Towards a fact-based approach to e-learning

Abstract

New methods and forms of higher education, enabled by modern, web-based information technologies and new pedagogical models, are a hot topic at universities today, both in Sweden and abroad. Many of us have a strong belief in many of these new forms of education, and the students are definitely attracted by them and often choose them when they are available.

On the other hand there are many university teachers, who are sceptical to the new methods and forms of education, and many students are also critical to some aspects of them. There are definitely needs to improve all forms of higher education in order to achieve better results in more efficient ways, both from a producer's and from a customer/student's perspective.

Regardless of our attitudes towards the new methods and forms of higher education, we should be able to agree that many more facts are needed as a basis for our evaluations and decisions. And we also need to know more about which aspects and criteria should be evaluated and compared.

Some visions for the future:

- The demand from students will continue to grow for new methods and forms of higher education, enabled by modern, web-based information technologies and new pedagogical models.
- The new methods and forms of higher education will continue to be improved, taking advantage of technical as well as pedagogical innovations, often in combination.
- Disruptive phenomena like Open Education Resources (OER), Massive Open Online Courses (MOOC), and Open Access (OA) publishing will continue to grow rapidly, creating great opportunities for democratising distance education and self-learning, giving underprivileged groups of students access to advanced knowledge and skills, instrumental for a good life.
- The new methods and forms of higher education will lead to improvements of quality, cost-efficiency, and student satisfaction.
- Universities will develop and intensify cooperation and organise joint virtual educations and virtual universities, engaging the best teachers and resources, wherever they are physically located.

This paper discusses how we can meet the challenges and exploit the potentials of these developments, basing our actions and strategies on facts rather than myths and speculations.

Background from a Swedish perspective
There is a lot of prejudice about e-learning\(^1\). For example, many people, including some politicians and some teachers, suggest that e-learning, or distance education, is *per se* of lower quality than conventional, campus-based education, delivered *ex cathedra*. There is a tendency among these critics of e-learning to compare ideal conventional courses, given by the best teachers, with mediocre online courses produced by mediocre teachers with their main focus on low costs, rather than on high quality and other features meeting the demands of students.

On the other hand, there are also enthusiasts and bureaucrats who believe that net-based learning will automatically rationalise and lower the costs of producing courses, increasing the productivity drastically, since the same lectures and education material can be reused over and over again for huge masses of students. This may sometimes be true, but one should not underestimate the costs of designing and producing high-quality online courses.

So far there have been relatively few serious studies, focusing on facts, and aiming at fact-based evaluations and comparisons of different modes of teaching and learning, including so-called blended approaches, combining the best aspects of different models.

This paper will try to sharpen the formulation of the issues that are at stake. The education debate that has taken place in Sweden during a number of years now will serve as a background. I will present and draw some conclusions from fact-oriented studies that have been undertaken in Sweden, and I will point to some challenges for the future.

**The Swedish education debate**

Since many years there is a growing frustration and discontent with the Swedish education system on all levels and among all stakeholders: students and their parents, teachers, education bureaucrats, and politicians. The results of Swedish students have gone down in international comparisons. The salaries and prestige of teachers have gone down. Students are dissatisfied with the climate in the classrooms, which is often noisy and undisciplined. One of the present party leaders in Sweden, the leader of the Liberal Party, Jan Björklund, minister of education, made his political career by putting the education issues on the top of his agenda, and presenting concrete measures to be taken.

Some of the main “recipes” of the Swedish minister of education are:
- Law and order in the classrooms – the teacher should be in charge.
- More focus on knowledge goals.
- More structured education, led by the teachers.
- Less group work and other education forms where the students are left on their own.
- More frequent and more standardised tests, from earlier ages, providing feedback to all parties involved: students, parents, teachers, etc.
- Less administrative work for the teachers – “the teachers should teach”.
- Better salaries and career possibilities for good teachers, in their role as teachers.

Certainly there has been some opposition to the “military style” of Jan Björklund, who has a military background, and some have thought he has sometimes gone too far, when he talks about these issues, but by and large there is a broad consensus in the Swedish society about the necessity and urgency to move in the direction indicated by the above list of “recipes”.

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\(^1\) There are a lot of terms overlapping in meaning with the term “e-learning”, e.g. online learning, net-based learning, distance education/learning, flexible learning, next generation learning (NGL). Within the Swedish education system the term “distance education” seems to dominate, especially among education bureaucrats. In this paper I focus on education/learning on university level, where the communication via the Internet is an extremely important technical enabler. However, so-called blended learning modes are definitely not excluded. For a deeper discussion of basic concepts, see Sundgren (2012).
Nevertheless, there are some potentially negative and even destructive and harmful side-effects of the recipes prescribed by the minister of education. The following side-effects are particularly negative for the future of e-learning and distance education in Sweden:

- Some of the recipes may be interpreted as an order to go back to rather old-fashioned authoritarian education methods, where the teacher lectures from a pulpit, and where the students, always present in the classroom, accept and try to understand what the teacher says without questions. In the Swedish debate this has been called the “education ex cathedra” model, as opposed to individual tasks and group tasks, performed more independently by the students on their own responsibility. See figure 1.

- The “education ex cathedra” model is also easily interpreted as being in opposition to distance learning, giving preference to campus-based education with close contacts in time and space between teachers and students.

As a result of this debate, the education minister became closely associated with “lecturing ex cathedra” and other traditional education methods. Moreover, he seems to have become an enemy, or at least a sceptic, of modern, technology-enabled education methods. For example, he strongly condemned a primary school, where the teachers introduced iPad tablets (or equivalent equipment) to support the children’s efforts to learn reading and writing.

I have checked what Jan Björklund actually said in the debate about “lecturing ex cathedra”, and there are three things that he emphasises:

- learning activities led by teachers should become more common than today
- learning activities where the students have to take responsibility for their own learning without the support of a teacher should become less common than today
- learning activities should become more structured than they are today

Regardless of whether one agrees with these opinions or not, it is obvious that all three goals stated above can be achieved regardless of whether the learning takes place in traditional physical classrooms, on a campus, or whether they are implemented, for example, in web-based education.
I agree that the quality of education is extremely important. However, it is important that the quality is measured in relevant ways, regardless of delivery mode of the education, so that
- the quality can be measured in an objective way against explicit education goals;
- the quality can be compared in an objective way between different modes of education, e.g. traditional, campus-based education, and various forms of distance education.

Briefly expressed, we need more facts and less guesswork, myths, and speculations about different aspects of higher education: different qualities, cost efficiency, student satisfaction, etc. In a subsequent section of this article, we shall take a look at some facts that already do exist, but first I will say a few words about my own personal background and experiences.

**My own background and experiences**

I received my PhD in 1973 from Stockholm University in what was then called “Information Processing”, a topic and a department founded by the pioneer Börje Langefors, who managed to make the department belong to the faculty of social sciences of Stockholm University and to the Royal Institute of Technology at the same time – a very unconventional organisation in the typically extremely stovepipe-organised academic world. During my subsequent academic career, which has taken place in parallel with an expert and management career at Statistics Sweden, the central statistical office of Sweden, I have been a professor of information systems, information management, and informatics – different names of more or less the same academic discipline. One of the main characteristics of this discipline is that it is neither pure social science, nor pure technology, but it is what I would call “technology-enabled social science” – much like the discipline we deal with in this conference, which could be described as “technology-enabled education and learning”.

Indeed, both in informatics and in e-learning, information technology is something more than just an “ordinary” enabler. It has become a completely indispensable enabler, enabling what is called “disruptive innovations”. But it is still an enabler, not an end in itself, much like pedagogical models are important enablers but not ends in themselves. Moreover, modern information technology enables a wide range of new and innovative pedagogical models, and innovative pedagogical models may induce a huge multiplication effect to the improvements in quality and efficiency of technology-enhanced education and learning.

My first meeting with the modern form of technology-enabled distance education was at Mid Sweden University about 10 years ago. The Mid Sweden University had just become a university, and I was asked to help them create a research program in public information systems, or e-government, as it is sometime referred to in a more narrow sense. During my first years I was wondering how Mid Sweden University could actually survive as a university. There were few students on the campus, and although, and there were few students attending the campus courses. Then, when I asked somebody, how Mid Sweden University could survive economically, I got the answer: “Oh, it is the distance courses.” Nevertheless, few people wanted to talk about the distance courses, and although technology-enhanced distance courses potentially offer so many advantages over conventional, campus-based education, these potential advantages did not seem to be exploited to their full extent, and the distance courses seemed to uncritically take over many of the metaphors and administrative restrictions used (by necessity) by campus courses and programs.

When I returned as guest professor to Stockholm University, Department of Computer and Systems Sciences (DSV), after my retirement from Statistics Sweden, I encountered an impressive investment in flexible learning, strongly supported by the head of the department, and implemented by a special unit within the department. Both pedagogical and technical aspects were emphasised. I decided to test the possibilities by developing a completely web-based course called “eSociety – evolution or revolution”. All teaching material is available both on a public website, and on iLearn,
the learning platform of DSV. The teaching material includes video recordings, PowerPoint-supported lectures, and open access articles. Together with colleagues, I developed a course consisting of five course modules. With the exception of the videos, we did all the development work ourselves, including the creation of the public website and the iLearn contents. We engaged a few external lecturers for some of the modules. Authors’ rights problems were solved by means of a mutual use rights agreement between DSV on one hand, and teachers and guest lecturers on the other. Both parties receive free copies of the teaching material, which they may use as they want.

The first time we gave the course it attracted 67 students, and the second time we had 103 students. Once we had made the investment in course development, we could focus entirely on supporting interactions with the students. This was quite a positive experience, and the students seemed to appreciate our individualised engagement in their efforts.

The most common questions from the students were of administrative nature. It seems that both the students and the administrators of the department have difficulties to fully understand and appreciate the flexibility that net-based distance courses could offer: there is no good reason why an interested and highly motivated student could not start studying the course before it starts “officially”, and on the other hand there is no good reason why a student could not make a short interruption in the studies because of other duties, or study the course at a slower pace than full-time studies, postponing the final examination until the next semester. It is obvious that both the national and local formal rules and administrative systems have to be better adapted to distance courses in order to take full advantage of the flexibilities inherent in net-based distance courses.

My third experience of distance education is from Dalarna University. Dalarna University is a bit dogmatic about its aversion to the term “distance education”. “Next Generation Learning” (NGL) is the only term that is politically correct there. The Department of Informatics is very successful with its brand of NGL called “Free start, free speed”, a slogan which emphasises the inherent flexibilities of distance education that I have just discussed in connection with my experiences from SU-DSV.

I have tried to find out why it is so sensitive to talk about “distance education” and other similar concepts and terms at Dalarna University. It seems that – although the official policy supported by the top management of Dalarna is very positive to distance education enabled by modern technologies and innovative pedagogical models – there are many teachers who are really opposed to distance education. The pragmatic compromise to use the term “Next Generation Learning” instead.

Finally, about a year ago, I was asked to join the Department of Statistics as a mentor and senior advisor. There were many problems at this department, but one of the challenges was to adapt the department and its teachers to the use of modern e-learning methods. Naturally the teachers already used computers and modern software supporting advanced mathematical and statistical methods, but apart from that they hardly used computers at all, relying on traditional teaching technology (whiteboards, overhead projectors, etc.) and ex cathedra pedagogic. I am now involved in creating a net-based course for teaching advanced researchers from other disciplines than statistics to understand both the potential strengths and pitfalls of statistical methods, without using too much mathematics and formulas. A similar course has already been developed and successfully executed by a colleague of mine at another university, Rolf Dalin, and we have now recruited him to the Statistics Department of Stockholm University. The course is based upon Dalin (2010).

Since this new course does not replace anything that already exists at the Statistics Department, it should not be felt like a threat to the staff of the Statistics Department and the courses that they give. Nevertheless, the initiative has been met by sceptical comments like:
We have no experience of this kind of course, and we do not have the capacity to assist Rolf Dalin, if he should need our expertise.

Why should we engage in e-learning? There are so many others at other universities that do this, so we can refer our students to them.

How can we ensure secure examinations?

Towards a fact-based discussion

There are many beliefs, convictions, assumptions, and opinions – often agitated and prejudiced – about distance education and e-learning. Unfortunately there have been few attempts to find facts that could help us verify or falsify hypotheses, and which could help us determine which practices should be abandoned, and which should be promoted. Naturally, some practices may be good for some students and bad for others, and studies about such variations should be done.

Speaking with Hans Rosling, founder of Gapminder and world-famous “edutainer” and professor of international health, we should replace devastating myths with a fact-based worldview. This statement is very relevant within the field of e-learning. There are a lot of myths within this field, which are widely circulated and sometimes accepted as truths, although they are seldom underpinned with hard facts. Instead the few facts that are available, often point in other directions.

Thus there is a need for more facts about e-learning. For example, we need:

- Quantitative and qualitative facts about education/learning results, comparable between
  - distance education/learning and
  - conventional campus-based learning
- Facts as seen from the perspectives of
  - producers/universities
  - customers/students

Most of the few facts that are available are associated with the producers/universities perspective, rather than with the perspective of the customers/students. Thus we are not “putting the customer in focus”, as a popular business slogan goes.

Some facts from Sweden

Basic facts collected by the Swedish Agency for Higher Education (HSV)

One of few fact-finding investigations in Sweden is the one, which was published in 2011 by The Swedish National Agency for Higher Education, Högskoleverket (HSV). HSV (2011). Figures 2, 3, and 4 show some examples of statistics from the report.

Figure 2 illustrates how many students take distance courses at Swedish universities. As seen by the red circled figures, more than half of the students at Mid Sweden University and Dalarna University take distance courses. These are small universities located in sparsely populated regions. In contrast only 11% of the students at Stockholm University take distance courses. Stockholm University is a major university, located in a densely populated region, which can easily attract campus students.

Figure 3 illustrates that many distance courses are so-called independent courses, whereas there are relatively few complete programs that are based on distance courses.

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2 HSV was recently replaced by two new authorities. One of them, “Swedish Higher Education Authority” (Universitetskanslerämbetet), is responsible for statistics and quality evaluations.
Figure 4 shows the throughput rate of students who register for distance courses. For independent courses as many as 40-50% are so-called “no-shows”, that is they do not take any points at all after having registered. An explanation is that many of the students have changed their plans, and decided not to study, or to study something else. There is no incitement for the students themselves, or the universities, to get these students unregistered. Until recently, the university got money from the government for all students that registered, regardless of whether they started to study or not.

As shown by the right-hand diagram in Figure 4, the throughput rate is reasonably high, especially among female students, if we remove the “no-shows”.

Students in distance education in Sweden

![Table of distance education students by university]

Figure 2. To the left: Number of students in distance education, by university – in absolute numbers and percentage of all students. To the right: Number of full time students in distance education – in absolute numbers and percentage of the total number of time students.
Based on the facts presented in HSV (2011), HSV has concluded concerning distance education:

**General**
- Independent courses dominate (rather than complete programs)
- Distance students are seldom beginners in higher education
- Many distance students acquire 0 points – they do not show up at all after they registered
- Great variation between universities regarding their strategic work with distance education
Supply of distance education
- The volume of distance education has increased
- The supply consists mainly of independent courses as opposed to complete programs
- 90% is basic education
- Law and social sciences are the biggest areas

Who are the distance students?
- There is an ongoing increase in the number of distance students
- Women are in majority
- Many older students in distance education
- There are relatively few students with foreign background in distance education
- Many distance students have parents with low education
- Distance students have often children
- Many distance students do not have financial study support

Study patterns and study achievements
- A majority study independent courses
- Unusual with full time studies on distance
- Low degree of achievement in distance education

Producer/university perspective vs. customer/student perspective
Most facts about distance education have been collected from a producer’s perspective. This is true also for the HSV (2011) study referred to above. There are very few studies, which observe and analyse distance education from a customer/student perspective. However, HSV (2011) refers to some other surveys that have been made by researchers with the purpose to catch facts about why the students choose distance educations, and what they think about these educations.

Why do students choose distance educations?
Some Swedish universities have used questionnaires, focus groups, or interviews in order to find the motives that student have to choose distance educations. Some facts about this are available from Umeå Center for Evaluation Research (UCER), which has had a task to evaluate the usefulness for students achieved by net-based distance education.

Some findings from the evaluations:
- The flexibility is the factor which has been most important for motivating the students to choose distance education.
- The students chose distance courses because of their interest in their contents.
- A large share of the students participating in distance courses were looking for jobs at the same time. Some of them chosen distance courses in order to be able to finalise their studies, even if they got a job in another part of the country.
- Another group of students choosing distance education were Swedish students living abroad.

What do the students think about distance courses?
The opinion of students about distance courses that they are participating in, or have participated in, may contribute constructively to systematic quality work by indicating strengths and weaknesses in distance educations.
Some findings from the evaluations:

- Many students think that the pedagogical quality of the courses is miserable, and that the IT support does not live up to their expectations.
- One shortcoming in some courses is that the technical possibilities are not exploited. The students are well aware of the potential of different forms of IT support from other courses, from which they have positive experiences.
- Students over 30 years of age are most critical.
- Several students think that many teachers have just copied a campus course and put documents on the learning platform without adapting the pedagogical model to distance education.
- Most of the criticism concerns the support from teachers. The students miss engagement, guidance, and dialogues from the teachers.
- Those students who are satisfied with the support from teachers are particularly satisfied with the availability of the teachers.
- Several students wanted more social contacts through physical meetings in order to keep up the motivation for their studies. This view was mainly expressed by students in health care and medicine, students on longer courses (more than 30 points), full time students, and beginners.
- Group work was strongly criticised by almost all students. On the other hand, those students, who had not had any group work, found that to be a shortcoming.
- The students asked for more continuity in the studies, for example more deadlines, and more assignments to be accounted for during the course, and they were missing a complement replacing physical meetings, lectures, and discussions. Almost all students wanted more teacher-led discussions in available net-based forums.

See also Almqvist&Westerberg (2005) and Mårald&Westerberg (2006).

Despite all the deficiencies of distance courses indicated by critical comments from the students in these surveys, the bottom line is that the students are very satisfied with distance courses. This is quite remarkable, and some explanations are:

- The flexibility in time and space, enabling many students to carry out higher studies, students who – because of their life situations – are not able to participate in campus courses
- Distance courses offer good possibilities to go back to the course material, including recorded lectures, as often as the student wants
- Many teachers are good at giving individualised, fast, and constructive online feedback to the students during distance courses
- Students are able to use social media in order to help themselves with difficult parts of the courses, with or without the presence of the teachers in these communities

E-learning: major concerns

There are some major concerns about e-learning, explicitly expressed or tacitly held by sceptics, especially among teachers. We shall look at some of them here.

Fears of teachers

Teachers are particularly concerned about the following aspects of e-learning:

- They are not prepared for this relatively new form of teaching, and they realise that they need education and training themselves.
  - This is a valid argument and should be taken care of. Naturally the teachers should be given the education and training that they certainly need.
• They are afraid to be disclosed as bad teachers, when their performances are recorded and made available to their colleagues and supervisors.
  o This may be tough, but bad teachers are bad, regardless of whether their bad performances are made public or not. Bad teachers should be given better support and training, enabling them to give students the good quality teaching they have the right to expect.
• They are afraid to become redundant if and when distance education turns out to require less teacher hours because of assumed higher efficiency of e-learning, where the recorded lectures may be reused over and over again.
  o It is an open question if, and to what extent, e-learning lowers the costs of education. Education material can be reused, but improvements are often desirable or necessary. Material to be used in online courses takes longer time to prepare, and require more work than traditional education. A well prepared online course may offer better quality in many respects, but it takes time and resources to exploit these possibilities. Low budget distance courses may lower the quality of the education, which is not acceptable.

Quality concerns
Many teachers and education politicians express their concerns for the quality of e-learning and distance education. Certainly most of these concerns are genuine and not just an excuse for being against new education forms that may threaten some self-interest of those who express them.

There are some major problems making quality discussions difficult. One problem is the concept of quality. How should quality of education and learning be defined? For example, do we mean the quality of education/learning processes, or the quality of the “end-products” of these processes, the knowledge, insights, and skills acquired by the students? Quality is certainly a multidimensional concept, consisting of several quality components, which also have to be carefully defined.

The next problem is to measure quality, and to make comparisons between students, courses, education programs, and universities – and between different modes of education.

Individual countries and the European Union have made some attempts to standardise evaluations of higher education the achievements of students, but these attempts are still disputed and definitely need to be further developed and improved.

Low student throughput
When looking superficially at throughput statistics for distance courses, one may get the impression that they have unacceptably low throughput. However, as shown by Figure 4 above, the high rate of “no-shows” may fully explain the low throughput at distance courses. If one removes students who only register and then do not show up, the throughput becomes quite normal, around 80%.

However, one must also ask whether the high rate of “no-shows” creates a problem for the universities or for the students themselves. I would argue that it does not. As already mentioned, until recently the “no-shows” have in fact been a good business for Swedish universities. The universities have got paid for them by the government, although they hardly cause the universities any costs. As for the students themselves, it is easy to imagine very good reasons that they may have for not showing up at the course: they may have got a job they have been looking for, they may have chosen to attend another course, or to do something else that they want to do, etc.

Even if one looks at those students who actually start studying a distance course, but not complete it, there may be good reasons for this as well. Many distance students are persons who already have a job, but who want to develop or refresh their competence. These students may not require all parts of a course, and it may not be essential for them to complete the course and get points.
Cheating

Those who are sceptic about distance education often mention the risks of students cheating – as a real or pretended concern. I have not seen any facts yet indicating that cheating is actually more frequent among distance students than among traditional campus students. There has always been cheating, and some of the cheating is detected, whereas some goes unnoted.

It could be argued that an online course, and especially online examination, makes it easier for a student to hire somebody else to masquerade for him or her, performing all examination tasks etc. But it may not be so easy for a student to find somebody to undertake this job, which may be rather difficult and time-consuming, if the examinations are well designed. A good practice for designing examination tasks is to make it more difficult to cheat than to solve them in an honest way. Another good practice is to individualise the tasks, so that a student could not get much help by having access to another student’s solution.

E-learning: major challenges and potentials

The challenges facing e-learning and distance education can be divided into two categories:

1. **Defensive challenges**: meeting the concerns that I have listed above, and maybe others. Here again we need facts do know whether the concerns are justified or not, and whenever they are justified, we have to meet them with constructive actions for improvements.

2. **Offensive challenges**: actively exploiting the positive potentials of e-learning and distance education, including blended learning. This means, *inter alia*,
   a. to remove administrative restrictions, inherited from traditional campus-based education, which are obsolete in the new, flexible education forms; this requires reengineering of concepts, procedures, and information systems supporting the procedures³,
   b. to maximise the positive effects of e-learning and distance education, taking good care of innovative ideas that emerge from creative persons and institutions all the time.

Goals and enablers

In e-learning and distance education – like in other forms of learning and education – it is important to distinguish between goals and enablers, and to understand the roles of different types of enablers.

The goal of education/learning is, expressed on a very general level, to provide the students with (for them) new knowledge, insights, and skills. The knowledge, insights, and skills are closely associated with what we usually call the **contents** of a course, program, etc.

Major enablers in education/learning are the **pedagogic** (pedagogical methods) and the **technology** (technology-supported methods) used for providing the contents to the students.

Both pedagogic and technology are extremely important enablers of efficient, high-quality education/learning, where the students perceive and digest certain contents in order to improve their knowledge, insights, and skills. But the enablers are not ends in themselves, and however good they are, they can never compensate for insufficiencies in the contents.

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³ Examples of concepts that need to be redefined are "course" and "course execution" in a situation where a student may start and finish courses in a flexible way, not synchronised with other students, or with the start and finish of university semesters. As a consequence administrative procedures and information systems based on these concepts must be reengineered.
Major innovations: OER, MOOC, and OA


Open educational resources (OER) are digital materials that can be re-used for teaching, learning, research and more, made available for free through open licenses. OER include different kinds of digital assets. Learning content includes courses, course materials, content modules, collections, and journals.

If properly designed, certain types of open education resources, often called learning objects, cannot only easily be shared by many students and course providers, they can also be reused as components or services of other learning objects and courses. This idea resembles the idea of building information systems by reusing already designed and developed software services – service-oriented architectures (SOA).

Open Educational Resources could be seen as a generalisation of the concepts of Open Access (OA), Open Archives, and self-archiving, phenomena of rapidly growing importance for efficient publishing and dissemination of scientific work (articles, journals, books, etc.).

A massive open online course (MOOC) is an online course aiming at large-scale interactive participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for the students, professors, and teaching assistants.

Some famous TED talks about MOOC:

Shimon Schocken, The self-organizing computer course, October 2012
Daphne Koller, What we're learning from online education, June 2012
Peter Norvig, The 100,000-student classroom February 2012
Salman Khan, Let's use video to reinvent education, March 2011

Figure 5. Rapidly rising prices for education in the United States.
Self-learning
Possibly the most revolutionary aspect of OER and MOOC is its potential to provide free or inexpensive and efficient access to valuable knowledge and skills for self-learning for those who cannot afford to attend traditional university courses. This is an important possibility not only for gifted students in poor countries, but also for gifted but poor students in rich countries, like the United States, where traditional education is very expensive. According to the U.S. Bureau of Labor Statistics, quoted by Koller (2012), the prices of higher education have grown twice as fast as the prices of medical care since 1985, and four times as fast as the prices of all items. See Figure 5.

Towards concrete action plans for university departments
Since 2002 the number of full year students on distance educations has increased by 100% in Sweden. Between 2007/2008 and 2008/2009 the number has increased by about 20%. There is a similar development in, for example, the United States, where the number of “online students” has increased by 21% during the last year; Allen&Seaman (2010).

The most significant development potential for distance education can be seen in Africa and Asia. For example, Tanzania expects a tripling of the number of students from 2009 to 2025; Kotecha (2010). India expects an increase from 14 million students today to 40 million students in 2020.

At the same time the share of students in Open and Distance Learning is expected to grow from 24% to 40%; Vardarjan (2009). In Sweden 20% of the students study, at least partly, on distance, and in the United States the figure is about 30%; Allen&Seaman (2010).

Yet the remarkable development indicated by the figures above have taken place without much active support, and despite outspoken or tacit opposition, typically not supported by facts. It is time now for universities and university departments to embrace the potentials of e-learning and distance education in a more positive and constructive and less hesitant way, and to exploit the potentials systematically.

It would be natural for each university and each university department to have a strategy and action plan for e-learning. The department strategies and action plans need to be consistent with the university strategy and action plan, but it may also be an advantage to have a certain degree of variation between different university departments, if nothing else to facilitate comparative evaluations between different approaches.


Here are examples of topics to be treated by strategies and action plans:

- Which should be the role of e-learning: equally important as traditional campus education, or just a complement; should e-learning courses be separated from campus courses, or should they just be seen as different education modes of the same courses?
- To which extent should e-learning courses have synchronised campus elements, e.g. seminars, examinations, etc.? Blended learning?
- Would it be possible to structure courses into modules (learning objects) in such a way that some of these modules could be reused by several courses and programs? Could this be done in a systematic, e.g. by using a so-called service-oriented architecture used by information system designers and developers?
- To what extent should our university compete with other universities, and to what extent should we try to cooperate with others and reuse the best courses and course modules from other universities, developed and presented by the best teachers of certain topics? Can we really
afford to continue to develop and execute very similar courses in many universities? See Friedman (2013).

- What could be the new role of teachers and assistant teachers if they can rely on already existing e-learning courses? Can they help the students in new ways, when they do not have to spend a lot of time and energy on basic lecturing?
- How can we best organise, exchange, and make use of open education resources (OER): in our department, on the university level, nationally, globally? What can we contribute?
- Can we play a role in the international movement of Massive Open Online Courses? Should we encourage and facilitate self-learning, free of charge, and can we justify the costs for this? How should we take care of those self-learners who – in addition to the knowledge and skills they have acquired – would also have a certificate of their achievements? How could examination of self-learners be organised in an efficient and trustworthy way, at a reasonably low cost?
- Design and implementation of an ongoing, systematic evaluation of the quality and efficiency of different modes of education/learning – seen both from the student’s perspective and from perspective of the university and university department.

References


Varadarajan, A. (2009). Enrolment, Retention and Achievement in Distance Education.