

May 2013

## Whole School Student Focused Approach in Education with ICT

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### Abstract

Menntaskólinn á Tröllaskaga was founded 2010 in northern Iceland. All students are required to use laptops in their studies and teachers have access to both a laptop computer and an iPad. Classes are organized into one week modules, in which students can both access and hand in their assignments online, with few exceptions. One-to-one approach is used in grading by formative assessment methods. There is a trend towards flipped teaching and collaborative approaches where formal class sessions are divided between single subject's class work and open all-subjects sessions. Teaching material varies from student's own research on the Internet, collaboration within a cloud, videos, various specialised material provided by teachers to books.

The school's fundamental aims are: Innovation – Creativity – Daring, which are reflected in every aspect of the school's work. The school has implemented a formal internal audit, which is actively performed each semester, and its findings are used to refine the school's work.

Each semester ends with an exhibition of students' paintings, photography and music as well as other innovative projects. At the exhibition students also present various other assignments from their classes such as videos, posters, online activity, and more.

**Keywords:** ICT in education, flipped teaching, learning environment, laptop computers, whole school approach.

Menntaskólinn á Tröllaskaga (hereafter called MTR) is an upper secondary school for students aged 16-20, which issues its graduate students Secondary school Certificates and aims to prepare them for university study. The school was founded 2010 in Ólafsfjörður, a small fishing village located in northern Iceland with 800 inhabitants, and another 3000 living in the nearby communities of Siglufjörður and Dalvík.

The school's vision was established with the words: Innovation – Creativity – Daring, defined as the school's aim for its student's studies and teaching as well as the school's management, finances and collaboration (Héðinsdóttir, 2012: 26 – 32). At present there are 176 students registered in the school's several study programs; social sciences (24%), natural sciences (14%), fish production (2%), sports (18%) (students can either specialize in their own choice of professional sport training or in outdoor activities), and arts (22%) (fine art (painting), art photography and music) and finally in environment and natural resources study (3%). Furthermore, there is a study program for handicapped students (5%) focused on individual curriculum based on their abilities.

A new Upper Secondary School act was passed in the parliament (Alþingi in 2008, but due to how hard the recession in 2008 hit Iceland, the plan for implementing it in schools got delayed and the current ongoing plan is to have all schools following it by 2015. The new act brings with it great changes to the entire school level, as well as immense new possibilities when creating a new school. "According to the Upper Secondary School Act No. 92, 12 June 2008, the responsibility of curriculum development is increasingly transferred to the upper secondary schools." (The Icelandic national curriculum guide, 2012: 7).

### **Distance education**

It was decided in the beginning to plan all courses in such a way that they could be taught in online distance education in the fall of 2012. The main reason was that a small school with a wide selection of studies can not survive financially if the classes are too small. This would limit the opportunities for local students. Now, 20% of our students are distance students who study within the same group as local students.

### **Organization of study framework**

All courses are online in a open course management system (Moodle), and organized into one week modules. It helps with addressing issues with one student and one – to – one working method. All modules begin on Monday morning and close Sunday evening. Students can not under any circumstances deliver their work too late. Students who need to be absent for any reason are not relieved from delivering their assignments, as they can deliver them online. Study surveys show that students like the rule, 98% in the fall 2011 and 95% in the spring 2012 (Héðinsdóttir, 2012: 12).

For each 5 credit class, four hours should be with a teacher each week of the semester. As each student's study pace is different, it was decided to divide their work between time in a traditional class with a single teacher and open work sessions with access to many teachers. Each week there are 6 hours of such open work sessions where students can go to the teacher they need for further information or help. A student can therefore decide to add up to 6 hours to one subject or divide it between many.

### **Laptop computers**

Every student has his or her own laptop computer and every teacher is provided with a laptop computer as well as an iPad. Research on students using laptops shows that they are divided into three categories: those who said they had enhanced their study techniques, those who said their resource gathering had increased and finally those who feel that they were distracted from their studies by the laptop computers (Stefánsdóttir, 2003: 136 – 138). The research does not extend to how big each of these three groups might be, but it should be noted that different teaching methods are an important factor.

Furthermore, the teachers in the research state that during lectures students tend to do other things, and one teacher pointed out that students tended to divide the work amongst themselves so that only two in a classroom payed attention and wrote notes for the rest of the class. Others were simply using the time to do other things (Stefánsdóttir 2003: 82). It was therefore clear that teaching methods had to be adapted in order to include the computer. This does not mean that students are not found on Facebook or in computer games, but it is quite obvious when a student is not working on his or her studies making it easier to address the issue. A student who is in class but does not work or show up doing the assignments in Moodle is considered absent and registered as such, although the body is there the mind which is the primary study tool is not.

## **Flipped teaching**

Teachers are free to use any teaching method they like within the week modules. Of course one assignment might take longer than a single week, but the assignment is then divided into phases. Teachers learn fast that lectures are not an effective teaching method, which has resulted in many starting to use flipped teaching, which means that they give talks or explanations on videos for students to watch as homework but use class time for working on assignments. The iPads have been a great resource here due to the easy use of software. It also leads to verbal feedback from teachers, which helps the dyslexic students greatly and often leads to a more detailed feedback.

Few teacher use traditional study books. They refer students to YouTube videos, Khan academy and many other online resources. They also ask students to find out on their own and to evaluate their resources. To help students they all have to take a class on studying with ICT at the start of their studies. There they learn to work with open source software or free software for word processing, spreadsheets, to process pictures and drawings, make movies, programming, learning on the Internet, working with sound, and introduced to the rules ethics and ideas when studying with distributed learning online both, distance and local. They are introduced to online dictionaries, databases, and other resources that could prove useful and they learn to collaborate in a cloud with google docs, dropbox and more. The only service students get from the school is an Internet connection.

A serious lack of online educational material written in the Icelandic language is difficult but as students are well advanced in English it helps a lot.

## **Learning from people**

In the innovation class the focus is on innovation in the nearby area. Half of the semester innovators come to school and introduce students to their work, students then write about what they learn from them. During the second half students make their own innovative project and show it at an exhibition at the end of the semester. Here students are learning from experienced people instead of books. They also get a visit from the national Innovation Center where they are introduced to how they could plan and execute their own project or business.

Other classes get visitors as well, some talk to the students online which is important as the school is located in a rural area where access to specialists is limited. They have even had one visitor connected from Portland in USA.

## **Students feedback**

Students are asked to participate each semester in an internal audit, in the spring semester 2012 94% said that study schedules and information in Moodle where useful, 89% felt that the educational material was good, 97% said that they strived to get a better grasp on their studies and that they felt they showed innovation in their study, and 84% said they searched for more knowledge than they were required to. 90% said they felt well in their classes, 85% that they could express their opinion on what they were learning and 99% that the assessment methods suited them well. 98% felt that the teachers had good knowledge on the subject they taught, 95% that they were encouraging in their study and 84% said they delivered their assignments within the expected time. All issues that go below 85% are addressed specifically by the teacher group as a whole. (Héðinsdóttir, 2012: 12).

## **Exhibitions**

As mentioned earlier, students present part of their studies at the end of each semester in an open exhibit. Over 25% of the people in the nearby community usually visit at the

opening day, greatly strengthening the relationship between the community and the school. They support and they praise ,and are one of the most important factors supporting the school.

### Summary

ICT in education as developed in the school has received positive feedback from the students, the staff and the parents. Students find it easier to organize their work in the learning environment (Moodle), in a week long modules where all the learning material is located or listed.

Flipped teaching seem to have positive feedback from both students and teachers who say that the class hours are more focused work on the assignments under teachers guidance. Every student and teacher with a laptop computer gives the opportunities to active learning avoiding known problems on students with computers.

The main problem is lack of online educational material written in the Icelandic language so we have to rely on foreign material in many subjects.

It takes work to create a new school with its own written curriculum, demanding but it is a very rewarding work.

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