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EXPLORING QUALITY IN TEACHING AND LEARNING WITH ICT: A QUALITATIVE STUDY

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Introduction

ICT in education is often associated with increased opportunities for flexibility, efficiency and availability. Technology can for example make education available to students that are unable to move from their homes or commute to HEIs; and to save time and resources in administration and communication activities. Such arguments have often dominated when ICT in education has been on the agenda (Norwegian Ministry of Education, 2013; Selwyn, 2011). Moreover, the importance of providing students with education relevant for living and working in a modern technology-rich society. However, ICT in education also means that different technologies, media and resources that are increasingly used in higher education.

The purpose of this qualitative study was to explore lecturers and students' experiences with and opinions on the use of ICT in teaching and learning activities. The key issue in this work was to explore on how ICT contributes to the quality of teaching and learning. To achieve this, we interviewed students and teachers at campus based educational programmes and online educational programmes in various fields and disciplines.

Review of previous research

In the research literature, digitally competent teachers are characterized by their ability to draw upon multiple areas of knowledge; teaching skills, expertise on ICT and didactic skills are often highlighted in this case (e.g. Mishra & Koehler, 2006; Koehler, Mishra & Yahya, 2007; Voogt et al. 2012). Teachers must master the basic technological skills, like being able to make use of presentation programs, audio and video, communicate via digital learning platforms etc. Another important dimension is that teachers must have sufficient self-confidence and sense of achievement to be able to use ICT and integrate this seamlessly in their own teaching practice. Far from all teachers master this, and teachers face many barriers in this process. Prestige (2012) distinguishes for example between what she calls "first order barriers" and "second-order barriers." "First order barriers" are characterised as access to the necessary technological infrastructure, hardware, software and the like, competence in teaching with and through ICT and especially access to adequate digital learning resources. What Prestige referred to as the "Second order barriers" are more complex challenges, related

to teachers' self-esteem and their confidence in applying ICT in their own teaching. Prestige found that confidence and sense of achievement, in itself, was not enough for teachers to practice 'digital pedagogy', i.e. seamless use of ICT in teaching and learning activities where students also contributed as active producers of digital content. ICT involves many different forms of technology, media and tools that teachers and students can use in teaching and learning. Other researchers have identified aspects of excellence in all kinds of teaching with ICT, not only those related to the teaching context, such as campus or online (Janzen, Perry & Edwards, 2011). They also agree that teaching excellence uniquely connected with online teaching differ in various ways from campus based teaching (ibid).

At European level, the European Foundation for Quality in E-learning, EFQUEL, has developed a framework to define the characteristics of quality in the educational use of ICT/e-learning in higher education, (EFQUEL, 2011). The framework includes three main criteria; learning resources, learning and teaching processes and context (ibid.). In our study, we have applied these criteria in order to structure and analyse our findings. In this, learning resources will include digital learning resources, both videotaped lectures as well as others. Learning processes will include teaching and learning with ICT; and the learning contexts include several levels; organizational conditions, such as infrastructure, expertise and location (campus/onsite or online).

Methods

The study is based on qualitative methods. Such an approach enables us to carry out an in-depth study of the various issues related to quality of education. There are two main groups of informants; lecturers and students. Our approach is based on a case study-design, each institution of higher education visited represents one case. A case study approach can involve several approaches. Thomas (2011) defines case study that analyse people, events, decisions, project periods, policy fields, institution or system, illuminated from a holistic approach through one or more methods. In this way stands the case itself as being the centre for the study and this again requires an analytical framework to illustrate and explain the findings that may arise.

In our study, at each of the institutions visited, we conducted focus group interviews lecturers and students. In total, we conducted eight case / institution visits. The intention is that our selection of cases will tell us something about the breadth of opinions, attitudes, actual use of ICT in higher education and perceptions of what digital literacy means. We wanted, as far as possible, to capture some of the diversity within higher education by including a variety of educational institutions. In the selection, we have included colleges and universities, professional education and university programs, different disciplines, geographic variation, large and small institutions (in terms of number of students). In addition, we wanted to include lecturers and students involved in online education. Students in online education were interviewed while attending gatherings on campus.

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The criteria used to ensure diversity can be summed up as follows:

- University/university college;
- Professional education / educational programs;
- Areas;
- Large and small institutions (number of students);
- Campus based / online study;
- Geographical diversification.

Informants, both teachers and students at each of the selected institutions affiliated to the same selected education program at the institutions. Teachers were selected due to their experience in educational use of different technologies.

At each institution we interviewed lecturers and students through focus group interviews. The focus group interview differs the from traditional group interview, in that participants converse with each other, rather than with the researcher. The researcher functions more as a facilitator than an equal participant in a dialogue. Focus group interviews, can be an efficient way of gathering data from several people at the same time in the form of semi-structured group discussions with a smaller sample of a population (Notnæs, 2001). Each focus group included between five to seven participants. It is in their nature that focus group interviews cannot be anonymous. The data arises as several people discuss and compare their experiences and interpretations during the interview. Experiences and quotes from focus group interviews have been reproduced without using names of people who speak out. Instead we write as "teacher" or "student". An interview guide was developed in advance of the interviews; this worked primarily as a reminder during the interviews to ensure that the same topics and issues were included in all interviews. The interview guide included topics such as teaching with ICT, learning with ICT, communication and information through ICT and contextual conditions for teaching using ICT. Each interview was recorded as audio file, based on the consent of the interviewees. A short summary note, which included the essence of the interview, was produced from each interview. Our treatment of personal data was approved, in advance, by the Norwegian Social Science Data Services (NSD) and we followed their guidelines for good research practice.

Findings

Following the structure from the EFQUEL as previously introduced; our analysis is concentrated on three main areas: learning processes, learning resources and learning contexts.

Learning processes; teachers and digital literacy

Teachers interviewed in this study were all experienced with teaching with various technologies. Teachers without such experience are not included in the study. Still, we found that the teachers interviewed had different approaches to, and understandings of why they actually use digital tools and media for teaching and learning purposes. Teachers also

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demonstrated diversity on their perceptions of teaching practices with different technology. Where some teachers talked about a kind of tool-based approach to digital resources and media, others were clearly keen to see how different technologies and digital resources supported the educational processes.

Another important dimension related to teachers' digital literacy from the research literature, is that teachers must have sufficient self-confidence and sense of achievement to be able to use ICT and integrate this seamlessly in their own teaching practice (Prestige, 2012). All the teachers we have been in contact with seem to have access to basic technology and adequate learning resources. Nonetheless, not all teachers managed to get students to contribute to their own learning by being active producers of digital content. We also identified teachers who were more likely to be "tool-oriented" in the way they applied ICT in teaching, they were more likely to pick a technology for a certain purpose without the seamless embedding of content, pedagogy.

In teacher education-programmes, both onsite and online, the teachers were particularly concerned with dialogue based learning and co-creation of knowledge. Various technologies were adopted to support this pedagogical approach. In the research literature there seems to be agreement that a precondition for successful dialogue online is that it must be integrated into the very structure of teaching. Many students do not participate in online dialogues even if they are encouraged to do so by their institution (see e.g. Shearer, 2009). The lecturers interviewed in this study confirmed this experience. In one of our cases, an online educational programme on nursing, teaching staff had dedicated a full month before the semester started, to facilitating communication and helping students to become familiar with each other and teaching staff via the Internet.

Although a number of learning resources appear to be specific to certain subjects, making it necessary for students to master these specific technologies, we also found examples of general digital learning resources that can be adapted to multiple subjects and teaching syllabuses. Much depends on how the teachers themselves identify the potential in the technology and apply it in developing their own participatory approaches. Different digital learning resources and technologies can therefore help to achieve participative or "student-active" teaching regardless of the number of students. A digitally competent teacher is thus characterized as one who has mastered methods of making students become actively involved in their own learning process.

Learning processes; students and digital literacy

Teachers considered students as quite traditional in their expectations of how teaching should take place. Many students even showed resistance to having to include digital tools and learning resources as part of the education. Through our interviews with the students, however, the picture became more nuanced. Perhaps not very surprisingly, the students seem to have trouble reflecting directly on their use of technology in isolation from the subject they studied. We interviewed students in different education programmes and in our study it

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became clear that student teachers came in a unique position, given that education in itself is intended help the students develop their own profession professional digital literacy. We would therefore expect these students to reflect on their own teaching practices and use of digital tools. Through the interviews, we heard how this was done, for example, about how the experiences of teaching practice was reproduced in terms digital stories that combined sciences, education and technology use, and their own process of learning by reflecting was embedded in this narrative .

Learning resources; the use of video recording

To provide access to education by using different technological solutions does not necessarily imply a promise of increased quality of education, although it may indirectly have this effect, given that ICT is applied in an educational manner. In our cases we found that when ICT enabled collaboration regardless of time and space, it contributed to increased flexibility for both teachers and students, which itself was considered a mark of quality. In addition, both teachers and students considered video recordings as contributing to increased quality of education particularly as they served as good resources for revision and repetition of classwork.

A new trend in the use of video recording in teaching are variations of what is referred to as "inverted classroom pedagogy." Several of our cases present variations within this concept and lessons learned so far are complex, in that both teachers and students are facing new forms of teaching and learning. Students are not necessarily interested in non-traditional forms of education even though they are interested in technology that maintains flexibility (OECD, 2012). Not surprisingly, we found that students were somewhat mixed in their reception of inverted classroom pedagogy.

Learning Contexts

Students and teachers were largely satisfied with the equipment situation in educational institutions. Nevertheless, we got the impression that some of the technological equipment was out-of-date and in need of upgrading. In addition, the technology appeared to have stagnated in several places, in the sense that little new was added to educational institutions after a basic infrastructure was implemented a few years back. For example, many teachers wanted digital boards. When quality of equipment was poor, we found that this affected the extent of its usage in teaching and learning situations. Another observation was how professional environments which embraced both pedagogical and ICT expertise were key drivers in the effort to develop excellent teaching and learning opportunities using ICT. Such environments also represented purchasing expertise for new technology. At its best, innovators in how ICT can help to improve the quality of teaching acted as an important support in getting teaching staff to adopt new ICT-supported approaches in the educational work.

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Summary

Initially we asked about how ICT can help improve the quality of teaching and learning. In this paper this has been illuminated based on the three main categories of EFQUEL, learning resources, learning and teaching contexts. The research literature emphasizes that a digitally competent teacher should be able to combine content, pedagogy and technology in a seamless way of teaching. In our study, we found examples of this kind of teacher. We have also seen that teachers' own understanding of what it means to be a digitally competent teacher varies. While some teachers were mostly concerned with hooking different technologies / software on to traditional education, others wanted to exploit the options provided by the various technologies to improve the quality of their own teaching practice. We found that when teachers succeeded in involving students and making them more proactive in their own learning process, the students reported a greater experience of educational quality. We have seen that ICT can help in many ways in such processes, and that much depends on learning digital skills related to teaching. To stimulate students in their own learning comprises various approaches; much depends on the subjects' uniqueness, number of students in an educational programme, and on context; campus students and online students. Nevertheless, there is a common denominator and that is that the students are no longer passive consumers of education, but must instead actively participate in learning activities. We have seen how ICT contributes on many levels in such processes and will be adjusted to the subjects and programs, not to mention the number of students admitted to degree programs. Work requirements, and the practice of reverse classroom pedagogy represent some examples of this kind of approach. Both teachers and students are aware of and see the need for multiple teaching methods and our study has provided many examples of how ICT can contribute to these multiple methods, such as the use of videos of teaching as learning resources. We have also seen how a certain minimum level of technological infrastructure and access to expertise is crucial to the success of the learning and use of learning resources. Finally, our study suggested that the teachers, who achieved this seamless integration of ICT into their teaching, were enthusiastic individuals willing to put in a lot of extra time to make things work. If the ambition of ICT in education is to raise the quality beyond these enthusiastic individuals, then we conclude that this will require a more systematic effort by management of educational institutions.

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