ACTIVE LEARNING TRAINING FOR THE FACULTY: A CASE STUDY

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ABSTRACT

The faculty of Telecommunication and e-Business in the Turku University of Applied Sciences wanted to lower the risk factors of student withdrawal relating to motivation, poor quality of student experience and lack of student engagement. The CDIO standard number 8 – Active Learning – provided some solutions to these risks. In addition, the faculty wanted to increase and support the use of active experiential teaching and learning methods. Therefore a training program was started in the autumn of 2008. The training was finished in January 2009. The main goal of the training was that teachers get to know, begin the experiments and usage of active learning methods. In addition, the training should provide new viewpoints for the role of a teacher and tools for assessment with active teaching and learning. The content of the training was divided into four topics: a) active learning methods, b) managing groups, c) different teacher roles and d) new tools for assessment. The training had four contact days and between the contact days study groups of four to six teachers were supposed to work with the agreed topics. There were altogether 10 study groups which all had a different development focuses. The training used a web-based learning environment for distributing materials and providing a discussion platform for teachers for example. The faculty gave very positive feedback over the training and several experiments were developed and many were implemented as well. The training fulfilled its' main goals and we can warmly recommend this kind of training to others as well. However, the implications for student retention remain to be seen.

KEYWORDS

Active learning, Faculty development, Case study, CDIO Standard 8

INTRODUCTION

According to a recent OECD publication, about 27 percent of students enrolling to higher education institutes leave without a degree in Finland [1]. There are many different risk factors affecting student withdrawal [2-5]. Identified risk factors are for instance: low motivation [2], poor quality of the student experience [4] and lack of commitment to educational objectives[5]. Students expect to have interesting and challenging courses. Furthermore, students expect to have versatile teaching with advanced learning methods. [6]

One of the basic requirements of the CDIO initiative is to make engineering more interesting, to increase students' motivation and retention [7]. Active learning is one answer to support this. Standard 8 of the CDIO initiative focuses on active learning. It defines that teaching and learning should be based on active and experiential learning methods. Active learning methods engage students in activities that support deeper approach to learning. [8] The

standard describes what this mean and rationalizes the use of active and experiential learning methods following:

- ***Description***: Active learning methods engage students directly in thinking and problem solving activities. There is less emphasis on passive transmission of information, and more on engaging students in manipulating, applying, analyzing, and evaluating ideas. Active learning in lecture-based courses can include such methods as partner and small-group discussions, demonstrations, debates, concept questions, and feedback from students about what they are learning. Active learning is considered *experiential* when students take on roles that simulate professional engineering practice, for example, design-build projects, simulations, and case studies.
- ***Rationale***: Students remember less than a fourth of what they hear and only about half of what they see and hear. By engaging students in thinking about concepts, particularly new ideas, and requiring some kind of overt response, students not only learn more, they recognize for themselves what and how they learn. This process of metacognition helps to increase students' motivation to achieve program learning outcomes and form habits of lifelong learning. With active learning methods, instructors can help students make connections among key concepts and facilitate the application of this knowledge to new settings.

The faculty of Telecommunication and e-Business in the Turku University of Applied Sciences wanted to enhance the use of active experiential teaching and learning methods and to lower the risk factors of student withdrawal. Therefore early 2008 a training program was planned and potential educators were analyzed. The training program started autumn 2008 and it finished in January 2009. Altogether 55 teachers and experts participated in the training.

In this paper, we describe the overall structure of the active learning training program, the content and activities in training, the results of the training and finally conclude with the discussion.

THE ACTIVE LEARNING TRAINING PROGRAM

The training program was designed to support and enhance our faculty in the use of active and experiential learning methods. The main aim of the training was to learn new methods for active and experental learning. In addition, the training aimed at new viewpoints to teacher's role, new tools for assessing active learning and concrete and practical ideas for instant use in teaching.

The training program started in the August of 2008 and finished in the February of 2009. Altogether 55 teachers participated in the training. The training had four contact days and between the contact days study groups of four to six teachers were supposed to work with the agreed topics. Before first contact day, a pre-assignment was sent to the participants. This assignment had two functions. First, it provided basic information on the participants' skills, knowledge and expectations for the educators. Second, it served as an orientation for the forthcoming training program.

Table 1
Contact days and topics

Contact days	Topics
21.8.2008 – 4 h	Orientation to the training Active learning vs. traditional learning Forming the study groups
4.11.2008 – 8 h	Focus on active learning methods
26.11.2008 – 8 h	Focus on learning assessment Presentations of the study groups
5.2.2009 – 8 h	Focus on tutoring the learning Presentations of the study groups

There were altogether 10 study groups which all had a different study and development focus. The focus of each group was supposed to be as concrete as possible. The aim was that the study groups actively test and try the ideas they are working on in their teaching. The topics of the study groups were following:
- Self-assessment and peer-assessment
- Virtual learning and tutoring
- Active learning with large student groups
- Assessment and feedback
- Motivating independent learning
- Continuous assessment in courses
- Moving to experiental learning
- Enhancing student cooperation in learning
- From competences to assessment
- co-operative learning in practise.

The training utilized a web-based learning environment for distributing materials and providing a discussion platform for teachers for example.

At the end of the training feedback was collected with a web-based questionnaire. The questionnaire had following questions:
1. How the training succeeded to fulfill its' goals?
2. What was your own role in making the training to succeed?
3. What support and tools you received for your teaching?
4. How are you going to use the active and experiental methods?
5. How was the training organized?

Altogether 41 participants answered the feedback questionnaire.

Day 1

Day one started with short orientation to the training. After that the aims, content and schedule of the training was introduced and discussed. At the same time, the results of the pre-assignments were discussed too. The pre-assignment showed that there are many active learning methods that are not so familiar to our faculty – at least by the names. However, it confirmed that we have already quite many active and experiential learning methods in use.

In the first contact day the main idea was settling active learning and experiential learning into the pedagogical field. Finally, at the end of the day study groups were formed. The

groups formulated their own study question using the so-called double-team method. Every team was supposed to work with their topics before the next contact day.

Day 2

The second contact day focused on active learning methods, but before it we discussed about the change from the traditional teacher's role to a guiding and tutoring teacher's role. During the day, several active learning methods were studied as listed below. The methods were learned using gallery walking.

Table 2
Active learning methods learned

Method	Short description
Creative problem solving: 8 * 8	• the problem is written on a paper and around this paper eight papers are set • in each of these eight papers a viewpoint raising from the problem is written • after the viewpoints are set eight ideas are generated from each viewpoint
Creative problem solving: brainstorming	• every member of the group writes one idea on a paper and puts the paper on the table to his right side • this continues as long as new ideas come to mind • when new ideas are finishing, you take the first paper from the pile on your left side and develop this idea further and put the paper to your right side on top of the pile • at the end the idea papers are sorted and assessed • the rotation of the idea papers is meant to give new views to idea generation
Gallery walking	• a form of cooperative group work • make free riding quite difficult • there are home groups and walking groups • one topic is learned in each home group and a poster is prepared • each walking group is made of one member from each home group • the posters are set up in a "gallery" and walking groups study each poster one by one • each student teaches own group's poster to other members of the walking group • at the end results are discussed and unclear topics are clarified
Puzzle	• cooperative group work • basic idea is presented in Figure 1 •
6-3-5 – method	• also known as brainwriting [9] • With this method 108 new ideas can be generated. • A group of six peoples write three ideas in five minutes. • The papers are forwarded to next member of the group, who reads the papers and adds three new ideas in next five minutes. • The papers are circulated every five minutes until the round is finished.

Table 2 continues
Active learning methods learned

Debate	- effective way to support information adoption and usage - traditional debate is the most common form of debate in education - phases of traditional debate are following - chairman, secretary, referees, two teams of debaters and public are selected - theme of the debate is selected; other team is against it and other team is for it - teams prepare their arguments - debate last 10 to 20 minutes and each address is 1 to 3 minutes (both sides have as much time to speak) - at the end of the debate closing speeches are given - finally the referees assess which team won (based on relevance of arguments, presentation, entertainments and credibility)
Six hats [10]	- idea of six different hats is to have six different viewpoints and roles for looking at the problem - the six hats are - white: "let's look this objectively" - facts and figures are important - red: "let's listen our feelings and intuition" - emotional arguments are allowed without rationale and explanations - black: "let's look at the risks and weak points - logical and relevant arguments why something is not working or not succeeding - yellow: "let's think about the advantages" - things are supposed to progress logically - constructive suggestions are provided - green: "let's develop new ideas, let's fool" - traditional thinking is forgotten - blue: "let's think how we have progressed so far and how we should continue towards the goal" - observing and planning action and timing - make conclusions - there are three different ways to use this method - In a group with all hats in use at the same time - In a group with one hat in use at the same time - By yourself

1. Planning in home groups

2. Studying in the study goups

Topic A Topic B Topic C Topic D

3. Teaching and learning in home groups
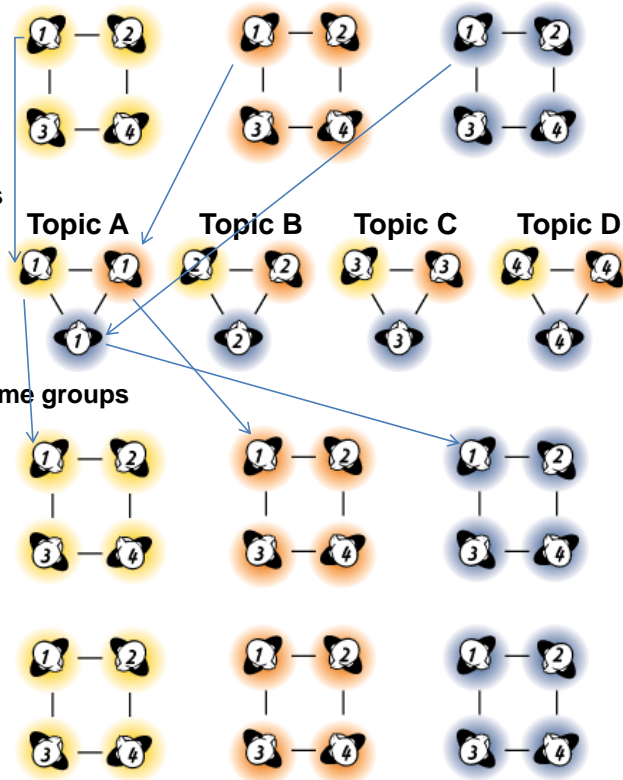
4. Evaluation

Figure 1. Puzzle method.

At the end of the day, guidelines for independent group work were given. Every group should study different sources and try to form a common understanding about the pedagogy that is involved in the topic they are working on. Furthermore the group should have the practical part of the group work i.e. test the developed ideas in a real teaching setting/course. Finally, the groups should start planning the presentation part of their group work for the other member of the faculty.

Day 3

The third contact day focused on assessment. There were three presentations by the study groups too: From competences to assessment, Self-assessment and peer-assessment and Assessment and feedback.

The assessment was studied from many different viewpoints, but the main idea was all the time to rationalize the need for new kind of assessment for active and experiental learning. The message was that we have to move from a "red assessment house" to a "blue assessment house". We should change assessment from traditional students' classification and comparison to students' guidance and development. Students' skills and competences should be understood as functional packages. Students' skills and competences are a continuously improving relationship between a student and the assignment.

Day 4

The final contact day focused on the presentations of the study groups. In addition, we learnt tutoring related topics such as different learning styles and their features and students' motivation. Finally, final discussions and preliminary feedback we gathered. The web questionnaire was delivered later for collecting more precise feedback.

RESULTS

The feedback of the training shows positive results. Most of the participants (30/41) answered positively to the question how the training succeeded in fulfilling its' goals. Typical positive comments were following for example:

- I received a lot of new ideas to active learning
- The training offered time to truly understand active learning methods
- I got new ideas to teach my topics
- The training refreshed old thoughts of active learning.

The critical comments mentioned following for example:

- I didn't get anything new out of the training
- I was expecting a more innovative approach by the trainers
- I hoped more concrete information and experiences of active learning methods
- The timing of the training was bad – too hurry period in teaching.

The participants saw that the training had given them support and tools for their teaching. The following comments confirm this interpretation:

- I had to actively evaluate my own way of working/teaching
- Active discussions with the colleagues were very fruitful
- I now have the courage to truly use active learning methods
- Pedagogy is now official and accepted discussion topics in coffee rooms.

Most of the participants said either that they have already used active learning methods or they have plans for using active learning methods in the next courses.

The results of the study groups are presented in the table 3.

Table 3
Active learning methods learned

Study group focus area	Group results
Self-assessment and peer-assessment	- Self- and peer- assessment was tested in Information services course at the Degree programme in Library and Information services. - Thesis seminars developed peer assessemt practices
Virtual learning and tutoring	- Study on virtual learning and better understanding of the virtual learning environment - Implementation of virtual learning and tutoring in work placement management practices
Active learning with large student groups	- No results
Assessment and feedback	- Every member of the study group rewrite the assessment descriptions of at least one of their courses - Test different assessment methods in own courses - How to manage a group exam? - How to manage an oral exam?

Motivating independent learning	• Every member of the study group tries some new way to motivate students and evaluates the effects

Continuous assessment in courses	• New possibilities for assessment and evaluation were developed for the Practise Enterprise course
	• Different evaluation methods utilized:
	  1. Self Evaluation
	  2. Peer Assessment
	  3. Process Evaluation
	  4. Consortium Evaluation
	  5. Rotation Evaluation
	  6. Outcome Evaluation

Moving to experiental learning	No results
Enhancing student cooperation in learning	• A special testing focused week was arranged • New implementation of Customer focused marketing
From competences to assessment	• Plan for improved assessment practise to whole faculty was developed • New curriculums are required to describe competences and assessment better and more understandable way than earlier
Co-operative learning in practise	• A small survey among first year students relating their study methods • New group assignments were introduced in Electronics • New optional exercises were introduced • Lectures have more active learning parts that they used to have

DISCUSSION

The training program was quite intensive and suffered little from the other responsibilities the faculty had parallel to the training. Still, the faculty was very active and committed to the training as the results described earlier showed. The training resulted in new ideas and plans to implement teaching. Some of the plans are already tested and some are still to come. Besides the information on active learning, the training provided time for discussion and networking for faculty members. The training has initiated several discussions over pedagogical choices and solutions.

The active learning methods learned were not totally new to our faculty, but this training refreshed the methods in our minds and hopefully encouraged our faculty to use these methods more. A very helpful matter was that the training was arranged in a way where we studied the active learning methods with active learning methods. While learning active learning methods we gained experience from these methods at the same time. This teaching method worked for us because the level of knowledge with active learning methods was quite good at the beginning.

Based on our experience we can recommend similar training programs for other faculties as well.

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