



iPods feature in innovative teaching



Students are very excited about the new teaching methodology, and not just because of the iPods.

Photo: Lars Erik Skjærseth/NRK

A teacher's dream scenario: All the students are able to give an answer to the quiz immediately, and everybody get immediate feedback on whether it was too difficult or not. Nobody even has to raise their hand to answer.

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In the same city where students at the Norwegian University of Science and Technology (NTNU) have started a petition against old-fashioned lectures, innovation is happening. In some of the classes at the Sør-Trøndelag University College (HiST), the lectures are interactive, and the project manager and the teachers are unanimous in their verdict: the response from the students has been fantastic. We paid them a visit.



Students at NTNU are protesting against old-fashioned lectures, whereas HiST is testing new methods to promote interactive teaching.

Meaningful quizzes

It's a large class of some 48 students. In it are students who follow the qualifying course for the engineering courses taught at HiST. As we arrive, the subject is mathematics. The atmosphere in the class room is like any other class, but not for long. The teacher presents a mathematical quiz, in the form of a written story. The assignment for the students is to translate this into a mathematical equation, and to solve it.

– You have minutes to work out the question on your own, and then we do a vote, proclaims teacher Jon Eirik Hennissen.

He clicks a few buttons on the PC and writes some alternatives onto the whiteboard. The clock is ticking. The students are to select one alternative, and give their answers by pressing buttons on their smart phones – or the iPods they were given on loan at the beginning of the term. The countdown is complete. The results of the quiz show up on the screen. The majority opted for “15”, but not everyone. Only one alternative is correct. The teacher sees immediately which sections of the preceding chapter has to be revised.



Teacher Jon Eirik Hennissen is anxiously awaiting the results.

Photo: Lars Erik Skjærseth/NRK

Every student is included

– Now I'd like you to work together in groups, then we'll do another vote, grins Hennissen.

He enjoys this. He and all the students can see immediately if the assignment was too difficult, or too easy. Everybody gets to see how the other students voted by means of a graphical display of the distribution of votes. This gives invaluable feedback on the level of the students, and the degree to which repetition and continued work is needed. The math mystery is to be solved.

– This is good, I get to reach all the students. Because classes are so large, it's easy to ignore some students, and students who are ignored easily drop out. Now I have a good overview of the entire class, and can act accordingly. Every student is given a chance to participate. Normally, only a handful of students are able (or willing) to actively participate in class. This methodology creates more work on part of the teacher, but I get a ten-fold return on every effort invested, says Hennissen.

The students are discussing in groups. The clock is ticking down. The students cast their votes. This time around, more students voted "15", but not everybody. All votes are anonymous. We don't know who, but rather how many, have answered incorrectly after the group discussion. The students are laughing discussing the results. The atmosphere is relaxed.

The teacher now chooses to solve the assignment on the whiteboard. And believe it or not: nobody falls asleep.



Pål Kenneth Lundereng, Bjørnar Fugløy and Thomas Koch all agree that many more students are actively involved in classes using this system.

Photo: Lars Erik Skjærseth/NRK

Excited students

– This works very well. Everybody is able to participate, not just the elite who already know all the answers. It makes classes more exciting. Nobody has to worry about giving a wrong answer, because all the votes are anonymous. Everybody get to see if the class actually follows the lecture, and the teacher can adjust his classes on the spot accordingly. If half the students get it wrong, it's too difficult, says Thomas Koch.

He's eagerly discussing with Bjørnar Fugløy and Pål Kenneth Lundereng. They weren't quite sure during the first vote, but the group discussion has put them on the right track.

– We get involved, we want to complete the assignment. It's a sort of competition, says Fugløy.

This goes a long way to confirm project manager John Birger Stav's claim that this engages the students, and many more students join the chorus: they like this.



Smart phones are actively used in classes, helping students and lecturers alike.

Photo: Lars Erik Skjærseth/NRK

Scientifically controlled experiment

– We have to classes who were given iPods on loan at the beginning of the term, enabling everybody to join in. They have classes using this technology in three different subjects, with up to 20 hours of lecturing a week. Then we have two reference classes who use conventional teaching methods without mobile devices. Then we can see if the focus groups learn better and faster, and if more students complete the course, compared to the other two classes, says Stav.

The vision is that the students should be able to use their own mobile phone interactively in classes. A teacher should be able to set quizzes, and discuss the response. Both teacher and students alike will have a life gauge of the level of the class. Everything is transparent and anonymous. The challenge for the teachers is to construct good quizzes. Between two and three quizzes are normally held during a 90-minute lecture.



Bård Arvid Gjengstø thinks this system should be introduced in high school as well.

International breakthrough

The projects are financed by 1.3 million euros from the EC, and from Sør-Trøndelag University College. A prototype of the system was tested last year, and is used full-scale this year – in many different subjects and types of educations.

– The software and our methodology is used in ten European countries and some universities in the US, and here at HiST in Trondheim, says Stav, and the software is free.

The new teaching methods that are being developed here have caused quite a stir abroad. 37 countries would like to use the new simulation tool for welding education.

– This way of teaching would no doubt have engaged those who set quietly, silently and cautiously in my class in high school. It would have made a big difference, says Bård Arvid Gjengstø.

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