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# Live Remote Classroom: A Tool for Coherent Teacher Education

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**Abstract:** Teacher education has been criticised for a lack of coherence and for not preparing student teachers for teaching. To prepare student teachers for practicum and create connections between theory and practice and between schools and university, this study explores how the practice field can be brought onto the university campus through digital resources. Four teacher educators in secondary school teacher education in Norway collaborated with a schoolteacher and tested Live Remote Classroom. The tool provides student teachers with real-life classroom experiences while they are on campus by providing access to a streamed lesson. Using an action research design, the teacher educators evaluated their facilitation of the arrangement through an interview with the involved schoolteacher, a focus group interview with student teachers and the teacher educators' own logs. The results show that by presenting authentic practice situations, Live Remote Classroom created opportunities to prepare for teaching. However, certain conditions need to be in place for that to happen. We see it as important to support student teachers in their analysis of the observed lesson and to collaborate with a schoolteacher who is able to make her professional choices explicit.

**Keywords:** teacher education; practicum; secondary school; digital resources; action research

## 1. Introduction

Teacher education has been criticised for a disconnection between theory and practice and for not being relevant for teaching [1–3]. Consequently, there has been a call for more coherent education [4–6]. Coherence implies that there is a connection between the practice field and the university coursework and that learning in one arena reinforces the learning in another arena, and vice versa [5,7].

The current study focuses on how the practice field can be brought onto the university campus through digital resources. The study is part of the Erasmus+ project Digital Practicum 3.0: Exploring Augmented Reality, Remote Classrooms, and Virtual Learning To Enrich and Expand Preservice Teacher Education Preparation (PRAC3), with five participating countries. One of the objectives of the project is to develop digital resources for teaching in the practicum. PRAC3 was developed based on experiences from the COVID-19 pandemic, which required universities to find online solutions for teaching. Live Remote Classroom was one of the tools tested, a tool that brought real-life classroom experiences to student teachers and university teachers who were on campus. The tool was meant to enable student teachers to watch and analyse streamed classroom situations as preparation for their own teaching in practicum and to facilitate fluid communication between school and university.

This study relates to experiences from a Live Remote Classroom session in secondary-school teacher education in Norway. The involved teacher educators and authors of this paper developed the session into a joint action research project aiming for coherent and relevant teacher education. Our research question was as follows:

How can we through Live Remote Classroom prepare student teachers for teaching in practicum?

Being prepared for practicum means not only being prepared to teach but also being able to give reasons for their choices as teachers.

## 2. Background

Professional knowledge is sometimes described as knowledge that draws on both theory and practice [8,9]. There is a problem when field work and university coursework are perceived as two different arenas in teacher education, with a divide between knowing and doing and between theory and practice [10].

Furthermore, what teachers do in a classroom is based on holistic judgements influenced by a range of factors [3]. What happens in the practice field is ambiguous, value-based, and in need of rapid solutions [3]. For student teachers entering the field, it can therefore be challenging to see the relevance of the theoretical knowledge taught on campus. While practical knowledge is described as sensitive and context-bound, theoretical knowledge is general and decontextualised [11,12]. However, the school practice that student teachers experience will always be theory-laden [12]. Kvernbekk [12] distinguishes between "strong" and "weak" theory. Weak theories are embedded in preconceptions, beliefs and prejudices that shape and guide practice. Strong theory, which is general, may provide alternative explanations and critical views of practice. The two might challenge and complement each other [13].

Teaching is complex and not easy to prepare for [14]. Bringing real-life experiences to campus, for example through cases, has been one way of interlinking school procedures with university coursework [15–17]. Cases are real or realistic situations from the practice field that are presented and discussed on campus [17]. They can explore complex problems, work as examples and stimulate reflection, therefore preparing teachers for uncertain practice and helping them to develop habits of reflection [15].

Another way to create coherence can be to provide opportunities to learn that are grounded in practice during university coursework [18]. One way of doing this is through modelling [19–21]. Jenset and colleagues [18] found in their study from three different countries that student teachers had few opportunities on campus to see models of teaching. However, the researchers stressed that for something to be coded as a model of teaching, the teacher educators have to explicitly model it. Previous research confirms this viewpoint. Student teachers do not learn from examples if they do not recognise what they see as examples. Examples therefore need a metacommentary [20,21].

Furthermore, practical and theoretical knowledge can interact in what the literature describes as a third space. This meeting space is a state of intersubjectivity [22] in which "people's ideas and practices from different communities meet, collide and merge" [23] (p. 46). These meetings might happen when teacher educators from the university visit student teachers during their practicum. In the third space, theoretical and practical knowledge can exist side by side in a non-hierarchical way [24]. Based on respect and trust, critical thinking and new knowledge can develop in the meeting space that is created [23]. However, in Norway, as in other countries, the connection between schools and universities is limited [10,24,25]. Academic knowledge is often viewed as the authoritative source of knowledge about teaching [24]. Meetings in the third space might therefore be rare.

In the current project, we explored how the Live Remote Classroom session prepared student teachers for teaching and also for being able to give reasons for their choices. By means of technology, Live Remote Classroom offers an online meeting space for the school and the university. The session provides authentic classroom experiences to reflect on and provides realistic situations that not only offer pre-collected examples to reflect on, as in case-based teaching, but which also allow student teachers to follow teaching as it unfolds.

The PRAC3 project, which this study is part of, responds to a call from the European Commission to make Europe fit for the digital age and addresses the challenges and opportunities discovered during the COVID-19 pandemic [26]. The project aims to design technological products and solutions for online practicum experiences. During the COVID-19 pandemic, ICT evolved from being something that was expected to be implemented in teacher education [27,28] to something that had to be utilised. For many teacher educators, merely making use of ICT was a challenge. It was a step further to implement technology in a pedagogical way underpinned by theory and modelling good teaching [29]. This,

however, was how we wanted to adopt Live Remote Classroom in the current study and investigate how this online approach could create a connection between practice and theory and prepare student teachers for practicum.

Through a collective action research approach, we wanted to develop our practice and evaluate our action, in this case our facilitation of Live Remote Classroom. According to McNiff [30], "Action research is a term which refers to a practical way of looking at your own work to check that it is as you would like it to be" (Internet address, no page number). It is an ongoing process of planning, acting and evaluating in order to inform and challenge previous practice [31]. It is a self-reflective enquiry that includes a variety of perspectives [32], here from student teachers, a schoolteacher and teacher educators. We wanted to open a space in which we could reflect upon our practice and learn from it. Furthermore, we wanted to add to our joint learning by including perspectives from the literature and from the involved participants through systematically collected data. The idea of joint reflection and learning is based on the assumption that our own reasoning is tested and might develop through interactions with others [33].

### 3. The Study

#### 3.1. The Context

In Norway, as in other countries, the COVID-19 pandemic created challenges and opportunities in education when it came to using technology in education [10,34]. Norway had the advantage that its digital literacy is quite high. The level of access to ICT in Norwegian secondary schools is one to one, and ICT has been one of the five core competences in schools since 2006 [35]. Nevertheless, the pandemic forced teacher educators to incorporate technology use to a larger extent than before [36]. They became more confident about using technology and after the pandemic they were ready to use the benefits that the technology provided and avoid the pitfalls. Regarding Live Remote Classroom, the technology was already available and now we intend to utilise it in the current project.

Furthermore, it should be noted that in Norway, student teachers are mainly satisfied with their field placements, but they point to challenges when it comes to how practice and theory are integrated into teacher education and how schools and universities collaborate [25,37]. We know that students in our own teacher education share similar viewpoints [10].

#### 3.2. Sample

The participants in the study were ten student teachers, a schoolteacher and four teacher educators. The schoolteacher could be called a school-based teacher educator. To differentiate the participants, we have decided to refer to her as a schoolteacher. The student teachers were a self-selected group from a one-year postgraduate teacher education programme for secondary schools. A cohort of 52 student teachers was invited to join a Live Remote Classroom session as part of their campus studies in pedagogy (general didactics, educational theory). As this activity is not included in the curriculum, we could not make the session mandatory. Ten student teachers chose to attend. They had master's degrees in language, social sciences, ethics and religion, or mathematics and were somewhere between their sixth and ninth years of study. In the one-year programme, they follow lessons in pedagogy and subject didactics on campus. Additionally, they have seven weeks of practicum in school during both terms. Four of the student teachers participated in a focus group [38] after the session. The others had follow up lessons in subject didactics.

The schoolteacher is regarded as a skilled teacher. Furthermore, she was an educated mentor (30 credits in mentoring) and had collaborated in teacher education for about a decade. She immediately agreed to be part of the Live Remote Classroom project and was quite enthusiastic about the idea. For the session, she chose a history lesson in a class she knew well. The students were in their last year of upper secondary school and were about 18 years old.

The involved teacher educators (T1–T4) were all part of the PRAC3 project. They were connected with the current teacher education programme and taught pedagogy.

*3.3. The Action*

The Live Remote Classroom session took place shortly before the seven weeks of practicum in upper secondary schools. The student teachers observed a streamed 60-min history lesson from a seminar room on campus. The session started with a short introduction from the schoolteacher. After the lesson, the participants on campus had a conversation with the teacher. To allow us access to the lesson, the schoolteacher invited us onto the digital platform her school used. In the classroom, as well as in the seminar room on campus, we had cameras and microphones to support video conferences. Beforehand, we tested the technology and it worked quite well. However, during the Live Remote Classroom session, the overview of the classroom as well as the sound quality could have been better.

After the schoolteacher's introduction, the participants on campus could see the students coming into the classroom. In this part of the session, the students could also see the student teachers and the teacher educators on the interactive board in their classroom. Some of the students waved and said hello. They had all agreed to the streaming of the lesson and were old enough to decide for themselves whether they wanted to participate. When the lesson started, the camera as well as the sound from campus were muted.

The lesson started with small talk between the teacher and the students. Then, the teacher introduced her plan for the lesson, which was about the Sami people from a historical perspective. While the students wrote individually for a few minutes about why the Sami people are recognised as an indigenous population, the teacher played a Sami joik. Some of the students were asked to present their answers. Afterwards, the teacher talked for approximately 15 min about some of the main points of Sami history, which were illustrated by an excerpt from a film. This was followed by another individual writing exercise. In the last part of the session, the students learned some Sami words presented by young people in a video. During the lesson, and as convenient, the teacher provided tips about note-taking and study technique.

During the lesson, the student teachers filled in a structured observation form that had been sent to them digitally beforehand and which was also handed out in paper there and then. The observation form and the interview guide for the focus group had been developed by the international team in the aforementioned PRAC3 project. In the observation form, the student teachers were asked for demographic information and about the technologies and teaching methods that were used during the lesson, and they were also asked to rate statements on teaching strategies and classroom climate and communication on a scale consisting of "not at all", "adequate", "good", "very good" and "excellent". All the participating student teachers filled in the form.

After the lesson, the participants on campus had a conversation with the teacher about the lesson. The conversation was audiotaped and transcribed. All four teacher educators were present during the lesson and the conversation with the schoolteacher.

To evaluate the action, including the introduction, the lesson and the subsequent conversation, we conducted a focus group interview with the student teachers, interviewed the schoolteacher and collected the logs from the four teacher educators.

Two of the teacher educators conducted the focus group interview with the four student teachers about the Live Remote Classroom experience. One educator acted as a moderator. Focus groups are especially well suited to examining experiences, attitudes and beliefs. By gathering people to talk about a shared experience, meaning can be created collectively (Kitzinger & Barbour, 2001). In the focus group, the student teachers were asked, among other things, what they thought about remote classrooms as a component of their studies and if they recommended the inclusion of remote classrooms in the course syllabus. Furthermore, they discussed how helpful the session was compared to visiting a school and what they saw as the advantages and challenges of using the Live Remote Classroom

tool. Furthermore, all four teacher educators wrote independent logs to document their experience in retrospect. A few days after the remote classroom experience, the first author had an interview with the schoolteacher to gain her perspective on Live Remote Classroom. The same interview guide was used as in the focus group, but some of the questions were relevant only to the student teachers. Furthermore, the teacher was asked about her motivation for participating in the arrangement and what she thought about making similar use of Live Remote Classroom in the future. The focus group interview, as well as the interview with the schoolteacher, was audiotaped and transcribed.

The focus group interview, the interview with the schoolteacher and the logs from the teacher educators were the main sources of material for the analysis of the action. Additionally, we drew on the observation form and the conversation with the teacher (see Table 1).

**Table 1.** Collected data.

| | |
|---|---|
| Structured observation form | Filled in by 10 student teachers |
| Conversation after lesson | Student teachers, teachers at the university, class teacher, audiotaped and transcribed |
| Focus group interview | Four student teachers, two present teacher educators, audiotaped and transcribed |
| Interview with class teacher | Audiotaped and transcribed |
| Teacher educators' logs | Four logs about the remote classroom experience |

*3.4. Analysis*

The analysis can be described as a combination of thematic and interpretative analysis [39]. The four teacher educators and authors of this study read and reread the data material and tried to make sense of it. We alternated in a hermeneutic movement between the parts and the whole, between working individually and working together in a moderation process. In the analysis, we all interpreted each data source separately before seeing them in connection with each other. With our research question in mind related to preparing student teachers for teaching, including interaction between practice and theory, we explored the data material, looking for relevant themes [40]. The main themes are as follows: an exemplary picture of today's schools, complexity of teaching, connection of practice and theory, joint reflection, technical issues and availability.

**4. Results**

In the following we present the involved parties' perspectives on Live Remote Classroom as preparation for practicum.

*4.1. Student Teachers' Perspectives*

The four student teachers who participated in the focus group interview were very excited about the Live Remote Classroom session. Through the lesson they obtained a picture of today's school presented by a teacher they describe as "skilled". One of them explained this as follows:

> It was very good, and I have not had any experience before. And I notice that [ . . . ] it is very different from when I went to upper secondary school [ . . . ]. It has become a completely new concept with more activities, and it is more in a way student focused.

Two of the student teachers had worked as substitute teachers and commented that they still learned a considerable amount from the lesson. The focus group emphasised that the lesson was very interactive with a lot of variation and that the teacher used PowerPoint in a creative way. She not only had bullet points but presented material in different ways. Furthermore, the student teachers brought up that the teacher used music, in this case a

Sami joik. "It was interesting that she used it for the writing task, but then it is important that the music is relevant," one of the student teachers commented.

Due to the limited overview of the classroom, the student teachers found it difficult to observe the interaction during the lesson. However, they described the atmosphere as comfortable. "There was a lot of smiling and there was laughter." The atmosphere seemed "natural and nice".

The student teachers agreed that Live Remote Classroom was a good introduction to practicum and that the timing, a few weeks before practicum, was excellent. Furthermore, they enjoyed gaining knowledge about the complexity of teaching. They claimed that at the university, there is often a focus on single incidents.

Following a lesson from campus made it easily available. The lesson started a thought process and the student teachers emphasised that they had an opportunity to reflect together as a group. It would be impossible "to stand 20 people in the back of the classroom", a student teacher claimed.

The advantage of Live Remote Classroom, as the student teachers saw it, is that it is easily available to a whole group of student teachers and it creates an opportunity for reflection. The conversation afterwards, in which the teacher explained her choices, was perceived as valuable. Observing the lesson together made it possible "to lean on the person next to you" and have "a short quiet conversation while the lesson is going on". Joint reflection offered new perspectives. As one student teacher stated, "It is a very nice way of learning and made it easier to connect theory to practice."

One aspect the student teachers missed was the feeling of being physically present in a classroom and getting a feeling of the relationship in the classroom, something that could provide a better understanding of the situation. Furthermore, they missed having a better overview of the class and better sound quality. If the technology had worked better, "it could have been very educational". The student teachers agreed that they would like the students' perspective on the lesson as well as the teacher's. Furthermore, they wanted to see how a teacher would handle a challenging situation. One commented, "One might get an unrealistic picture of the school, if one gets to see a well-functioning class—or could it be that it is nice to know that it could be like that as well?" As the quote expresses, seeing a well-functioning class can have advantages as well as challenges.

All in all, the lesson inspired and initiated reflections about how one could structure a lesson. The student teachers recommended including Live Remote Classroom in teacher education, but the technology would need to be improved. They also discussed whether the lesson could have been recorded. However, to see an authentic lesson as it unfolds was perceived as crucial and to obtain an overall picture of the lesson, the student teachers emphasised the importance of the introduction of the lesson and the conversation with the schoolteacher afterwards.

*4.2. Schoolteacher's Perspective*

In the interview, the schoolteacher mentioned several benefits of Live Remote Classroom. The most important outcome, as she saw it, was the opportunity to create coherence between practice and theory. When following a lesson on campus, student teachers can work with it immediately after the lesson from a theoretical perspective and easily move between practice and theory. Furthermore, as the teacher emphasised, it is easy to arrange. The disadvantage is that it creates a distance. As the teacher explained:

> I think it is extremely important that they [student teachers] get into schools, can be there and feel the atmosphere and decide whether it is a good place for them to be. However, they will have that experience in their long-term practice.

The schoolteacher thought that the session gave the student teachers a realistic picture of today's school. From her perspective, the students behaved normally. However, when she asked the students afterwards, she was surprised to learn that they had been self-conscious about being streamed. Knowing that someone was watching them behind a screen made them feel observed. The teacher suggested that it might be different with

student teachers in the classroom: "Then they are sitting there and many of them are quite young [ . . . .] It is not that scary."

The schoolteacher was asked if Live Remote Classroom could have been better utilised and if there were alternative technologies. She suggested that the lesson could have been recorded but added that if it is not streamed, in a way it becomes more theoretical, a visual example of a lesson. However, she thought it could have been useful to record the streamed lesson. Then, important situations could have been repeated and discussed. The schoolteacher suggested that the technique could also be used for giving student teachers online access to other parts of teachers' work, such as planning and assessment.

At the end of the interview, she said, "I'm very interested in the proximity between theory and practice and between teacher education and the practice school [ . . . ]. I like being part of teacher education and that there is a bridge."

*4.3. Teacher Educators' Perspectives*

Based on the observation form, the teacher educators learned that the student teachers perceived the streamed lesson as exemplary. The schoolteacher's teaching strategies were highly rated (17 good, 30 very good, 33 excellent). Additionally, the classroom climate and communication were given high scores (1 adequate, 13 good, 18 very good, 15 excellent). However, due to the reduced sound quality and the lack of an overview of the classroom, it was difficult to grasp the climate and communication, something that was commented on in the form.

Furthermore, the teacher educators noticed that there were issues related to the observed lesson that the student teachers did not mention. When it came to the technologies that were used, all the student teachers mentioned PowerPoint, video and music. The interactive boards that are commonly used in Norwegian classrooms might have been taken for granted and were mentioned by only a few. Furthermore, brainstorming and think-pair-share were teaching methods that all the student teachers noticed. Some also included notetaking, writing exercises and dialogue. The students had several writing exercises during the lesson, including one that lasted 15 min, but only a few student teachers mentioned it as a method.

In the following paragraphs, we will indicate what the teacher educators found important in the conversation with the schoolteacher immediately after the lesson. The conversation broadened the perspective of the lesson. The student teachers had only a few questions. Therefore, the teacher educators' and schoolteacher's questions and comments were very important. Their varied perspectives complemented each other.

Something the student teachers wanted to know more about was how the schoolteacher planned her lessons. She revealed that she spent a lot of time on planning and explained that there should always be a purpose to teaching and that one has to plan for the didactic intentions of "what, why and how". Furthermore, she explained the rationale behind the observed lesson. The lesson started with what the teacher referred to as a theme opener. By letting students write freely about a topic and turning on music related to it in the background, she wanted to activate previous knowledge and make her students tune in to the specific topic. Beforehand, the schoolteacher published some information about the lesson on the school's online platform to prepare the students. In the lesson, she wanted variation and some concept learning, but she also wanted to include lighter moments, especially towards the end of the lesson. She referred to research that has shown "that when 15 min have passed, most people start to feel that it is difficult to keep going". To break up the lesson, the students were given varied writing exercises. The schoolteacher said, "It becomes an assessment for me, because I see which concepts they don't know yet and which ones they do, so then I can use that going forward."

The schoolteacher explained to the student teachers that a lesson might have several aims. In addition to the subject, she worked with the class on notetaking and study techniques, something that she thought went well in the observed lesson.

When it came to the logs, all the teacher educators (T1–T4) commented on technical issues. They would have liked a better overview of the classroom and better sound quality. One of them commented, "The whole arrangement turns on technical solutions that work, something that makes it very vulnerable" (T1). However, the teacher educators who participated in the focus group (T2 & T4) noticed that the student teachers paid less attention than the teacher educators to technical issues. A suggestion for future remote lessons was that the schoolteacher should have a wireless microphone.

All the teacher educators found it very useful to observe an experienced teacher. One of them explained this as follows: "It worked much better than I had expected. I experienced it as realistic and good" (T2). Another teacher educator found it positive to observe teaching together as a group and added, "I got a feeling of visiting a classroom together [ ... ]. I think that the dialogue afterwards became richer" (T3). Then, the schoolteacher's reasoning became explicit, and the student teachers had an impression of all the planning and knowledge that quality teaching is based on. "The focus was moved from what and how to also include why" (T4).

It was agreed that the lesson was exemplary and very suitable for observation. "They [the student teachers] got a picture of how teaching in upper secondary school can take place. These are students with long experience from the university," said a teacher educator (T2). The lesson was described as very well considered (T4), as planned and varied (T1), and as inspiring (T3). One teacher educator said that she learned something about "reducing the tempo, about student activity and about good relations" (T3). In her meeting with the students, the schoolteacher was described as "warm, relaxed and amusing" (T3).

Furthermore, the teacher educators emphasised that the conversation after the lesson was crucial. At the time, the schoolteacher explained her planning and the student teachers could ask questions. Furthermore, "it made it possible for us as teacher educators to point to issues we have noticed and [we] could challenge the teacher to say something about how conscious her choices were" (T2).

In retrospect, one of the teacher educators had some comments related to the observation form: "I would have liked to know what they [the student teachers] thought about the form. Did it help them in the observation? Were the questions relevant?" (T1).

The teacher educators found that Live Remote Classroom is an easy way to bring practice to the campus, not to replace field practice but as a supplement, and that it was useful for preparing student teachers for practicum. "The timing is important," one of them explained (T3). However, the technical part needs to work. Furthermore, it could have worked better if the whole cohort had participated in the session and provided the student teachers with a common frame of reference. One of the teacher educators asked the following: "Could it be possible to record the streamed lesson? Then it would be possible to draw on the lesson in the mandatory teaching" (T4).

## 5. Discussion

### 5.1. Preparing for Teaching

In the current study, we asked how Live Remote Classroom can prepare student teachers for practicum. A challenge in teacher education is that student teachers have observed teaching for many years and they go into teacher education programmes with strong images of what it means to be a teacher [21,41]. To hinder the reproduction of teaching that is undesirable, student teachers need models of the method of teaching that is desirable. According to research, the modelling needs to be explicit [21], something that remote classrooms make possible.

Previous research has concluded that student teachers have few opportunities to see explicitly modelled teaching on campus [18]. Teaching modelled by teacher educators might have transfer value in classrooms, for example, when accompanied by metacommentary that articulates what underpins the teaching [20]. However, teaching adults is different from teaching students in school. With Live Remote Classroom, student teachers can access exemplary teaching from an authentic classroom while they are still on campus. The

explanation that the teacher gave beforehand relating to her intentions and the conversation after the lesson ended up playing a crucial role in making what happened explicit. By moving from what and how to why, practice and theory became connected and the student teachers' understanding of teaching could be developed.

Field practice in Norway has been described as a lottery [25]. It is highly valued by student teachers, but not all placements are of a high quality [10]. In cases where a placement is not very good, it can be valuable to have observed at least one lesson with exemplary teaching on campus. Student teachers will then have had a glimpse of well-performed teachership, a teaching quality that encompasses professional knowledge, skills and wisdom and which is not easy to put into words [14]. Furthermore, the conversations the student teachers have with the schoolteacher and the teacher educators offer an opportunity to discuss multiple approaches to the different situations observed in the class.

Teaching is complex and there will always be an element of improvisation [42]. Working with cases might be one way of preparing for what is unpredictable [43]. However, as a student teacher expressed, working with single cases might not catch the complexity of teaching. Being allowed to follow a whole lesson in real time makes a difference. Something is at risk. The schoolteacher suggested that observing a recorded lesson distances the lesson from the real life of the classroom. Furthermore, cases will often have characteristics of a critical incident, therefore the learning comes from atypical situations rather than from normal practice [44].

Observing from a distance might have both advantages and disadvantages. An online experience of a classroom is missing something from the experience of actually being in a classroom, such as the feeling of being physically present and experiencing the classroom with all the senses. Therefore, Live Remote Classroom is perceived not as a replacement for practice but as a supplement. However, observing from a distance might also create opportunities that are not available in a classroom. For example, many student teachers can share the same experience and reflect on it together. Furthermore, to provide alternative ways of understanding practice and to adopt a critical perspective, a certain distance might be beneficial [12].

There is a lot to observe in a classroom, as well as different approaches to observation, from open to more systemised methods [45]. The structured observation form in the current study gave the student teachers something to focus on during the streamed lesson. It helped them start and gave them something to reflect upon and talk about. However, structured observation may also have limited what they saw. The observation form could have been tailored more to the specific lesson. Still, the observation form gave the student teachers something to work with. However, in order to prepare the student teachers for teaching, the form could have focused on didactic categories such as goal, content, frame conditions, prerequisites for learning, assessment and the learning process. These are the categories that the schoolteacher emphasised. Now, all the student teachers had to do was tick some statements. An observation form that was more in line with how teachers prepare a lesson might have prepared them for planning their own teaching.

One can question whether the streamed lesson was a real-life experience. Even if the lesson did not seem to be influenced by the observers, the situation might, as the schoolteacher afterwards found out, have affected the students. Furthermore, is observing a successful and exemplary lesson good preparation for practicum? When working with cases, it is easy to include a variety of situations; when streaming a lesson, however, the exposure of vulnerable students or the choice of a less-skilled teacher might be ethically problematic.

The participating student teachers perceived that they were given an impression of today's school and students. Furthermore, it was an easily accessible way of observing a classroom. The student teachers and teacher educators emphasised the timing, which was a few weeks before practicum. Many of the student teachers had not been in a classroom for many years. Now, they obtained many ideas of how to plan a lesson, such as the importance of variety. Furthermore, they obtained examples of how to use an interactive board, how

to talk to students and how to create a good atmosphere. As they are focusing on the approaching practicum, it is understandable that student teachers are more interested in tips than theory. However, the framing of Live Remote Classroom was important for shedding light on the rationale behind the lesson and for connecting practice and theory.

*5.2. Interaction between Practice and Theory*

One intention behind the action aiming to prepare student teachers for practicum was to help make connections between practice and theory and between fieldwork and university coursework, in order to help student teachers to become lifelong learners. Learning from teaching in an ongoing way is considered a hallmark of the professional teacher [46].

The participants all agreed that Live Remote Classroom made it easy to move back and forth between practice and theory. The schoolteacher included theory in her explanation of her choices and in her answers to the questions posed by the teacher educators. Underpinning theory with practical choices connected it closely to observed practice. The student teachers in the focus group saw an opportunity to link practice and theory, but apart from the mention of such a possibility, they did not refer to theory themselves.

In the data, there are no examples of theory offering a critical view or challenging practice [12]. However, as some participants suggested, the lesson could have been recorded. This would have made it possible to use excerpts in later lessons and make use of a variety of theoretical perspectives, for example learning and motivation theories. It might be easier to introduce alternative explanations when there is more distance from the specific lesson. Furthermore, we experienced that moving back and forth between practice and theory did not happen by itself but through the initiatives of the schoolteacher or the teacher educators. Timperley and colleagues [47] suggest making use of an external facilitator when it comes to teachers' professional development. In our case, we saw that this was also needed in teacher education.

Could the conversation after the lesson be characterised as a third space meeting? In the literature, conversations among schoolteachers, teacher educators and student teachers are often described as challenging and characterised by power struggles [48–50]. This was not the case in the conversation after the Live Remote Classroom session. Theoretical and practical knowledge seemed to exist side by side in a non-hierarchical way [24]. A probable reason for this was the choice of schoolteacher. She appeared as a skilled teacher and those who observed the lesson agreed that the lesson was exemplary. Furthermore, the schoolteacher was a qualified mentor who was able to use theoretical concepts to talk about her practice. In Norway, qualified mentors are mentors with a formal mentor education (30 credits). Studies have found that these mentors see themselves as teacher educators and that they see the value of the interaction between practice and theory [10,51]. Even if there had been fluid communication between school and university, the student teachers' voices could have been even stronger in the conversation. They had few questions and did not always notice what happened, such as the teacher's focus on study technique. Here, a more adapted observation form could have been useful.

*5.3. Concluding Comments*

Live Remote Classroom worked better as preparation for practicum than we had anticipated, even if the technology did not work optimally. Technology should support the pedagogical and not disturb it, as we experienced to some degree in the current session. Observing a lesson as it unfolds might add to the experience, but then there is a risk that not everything will go as planned.

Regarding the action research approach, what did we learn about our facilitation of the Live Remote Classroom session as preparation for practicum? We see it as crucial to collaborate with a skilled schoolteacher who can link her teaching to theoretical perspectives and make her choices explicit. Crucial components of the experience were the introduction of the lesson and the conversation with the teacher afterwards. In the future,

we would like to work more closely with the teacher to develop Live Remote Classroom further. A suggestion we would like to discuss with her is the possibility of including the students' voices.

To better support student teachers' learning, the observation form could have been improved and tailored more to the specific lesson. We suggest collaborating with the teacher and developing a form that matches the lesson as well as the university course.

Live Remote Classroom created an opportunity to reflect and move between practice and theory. However, its potential could have been even better utilised if the session had been part of the mandatory teaching and had been recorded. Then, we could have revisited certain excerpts and examined them more closely through the literature. As it was, there was only limited time for analysing and discussing the experience.

Action research can be described as a never-ending process of planning, acting and evaluating in order for one to learn from it and develop one's own practice (McNiff, 2002). In the future, aiming for coherent and relevant teacher education, we would like to include Live Remote Classroom in our teacher education programme, but with some improvements as mentioned above.

Epilogue: When we later visited the student teachers during their practicum, we saw examples of how they used ideas from the streamed lesson in their own teaching; the lesson they had observed on campus had expanded their teaching repertoire, which was a positive experience for those of us who facilitated Live Remote Classroom.

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