Success in CAA will change the way we learn

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Abstract

Learning at virtual universities is becoming more widespread. A critical issue yet to be fully addressed is how we deal with assessments and examinations online. In conventional education students will only focus on what material is examinable. Too much of the student's attention is often given to passing an exam rather than developing a deeper understanding of their subject. Another problem is the organization of these exams in a foreign country perhaps where little control is guaranteed. We will report on our attempts to address these problems.

The challenges of tomorrow

High bandwidth will be available to every student anywhere in the world. Hand-held devices and other gadgets are coming onto the market at affordable prices. Satellites in low orbits as well as communication technologies such as Ericsson's Bluetooth are rapidly changing the way people interact with each other. A mass of information will be available to students. However there will be no gatekeepers, everyone is able to publish anything. Therefore, we believe that it is the art of critical thinking that will be the most important skill to master. Students also have the right to get an answer to "What's in it for me?"

To cultivate critical thinking amongst students and increase student responsibility for their own learning the student needs to

- Work in groups with other students and let them solve problems together by making the exams into Problem Based Learning (PBL).
- Contribute to and give value judgments that are taken seriously. This is done by not setting a fixed answer to any given question. All questions should have a range of possible answers.
- "Create their own courses" that fit their special needs - education on demand. When the goals set in these courses are realized it constitutes the examination of the course.
- Be allowed to criticize their teacher

For the student the possibilities of tomorrow are:
- To constantly learn when he likes, where he likes and at his own pace.
- To find and take the very best courses online.
- To be able to demand to learn the bits and pieces of use and interest to him and nothing more (or less).
- He will pay very little for these courses due to the huge competition between virtual universities online.

For the virtual university the challenges are:
- Educate many more students most of whom will be lifelong learners
- Supply higher quality courses
- More targeted to student's individual needs
- At a much lower cost.

The technology and economic pressure will force universities to compete and cooperate. Students will be free to choose from courses offered at hundreds of virtual universities and educational business online. Student will not take a course because it is close to home, but rather because it gives him the best value. We can foresee a development similar to when the handicrafts turned into industrializes processes. Thus we think of virtual universities having 10 000 students in a course. How can that be handled?

What do the employers want? If you look at various advertisements for new personnel you find certain skills listed that often fall outside what students can show

in their degrees. We think it is essential that the students of tomorrow can master these skills and therefore suggest "skills courses" like:

- How to write a report
- How to present on posters and overheads
- How to get along with the press
- How to give a speech
- Study skills, focusing on the students personal responsibility
- Co-operative skills, teamwork
- Managing your time

How can we determine the quality of learning

Blooms taxonomy for cognitive skills

- **Knowledge** - The student remembers facts
- **Understanding** - The student understands relations and context
- **Application** - The student can apply his knowledge to new areas
- **Analysis** - The student can analyze and find the parts
- **Synthesis** - The student can create something of his own and relatively unique
- **Evaluation** - The student can give value judgements based on facts in his field

Solo taxonomy for learning

Biggs and Collis (1982) designed another tool of evaluating student's responses: SOLO - Structure of the Observed Learning Outcome.

- **Prestructural** - Irrelevant response.
- **Unistructural** - The use of one obvious piece of given data
- **Multistructural** - The sequential use of one obvious piece of given data
- **Relational** - The integration of the given data to form a unique conclusion or generalization
- **Extended abstract** - The use of multiple interacting abstract systems to form a response. This may include forming a general hypothesis, assessing the quality of models and accepting open-ended answers.

What kind of exams do we need tomorrow?

Virtual universities need a new way of assessment since it is always the factor that most influences learning. Students often only focus on those aspects that are likely to appear in exams. "Is this examinable?" Forget about "interesting". The question from most students is "Will we be tested on this?" Traditional exams often only address the lower levels of cognitive skill in the taxonomy proposed by Bloom. To focus the student's learning and address all aspects of the taxonomy we must develop new forms of assessment. We believe that this is the most important challenge in CAA. Success with assessment will change the way students learn.

We would like to shift from assessment as a scary and intimidating experience to look at assessment as a learning tool. In this transition it is important to ask the question

"what do we assess?" What do employers ask for? Can the assessment be used as a tool to find a match between students and employers need? In a rapidly changing world we must answer these questions ourselves: What kind of assessment do we really need in the 3rd millennium?

We think that the Portfolio concept will therefore be of central importance: The students will have to be able to convince their future employer that they are the right people for the job. No grades on a piece of paper will convince the employer of that. Essays and work online will enable the student to easily direct an employer to a portfolio of their credentials.

Today we require students to take a course from the beginning to the end independent on their previous knowledge. We are working on ideas of placement tests that enable a student to enter a course at an appropriate level or take the parts that he actually needs. This requires that courses are built in modules.

A proposed example of a new type of exam

URL: http://pentium.citu.lu.se/SAFTTEST/default-eng.asp

To stimulate the discussion we will demonstrate a test with SAFT - Self Assessed Free Text and an assessment of open-ended questions without the need of a marker - a tool that could reduce costs and increase quality. The test is part of a "skills course" on writing an essay.

Initially the student answers a question in essay form. He is then guided by the test through a series of questions and exercises that aim to further develop his insights into the subject of the test. As feedback to his answer the student receives the teacher's recommended answer to the question. This recommended answer is then used as a basis for further insights from the student. He may for instance be asked to give possible improvements to the combined student-teacher solution. He might be prompted to mark all the sections of the recommended answer that he himself covered in his own answer. At certain points of the test the student might be able to read other students answers to a follow-up question to inspire his own thinking. These other answers make up a knowledge bank that the students may obtain ideas and insights from. In fact the student's own answer to the same follow-up question is in turn added to the bank of information for other students' possible gain. The student will also give a value judgement on his own accomplishment that will be included in the final grade of the test.

Advantages with SAFT:

The ideas put forth in the SAFT-test have, in our opinion, the same advantages that traditional examinations have today. An important part of the techniques is the knowledgebanks that all students may contribute to and everyone may obtain ideas from. The knowledgebanks makes the course grow and improve. Other advantages include:

For the student:

- Is given an opportunity to apply his knowledge to new areas.
- Is helped to analyze the given situation and find the parts of the problem.
- By being motivated to create something of his own, with his knowledge, he is helped to move his thoughts in new directions of his own.
- Has an opportunity to think more about a give value judgements on his knowledge as well as his own opinions and from this draw his own conclusions on the nature of a correct answer.

For the teacher:

- Guides the student towards higher levels of Blooms taxonomy.
- Receives valuable input from his students that may be incorporated into and help develop the course given.
- The students take care of their own examinations. No teacher correcting will be necessary.
- There will be no need to gather all students at once in a big room and perform a written test.
- Reduced costs for examinations.

Other tools developed at CITU

EVA (http://bengt2.citu.lu.se/eval/)

A web-based evaluation tool for editing questions, publishing the evaluation and its results on the web. This tool is of great use for quick and easy evaluations. It contains over 600 questionnaires, over 12 000 questions and over 350 000 answers have been posted to the database.

ITcampus (http://itcampus.org/)

A resource by students, for students has been built for three years at CITU. The work of summer 99 will soon start at CITU and will aim to include even more student-related material than is available now.

ITcampus includes lecture notes and old examinations (questions and answers) making it absolutely necessary for the teacher to update his lecture speeches and exams every semester or he will quickly be out dated!

There are many resources at ITcampus collected by students for students to develop the quality of education. There are planes for a news section on what happens in Lund and a course section that includes searchable, updated and accurate information on all courses given at Lund University virtual as well as physical.

ITcampus is the 37:th most visited site in Sweden and it is mainly concerned with issues that involve Lund University.

ITcampus has grown beyond the student world of Lund University to include a cooperation with Aalborg University in Denmark and may still grow further to include other Universities and languages.

KNUT (http://knut.kks.se/)
Knowledge Network for Education in Schools

LUVIT, Lund University Virtual Interactive Tool (http://www.luvit.com/)
LUVIT is an internet-based system for interactive education and information management, designed to help teachers create and publish courses on the web, and to guide students to learn and communicate, and to record student progress.

Continue thinking

On your next exam ask your students to bring and use their own telephone and computer!

- ***How will that change the questions?***
- ***How will it change how students learn?***