

Dialogical inquiry in practice teaching

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This article refers to a project in which the preconditions for a subject-oriented¹, reflective approach towards mathematics and mathematics education in the context of practice teaching were investigated. Student teachers, their tutors and teacher educators participated in the investigation. The article elaborates on their participation as "co-researchers" in developing the methodological approach and analyses. In addition, the article explores how the analyses provide insight into the didactical conditions for including a subject-oriented approach in practice teaching. More specifically, it was found that practice teaching communication bears the imprint of an evaluative approach that restrains the development of a subject-oriented reflective approach. The conflicting processes characterising these approaches are highlighted.

The Norwegian teacher training curriculum focuses on practice teaching as a key element in teacher education. The need to develop a strong bond between practice teaching and other parts of the study programme is emphasised. More than in the past, the curriculum now focuses on the responsibilities of the mathematics teacher educators (as well as those in other subjects) in the field of practice². Evaluations indicate that student teachers consider their practice to be one of the most important aspects of their education (Hove, 2004). However, they also claim that the connection to the academic components of their study programme is not good enough. An official evaluation in 2007 corroborated these findings and showed that relationships between theory and practice are a general problem in teacher education in Norway³.

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Acting against such lack of relationship had in fact been one of the local priorities in Bergen University College for some years. When Beate Lode and I initiated the project this paper refers to, we wanted to gain insight into how we, in our role as mathematics teacher educators, could strengthen a *subject-oriented discussion* in practice teaching (Lode & Johnsen-Høines, 2003, 2007). The term subject-oriented here refers to the academic subject mathematics, as well as to mathematics education. We envisioned that it could be possible to include mathematics and mathematics education as an issue for discussions between student teachers (S), their tutors in schools (T) and the mathematics teacher educators (M); and we foresaw that, through these discussions, practice teaching would have a greater influence on the teaching of mathematics at the university college. Nevertheless, our previous experience had shown us that subject-oriented discussions in the frame of practice teaching were not easily achieved. Tutors and student teachers supported our opinion and underlined that the issues discussed in practice teaching most often were connected to general pedagogical matters while the subject-oriented issues seemed to have low priority. Still, it could be possible to bring our vision into reality. We were challenged when the tutors and student teachers we worked together with expressed their desire to study the communication in practice teaching, and we saw the potential for developing a collaborative inquiry together with them.

The collaboration was developed at the initiative of the Ms (Beate Lode and myself). The dialogical process involved all participants, who gained insight into how the collaboration developed and how it could evolve as shared enterprise. I use the notion *collaborative inquiry* according to Lindfors (1991). She defined inquiry act as "a language act in which one attempts to elicit another's help in going beyond his or her own present understanding" (p. 1). Similarly Alrø and Skovsmose's (2002) critical and dialogical approach stresses the significance of investigative processes by describing that:

participants of a dialogue go through a collaborative process of perspective inquiry. In this process perspectives must be expressed in words in order to become accessible on the surface of communication. The process of making perspectives explicit can be an entrance to hidden perspectives that makes it possible to use them as resources for further inquiry. Further, each of the participants can gain new insight through the other by coming to see a problem or a solution from new perspectives. (p. 120)

In addition, the concept of *critical alignment*, as emphasised by Jaworski (2007), is useful in characterising the collaborative and dialogical inquiry

that the participants are aiming at developing. In applying these notions, I observe that we all became members of an established practice teaching culture; and did not reorganise the structure of that practice. While generally participating according to cultural expectations, we nevertheless challenged the established tradition by trying to implement critical discussions in practice teaching.

In this paper my aim is to elaborate on the dialogical inquiry as it evolves as shared enterprise, and on how different conversations are positioned in the context of practice teaching. More specifically, the conditions for establishing a subject-oriented reflective approach are investigated and discussed.

The initial phase proved to be essential for the project

The collaborative inquiry project that we started was linked to a compulsory 30-ECTS course in mathematics and mathematics education in the teacher education programme, and the term subject-oriented was in this context connected to the content of that particular course as part of the four-year teacher education programme the teacher students were following.

Most often, one practice teaching tutor is responsible for a group of two to four teacher students for a set period of time (for instance four weeks). The Ss and their T work closely together during this period. The teaching/learning environment is affected by the tight-knit nature of the group and shaped by the professional knowledge that the T has regarding the pupils, the curricula, the local teaching tradition and the teaching models that have been developed through daily practice. When present, the Ms are often cast in the role of visitors, observing the teaching/learning sessions and taking part in the post-teaching conversations. As visitors, Ms are entering, or perhaps are being confronted by, a pre-existing discourse that has developed during the didactical post-teaching conversations between Ss, Ms and Ts on the basis of teaching that the Ss had participated in. The discussion among these participants is already ongoing⁴.

In this case, the Ms, we were not only mathematics teacher educators but also researchers. The Ms initiated the project by inviting two groups of Ss and their Ts to join them in a collaborative investigation. Five Ss, three Ts and two Ms participated in the project. The invitation was sent by e-mail and followed-up phone calls were made to the tutors in order to explain our intentions. I had worked with the students and the tutors half a year earlier in practice teaching and had already established some common platforms for communication. All the people contacted

accepted the invitation. The groups of Ss, Ts and Ms were going to be formed in order to create a forum where participants could:

- Discuss the role of the Ms in the context of practice teaching. (Why should the Ms be there?)
- Discuss the place of a subject-oriented focus as part of the conversation that prevails in the context of practice teaching.
- Explore the communication as it unfolded and discuss the learning potential.

The Ss reported that they wanted to participate because they expected the cooperation to be interesting, but that they did not really understand "what this project was all about". The Ts agreed with the students. T3 helped to clarify the focus using as an example a common situation in which children and Ss focused on "telling the time". She told that the post-teaching discussion had dealt with how the activities were organised in social and interactive ways. They had talked about the use of references, both those they made and those they could have made to relate this topic to the children's daily life. They had talked about different types of clocks, but they had not emphasised their different geometrical shapes, and had not investigated the mathematics underpinning the way we measure time by using clocks. "We did not develop the mathematical discussions further. I suppose that this should be an issue here?" T3 said. The discussion that followed regarding this specific classroom situation helped us to distinguish which issues we wanted to investigate. In retrospect, this T3's initiative was the first exemplification of the way in which episodes were used in this project as a methodological tool.

The Ss and Ts showed interest and engagement. We (Ms) had invited them to join us at an early stage of our own thinking and did not feel able to articulate our ideas precisely. Thus, all of the participants, including the Ms, considered the initial proposal in the invitation to be rather vague. When joining projects most participants (including the project leaders themselves) would expect to receive information about what sort of project they are being invited to join, about which role they and other participants are expected to play, and about what kind of opportunities they can expect for themselves. Such requirements were not met in this project. Nevertheless, the very vagueness of the invitation and the insecurity of the participants was an important feature that had a positive impact on how the project evolved. We argue that there is evidence to suggest that the rather fuzzy introduction helped to motivate the Ss and the Ts to become actively engaged in the project. It seems that they saw

themselves as important co-participants, whose engagement was needed to construct the project. Their engagement went beyond the post-teaching discussions and they played an active role in the establishment of the research forum, which strengthened their feeling of personal ownership of the project. For example, during a presentation of the findings of the project, T3 became provoked when a colleague who had not been involved in the project raised her hand and criticized the fact that the Ms, as researchers and teacher educators, had carried out research on the tutors and their practice. T3 stood up and firmly denied that this had been the case: "They did not carry out research on us. What has been stated here is true. They did not know what they were looking for or what they would find. We developed the investigations together!" T3 explained the link between the beginning and the development of the collaboration. We interpreted this as evidence that she had experienced the project as an exercise in collaborative participation, where interaction between the different participants had been considered necessary and achievable.

To participate in and study the conversation

The shared aim of the whole inquiry team became then to study and discuss the post-teaching conversations among Ss, Ms and Ts (from now on called SMT-conversations). The practical approach chosen was somewhat similar to the traditional organisation of practice teaching. We all observed teaching-learning situations in which the Ss were actively engaged with the pupils. These observations served as a common platform for SMT-conversations. The fact that the Ms joined an already established activity may have had an impact on these conversations. In addition the Ss may have found it easier to take control of the discussion when the Ms were in a peripheral position with regard to the experience of actual practice.

As Ms, we introduced a meta-perspective into these discussions in order to gain insight into the position of mathematics/mathematics education in practice teaching and the nature of the didactical discussions that were established, as well as into the kind of conversations Ms would like to develop. The Ss and their Ts were invited to participate in the development of a joint understanding of the *qualities* and the *conditions* for interaction. We all joined in a conversation discussing the conversation itself.

The project was organized in three phases:

- P1. Observation of sessions in which Ss, Ms and Ts observed the Ss' teaching. These observations generated material for the second

phase (P2). During the sessions notes were taken (by all the participants, but mostly by the Ms), some of which were detailed and well-developed texts.

P2. SMT-conversations based on P1 observations. The conversations were supposed to build and elaborate on the observations and generate discussions focusing on mathematics and mathematics education. In addition conversations about the conversation were developed. Notes from P1 provided the basis and notes of the P2 conversations were taken as well.

P3. Ms conducted individual interviews with the Ss and the Ts, based on the subjects raised in P2. The interviews were recorded.

Since the emphasis of the project was the development of a subject-based approach as part of the SMT-conversation, the topic of the meta-level conversation was the SMT-conversation itself (P2). In order to gain insight into the positioning of subject-based perspectives within the didactical discussions of practice, we tried to frame the interviews (P3) as investigative conversations. Hence, it became important not to "pose questions for them to answer" – or at least to minimize this. As Ms, we invited the participants to join us in exchanging and developing insights, in expounding perspectives, and in turning and twisting issues in search of possibilities. We emphasised the need to develop a *learning community*, a concept elaborated by Jaworski (2004, 2007), based on the notion of *community of practice* (Lave & Wenger, 1991; Wenger, 1998). Our foundation was the dialogical approach to mathematics learning developed by Alrø and Skovsmose (2002), in which it is stressed that dialogue is a conversation of inquiry:

Entering an inquiry means taking control of the activity in terms of ownership. The inquiry participants own their activity and they are responsible for the way it develops and what they can learn from it. The elements of shared ownership distinguish a dialogue as an inquiry from many other forms of inquiry where, for instance, an authority sets the agenda for the investigation and the conversation. (p. 119)

However, in developing this dialogical understanding the issue is not simply the need to understand each other's perspectives, but also the need to gain shared insight into the issues under investigation (Johnsen-Høines, 2002). According to Bakhtin (1975/1981, 1979/1998), discourse is dialogical, not because the persons involved take turns speaking, but because the dialogicity is related to how each utterance is dependent

on another and how the tension between these utterances creates new meaning. Bakhtin claims that every utterance is addressive; being directed towards the continuations, it is intentional. Understanding is created through the tension and struggle between understandings. Therefore learning processes are regarded as dialogical and relational. This theoretical perspective describes text as being developed in the interaction between texts, by texts confronting each other (Johnsen-Høines, 2002, 2004). Thus, studying SMT-conversation can imply the identification of different conversations within the conversation and the movement between them. It also implies the study of the communicative characteristics of conversations.

This theoretical and methodological approach had implications for the analysis. The SMT-conversations and the interviews were analytical processes, since we discussed how we all understood and developed relevant concepts and issues. As will be exemplified later, all the participants made serious contributions to the analytical processes. Some levels of the analysis were included in the empirical data for further analysis by the Ms. There appeared to be a complex network of processes involved in gathering, interpreting and analysing the data. These analytical processes may be characterised as *inquiry* insofar as they are collaborative, investigative and questioning processes (Alrø & Skovsmose, 2002; Johnsen-Høines, 2002; Jaworski, 2007). They developed on three different levels:

- L1. The didactical post-teaching conversations (SMT-conversations) were to some extent analytical by nature. The discussion was intended to take up a reflection on practice. Shared experiences and notes were used as references for these conversations. The participants were Ss, Ms and Ts.
- L2. The Ms initiated a conversation about the conversation itself in order to investigate how it could be described and developed. We developed criteria for identifying and describing various aspects or types of didactical conversations together. The empirical material consisted mostly of L2 discussions of L1. The participants were Ss, Ms and Ts.
- L3. An analysis of L2 (and L1) conversations was undertaken. The participants were Ms.

The three levels described above are not sequentially organized. For instance, the L3 analyses hypothesis and results would be discussed with Ss and Ts, either in interviews or in informal conversations, which could have an impact on future activities/conversations. It is obvious, however,

that L3 is the level where the Ms in their role as researchers have the ultimate academic responsibility (Lode & Johnsen-Høines, 2007).

Establishing common ground

Already in the preliminary discussions an effort was made to create an awareness of the kind of discussions we were proposing. Having identified that an evaluative approach was the most common form of SMT-conversation, the Ms proceeded to question its efficacy. All the participants were familiar with *evaluative conversations*, in which the focus was the interpretation of a learning/teaching session in terms of what had or had not worked well, what could or could not have been done, and why specific choices had been made. This kind of conversation represented a "what-happened" or retrospective fault-finding approach. A conversation in this evaluative mode might prove useful to Ss by enabling them to evaluate what they had done in order to describe changes in their future teaching. However, this approach relies on a dominant-subordinate relationship between, on the one hand, Ss and, on the other hand, Ts and Ms; and it is largely directed towards the past.

At an early stage of the project, therefore, the Ms made it clear that we intended to challenge the dominance of evaluative discourse in the SMT-conversations. We began by inviting the Ss and Ts to reflect upon what happened in the conversations in addition to these discussions of "what-I-did-right-or-wrong". Such didactical exchanges were termed *subject-based conversations*, and their importance was recognized even before we were able to explain what a subject-based conversation should be. Our aim was to learn about the established discourse, on the one hand, and the discursive possibilities, on the other. To the latter end, all participants in the SMT-conversation shared a common focus: How would we describe a subject-based discussion? What didactical conditions do we consider necessary in order to include subject-based discussion in the didactical conversation in practice teaching?

Empirical examples as a tool for collaborative investigations

Already in the preliminary discussions an effort was made to use empirical examples to create an awareness of the kind of discussions in which we were participating. It was evident that the participants shared the view that traditional SMT-conversations often dealt with organisational issues such as "Just say it once; the pupils should not learn that messages will be repeated over and over again" or "You should have collected all the books earlier". Drawing upon such examples from discussions

enabled us to develop a shared understanding of the fact that such general pedagogical issues easily become the focal point of conversation; and also to explore how these issues affect the conversation as it develops. These organisational issues were not considered unimportant. Rather, we acknowledged that their prevalence obstructed the development of other types of discussions: "We are hiding when we discuss such problems", T3 said. "This prevents us from entering more challenging discussions. I have never thought about this earlier, how much time we spend dealing with such matters."

Episodes from the classrooms as well as from the SMT-conversations – the examples and the discussions of the examples – were part of the empirical data of the project. This use of shared examples as a reference point for developing new insights can be viewed as a methodological strategy that is implicit in the SMT-conversation. Thus, shared experiences and references can be considered a precondition for the inquiry processes. In addition, such examples support the process of empowerment and active collaboration for all the participants. However, since analytical processes demand that the participants maintain a distance from the subject of investigation, this close connection to experience proved to be vulnerable. Personal involvement can create resistance. Since the Ss and Ts, in particular, were playing active parts in most of the examples, it became evident that it was not easy to establish the necessary distance. We identified and investigated examples that the participants seemed to be avoiding in subject-oriented discussions. The following example was partly used to explore and illustrate such issues⁵.

Example: "The pupils at the back table were not paying attention"

Phase 1: S2 had been working on the concept of number with 28 six-year-olds using Lurvelegg, a fantasy-figure. Lurvelegg has one eye, two noses, three heads and four legs, five feet, six ears and seven nails made of stones. Lurvelegg had been central to pupils' activities such as modelling, drawing, singing and dancing. We enjoyed ourselves as we observed how S2 managed to introduce various aspects of the concept of number in a flexible and creative classroom dialogue. The pupils helped to choose the symbols to be used (drawings); they negotiated numbers, letters and positions; and they discussed and made changes on the blackboard.

Phase 2: S2 started the SMT-conversation by stating that "It went pretty well as planned: Most of the pupils followed what I said and grasped it, I think". He seemed satisfied. "We noticed that [the pupils at] the back table were not paying attention", T2 commented. We (Ms) noticed that the comment disturbed S2. We interpreted the change of his

face and body language as a sign of him feeling confused and worried. The conversation then turned to issues of behaviour, norms and limits. S2 sat quietly and did not participate. After a while, M2 shifted the focus to the concept of number and to how communication could be used to foster linguistic and mathematical creativity. S2 did not seem keen to enter the discussion. Several times he responded to points raised saying, for example, "I muddled the order...", "I should have done...", "No, I did not...", and "I tried to...". Although M2 tried to reassure him that the matter of the pupils at the back table was not so important, it was obvious that S2 did not change his attitude in order to join the discussion. He remained concerned about what he might not have done well enough.

M1 then intervened, emphasizing that S2 had taught a very good lesson. Her description was detailed and had a strong evaluative component. She interpreted his muddling with numbers, signs and order as a brilliant didactical example, and gave reasons why the lesson had been very good. M1 stressed that it was important to go beyond a discussion of what was good and what was not, and that she wanted us to establish a basis for a subject-based discussion independent of whether he had succeeded or not. This appeared to help; S2 seemed more relaxed and satisfied.

T1 commented on that fact that the children had discussed cardinal and ordinal aspects of numbers simultaneously: "I thought that you would plan to separate these two aspects?" T1 did not receive any answer and continued: "But I see that this worked very well ..."

- S1: And they worked on addition *and* subtraction, they were arguing eagerly that two more were needed to get six ... Did you expect them to ...? [S2 shook his head to express a "no"]
- M1: Several children that do not speak Norwegian well, joined in actively. More than usually, I think?
- T2: Yes, they did. And this was so even though your (S2) dialect is not one they are used to ... And you speak rather quickly ...?
- S1: Well ...
- S3: It might be important, it might have a positive effect that S2 made some mistakes on the blackboard; the pupils corrected him and argued ... Perhaps that could be the reason why they became so interested and concentrated so well? ... And they knew the context ...?
- M2: Drawing and writing on the blackboard worked very well. The children just joined in. Some even ran up to the blackboard, arguing and pointing. But it wasn't chaos. How ...?
- T1: This kind of engagement ... Some of the pupils that do not understand Norwegian were also active ... and I think they understood ... We do not learn issues like ordinal *and* cardinal aspects separately, I think ...

and the same is true for addition *and* subtraction ... and lots of issues ...
Perhaps we restrict the frame too much because we want to deal with
the language problem? ... Perhaps we simplify too much ...?

S1: Perhaps the most important thing is to get them interested ...?

S2: But all of them were not paying attention ...

S2 managed to take some interest in the conversation that – in a questioning way – addressed how the pupils seemed to be able to deal with several conceptual aspects simultaneously, and how they joined in even though the pupils' Norwegian language was not good. The matter of the extent to which simplification may limit the opportunities for children to be stimulated to understand what is going on was raised. Nevertheless, S2 did not participate actively and soon returned to evaluative comments such as: "All of them did not pay attention" and "I should have seen".

The above excerpt illustrates features that we consider characteristic of a subject-based conversation. Such a dialogue may develop as a sequence within a longer conversation. We learned to recognise the characteristic silences, and the slow and questioning voices, such as when T1 commented: "I thought you would plan to separate the two aspects?" The way he phrased his question did not indicate that he expected a short "correct" answer. He was introducing an issue that he was wondering about, and his questioning attitude was highlighted by the fact that he continued by saying: "But I see that this worked well ..." He let his unfinished sentence "hang" and S1 picked up on it, wondering about the pupils' activity and asking if S2 had foreseen this. M1 then inquired about the pre-conditions for stimulating pupils' eager participation, commenting that even though the children did not speak Norwegian well they joined in actively. When T2 commented on S2's dialect and the fact that S2 speaks quickly, it further highlighted the fact that, although circumstances that we usually consider counter-productive were evident, these had little or no impact. The children were interested and eager. S3's hypothesis that "it might be important that S2 made some mistakes ..." was followed up by M2 comments that the drawings seemed attractive. Then T1 returned to the fact that some of the pupils did not understand Norwegian well. The wondering tone supported the impression that the group was puzzled by the children's active intervention. Participants were considering whether they tend to restrict the lesson content and pupil activity too much for the sake of these children: "Perhaps they lose interest?"

In this conversation, it is possible to distinguish specific communicative features: the questioning tone, the hypothetical statements and the unfinished sentences. It is also possible to identify several evaluative comments, such as "what worked well ...", "did you expect them to ...?", and "you speak rather quickly". However, in the context of this

communicative mode, I would claim that these comments appeared questioning and forward oriented. A critical issue, however, is whether S2 was able to perceive this.

Phase 3: Later, during the interview, the Ms told S2 that they interpreted the way he interacted as resistance and he commented:

Yes, that is how I handled it, because that is what we are used to do. In practice teaching last year we always focused on what we did well enough and what we did badly. We were only supposed to be interested in what we did badly. The post-teaching conversations focused on what should have been done differently; that was the point. As if ... well, the evaluation was introduced by: Yes, but ... You should have done so and so. The discussions we have had this year have been fantastic in comparison.

Here he was commenting positively on the sessions led by his T.

S2 explained how he had interpreted the comment "we recognised that the pupils at the back table were not paying attention". He had felt relaxed initially since he felt that the children had been active and focused. "They were acting like I wanted them to, joining in. They grasped it, I thought." The comment about those at the back table had changed his perception. He had been unable to erase T2's words from his mind and could not concentrate on the discussion. Even at the time of the interview, the issue of the back table was what he remembered most clearly from the lesson and from the SMT-conversation. He referred to it as something that disturbed him: They were not paying attention, *and he had not noticed this*. S2's description corresponded with the Ms' observations. His body-language, his silence, his tone of voice when he was talking and the brevity of his utterances, had all indicated that he felt confused and insecure. This was highlighted by the evaluative statements: "I muddled the order", "I should have done", "No, I did not" and "I tried to".

We had tried to challenge him by leaving the evaluative mode and starting a subject-based discussion on the concept of number, symbolisation and communication. However, even when M1 started by praising his teaching and explicitly explained the intended subject-based discussion of pupils' learning, he did not fully participate. S2 never regained the relaxed and confident attitude that he had had initially.

Later in the interview, S2 commented on a discussion concerning a fellow-student: "That is just the way it is. We retreat easily into the perspective of evaluation. [...] It is difficult to shift one's focus and look for other aspects. [...] We focus on getting the pupils to do what we have planned." S2's comments support the view that the dominant approach in SMT-conversations is evaluative. He actually shifts the focus still further:

rather than evaluating what was good, or could have been better in a broad sense, he simply strives to get things done as planned. In addition, he refers to the issue of analytical distance when he says that it is difficult to "shift one's focus and look for other aspects".

We interpreted this situation as an indication that S2 was describing the discourse features of practice teaching by explaining what he considered relevant to talk about (and in which ways) and what not. The discourse he described was characterized by evaluative connotations and constituted an implicit frame for interpretation.

The above example is an excerpt from the empirical data. In addition to serving as an example, it is useful as a model for developing SMT-conversations and interviews. Consequently, new data was generated by investigating this example. Furthermore, the example and the way it is used can also be viewed as a tool for activating the participants, in order to gain insight into the different aspects of an investigative play. The fact that the example was used referentially, and that the discussions took place some weeks later, was intended to help establishing distance. The individual participants proved to be eager to reflect further on what had happened. When deciding which examples to choose, one has to consider their educational potential and which educational challenges and possibilities they can illustrate. However, such processes are not easy to predict. Our experience has shown that it is demanding to take the initiative in a conversation as it develops. The fact that we *participated* in the conversation and *talked about* the conversation seems to have influenced the way the processes developed. The level of awareness that was developed during the discussion of the conversation itself helped us to clarify what kind of conversation we were trying to develop. We were challenged to develop an awareness of "communicative navigation" and the necessary skills to achieve this.

Identifying conflicting approaches

M2 encouraged the participants to start the SMT-conversations in the way they usually did. The Ts always took the lead in this phase, while the Ms participated as visitors who were invited to join in. Drawing upon Foucault, we view this type of discourse as being institutionally generated (Mellin-Olsen, 1991; Popkewitz & Brennan, 1998). The participants know which questions are relevant (and which are not). They know how questions should be posed and responded to. When Ms visit different groups, we find that, although the communication patterns differ from group to group, there are marked similarities. Thus, the post-teaching conversations have an established discursive identity. This discourse is

based on the culture tutors establish through their practice, training and seminars. The tutors are given the responsibility for establishing a constructive basis for the conversations. However, they do their tutoring in a context that is associated with certain discursive limitations and possibilities. When analyzing the data collected during our project, the power of this discourse became evident. Most often Ss were challenged to reflect on the teaching session. For example they spoke about what had been done according to their planning, about the organisation of the lesson, about the extent to which they had managed to communicate with all the children, and about the extent to which the children had been actively involved, behaved as they were expected to, and enjoyed themselves. We could identify a pattern of what was "usually" addressed and the way it was addressed. The Ss supported each other and they suggested alternatives phrased in terms of "perhaps you could". Their approach corresponded with and was supported by the T's questions, comments and advice. We recognised that it appeared "natural" also to us as Ms (and visitors in the group) to adapt to the discourse of the group. The fact that we discussed the conversation itself provided insight into the power of this discourse. The participants stated that it was difficult to leave the evaluative mode of this discourse to participate in the subject-based conversation that we tried to develop.

The efforts to foster an alternative kind of discussion, a didactical discussion without a strong evaluative focus, challenged an established discourse. The latter discourse became more clearly visible when viewed in the light of an approach that the participants described as unfamiliar. Moreover, the fact that we were trying to develop an alternative conversation and to ascertain what kind of conversation this should be, influenced the way we interrogated the established discourse.

The students' attitude to this analysis of interactions proved to be inquiring and cooperative. The discussion of the example of "the pupils at the back table that were not paying attention" traces the way in which a collaborative inquiry may develop. The following statements by Ss illustrate this development. As S1 was on his way out of the interview room, he turned back and looked at us:

If I were to define a subject-based discussion, well ... I think ... the teaching-learning situation is the point of departure ... We are moving forward ... from the teaching-learning situations ... It is about winding up a discussion for later use ... or for use in appropriate situations later on.

Earlier in the interview, S1 had commented:

I am ready for this. We went through the "What? How? Why? Did it work as planned?" last year ... I need to move on ... not just to circle around in a what-happened perspective. We have learnt to cope with the "what-you-did-wrong-comments". My way of handling those comments developed into one of: Just forget about it. Go ahead. Delete the whole situation. Those comments are of no use. No ... I am ready to move on.

In another interview, S3 referred to another example, commenting:

That is the benefit of having you there (the Ms at the SMT-conversations). We really discussed things in a different way than we usually did. We had an excellent tutor, caring and supportive. But the questions we posed when you were present were of a different nature. I would never have thought in that direction. It's interesting ...

She explained that she had managed to change from an evaluative approach, but that she thought that her fellow student S5 would not manage:

He is showing resistance; I see that. It is not easy for him and it is not easy to push him; he simply does not want to. I think I can understand his resistance.

The students referred to *leaving an approach, resisting, moving on, and later use*. We assume that they are talking about being ready for a change and for distancing themselves, and that they understand the resistance they observe. By studying these expressions, it is possible to gain some insight into the discourse established. It is possible to identify different conversations as implied in the SMT-conversation. It is possible to identify the movement and struggle between them.

In addition, it is important to bear in mind that these expressions have been made relevant within the discourse of our group. We have actively questioned these issues. As mathematics educators the Ms have stimulated and influenced both the participants' understanding of the didactical conversation in practice and the way they express this understanding. As this is the case for all the participants, we have influenced each other within a group.

We have identified two different approaches to the SMT-conversations:

- A1. *An evaluative conversation*, the aim of which is a discussion of the learning/teaching session in terms of what was considered to work well and what did not, of what could have been done (and was not), of why and how choices had been made, etc. This represents

a what-happened perspective, a retrospective approach. A conversation in this mode might focus on the possible consequences of something for later teaching and learning sessions, but is more likely to concentrate on an evaluation of the past.

A2. *A subject-based, reflective conversation* would be an educative approach that aims at exploring how the situation might generate discussions for further development; hence, it is *a future-oriented perspective*. It is generated in the practice teaching situation, released from the evaluative aspects and developed as a subject-based interest and as a foundation for subject-based reflections. This perspective implies an investigative and dialogical approach (Alrø & Skovsmose, 2002, 2003; Johnsen-Høines, 2002).

These two conversations appear to be conflicting, although they do not compete as equals. The evaluative conversation has a strong tradition in the didactical conversations in practice teaching as we have experienced it in general and in the SMT-conversations developed during the project. The discourse is constructed in exchanges between Ts and Ss, and it is also embedded in the discourse shared with other Ts and also with the Ms. Thus, the dominant position of the evaluative discussion can be attributed to the discourse that has developed in the context of practice teaching (Mellin-Olsen, 1991; Johnsen-Høines, 2002). The findings in our project indicate that a strongly evaluative perspective may act as a factor that restricts the development of a subject-based, reflective discussion perspective.

The two perspectives can be represented by individuals in the sense that participants bring their personal approaches to their interactions with others. They can also be identified as intrapersonal, therefore, in the sense that each person moves between different perspectives in the process of gaining understanding into professional issues connected to the communication on mathematics teaching and learning. For example, S2 described how he had retreated to an evaluative argumentation. He reflected on his learning process and described the dialogical processes in which different perspectives were in conflict as part of his own thinking. S4's comments could also be interpreted in the light of this, when she claimed that she understood the resistance of S5, and the difficulty he was having in changing perspectives. She illustrated how different perspectives could be seen as conflicting perspectives, and confirmed that the confrontations may be perceived to be part of individual as well as social processes. S2's description of what he felt was going on, helped the Ms to explain his reserved and passive attitude referred to the discursive conflicts. Finally, our analyses are supported by the framework

developed in Johnsen-Høines (2002, 2004), and reveals that this is the case for all of us: both perspectives can be present in the argumentation of each participant. All participants, Ts, Ms and Ss, move between partly conflicting perspectives, intra-personally and interpersonally⁶. The two conversational approaches, A1 and A2, are not to be considered to occur only as pure A1 or A2 conversations. When A2 is identified, it may be as a sequence in a conversation or as a trace within a conversation (Johnsen-Høines, 2002). This can be exemplified by the excerpt at page 48 where M1 intervened by describing that S2 had thought a "very good lesson". Her evaluative input can be seen as a tool for establishing room for further discussions. The conversation that develops is interpreted as a subject-based reflective conversation, even though evaluative connotations are evident. Some utterances can be seen as continuation from M1's evaluative input. Tracing the evaluative connotations through the conversation can help us also to identify an evaluative conversation. The conversation can be seen as a movement between those two conversations (A1 and A2). We experienced that it was achievable to develop awareness of such "communicative navigation" through the SMT-collaboration.

Contrasting approaches: normative connotations?

In the frame of practice teaching, we have identified and described a *subject-based, reflective and future-oriented conversation* (A2) in contrast to the established dominant conversation (A1) that has been identified as having strong evaluative connotations. The evaluative conversation (A1) was linked to and described in terms of the widely stated purpose of the teaching/learning session, of what had been articulated as teaching method, and of the claims of keeping the schedule of the session. Most often the topic of discussion was personal actions: what had been done or could have been done. This kind of conversation would contain assertions, authoritative utterances, concrete advice and clear statements. The atmosphere was often described as polite and supportive.

The subject-oriented conversation (A2) was characterized as inquiring. The focus was changed from the actual teaching/learning session to the principles or features that would be of more general interest in relation to future teaching, and linked to mathematical issues. This would imply a distancing from the actual teaching/learning sessions and from personal actions, although examples rooted in the teaching/learning sessions were used to gain insight into the issues or phenomena under discussion. The inquiring mode was visible in the appearance of questioning utterances, pauses and unfinished sentences that could be formulated in a hesitant mode. The utterances were formulated while thinking. This

fact was often identified as a meta-comment during the conversation. A speaker could explore some thoughts, and contradict herself in the same utterance and thereby open for further inquiring interactions from others and from herself. The communication was imprinted by the willingness of the participants to stay focused and to struggle to gain insight into issues they do not have answers for (Wells, 1999, p. 121).

Both approaches could have evaluative elements (although A2 would have less marked evaluative connotations) and both could also bear investigative elements. However, the structural form, the genre⁷, seems to be different in each, and such differences have implications for the mode of evaluation and the mode of investigating. The inquiring approach, the distance from the actual teaching/learning episodes and the future orientation in A2 will influence the way the utterances within this approach are formulated and interpreted.

These descriptions of A1 and A2 can easily be interpreted as a contrasting of good and bad approaches for conversations in the context of practice teaching. However, the above descriptions should not be seen as normative, but simply as descriptions of two modes of conversation that are possible and that have been identified in the context of practice teaching conversations. Nor should the interplay between them be interpreted in a normative sense. The struggle between these conversations produces insight into both, resulting in discursive production (Dysthe, 1999; Johnsen-Høines, 2002). Discourses are developed (or changed) through opposition and the struggle between different approaches. We studied the conversation as it developed, and identified A1 and A2. The analyses revealed an asymmetry between A1 and A2 in the sense that A1 was more frequent and it also appeared to hinder the development of A2. The analyses also revealed the fact that each approach became more visible in the light of the other. The meta-discussions had a clear effect on the way the conversation developed, particularly on the way approaches were positioned by the participants. Although participants adopted positioning of approaches they see as fruitful when entering the conversation, we can describe and analyse "what is going on" in a non-normative way.

The normative aspects come into play when the participants (Ss, Ms and Ts) are discussing the conversations in the context of the professionalization of the student teachers. In discussions of how we can achieve 'good' learning for teacher students, we discussed issues such as what it means to train independent, critical reflective, argumentative and knowledgeable teachers. When discussing the practice-teaching conversations in the context of learning, normative analyses are present since we, as Ms, Ts and Ss, consider some approaches better than the others. Our

normative discussions, however, made it clear that both approaches are considered legitimate and should be given space. They were viewed as important and fruitful for slightly different purposes. It was evident that the subject-based conversation has great potential, but that the potential in relation to the Ss' learning in becoming a mathematics teacher is limited by the fact that the evaluative perspective is the established type of conversation and has a strong position in practice teaching. Moreover, by analysing the struggle between these two perspectives insight was gained into the practice teaching conversation. Finally, it was found that meta-conversation was the most important tool for developing fruitful conversations in the context of practice teaching.

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Notes

- 1 The term subject refers to an academic subject as mathematics and/or mathematics education, it does not refer to personal or subject-object relations.
- 2 http://www.dep.no/filarkiv/235560/Rammeplan_laerer_eng.pdf
- 3 http://www.nokut.no/graphics/NOKUT/Artikkelbibliotek/Norsk_utdanning/SK/Rapporter/ALUEVA_Hovedrapport.pdf
http://www.nokut.no/graphics/NOKUT/Artikkelbibliotek/Norsk_utdanning/alueva/NOKUT_INSTITUSJONSAPP_web.pdf
- 4 The fact that we enter a discussion that is already ongoing (we interpret that it is so also by the participants telling us), is interesting in a Bakhtinian perspective. A discussion is not a started and ended activity, it is seen as a complexity where a variety of interrelated discussions are brought to the fore (Johnsen-Høines, 2002, 2004).

- 5 The data is reconstructed from different teaching/learning sessions, SMT-conversations and interviews.
- 6 See Johnsen-Høines (2002, p. 77, 2004, p. 65).
- 7 Genre refers to the way of ordering a text. When we learn to use language, we learn how to form language according to different genres. When we listen to another person, we guess the genre even after we have heard a few words, we get an impression about the length of the utterance, how it is build up, and we have some ideas about how it ends. Our understanding of an utterance is reflected by our knowledge about the genre that is actualized. We interpret what is told and the way it is told. The genre gives directions for content (Johnsen-Høines, 2004).

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Sammendrag

Artikkelen utgår fra et samarbeid der lærerstudenter, øvingslærere og matematikkdiraktikere utforsker praksissamtalens slik den foregår i lærerstudiets praksisopplæring. Fokus rettes mot hvordan det etableres arbeidsformer som stimulerer til at studenter og øvingslærere deltar i samarbeidende forskning. De studerer hvordan samtaler med matematisk og matematikkdiraktisk innretning kan utvikles som del av praksissamtalene. *Den faglig forstsettende samtalen* løftes fram som didaktisk begrep. Det dokumenteres at praksissamtalen i stor grad er preget som *evaluerende samtale*, og at dette kan ses i motstrid til og kan virke hemmende i forhold til å utvikle en faglig fortsettende samtale. Artikkelen utdyper et perspektiv der samtaler består av flere samtaler, og der samtaler utvikles i bevegelse mellom, og i konflikt mellom, samtaler.

