



MAXIMIZING FLEXIBILITY AND LEARNING; USING LEARNING TECHNOLOGY TO IMPROVE COURSE PROGRAMS IN HIGHER EDUCATION

Martin Aasbrenn (author and presenter)
Diakonhjemmet University College, Norway

Hanne Maria Bingen (author)
Diakonhjemmet University College, Norway

Summary

We propose a framework for development of course programs in higher education : Our vision is that all teaching in higher education should aim for maximal learning with maximal flexibility. Learning technology could be used to optimize this, implemented through continuous feedback from the students.

We illustrate our vision with examples from the anatomy-physiology-biochemistry teaching at our school of nursing, where we have two sorts of classes : 1) Full-time students and 2) Part-time students, living in all parts of Norway, studying through distance education in a lifelong learning approach. The last couple of years, we have used video streaming and interactive multimedia lectures, combined with learning platforms including discussion forums and other learning resources. We present successes and failures with these various methods.

We further discuss why we think some traditional classroom teaching should be included in every course program and present some low-cost solutions to well known pedagogical and technological problems with learning technology.

Introduction

Norway is a long, mountainous country where people live widely dispersed. A steadily growing proportion of the population studies at universities or university colleges. A large part of the Norwegian population lives over two hours away from the closest university (Statistics Norway 2002 and 2007) Traditionally people from the remote areas have moved to cities to get higher education. The growth in e-learning has opened for other solutions.

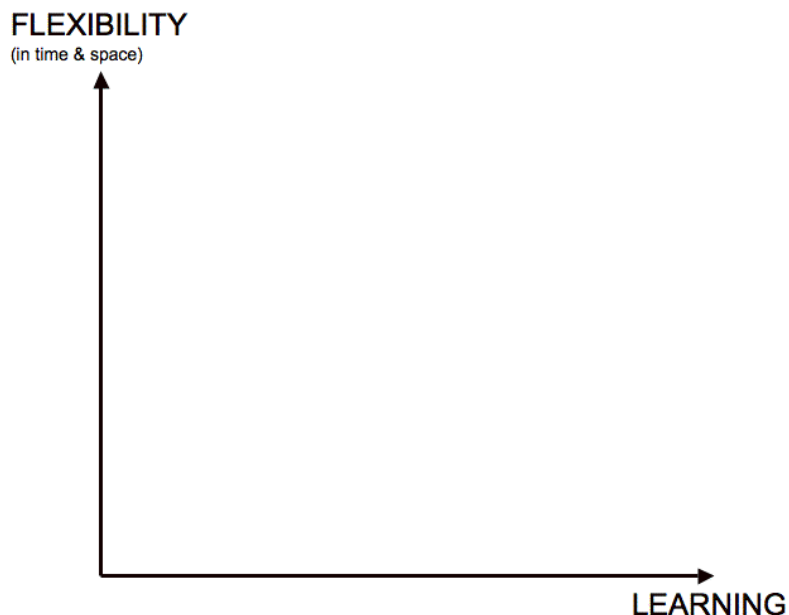
Our examples come from the nurse education at Diakonhjemmet University College, Oslo, where we have had part-time classes for ten years. The buildings of the university college are in Oslo, but our students live all over the country, many in remote areas like Hedmark or Finnmark. The average age of the students is around 35 years, and a big proportion of them have family and part-time work at their home place. The main idea with the part-time classes

has been that the students can have their clinical rotations at their home place, while the theoretical and practical part is taking place partly at the college, partly through e-learning. This geographical idea is still fundamental in the programme, while the specific e-learning methods have been changed several times. (Bingen 2008)

The authors of this paper teach anatomy-physiology-biochemistry. Our part-time students have mostly studied with blended learning methods, combining classroom education with e-learning. With all the e-learning methods we have tried to use student-active methods in a way that can support the full range of student learning (Laurillard 2002) Our students travel to Oslo around 3 weeks each year. The remaining 49 weeks they live at home with their families and work part-time. In this paper we present successes and failures with the different e-learning methods.

FRAMEWORK

We propose a framework when developing a course program in higher education: Our vision is that all teaching should aim for maximal learning and maximal flexibility for the student.



The purpose of teaching is learning. The concept of learning can be extensively discussed, but to get the main idea through in this paper, we simplify it: We presume in this paper that the students understand what they learn from.

Many factors contribute to learning, but good teaching is hopefully one of them. The aim of academic teaching is to make student learning possible (Laurillard 2002) We believe that the final purpose of all our activities as teachers should be that the students learn as much as possible.

Another important goal is in flexibility. Most students in Norway today study part-time (Statistics Norway 2008) Our part-time students are older than average students, so many of them have to fit the studies into a family life and most work beside their studies. Flexibility is fundamental to give the student the possibility to integrate the study activities in everyday life. Flexibility should in our opinion be seen as another goal separate from learning.

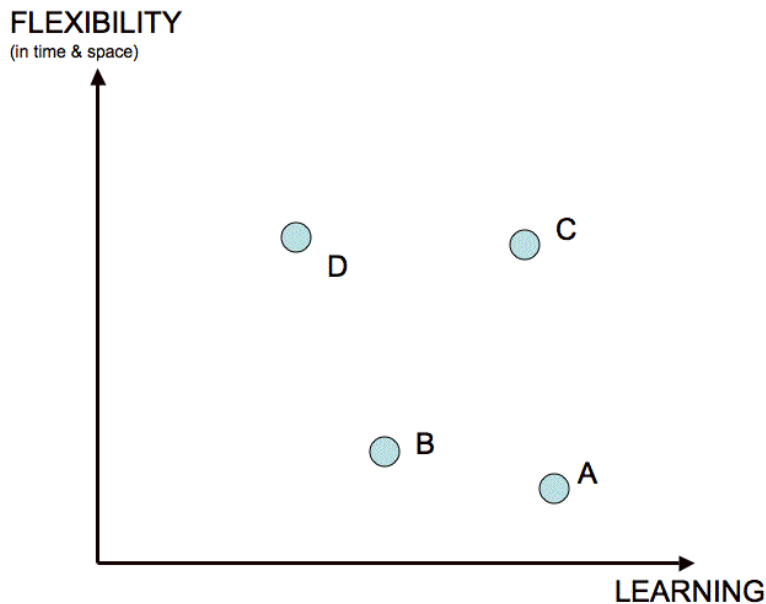
These two goals could be seen as two axes on a diagram. We do believe that ideal course programs offer much flexibility and great learning, and propose this diagram as a support when planning new course programs.

MATERIALS AND METHODS

This article is a synthesis of experiences we have made at our college the last ten years. We have collected much data of the students' opinions of the different learning methods through web-based questionnaires, originally created for internal reports. The questionnaires contain closed questions and open questions, and have decent response rates of 64-78%. To some extent, we have collected the teachers' opinions as well through structured interviews. Some of this data has been published as an internal report (Bingen 2008), most of it has only been used internally to improve our courses. The students' and the teacher's opinions are used as sources in the results section, though in a simplified way, to present the main trends.

One question used in many evaluations is "to what extent has this method helped you to learn the curriculum," where the student answers on a scale from 0 to 5, in addition to writing down open comments about the method. In our simplified concept of learning visualized as the X axis, we lean heavily on the average score of this question for the various methods. The main inspiration for the framework itself is the students' comments in the evaluations.

RESULTS, APPLICATION OF THE FRAMEWORK



A. Classroom teaching

As a baseline for comparison with the other methods, we discuss classroom teaching briefly. As in many other educational institutions, we use 45 minute lectures as the main teaching method, with much focus on interactions, questions, experiences and activities outside the classroom, trying to achieve what Laurillard describes in her conversational framework (Laurillard 2002) The classroom teaching in the physiology course gets good ratings. We use this as a baseline, what we want to achieve with e-learning is something the students learn as much from as good, interactive classroom teaching.

Classroom teaching is extremely inflexible, the teacher and all the students have to be at the same space at the same time. Classroom teaching might be a traditional way of doing it that adds little to learning compared with more flexible methods. We will discuss that further later

in the text, but as a start, we place classroom teaching far up on the X-axis and very low on the Y-axis.

B. Video conferencing in blended learning

When many students have to travel a day to get to the university college, it was tempting to move some of the teaching away from the traditional classroom solution to some kind of e-learning. The first thing that was tested at our college in 2001 was video conferencing. The teacher and the students saw each other on screens, and it was possible for the students to ask questions back to the teacher. The students travelled to 7-8 education centres spread around the country. Each centre collected students from the neighbouring areas. All the centres were connected to the teacher and some students in the studio in Oslo.

The teacher reports that the technical equipment at the time didn't work perfectly, so much of the teaching time disappeared in technical problems. There was limited interaction between teacher and students.

Importantly, this new method did not add any flexibility in time, the students had to study at the same time as the teacher taught. It did add some flexibility in space, but many of the students had to drive for hours to get to the centre where the video was shown. In retrospect and in this framework, it's easy to judge this kind of video conference as a step in the wrong direction.

Video conferencing as in 2001-2004 is placed the middle of the learning axis, still low on the flexibility axis.

C. Streaming video or multimedia web resources in blended learning

Based on the opinions of the students and the teachers, we moved one step further around four years ago: Instead of transmitting video live to the students, we recorded the video, and made the recording available to the students on the web. The teacher recorded 10-40 minutes of presentation and questions, including illustrations and blackboard close-ups. The students were able to access it whenever, wherever and as many times they wanted. The only thing needed was a good Internet connection. Most students saw them at least twice. Usually new video was recorded for each class. (Bingen 2008) Viewer passivity has been presented as an important problem with video streaming. (Fill 2006) We found a partial solution to the problem of the student being passive: The stop-sign-method, discussed later in the cutting costs section, proved to be a success.

Many students have commented in the evaluations that they don't want too long video sequences. The last two years, we have developed e-learning methods even more different from the traditional lecture. We mainly use multimedia web resources, MWRs, offered to the students inside a learning platform. The MWR include several learning objects; shorter video sequences, sound, figures, pictures and short texts that present main points of the curriculum. That the material is presented in a very systematic way on the web has been stressed by the students in several evaluations. (Bingen 2008)

The same teacher that produces the stream or MWR is also answering in the forums and teaching regularly in the classroom. The material in the streams or MWRs is closely related to what is done in the classroom, embedded in the context of the rest of the course. The students have access to a forum where the teachers answer questions regularly.

Streamed video or MWRs that can be accessed at night and day, wherever the student stays, is definitely flexible. An interesting, consistent finding in our evaluations is that the students report as much learning from the MWRs or the streams as from traditional classroom lectures after our effort to make these methods interactive. Is this just politeness? Probably not, other methods get bad ratings from the same student group. (Bingen 2008)

D. Multimedia web resources without classroom component

If streams and MWRs in a blended learning setting are evaluated as good as classroom teaching, why not go for the radical and cheap solution, where all the teaching is recorded?

We have some experience with this. and are sceptical. Of course, accessing a course whenever you want is as flexible as it can get.

However, we see two quite strong tendencies in our group of students only studying online: The exam results are not as good and it seems to be a bigger dropout rate.

Our personal experiences with blended learning, both as students and as teachers, are much better than with online-only learning. We think this is due to the motivation many students get from the social life in universities, meeting others in the same situation and seeing the teacher in person. Our main belief at the moment is that if you omit classroom sessions, you destroy some of the motivation and thus learning.

Discussion of low-cost solutions

In video streaming, it is a well-known problem that the students are passive. A simple partial solution to this is to use the stop-sign-method.

At our college, the teacher is the only one in the studio when recording video. It could have been possible to work digitally on the video afterwards to add questions and interaction. However, we have found that it works excellently to do it in a simpler way: The teacher simply raises his hands or a paper with a question mark every 2-6 minutes to ask a question. The students have got the instruction that when the teacher's hands are raised, they have to stop the video, find a piece of paper and note their answer to the question. The questions usually address things being explained in the last minutes of the video. This way, the student gets a sort of interaction, repetition and a stimulus to watch the video leaning forward instead of leaning backward.

Cost of the equipment is also presented as a problem in many e-learning solutions (Fill 2006). We do not really think this is a big issue. The pedagogical results seem to be just as good with simple equipment, like a 30 euro web cam, as with advanced equipment, costing several thousand euros. Our students are used to Youtube quality videos. This message might be especially important to course developers in low-cost nations: We believe that there is no need to maximize the technical part, what should be maximized is the learning. The aim is learning, not technical perfection.

It's possible to work for hours with videos to add figures, text and illustration. An approach where the teacher switches between various video sources during the recording is challenging for the presenter, but is much faster and therefore cheaper, and has been evaluated well by our students.

Our main point in this section is that designing huge, adaptive systems is expensive, but the student might learn as much, maybe more from creative, simpler and more personalized solutions.

Main discussion

To accept that the students understand what they learn from and that they answer honestly is an assumption, however, questionnaires like this are described in the research literature as one of several acceptable methods (Cohen 2007). In physiology, the students are mainly learning facts, and it might be relatively easy to understand where this is learnt. Whether this kind of learning is most relevant for their professional life is a big issue we won't address here.

Streaming video or MWRs as a part of blended learning is placed at the best place in our diagram. There are definitely even better solutions, and we do not believe that it is possible

to find a one size fits-all solution. What the teacher actually does with the method and how motivated the students are are two of many factors that probably are much more important than the exact choice of e-learning method.

We get our best results from blended learning. It might be possible to achieve the same social motivation with in-person-activities in the community where the student lives. Improvement in web conferencing might also make in-person meetings less necessary. (Downes 2008)

We started doing e-learning to address the needs of our part-time students, but today we use many of these methods to a similar extent with our full-time students. There are no natives in the e-learning world (Wesch 2008), no one has been doing this for a lifetime, and the technology is developing rapidly. Much of the future of online learning might be very flexible solutions outside the traditional systems.

However, today's educational systems are deeply integrated in society, and we think it is important to present recent experiences and basic ideas that have worked well inside the traditional systems to help shape the e-learning in the direction that is best for students.

Conclusion

The learning-flexibility framework has helped us when designing course programs. We started our e-learning journey with a geographical, practical problem: How to offer part-time nurse education to a group of students living all around a mountainous country. In this paper, we have discussed how we have worked on solving this problem in a pragmatic way, adapting to the students' wishes and ideas from the pedagogical literature. The issues our students have stressed in the evaluations are probably equally important for many other students around the world. To test the e-learning ideas circulating around the web in more formal ways is an important research field for the years to come.

References

- Bingen, HM, Dalland O, Flittig S, Gullhav I, Karlsen N, Kofoed, E, Lid, R, Aasbrenn, M (2008) Nåla i Posten Available 15. March 2009 from : www.diakonhjemmet.no/stream_file.asp?iEntityId=2571
- Cohen L, Manion L, Morrison K (2007) Research methods in education London : Routledge
- Downes, S (2008) The future of online learning : Ten years On. Available 15. March 2009 from : http://halfanhour.blogspot.com/2008/11/future-of-online-learning-ten-years-on_16.html
- Fill, K and Ottewill, R (2006) Sink or swim: taking advantage of developments in video streaming. Innovations in Education and Teaching International Vol. 43, No. 4, November 2006, pp. 397-408
- Laurillard, D. (2002) Rethinking University teaching a framework for the effective use of learning technologies. London: RoutledgeFalmer 2002
- Statistics Norway (2002) Education explosion in higher education Available 16. march 2009 from <http://www.ssb.no/emner/00/norge/utd/05-utdanning.htm>
- Statistics Norway(2007) Population statistics 1st january 2007 Available 16. march 2009 from <http://www.ssb.no/emner/03/hjulet/hjulet2007/tabell-01.html>
- Statistics Norway (2008) Every third student study full time Available 16. march 2009 from <http://www.ssb.no/emner/04/02/40/spuh/>
- Wesch, M (2007) A portal to media literacy Available 16. march 2009 from <http://www.youtube.com/watch?v=J4yApangnr0s&feature=PlayList&p=99191BF48C3D3EFE&index=0&playnext>