's role, classroom management and didactic planning, all of which were central items for the class on pedagogy.

Example 2 (below) features a slide describing how the current group utilized the Didactic Relation Model (Bjørndal, 1978) as a tool for planning and conducting a lesson. The slide is designed using three elements. The headline introduces the topic (didactic planning) and is separated from the other elements because it is placed in the designated area for a headline provided by the selected PowerPoint template.

Left is an unordered list featuring seven items that appear to be key words to support the presenter's reasoning. The key words do not convey meaning entirely by themselves, although the heading and the context of the presentation may give the viewer ideas of its intentions. The sparse design of the current slide forces the presenter to articulate its full meaning.

A sample of the Didactic Relation Model is embedded in the slide; however, the characters are too small for the viewers to read. The outline of the layout of the template does convey ideas of how the form is structured in terms of columns and headlines. The filled-in model, being an artefact representing "the world outside", contributes to making the slide appear as a representation of the reality experienced by the group of students.

Table 9.2 ex. 2.

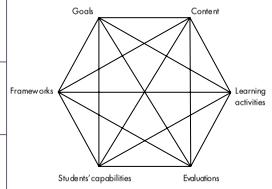
Semantic integration	
Visual information:	**Presenter's speech:**

DIDACTIC PLAN

- Before lesson
- Limit time
- Equipment
- Manuscript
- Pre assesment
- Feedback or reflexion
- Re-use

Plan for teaching made by students at: Autumn, 201x				*Diamond:*
Class:	Teacher:	Class:	Time:	
Competence aims from The National Curriculum for Knowledge Promotion (LK06):				
Competence aims expressed as learning aims of this particular session. What should the pupil know after completion of class/learning outcome?				
How would you begin the class? How would you motivate the pupils?				

Learning outcome: What? The pupils' work, the students' teaching. Content and methods.	Explain the reasoning behind your choices:	The organising of the pupils:	Conditions: ie. what ought the pupils know in beforehand?	Framework: What tools and utilities do you need?	Assessment for learning: How would you retrieve information about the pupils' learning outcome?



Ahm, planning using the (didactic) diamond has been quite helpful, because, to us students, it is, like, limiting your time, and finding what equipment you need, and stuff like that, before the lesson begins, and using it as a manuscript. Ahm, prior to the lesson, we did a little pre-assessment, the teacher offered us preassessment, and the teacher used the diamond in a way to know what we were about to do, and she would give feedback on what would work and what would not. And another benefit of the diamond is that the teacher after class can go back and give us feedback and reflect on what we did. And the diamond is kind of a reusable thing, because you can use it in different classes in various subjects.

The transcript of Example 2 features the presenter's entire speech pertaining to the slide. The speaker gives context to the slide by relating to the audience how the didactic relation model was used by the student-teacher and supervising teacher during practicum placement. The speaker elaborates and extends on the meaning of the key words by contributing new information. The apparent disparate list of key words is made into a coherent whole as the student-teacher relates to the audience how the template for didactic planning was put into use by the student-teachers as a tool for planning and by the practicum teacher as a tool for assessment.

The example represents a category of empirical data grounded in the student-teachers' own practicum experiences. However, the student-teacher's narrative describes a meeting between formal theoretical knowledge, in terms of the didactic relation model, and its application in practicum. Like Example 1, this category reports on student-teachers engaging with theoretical knowledge, which are items of the formal curriculum of teacher education. Whereas the first example illustrates student-teachers reporting practical knowledge articulated as "universal" theoretical principles, the current example reports on how the universal theoretical principle of didactic planning is applied to the local circumstances situated in practicum.

The particular becomes universal

A third example is selected from the second observation session where the student-teachers reported on their practicum experiences. In this case, the student-teacher filled in a standard report schedule designed for learning through self-evaluation (Tiller, 2017). The template invites the student-teacher to inscribe events that he or she is engaged in and make brief reflexive statements on what he or she learnt and what he or she considered "smart" in terms of knowledge worth passing on to others.

Affordance of the software is used to set up a table where the green color marks the first row as a headline. The columns below detail the content of each heading. The headlines evolve, left to right, from a concrete telling of what was done in practicum toward a higher level of abstraction and generalizability. Judging by just the slide, it is not clear whether there is a logical connection between the elements inscribed in each row. However, the presenter suggested that the group of student-teachers have emphasized showing a variety of elements. Hence, there is no cohesion across and between the elements of the table.

Table 9.3 ex. 3.

Semantic integration

Visual information

What we did	What we learned	Smart to pass on
Joined culture week	Different methods	Good planning
Acquainted w/ each pupil	Better at instruction	Be well prepared
Make butterflies during culture week	Become more confident when teaching	Prepare alternative activities to quick pupils
Test the teacher role	Various methods to call for attention	Good observations
		Make good relations

Presenter's speech:

Um, then we have made a "Did, learnt & smart" schedule. We did not select one event in particular, rather we have emphasized various things we have done, learnt and found to be smart. During the practicum placement, we have joined a culture week, we have had two days of out-door teaching and we have created butterflies during the culture week, um, a lot follows down the column. And we have learnt various teaching methods, become better at instructing, and we have become more confident when teaching, and we have learnt various ways of getting attention, and stuff like that. And we have found out, for example that it is smart, we knew good planning is essential, but now we have more insight in why that is smart. It is smart to prepare alternative tasks for those who finish early.

At the beginning, a comment by the presenter makes it clear how the content is organized. The presenter engages with the slide by articulating verbally the content of the table's cells, yet there is no in-depth elaboration of the content, and there are items not commented on at all. Rather than supporting a discussion of what makes "did, learnt & smart" relevant for the student-teachers' leaning and development, the display of the slide serves as evidence that the student-teacher did indeed make such a schedule.

This example represents a category of sample data that is grounded in the local, situated and context-specific. This is in contrast to the previous examples that were grounded in theory. Situated in the local, the current example displays how student-teachers generate knowledge based on their experiences gained in the practicum placement. The column of "smart to pass on" is knowledge of a universal character, in that it is transferrable to another context. It resembles the first example in that it is formulated as short principles, or "rules of thumb", for good practice. However, contrary to the first example, which summarized principles of a handbook, these rules for good practice are generated by the student-teachers themselves and are based on their personal experiences in practicum.

Procedural knowledge situated in the local

The fourth and final example is selected from a session where the students reported from practicum. The example represents a category of slides and narratives that detail the local and situated events as they happened, and it is void of theoretical references.

The student-teacher avoids the common practice of listing key words and embeds in the slide three images from the field on which are commented. Affordance of the media allows the student-teacher to set up the images as a collage and to add the caption "day out" in the top right corner of the collage. The images document people and events that took place one day, but there are few visual clues that suggest what exactly took place in the settings captured by the camera. The caption helps link the images to the same day and event.

Therefore, the student-teacher's verbal contribution is a decisive factor in making the slide represent concrete practicum experiences. The student-teacher's speech contributes verbal captions that address what is prominent in the collection of images. Thus, the poor weather, a visit to the school garden

Table 9.4 ex. 4.

Semantic integration	
Visual information	**Presenter's speech:**
	Then, we had a day of outdoor school, we were not fortunate with the weather conditions, it started raining, but not as much as we thought, so it actually went well. Um, we walked about in the school garden, and then we experienced a little problem in the middle, the sea level had risen and set our fireplace under water, so then we met a challenge where we just had to quickly improvise and make a new fireplace, but it ended well, we found a new place quickly. Then we divided the children into groups where four pupils were allowed to collaborate on lighting the fire. They had done so previously and knew how to do it, and some teachers just observed that it all went well. They enjoyed doing it. The other pupils collected sticks and prepared those for making campfire twists at the fire. That also went well, the children had done so previously, so it was not something we should teach them to do. We played a few games, the sheriff among others, and stuff.

and the activity of lighting a campfire are themes that anchor the images by detailing what happened, why choices for action were made and where it took place.

This final example represents a kind of professional knowledge that resides in the student-teacher's action and performance in the field. As discussed in the review section of this paper, it resembles the action-guiding knowledge regarded as essential to teachers. This mode of knowledge is represented by the student-teacher as images, and the mode of imagery is chosen as a means for representation across several samples within the same category. The images are supported by a spoken narrative that declares what procedures and action unfolded. This category of findings is defined by representing action anchored in the local, situated context. The knowledge is procedural because it unfolds in action as a response to the circumstances. The knowledge is exercised in the performance, which in this case is the carrying out of a field trip and reorganizing the plan by improvisation in response to unforeseen circumstances.

DISCUSSION

The above analysis has centered around four examples that represent what can be considered a teacher's professional knowledge. The examples are student-teachers' self-made representations of the knowledge practices that they have encountered in the field and on campus. According to the current study's ontological basis, there is no fixed reality as such. These examples are assumed to construct reality. Each sample, therefore, constitutes a version of what may be considered representing professional knowledge. The representations are subject to the perspective chosen by the student-teachers who design and perform the slide. The Learning Design Sequence supports this ontological perspective in that it puts the student-teachers' transformative activities at the center. The term transformation is a dynamic concept because it captures the agency of the student-teachers as they select the aspects of the world on which to focus. Governed by their interest, they choose what aspects of the issue to represent. They make choices as to what affordances of the semiotic technology to use so that they can give meaning with a shape and design, as exemplified by the four transcripts above. The Learning Design Sequence also captures how transformation occurs at the stage of presentation: the set of slides become subject to

transformation, yet again. The examples have shown how the presenter interacts with elements of the slides by elaborating and extending on their content, thereby altering the meaning of the slides. Representation, in the context of this study, can be described as an aspect of the teaching profession that is both pre-formed and performed by a student.

The analysis of the student-teachers' representations reveals that there is difference among the student-made representations of teacher's professional knowledge. The metaphor "professional knowledge landscape" as conceived of by Clandinin & Connelly (1998), p. 5), may be helpful because it acknowledges that teachers draw on a breadth of knowledge and that knowledge is both "narrative" and "paradigmatic". What would a map of such a landscape look like? In the following, the observations of the current study are placed along two axes.

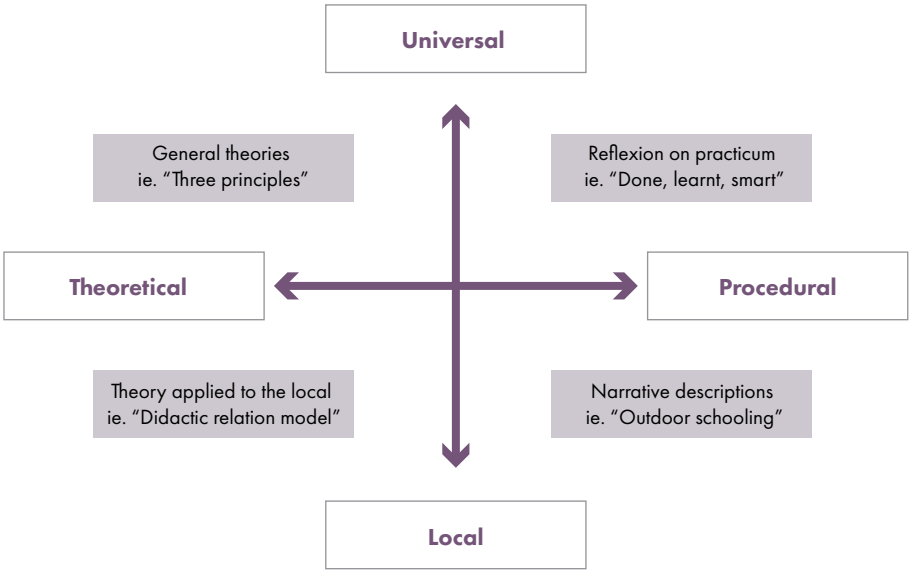


Figure 9.2 Professional knowledge landscape.

The horizontal axis reflects the span between theoretical knowledge on the one hand and procedural knowledge on the other. It reflects the analytical observations of whether the student-teachers' representations stem from a theoretical domain or from actions and activities in the field. The dichotomy is reflected

in the data material. The first encounter with theory is the representation on classroom management. The student-teachers transformed the book's content into rules, or "commandments", for best practice. The sample featuring the didactic relation model illustrates how theoretical devices, taught at the educational institution, can be applied during practicum. The procedural dimension is encountered in the samples featuring the story about outdoor schooling. The knowledge of the student teachers resides in the actions taken during the day in response to changing weather conditions. The "Done, Learnt, Smart" schedule evolves from the practical undertakings made by the student-teachers, such as participating in making butterflies together with their pupils. The epistemological positions of this axis are also reflected in the literature review which reports on pre-services teachers' complaints on the disparity between theoretical approach practiced on campus, and the action guiding knowledge called for in the practicum.

However, contrary to the traditional opposing view between theory and practice, the data reveal that there are other characteristic features that serve to diversify the "knowledge landscape". "Contextuality" appears to be a feature common across the samples. A second dichotomy introduces a universal dimension on one end and a local one on the other. The universal dimension is associated with normative statements and formulations of rules that are independent of the context. The handbook on classroom management is turned into a representation by the student-teacher that expresses normative statements on what good principles are and how to adhere to them. Such principles are universal in their application as they can be transferred to most classroom settings. The outcomes of the student-teachers' reflection on what they have learnt in practicum are universal. The "Done, Learnt, Smart" schedule takes the local experience as a starting point and encourages the student-teachers to identify what experiences from their practicum placement should be passed on to others. Preparing extra work for able learners became a rule. The particularities of the practicum are turned into universal lessons.

The local dimension is, on the other hand, situated and contextual. The use of the didactic relation model for planning local activities in practicum is an example of how theory is anchored in the local. The model for didactic planning forces the student-teacher to argue for the aim, content and assessment

methods of the lesson, while taking into consideration the local factors of each pupil's ability and the general framework factors of the host school. Theoretical knowledge on general didactics are adapted to local conditions. The local dimension is also present in the student-teacher's account of the "outdoor schooling" because it is a narrative of what events took place. The local represent the contextual because it influences the activities and actions accounted for on that day. Procedural knowledge was exercised in the local context in response to the local circumstances. The imagery of the PowerPoint slides emphasizes the local dimension because it gives a visual account of the events.

CONCLUSION

The current study observed settings in which student-teachers are at the center of meaning making activities. What is represented during performances of PowerPoint slides are the students' own constructions of reality and their own constructions of teachers' professional knowledge. The semiotic technology and the practice of presenting does not "mediate reality" as if reality were a fixed and finite object that is represented in the settings observed. The focus in instead directed towards *transformation* as an activity which involves the students' own meaning making. In the current setting, students give shape to experiences, ideas and conceptions related to teachers' professional knowledge. The outcome of the study shows a diverse "knowledge landscape", which reflects the contradictory positions that are inferred from the representations constructed by the students themselves.

Traditionally, the understanding of a "gap" is based on the assumption that the professional knowledge that student-teachers encounter on campus and during practicum wear different "epistemological disguises". The theoretical map handed out on campus does not fit the landscape encountered during practicum placement.

The current study turns the table and draws a map based on the students' own representations of teachers' professional knowledge. Such a map may aid the pre-service teacher in discovering the dynamics in the interplay between campus and practicum. The one does not exclude the other, instead, professional knowledge seems to rely on mutual inputs from different positions of the "knowledge landscape".

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