The networked classroom – Socially unconnected

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Abstract
By the turn of the century Norwegian educational practice was supposed to be changed through reforms and investment in technological equipment. Supported by research, the aim was to change practice in the direction of learning activities that could support learning understood as productive interactions. Few teachers and teacher educators participated in the discussion of how to use the technology. The focus for this article is student teachers’ attitudes concerning computer-supported classroom practice some years after the reforms. What are their presuppositions, experiences and future expectations? The results show that the traditional classroom practice is carried on and computers are adjusted to already existing teaching and learning activities. Possible effects are discussed.

Keywords: student teachers, computers, communication pattern, IRE, productive interactions

Introduction
The Norwegian educational context is characterised by the increasing focus of politicians on goal achievement, accountability and market orientation. Results in tests like PISA and TIMMS have created an international educational competition in which Norway does not come out at the top. There is a strong belief in ICT providing support for learning. The political programme for digital competence (MER, 2003) stated that by 2008 Norway should have been ranked on top when it comes to digital equipment in schools. The goal has been achieved. All Norwegian pupils in upper secondary school have been given a computer by the political authorities since 2007. After this year teachers in upper secondary schools in Norway have experienced every pupil having their own PC on their desk and being continuously connected to the Internet and to administrative learning management systems (LMS). The National Curriculum plan in 2006 (MER, 2006) states that digital competence should be one of five basic competencies together with reading, oral expression, writing and mathematics. What about teacher education? From 2000 to 2003 eight teacher education institutions participated in the national project PLUTO (Programme for Teacher Education and Change) (ITU, 2002–2003). Through significant economic investment made by political authorities teacher education was supposed to be changed in order to prepare...
student teachers for the technology-supported school context. The project was supposed to initiate different student active learning activities supported by ICT. The aim of the PLUTO project was to change the traditional teaching and learning practice and to give students experiences and competence related to their future work as teachers, something which in the next turn was supposed to influence their practicums. In 2001 the Norwegian Research Council appointed a group consisting of some of the most prominent researchers in the field of ICT and learning. The group was supposed to give advice concerning the future use of ICT in education in Norway. Referring to the concept productive interactions (Kulik, 1994; Scardemalia & Bereiter, 1994; Rochelle et al., 2000), their advice was to change teaching and learning practice in schools and teacher education in the direction where the teacher acts as a supervisor and the pupils are supposed to take responsibility for sharing and producing knowledge by means of computer technology (Norwegian Research Council, 2003). Altogether, this means that by the turn of the century great investments were made in order to change the existing practice in schools and teacher education. There was a strong belief in ICT as providing support for learning. Few teachers and teacher educators participated in the debate concerning computer-supported learning by the turn of the century. The focus of this study is computers and classroom practice some years after the reforms were introduced. Student teachers’ expectations and experiences are investigated. The questions raised are: How do student teachers expect computers to be used? What do they actually observe and experience during their practicums. For what purpose are the computers used, and what are the possible effects of such use?

**Background**

Teachers are often blamed for their resistance to change. In spite of political reforms, the same pattern of classroom discourse is recognised. Different reasons have been discussed. Research on classroom communication patterns seems to agree with the fact that teachers talk approximately two-thirds of the time pupils and teachers spend together. Time is spent on what is referred to as IRF or IRE sequences (Sinclair & Coulthard, 1975; Mehan, 1979). The letter (I) represents an initiative from the teacher, often a question concerning already known information. Pupils are supposed to respond (R) to the teacher’s initiative, followed by feedback (F) or an evaluation (E) from the teacher. According to Wertch (1998), this is the discourse pattern that has turned out to be most resistant to change across classrooms. Pupils knowing the rules of how to succeed is not only related to the correct answer, but also to knowledge of how to practice the correct rules of conduct. Consequently, classrooms are often equally furnished. Pupils have their individual desk turned against the teacher’s desk and the teacher communicates with one pupil at a time. Mehan’s conclusion is that teachers often ask questions concerning information that is already known. To be competent as a pupil means to respond to the teacher’s invitation and to understand how to behave and answer. Cazden’s (1988) later findings correspond to Edwards
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and Mercer’s (1987). They claim that teachers do not primarily ask questions in order to come up with new knowledge. The main aim is to maintain control. When pupils work in pairs teachers lose control and power and this is the main reason for retaining the traditional classroom discourse pattern. According to Fisher (1997), the asymmetric relationship between teachers and pupils in the traditional classroom discourse indicates that the teacher’s ideas are correct. Research on power relations within classrooms is based on a sociolinguistic as well as a sociocultural approach. What these studies have in common is that they try to highlight the social construction of meaning. Common to the traditions is that they look upon classroom discourse as an unity, not an individual concern. Attention is given to the process whereby learners can jointly understand a task, facilitate a solution and create new knowledge. The researchers are influenced by Vygotsky (1978) and his concept zone of proximal development. He saw the process whereby a problem is interpreted and a solution is adopted as highly social. Mercer and Fisher (1997) took these ideas one step further. While Vygotsky argued for different levels of ability between individual learners in what they call a neo-Vygotskian framework, they argue for the creation of meaning and development of new knowledge among equal peers. When people work on a problem together there are greater cognitive resources available for a solution than if an individual is faced with the same problem. According to Light & Littleton (1998), the advent of the computer as an educational tool coincided with a renewed and lively research interest in productive processes of interaction in peer learning. Their conclusion is that computers can afford new possibilities for collaborative learning which are different from those available in other contexts (Wegerif & Schrimshaw, 1997). Productive interactions depend on collaboration between social aspects and the technology. The computer’s interactive ability makes it suitable as a space for collaboration (Mercer & Fisher, 1997). It has the possibility for building new spaces inside the physical space. Due to its ability for storing, visualising and availability, the computer offers great possibilities for sharing and developing knowledge. Productive interactions are the combination of the pupils’ willingness to collaborate, assignments that open for creativity and argumentation and the technology. There are no correct answers. On the opposite, one question opens new questions in a creative dialogue. Creativity, reflection and imagination as well as argumentation and reasoning are valued in the understanding of productive interactions (Helleve, 2009).

Erstad (2010) claims that what he calls “the driving forces” of school development, e.g. the initiators of the PLUTO project, have pushed in the direction of knowledge understood as productive interactions. The teacher acts as a supervisor and pupils are supposed to take responsibility for producing and sharing knowledge. Evaluation should be to share knowledge through e.g. making common projects or building collective portfolios. According to Mercer (1995; Wegerif, 2007), the teacher plays an important role in creating a community where productive interactions are the learning outcome. This again should indicate a dramatic change from the traditional classroom described at
the beginning of this paragraph. The classroom has to be furnished for group work and collaborative learning activities. Pupils should be organised in peers and be presented for tasks and assignments that should encourage them to discuss and create new meaning and knowledge. The focus of this paper is computer-supported learning activities and communication in some Norwegian classrooms. What has happened since a computer was given by the political authorities to every classroom and every pupil in 2007?

How and for what purpose is the computer used and what are the possible consequences of this way of using the technology?

**Methodological approach**

**Context and research sample**
The study is conducted among PGCE students and their mentors in a Norwegian university context. The student teachers participate in the one-year course consisting of a total of 14 weeks of theoretical education and 14 weeks of a practicum. During these weeks student teachers are supposed to observe their mentors education and gradually become able to take over responsibility as teachers. The students in this study have their practicum in upper secondary schools. They were selected because they constituted one class of students. Students in this class were asked if they wanted to fill out a questionnaire, participate in a focus-group interview and a follow-up study during the practicum. Twelve students responded positively to the request. Three students were selected for a focus-group interview before the practicum, for observation in their classrooms during the practicum and for an in-depth individual interview after they had finished. The selection of the three students was made by drawing lots. They are called student A, B and C. All are female and between 30 and 38 years old. They have no experience as teachers. The students’ mentors are interviewed as well. In order to distinguish between mentors and schools they are called A, B, and C. Mentor A is a 50-year-old male. He teaches geography and history. Mentor B is female, aged 59 and teaches Norwegian and religion. Mentor C is also female. She teaches English and Norwegian. Her age is 34. The interviews were transcribed and analysed.

**Methodology and analysis**
The study takes a qualitative approach. According to Hatch (2002), qualitative studies try to capture the perspectives that actors use as a basis for their actions in specific social settings. Our aim was to understand how the student teachers and mentors made sense of their experiences with computers as tools for education. The study is based on different methods. According to Mathison (1988), triangulation as a strategy provides evidence for the researcher to make sense of some social phenomenon, not the triangulation strategy in itself. The value of triangulation lies in providing evidence so that the researcher can construct good explanations of the social phenomena from which they arise (Meriam, 2002). The methods used for collecting the empirical data
are two questionnaires, one group interview, six in-depth interviews and field notes. The first questionnaire asked the students how they expected the computers to be used in the classrooms before they started the practicum. The second asked them to tell which experiences they had acquired. The questionnaires were open-ended. This made it possible for the researchers to gain a broad overview of the students’ expectations and to make preliminary categories for further analysis. Two researchers analysed the data and suggested the categories. The focus-group interview with the three students asked the following question: For which purposes do you expect the computers to be used in the classrooms you are going to practice in? According to Puchta & Potter (2004), the aim of a focus group is to bring up participants’ understanding, feelings, attitudes and ideas concerning a chosen topic. The main aim is to provide insight into how people perceive a situation (Kruger, 1994). The moderator’s task is to be engaged in the discussion but not to be an active participant. The focus-group interview was transcribed and analysed by two researchers. During the practicum one of the researchers conducted interviews with the three mentors. After the practicum each of the three student teachers were interviewed. All of the interviews were semi-structured with several pre-prepared questions. The semi-structured design ensured that all respondents were confronted with the same set of core questions. In addition to the core questions, follow-up questions were formulated and offered the interviewees the opportunity to introduce unexpected ideas and thoughts. All interviews were transcribed before the structural phase of the analysis. The responses were analysed separately for each question, and the two researchers looked for categories within the responses to each question. During the practicum the researchers visited each classroom and made observations. The observations focused on classroom practice, how the classroom was furnished and what kind of learning activities the computers were supposed to support. According to Hatch (2002), direct observation of social phenomena permits a better understanding of the contexts in which the phenomena occur. The field notes were verified by the student teachers. In order to answer the research questions, the following presented categories were chosen. What do the classrooms look like? For which purposes does the teacher use the technology? What characterises the students’ future expectations? The categories are presented in the following paragraphs and are illustrated by selected quotes that emerged through a moderation process involving the two researchers. Concerning the ethical part of the study, the Norwegian Science Data Services (NSD) has accepted an application.

Findings

What do the student teachers expect to encounter?

In the open-ended questionnaire the 12 students were asked to write down their presuppositions concerning how the computers were supposed to be used in their classrooms during the practicum.
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Table 1

| Student | Presuppositions: I think/hope that:                                                                 |
|---------|---------------------------------------------------------------------------------------------------|
| A       | ICT is used as a support for learning.                                                             |
| B.      | Pupils’ faces are turned against the blackboard. There are lots of electrical cables and pupils who are chatting or playing. Teachers show video and PowerPoint. |
| C.      | Pupils can lose interest in the subject if they are connected to the Internet all the time. They hope teachers have respect and are able to tell them when they should look at the screen or not. Teachers use PowerPoint and statistics. |
| D       | Computers are used for music and webpages that are not meant for education. It might be useful for seeking information meant for education if pupils know how to do it. |
| E       | Pupils are not concentrated when everybody has their own computer. I think ICT is used for presentations. I do not want to use it that much. |
| F.      | Facebook and MSN are used a lot. It is used for PowerPoint and homework and messages are given through Itslearning. I do not think ICT is used pedagogically. |
| G.      | Pupils are hidden behind their own screens. I think they use it for purposes other than schoolwork. I think you need strict rules. |
| H.      | Plans and homework are given through Itslearning. PowerPoint and Smartboards are used a lot. Pupils mainly use the computer for note-taking. Some books are digital and the Internet may be used in support of the collection of information. |
| I.      | Pupils work together or alone with assignments. There is some noise and the Internet is used when it is not supposed to be used. |
| J.      | Teachers use pictures, videos etc. as support for lectures and pupils use Facebook and YouTube during the lessons. |
| K.      | Pupils use computers instead of pen and pencil, and teachers use PowerPoint. |
| L.      | Honestly, I do not understand why pupils should use computers in mathematics. |

What the student teachers seem to expect to encounter are classrooms where the teachers give lectures and computers are used to support and illustrate their messages. As many as seven students expect PowerPoint and presentations to be used. They suppose computers will be used for seeking information, for note-taking and messages. According to the students’ expectations, pupils have their individual desks with their own computers. Pupils’ faces are turned against the blackboard and they are hidden behind their own screens. Some students suggest that pupils use the Internet for purposes they are not allowed to by their teachers like e.g. Facebook.

In the group interview the three student teachers A, B and C were asked about their presuppositions concerning use of the computers in the classrooms they were going to practice in. They also mention the possibility of using PowerPoint and YouTube to illustrate and underline teachers’ lectures. The learning management platform is expected to be an important way of giving and storing messages from teachers to pupils. The students are concerned with the conflict between pupils taking notes from their teachers’ lectures and the possibility of using social media without permission. They claim that since the Internet and Facebook is on the desk the pupils have to learn to take responsibility. They should understand that it is their own choice if they are going to listen to the teacher or not.
If pupils use Facebook during a lesson they should know that this is a choice they have to take responsibility for themselves. They should be aware that when they enter universities nobody cares if they are on Facebook or not. As a teacher you should prepare them for their responsibility [Student A].

Student teachers expect to encounter classrooms with the traditional discourse pattern. Their opinion on how technology can support learning is based on the notion that the teacher asks for the correct answer. The answers from the questionnaire show the main concern of the three student teachers seems to be that the computer is used for information and instruction.

**Experiences during the practicum**

When they returned from the practicum the students were asked to answer the following question: For what purpose was ICT used in your school and your classes during the practicum? Please write down the main activities you observed. The following activities are listed below:

| Student | Experiences |
|---------|-------------|
| A       | The teacher sent pupils to the Internet without guiding them. Consequently, they lost focus. Pupils used computers for Facebook etc. |
| B       | Note-taking and seeking information. Facebook and MSN without permission. |
| C       | Some classes used the computer for note-taking. One of the teachers stopped this because she noticed that pupils used the Internet for other purposes. Teachers used PowerPoint and pupils found it boring. Itslearning was used for messages from teachers, e.g. homework. |
| D       | Itslearning was used all the time. The Internet as well, but pupils got comments if they used it for purposes other than school work. |
| E       | For note-taking and tests. Itslearning was used for homework. The problem was that it was used for games and Facebook. |
| F       | Used to collect information and note-taking. Pupils used Facebook. |
| G       | It was used as a tool for e.g. collecting information. Pupils closed the screen when they were asked to do so. |
| H       | I made assignments that were published through Itslearning. |
| I       | Computers were used a lot. Pupils used them for note-taking, for tests, for seeking information, for word-spelling and PowerPoint. They were too concerned with social media etc. but it was easy to stop. I just asked them to close the screen. |
| J       | Computers were used all the time. They used it for taking notes, and for all kinds of homework. It was possible for the teacher to close the Internet, but he never did that during our practicum. |
| K       | Just for note-taking like a modern typewriter. Pupils used it for games and chatting. It’s like putting a cake in front of a hungry person. |
| L       | For tests and note-taking and for showing videos. |
The student teachers’ experiences corresponded to their presuppositions to a large extent. Pupils seek information, take notes and answer tests through the computers. The learning management system is used for individual messages from teachers to pupils and for homework. According to the answers in the questionnaires there is a constant conflict between pupils and teachers concerning the use of social media. The following paragraphs describe the findings from the classrooms where the three student teachers spent their practicums.

What do the classrooms look like?
The classrooms in two of the three different schools are quite similar. Classrooms A and B are designed in the traditional form with the desks turned towards the front where the teacher is supposed to be. In classroom C the pupils’ desks are put in a horseshoe shape. The architecture of the classroom seems to be dictated by the computers’ connections to the plugs in the ceiling. All pupils have their own computers on their desks. This means there is hardly room for anything else like books or pens. All of the classrooms are equipped with a projector and a screen. In the three schools the pupils are connected to the Internet all the time. One of the students said:

In both classes all the pupils were using their computers. There was nothing else. They were using the computers all the time. They are never without a computer. They are not looking at books and they are not working with their subjects. And between two lessons they also live their social life inside the computer [Student C].

Both the teachers and students claim they always have to start a new lesson by asking the pupils to close their computers. Normally, most of them obey. Yet some pupils have to be asked and reminded several times, and others never do as they are asked. Mentor A has the possibility of closing down the Internet but student A never observes that this is done. This means the classrooms are furnished in the traditional way. The only difference is the computers on each desk and that the pupils are continuously online.

For which purposes is the technology used?
The computers are mainly used for four purposes; administration, tests, collecting information, and as motivation and support for lectures. To a large extent the LMS is used for administrative purposes like individual messages from the teacher to the pupils, information about homework, and plans for the next week or the next month. Further, the management system is used for messages concerning pupils’ orderliness and conduct, for remarks about coming too late to the lessons and for information about marks in different subjects. In all three classes the teachers complain about the pupils’ lack of willingness to figure out what is written about them. The learning management system includes tools that allow the teacher to discover if the pupils have visited the platform or not:
They cannot escape. All the time the pupils are obliged to be updated on what is going on. They have the possibility to find out what they are supposed to do as their homework. This means that I can say something like: ‘Come on, it doesn’t help that you were absent. You knew we were going to have a test. You are told in capital letters’. The pupils don’t like it [Mentor B].

Mentor B is satisfied with the new possibility of detecting pupils who are not doing their homework. Even if they are sick they are supposed to be updated. Another activity that is often used is the distribution of tests. Student A says that her mentor is very clever at making tests. She gives an example of a geography test which at first glance looked like an ordinary multiple-choice test. Her impression was that this was a test where the pupils could guess the right answer. She gradually understood that this was wrong. This test really presupposed that the pupils had read and knew the correct answer.

One of the best reasons for using this kind of test was that the five pupils who did not meet that day could take the test the following day. Because this was a test it was impossible to discuss with other pupils. It was impossible for them to remember so many questions. Suppose he (the teacher) had worked a lot on it, but now he can use it again and again without too much work [Student A].

The Internet as a source for collecting information is used more in classroom A than in the two others. In the subjects he was teaching (history and geography) mentor A made links to exercises and resources he had found on the Internet. His pupils were supposed to spend a lot of time searching for information. The other two mentors did not ask their pupils to use the computer for collecting information to the same extent. Instead, they often used PowerPoint or YouTube as an introduction to a subject they were going to lecture on. They had both experienced that this was a way of waking pupils up from the activities they had been engaged in during their break. All three student teachers agree that this is a good idea and wish to adopt the same way of motivating the pupils.

I use PowerPoint a lot and also YouTube. I enjoy finding funny things on the Internet. Actually I use it a lot. I find something funny because then I catch them. Because they don’t know what is going to happen. So I think it’s funny. Education doesn’t have to be boring [Student C].

The main purpose of using PowerPoint and YouTube seems to be to turn the pupils’ attention to the theme for the next lesson. During their break many pupils use Facebook. Their focus needs to be redirected towards the next lesson. A question that seems to be difficult to answer for both the mentors and students is what the pupils do when they are supposed to take notes. Mentor C says she believes the pupils have their own system for storing. They are supposed to take notes from her lectures. In class B, the student teacher has observed that the mentor is sceptical about taking notes on the computer. She has adopted the same attitude herself and argues that if
pupils are taking notes they are more likely to drop into social media sites. However, the problem when pupils are writing with pen and paper is that they have no system and not even space on their desks for doing so. The dilemma of when the computer should be closed or open is difficult for everybody. The student teachers describe how they become suspicious when they are talking to the class and the pupils are supposed to listen or take notes. It is impossible for them as teachers to know if the pupils are listening or not.

I became so angry when I was explaining something important and the atmosphere in the classroom was very bad. I become so suspicious when I lose eye contact with the pupils [Student C].

There seems to be a continuing struggle going on in all three classrooms between the teachers and pupils when it comes to open screens and the use of social media. Student A describes that some pupils are on social networking sites (SNS) all of the time. This happens in spite of the teacher’s continuing requests to stop. When the teacher approached they changed the screen picture for a moment, but when he returned to his desk they immediately went back to Facebook. The teacher’s reaction was to write a bad mark, but the pupils did not seem to care about that, according to student A.

Summing up, the computer is used for administration through the LMS, for tests, for seeking information and as support for lectures. Communication is between the teacher and the individual pupil. The three classrooms are characterised by the traditional communication pattern. Pupils use social media without permission. Yet there is one exception. In classroom C the student teacher introduced process-oriented writing in English. The pupils produced texts they had to publish in a closed space in the LMS where only the class was admitted. They were asked to share these texts and give feedback to two other pupils before they continued to work on the final product. According to student C, the pupils had to share their knowledge. In the interview her mentor mentions that she has learned a lot from her student teacher’s way of using the computer as a space for the common writing of texts and that this is an activity she is going to adopt in the future.

**Attitudes and future expectations**

At the end of the interview the student teachers were encouraged to say something about their expectations and wishes for the future based on their experiences with the ICT-supported classrooms.

**Student teacher A:**

I hope that as a future teacher I can be a guide for the pupils. I mean that there still is education. I mean that you can give some sort of lecture and that it still can be understood as useful. I think the pupils need some sort of basic knowledge even though there will be more and more independent work. Maybe they will have more and more work in groups. Maybe they will have more days off for self-study, what do I know? But I hope that you still have a base that is your class.
The first student teacher takes it for granted that the school based on a community will diminish. She thinks that schools will gradually become more individualised due to digitalisation. Still she hopes there will be some sort of learning communities like schools where pupils and teachers meet.

Student teacher B:

I hope teachers are reducing their focus on PowerPoint. I have understood that pupils are fed up with it. My hope is that education in the future is carried out in a dialogue with the pupils. Face to face. I also hope that pupils communicate face to face. Then the computer should be used when it is useful. Like a tool. And I think schools have a great responsibility for a counterbalance. That is not the same as to be reactionary. As a teacher you should know that you are contributing to the building of a society instead of adjusting to what is going on. You always make a choice.

This student is concerned with the communication between the pupils and teachers. She wants schools to be meeting places where pupils can have a possibility of reflection without computers as a counterbalance to what they experience in the rest of society.

Student teacher C:

I hope it is going to be better. There are possibilities to stop it, and we have to separate the Internet from the pupils. We have to face the fact that it is a great challenge for pupils. I am not against ICT. I use Facebook, MSN and Twitter myself so I know everything about the temptations. When I write a text at home I switch over to the Internet all the time. I understand the pupils. We are serving the pupils’ temptations. We are all like that. We are not reasonable. Somebody has to help us.

Student C wants to halt the constant connection to the Internet in the classroom. From experience she knows that it represents a world full of temptations. All the student teachers hope that the use of ICT will be reduced in the future, even though student A has a more fatalistic understanding than the other two students. She thinks that education will continue to become more individualised. However, she hopes for some sort of school community in the future. The student teachers want to meet pupils face to face without technology. Schools should represent an alternative to the rest of society where the Internet is available all the time.

Discussion

The student teachers had not been in a classroom since the time they themselves were pupils. Their expectations were based on those experiences. Their experiences of teacher education so far do not seem to have led to expectations of productive interactions. The study shows that student teachers’ expectations of ICT-supported future classrooms largely seem to correspond to what they experience. The pattern of IRE is still dominant in the classrooms. The students expected the dominant activities to be PowerPoint, YouTube and Smartboard in order to support the teachers’ talk. They supposed LMS was to be used as an administrative tool for passing messages. They
also expected pupils to seek information from the Internet and digital books, to take
notes from the teachers’ lectures, and they thought digital tests would be used. What
they also expected to see was pupils using social media without permission. There
were few, if any, expectations of productive interactions. The students’ presuppositions
corresponded to their experiences, which again is in line with other research in the
Norwegian context. The LMS is mainly used for individual messages and instructions.
What seems to be a fact is that the traditional furniture and communication pattern
for classroom discourse is carried on. Few teachers and teacher educators were in-
vited to participate in the debate on how to use the new media. What happened was
that the use of computers was adjusted to the existing way of practising teaching and
learning. The planning and arranging of collaborative activities identified as productive
interactions is demanding and has to be based on teachers’ beliefs in these activities
as meaningful for pupils’ learning. According to Light & Littleton (1998), the most
difficult aspects for teachers in putting group work into practice is the loss of power
and control. Building a community of collaborative computer-supported activities
has to be based on trust in young people’s responsibility and creative abilities. The
student teachers in this study expected to encounter the traditional classroom prac-
tice and have, with one exception, ideas in the direction of learning activities that can
support productive interactions. They have apparently not learned or experienced
any alternatives to the traditional classroom communication pattern through their
teacher education. ITU monitor (Arnseth, et al. 2007; Kløvstad, 2009) revealed that
there are still no in-depth reflections on the pedagogical use of ICT among teachers in
Norwegian schools. In spite of the significant investment in changing teacher education
through the PLUTO project, research also shows that teacher educators themselves
largely decide if they want to focus on digital competence in teacher education or not.
There are few discussions on how to use digital media in schools and teacher education
(NIFU-step, 2008). There are many possible reasons for the discrepancy between the
political request and the reality inside schools and classrooms. One possible reason is
that the initiative for the investment in educational technology does not come from
schools and teachers themselves. While political documents recognise the computer
as an instrument for learning, many teachers are sceptical. The decisions are made
from the top-down without possibilities for teachers to participate. The placement of
computers inside a classroom seems to be perceived as a guarantee for learning (Cuban
2001). Teachers are not consulted even if they are the actors who are supposed to use
the computers in their education. There seems to be a gap between the political aims
and the reality, reinforced by a strong belief in the fact that if educational technology
is introduced as part of the learning environment then learning is going to occur
(Cuban 1986; Arnseth, 2000; Ludvigsen, 2000; Kløvstad et al. 2005). This problem
is not exceptional to the Norwegian context. Around the world, when visionary policy
initiatives result in minimal change in classroom practice evaluators tend to blame
teachers and call for more training for them (Somekh, 2007). Teachers’ resistance
is looked upon as the main obstacle to development. What these evaluators tend to overlook is firstly the relationship between teachers' beliefs concerning pedagogical reasoning and the access to technology and, secondly, that teachers and classrooms cannot be considered in isolation from the framework of local and national cultures. Somekh (2007) argues that the difficulty of understanding the process of innovation is that we need to derive meaning from the activities we are engaged in, but can only attempt this in terms of our own experiences.

An important reason for teachers keeping up the traditional pattern of IRE was described earlier as the maintenance of power and control. The computer offers a great extension of possibilities for control. For teachers it is easy to contact pupils and parents through learning management platforms. The system is constructed to support individual communication. Plans for longer or shorter periods are stored and distributed by the teacher. Pupils receive instructions about their homework. Even if pupils are sick or absent for a period there is no excuse for not being updated. Teachers can trace whether the pupil has opened the webpage or not. Pupils are obliged to look into the management system every day and their teachers can register whether they have been there or not. Teachers complain about pupils' lack of interest and engagement in the LMS activities. A possible explanation may be that you can discuss with a teacher, but not with the technology. If the pupil disagrees the only possibility is to obey or to give up. Teachers' possibilities for control have been extended because the computer never forgets. The technology has qualities that can revitalise the most rigid learning activities from the pedagogy of the past. Larsen (1998) is concerned with the same problem. He argues that if computers are adjusted to the traditional way of teaching or what he calls “putting electric power” on traditional methods this is going to preserve the old ways of teaching and stop the necessary pedagogical development. The computer has an impact on teaching and learning that is stronger than any other artefacts. Kompf (2005) argues that the technology’s self-organising capacity may lead to control over education passing from the hands of educators into the hands of administrators. The fact that the computer is on the pupil's desk all the time and the computers are continuously connected to the Internet seems to cause conflicts between teachers and pupils. According to the mentors and student teachers, every lesson starts with a request to close the computer screens. Apparently, the two groups have different interests. From the front of the classroom the teacher can see a lot of open screens. Pupils and the teacher lose eye contact. Lost possibilities of eye contact may easily lead to suspicion. One possibility is to ask the pupils to close their computers. Yet if pupils are supposed to take notes during lectures their computer screens have to be open. Another reason for keeping the screen open is that pupils can no longer be asked to buy calculators for mathematics or glossaries for language education. They have to use their computers. Since many of the activities teachers want them to do are connected to the computer a constant conflict seems to be occurring. Teachers want students to listen and take notes and to seek information on the Internet, and
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they want to have their attention. The Internet is a constant temptation for pupils. Facebook, MSN and other social media are frequently visited. Pupils’ social relations are ever more connected through the virtual world. Virtual friends join them in the classroom and they are only one click away. This is a continuing problem for teachers who want pupils to listen (Erstad, 2010).

Compared to a traditional classroom without computers, teachers are losing control and power.

Pupils frequently visit Facebook. Mifsud & Mørch (2010) distinguish between teacher-defined activities and off-task activities. The latter are referred to as negative activities and the disruption of lessons. Based on classroom studies they argue that the assumption that learning is restricted to teacher-defined activities needs to be updated. Instead of off-task they want to use the term student-defined activities because these activities may also provide educational gains. When pupils’ computers are connected to the Internet while they are at school this means they also have the possibility of engaging in digital activities that are unintended by teachers like e.g. contact through SNS and playing games. According to Roblyer et al. (2010), pupils are more likely to use SNS like e.g. Facebook not only for social contact but also as support for school work. Thus SNS are used for learning understood as productive interactions. Teachers tend to use LMS which are mainly constructed for individual communication between pupils and teachers.

The aura surrounding technology seems to be automatically accepted by policy-makers as progress. Instrumental rationality makes us think that technology can solve all kinds of challenges (Taylor, 1991; Castells, 2002). In Norway policy-makers have gone further than in many other countries when it comes to technological equipment. This claim leads to a question that should be raised within all educational institutions: how to balance the use of technology with the educational needs of the student (Burbules & Callister, 2000). The social activity which is perhaps most challenged by the swift move towards what is called the network society is education. Politicians as well as educationalists argue that we need a new kind of pedagogy enhancing flexible thinking skills, learning to learn and creativity. However, the real problem is not a lack of a will to change, but a lack of any clear vision of how to change (Wegerif, 2007). According to McFarlane (2001), there has been a confusion of purposes concerning the use of educational technology at the heart of policies in England. McFarlane mentions three partly contrary areas. First, ICT is defined as a set of skills or competencies, second as a vehicle for teaching and learning and, finally, as an agent for transformative change. The author thinks the Norwegian context has been characterised by the same confusion. Several studies during the last 30 years show a common tendency within innovation in school and education: Changing educational patterns in schools imply greater complexity than in other organisations (Fullan, 1982; Huberman & Miles, 1984).

Although limited in its generalisation, this study shows that student teachers’ presuppositions are to encounter computer-supported classrooms where the traditional
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communication pattern is overall dominant. It also shows that their experiences correspond to what they thought they would find. Their future hopes are to encounter classrooms showing less impact from computers than today.

**Conclusion**

According to Erstad (2010), the focus in the education of teachers has been more on technical skills than on curriculum and content. In Norway, politicians took a serious decision when they gave all pupils in upper secondary schools a computer without asking their teachers. The decisions were made top-down without allowing possibilities for teachers or teacher educators to participate. According to this study, the traditional classroom pattern is being carried on in spite of the reforms and curriculum change, and so are student teachers’ presuppositions and future expectations. Computers are used for individual communication between the teacher and pupil. Gee (2005) raises the question of why schools in the future when students are more computer literate and learn better from the Internet world than their teachers. The question preceding why computers in the classroom should be: What should the role of the teacher be in future classrooms? What should count as knowledge in the digital age? How can computers possibly support learning? Student teachers and teachers as well as politicians should participate in this debate. This study cannot be generalised. More research in this field is important and necessary.

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