National plans and local challenges

Preparing for lifelong learning in a digital society

Sindre Røsvik

Giske kommune, N-6050 Valderøy Norway; sindre@mimer.no

Abstract: This paper presents a case study of a Norwegian primary school as an example of the approach used to introduce Information and Communication Technology (ICT) policy in Norway. After an overview of Norwegian school system and national goals for ICT in education, the paper describes the challenges teachers and schools face when implementing curricula designed to fulfill different national expectations, ranging from specific skills and pieces of knowledge to more general goals such as preparing students for the future society. National curriculum guidelines describe what should be taught and what skills should be mastered but local schools and teachers must do the actual implementation. The most important actor in the Norwegian classroom is the student while the teacher creates stimulating learning environments. Learning to learn and lifelong learning are considered the main tasks of schools. This paper presents a programme of a lower primary school (6 to 10 year-olds) which has taken up the challenge of focusing on learning to learn, including use of ICT. Skjong barneskule, where learning to learn and learning how to use ICT is combined with development of a richer learning environment and learning specific knowledge, exemplifies the Norwegian programme.

Key words: elementary education, conditions for learning, organising for learning, collaboration

1. INTRODUCTION

1.1 Education in Norway

During the last decades the Norwegian educational system has undergone a series of reforms. Education and the development of skills have a high political priority in achieving highest academic standards. The goals include

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learning for the largest possible proportion of the population. It is hoped that the plans will improve the quality of life for the individual as well as increase productivity. Equal opportunities and the right to education for all have the highest priority in our unified educational system (Education in Norway 1997).

In 2001 a revised version of eNorway was introduced to plan for ICT use throughout the country. The overall aim was to promote a “green knowledge” economy equivalent to the eEurope programme but with extra, specific-to-Norway goals since Norway was ranked as the world’s second-best information economy in February 2001. It is no wonder that education should emphasise learning opportunities that include ICT use for every Norwegian. The innovative Project for Innovation, Learning and Organisational development and Technology (PILOT), part of the initiative, represents a major effort to initiate and support educational changes and says that holistic approaches are necessary to achieve substantial and sustainable changes.

Earlier, curriculum guidelines (L97) were introduced and compulsory schooling was extended from nine to ten years by lowering the school starting age to six year-olds so compulsory education is now organised in three main stages: Primary school (preschool to grade four); middle school (grades five to seven); and lower secondary (grades eight to ten).

“Inclusion” is the key concept and means that everybody, regardless of background or physical abilities, should be included and belong to an ordinary school and class.

1.2 ICT in primary education

The curriculum guidelines for primary and secondary education for the 13 years of schooling emphasise holistic human perspectives and call for increasing knowledge learning as well as learning basic skills. Norwegian educators believe plans should take into account challenges not yet known so students need to be prepared to tackle ongoing developments and changes. Learning to learn and the ability to adapt to new situations are seen as basic skills.

In the digital society competencies such as use of digital media and computers are required. Computers and electronic learning materials are considered useful in cross-curricular areas of knowledge and it is emphasised that students should develop knowledge, insight and attitudes about the development of the Information Society and Information Technology. The Norwegian position is that students ought to develop the ability to use electronic tools and media critically and constructively. They should also be able to use ICT as practical tools for subject learning, for

themes and for projects. ICT offers the possibility of using national and international databases, and both girls and boys should be stimulated to use ICT to prevent development of social or gender differences (L97). Norwegian curriculum guidelines also emphasise that students shall be encouraged to be active, initiating and independent:

ICT is to be used in education in order to contribute to better organisation, greater skills and pedagogical competence within an education system that develops and exploits ICT as a subject. The potential of ICT is to be exploited within teaching and learning so that the skills requirements of the individual and the society as a whole can be met (L97).

Norwegian ICT goals should also prepare students for new forms of cooperation, work, learning and assessment, and provide individuals who have learning difficulties with opportunities to improve the quality of their lives and join a communal work force.

Action plans for 2002 (Utdannings- og forskningsdepartementet 2002) emphasise that ICT in education aims at improving the learning environment. Successful implementation identifies implementation barriers and aims at developing a national learning grid with new forms of examination and assessment. The development of electronic learning materials along with support for the use of ICT in different subjects and cross-curricular work is also a priority.

Development of teacher competencies is given a high priority with substantial resources allocated. Infrastructure improvement and maintenance, as well as cooperation between different levels of the education system are important as are access to equipment and access to broadband.

2. GISKE KOMMUNE: A COMMUNITY BLENDING OLD AND NEW

Giske kommune is an island community consisting of four islands connected by bridges and sub-sea tunnels. The population of the islands and the district is growing. The airport of the region is located at Vigra, one of the islands, and has good connections to international flights via Oslo. The district's business is international. Over the last 100 years the region has been exporting fish to Europe and, over the last decades, to Brazil, the USA and Asia. Trading of timber has long been important since historically the Vikings were not only warriors but also peaceful traders. Now shipbuilding

design and equipment are exported worldwide. In some niches district industries have links and production sites with companies around the world. So the people of the Giske kommune have always been open-minded and prepared to go abroad to acquire new competencies to bring back home. The kommune hopes to continue the tradition of sending its sons and daughters abroad but seeing them return to continue the maintenance of community traditions. It may be the same open-mindedness to change that generates acceptance of ICT as a tool for the future of Giske's young and old.

The Internet is considered a useful resource for all levels of teaching and learning. It should be noted that we deliberately do not use any kind of filtering technology, even for the youngest children. However teachers do monitor closely Internet use. Ethical perspectives and critical attitudes are taught from an early age. Only one complaint has surfaced concerning students visiting improper sites and this was dealt with in a way that taught the student the values of the community.

Schools in our municipality have participated in different national ICT projects since 1984. It is unusual for such a small community to participate in several different national projects. But Skjong barneskule, a primary school stage 1-4 (ages 6-11 years) in the kommune, has never been considered an outstanding school although they work in a systematic way with ICT. As municipal director, I must ensure that the school, along with other schools on the islands, provide equal opportunities, focus on relevant outcomes and participate in the use of national ICT resources.

2.1 Teaching and learning with ICT: Skjong barneskule for 6 to 10 year-olds

Skjong barneskule has chosen to introduce and use ICT with children in the same way they work with other subjects and themes. Teachers lecture to children, working quite traditionally, but for several lessons a week more and more students work on their own by following work-plans called "study lessons". So changes in methods and organising are taking place. During the coming year each student will make his/her own plan of study, concretising the aims of the national curriculum linked to their own interests and abilities. The activities will include: "This is me ..." (self presentation) and continue with "I am good at ... , I like ... , and I can ..." as well as "My goals, actions to achieve the first step are ..." and culminating with "Evaluation, what were the results?" Of course they work with their teachers along the way but they also become aware of their own roles and responsibilities.

Children are also expected to take charge of their own learning by searching and constructing their own knowledge, and are trained in this learning approach. It is considered important to share ideas and

competencies contributing to building a better society — “designing and building our common future” (UNESCO 1996). Taking charge of your local community is considered an important value. The concept of learning throughout life emerges as one of the keys to the 21st century (UNESCO 1996).

Skjong has also integrated learning into the community by inviting grandparents to learn ICT from the children. The children demonstrate the Internet and explain how to use it for information and communication purposes.

So how do the children learn to use computers, and what kind of access do they have? The school has 15 computers for 80 students and the computer lab is equipped with nine computers. There is also one computer per classroom and two special needs students have their own computers. The computer lab is a group room situated between the classroom of the third and fourth graders with access directly from both classrooms. As part of their programme students are allowed to go to the computers, and normally they organise queuing and use of computers between themselves but sometimes teachers have to mediate and guide the children for a more purposeful use and organisation.

Learning how to take responsibility for their own learning allows children to decide what methods and material they will use, and when to go to the computer lab to fulfil tasks to be solved or to play with the computers to develop and maintain their computer skills. As prescribed in the curriculum, students should learn certain abilities at each class level. The school has developed a nine-stage computer certificate programme where those abilities are included. Instead of the teacher introducing each theme or certificate, the students teach each other. In this way several aims of the curriculum are fulfilled. Normally, third or four graders teach the younger ones. The goals of the certificates are listed below. The certificates are related to specific goals and progress according to the curriculum, but children may follow a faster progression when they are interested in doing so as shown by a sample in Table 1.

2.1.1 Certificate achievement

The certificates issued to children are supposed to be achieved at the following levels:

- Computer certificate 1: Put together a jigsaw puzzles: first grade autumn;
- Computer certificate 2: Use educational software: first grade spring;
- Computer certificate 3: Use MSWord and enter letters of the alphabet: second grade autumn;

- Computer certificate 4: Use MSWord and write words and sentences: second grade spring;
- Computer certificate 5: Go to the homepage of school: third grade autumn;
- Computer certificate 6: Save text in a file on the hard disk and print: third grade autumn;
- Computer certificate 7: Save text to a diskette and print: third grade spring;
- Computer certificate 8: Go to the Internet, search for themes and print: fourth grade autumn;
- Computer certificate 9: Use MSExcel: fourth grade spring.

Table 1. Computer Certificate 1 issued when a student acquires the skills

Computer Certificate 1	
Name of student	
I am able to:	Turn on the computer
	Write my password
	Find and put together the puzzle
	Terminate and turn off the computer
Signed by the teacher _____	

When students claim that they have mastered skills, they approach their teachers to be tested and, if they are able to prove their abilities, the teacher gives them the certificate which they then bring to the computer lab. They are only supposed to work with programmes and tasks they are certified to use. In cases of misuse the teacher may withdraw their right to work on their own with computers. For example, if they are just surfing purposelessly on the Internet or searching sites not approved, their right to use the computer may be terminated. Even young students are able to help each other by explaining how to learn and use ICT. A child with Downs syndrome received certificate 1 and 2 and that made him very happy.

The programme is presented at the school's homepage <<http://www.skjong.gs.mr.no/>> where other activities and projects are also presented. Typically, the children use many pictures to document activities. The idea of using certificates may seem to be a gimmick but it works. After they master the computer they also use other programs such as Word Art.

The children have used this program to make a “reading diploma” to be handed out to those who have read a certain amount of time (100, 250, 500, 1 000 minutes). This has become a very popular way of increasing reading and reading ability. Students get a clear understanding of what is to be learned and what to explain their fellow students. The teachers are amazed to observe how well-behaved, self-confident and able the students are at instructing grown-ups such as their grandparents to find their way on the Internet.

ICT for the children is just another source of information. Sometimes they prefer using ordinary books but working on a project about universe with the Internet was found to be a unique way to learn and some were able to find their way by using sites written in English. But since they will not be fluent in English for some years to come Norwegian sites are preferred by the children. The headmaster of Skjong reports that when the children gain certificate 5, the homepage of Skjong barneskule is used from the homes more. Some families have even chosen the homepage of Skjong barneskule as their Internet starting page, meaning they closely follow the activities of the school.

The most important learning, however, is that the children learn to learn and to help others learn. The programme applied at Skjong barneskule supports children to progressively find the most effective ways of learning and the best ways to act responsibly, especially in situations where they are working together with others. Observing the children at work confirms that: (1) they show greater social reciprocity adapting to each other and the environment; (2) they are taking greater personal responsibility for their own actions and consequences of these for others; (3) they act in more comprehensive and culturally appropriate ways; and (4) they work with enhanced motivation, allowing for a greater variation of alternative actions (Appelberg and Eriksson 2001).

The children develop social and emotional competencies along with acquiring subject knowledge and skills. The computer turns out to be a social tool enhancing abilities to work together. Children wait for turns and help each other. If children are guided or instructed too strictly by teachers negative consequences may be the result and the usefulness of computers reduced.

During the last three years parents and politicians have been included in quality assurance inspections. The educational advisor plans the inspections with the educational director. The actual inspection takes only one day but the schools prepare by doing an internal evaluation with a defined focus. The politicians and parents say that they are very impressed with what they see and experience. They are satisfied that the children are content, open-minded and self-confident. More than one grown up has said that they “envy” their

children being students in such a school. The organising of ICT is also praised, not least because it provides equal access to children regardless of their access at home. Some parents also say that they were not aware of the potential of ICT for supporting children's learning of basic skills and other subjects.

3. CONCLUSION

The results at Skjong barneskule show that teacher instruction is reduced, allowing children to support each other in playing and learning situations. Children are encouraged to take responsibility for their own learning and their own social environment, while the teacher tends to be more a facilitator and guide. The computer is not the primary focus, but rather the focus is on interaction between computer and children as well as the social learning. Cooperation is given focus, not only individual learning.

On the whole, teachers report that children are learning to learn using different sources and methods in a meaningful and effective way. Working with textbooks, traditional workbooks, singing, playing and making real models of paper or other materials are more commonly used than the Internet or other ICT-based tools. Both teachers and children are comfortable with the situation as it is. Use of ICT is still limited by access to computers and the availability of suitable software.

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BIOGRAPHY

Sindre Røsvik is the municipal director of the Giske municipality where Skjong barneskule is situated. He is the founding chairman of the Norwegian Educational Computer Society, a longstanding member of IFIP's Working Group 3.5 (Informatics in Elementary Education) and presently serves as its chairman.