

# Experimenting with eXtreme Teaching Method – Assessing Students’ and Teachers’ Experiences

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## Abstract

During the course *Implementation of Information Systems in Organizational Context* we experimented with a reflexive and participative teaching method called eXtreme Teaching. This method proposes a consideration for values, such as respect, communication, feedback, courage, and simplicity, in teaching. We wanted to experiment with an informal teaching method to gain more interaction. During the course, an openly discursive atmosphere was achieved through careful planning and spontaneous performance. In this article, we propose an approach that successful learning experiences are not achieved only by the efforts of teachers but also by students’ active participation and interests towards the course issues.

**Keywords:** Implementation of information systems, teaching in computer science, eXtreme Teaching, assessing teaching, teaching interaction

## Introduction

This paper sets out to explore the experiences of students and teachers during the course *Implementation of Information Systems in Organizational Context* (the Implementation course from now on) that is held annually by the department of Information Technology in the University of Turku. This implementation course is a part of mandatory courses for Information Systems students and optional for others, which means that every year we have participants also from Computer Science.

The Implementation course is taken by the students near the end of their bachelor’s degree or in the early stages of the master’s degree. The content of the course has been planned by Professor Helena Karsten with the goal to build up an extensive understanding about the change processes during the implementation from the perspectives of an individual worker, the working community and the whole organization. Here, the information system is scrutinized from longitudinal perspective, which means studying it from the idea to everyday use.

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The course was arranged in spring 2006 for the fifth time in Turku by Professor Karsten with us as course assistants. We organized the exercises and participated in planning the course details. The students receive 8 credit points from this course, which indicates that it is rather a large ensemble. In practice, this means also some problems in fitting the course into one eight-week period. Due to the size of the course, in previous years, we

had faced problems especially with keeping students interested in the assignment topics and taking part in discussing them. This year, we wanted to create a more interactive and open atmosphere which would support better learning.

For students, it isn't only important to pass a course, but also to build a foundation of skill for working life. Tourunen (1992) argues that as information systems have become inseparable parts of working life and organizational interaction, the increasing requirements and complexity for an information system professional should also be acknowledged as a new challenge in university education. He supports participative teaching methods that emphasize also communication skills and team-working. Even though, among others, Jones (1987) has noted that participatory teaching methods may bring good results, they remain largely unused by computer science educators. As an inspiration of an iterative and reflective teaching method, we came across with an approach called eXtreme Teaching (Andersson & Bendix 2006), which we will introduce in section three.

The rest of the paper is arranged as follows. In section two we review shortly teaching in Information Systems mainly by using teaching in Computer Science as references. In the fourth section, we describe the course exercises and our evaluation survey. The next section discusses the experiences by the students, and in the last section, these experiences are discussed in relation to the teachers experiences.

## Teaching in Information Systems

In Computer Science (Ben-Ari, 2004; Carbone & Kaasbøll, 1988; Jones, 1987), there is research concentrating on teaching programming for students. And although some more experimental research exists, successful teaching experiences should be documented to a greater degree (Carbone & Kaasbøll, 1988). Not all are content with traditional way of teaching (Bruce 2005), which would also indicate that further research is needed. For example, McGuffee (2004, p. 292) asks: “Even if students were able to remain attentive for a reasonable length of time, is passive listening the best way to learn complex subject material?” Especially in teaching Information Systems, there are fewer formal reports on assessing of educational success or development of teaching (Carbone & Kaasbøll, 1988).

Jones (1987, p. 155) states that participatory teaching methods are “those which draw the student into the classroom learning process.” A good learning experience can be born out of the interaction between the participants freely exchanging their knowledge and ideas (Andersson & Bendix 2006). Participatory methods can increase both the teachers’ and students’ motivation, as the awareness of what is going on in the classroom increases through interaction (Jones 1987).

According to Jones (1987) participatory methods include, for example, brainstorming to create ideas spontaneously, directed dialogues as examples of problem solving, small group discussions for preparing food for thought for the whole group, role playing as a stimulation, games as thematized interaction, panel discussions for airing ideas, debates for learning argumentation, and Socratic dialogues as a way to explore the theme further. Scharff and Brown (2004) add learning communities to participatory methods as a way to integrate together students with heterogeneous backgrounds.

In theory of situated learning both learners and teachers are considered to form a community of practice together (Wenger, 1998). Similar to apprenticeship, the learner participates in the community, first to learn legitimate ways to communicate within it, and gradually to participate as a full-fledged member in transferring knowledge and skills. The situated learning approach enlightens how the learning is a two-way process of interaction.

Participation aside, one problem rising from the diversity within the field of Computer Science is apparent when trying to compare various courses on a qualitative basis (Oliver et al., 2004). One

way to define the level of a course is to use Bloom's taxonomy (Andersson & Bendix, 2006; Oliver et al., 2004) where attainment levels point out, for example, students' abilities to recall facts on lowest level, to understand and translate, and use or assemble knowledge. The highest level of attainment emphasizes the students own abilities of making judgments. However, such assessments tell nothing about how to motivate the students.

Oliver, Dobele, Greber and Roberts (2004) state that assessing has a significant role in education. Academic teachers wish to receive satisfactory results in course assessments, and students are especially interested in assessments for grading purposes and as direct rewards for different achievements. Carbone and Kaasbøll (1998) describe course evaluation methods to consist of three common types: making formal questionnaires at the end of a course, comparing examination marks, or arranging various participatory experiments during the course. Assessing can also consist of observation of students' working and discussion with the students and colleagues. Carbone and Kaasbøll (1998, p. 43) state that "most computer science and information systems teachers do not have substantial additional resources to spend on evaluating their teaching improvements." They continue that the credibility of any report on teaching experiments is strengthened by more iterative cycles. Andersson and Bendix (2006) note that there might be mental barriers, which inhibit academic personnel to experiment with teaching. Their work in eXtreme Teaching is an example we used as inspiration to develop our own teaching methods.

## Background of eXtreme teaching

Andersson and Bendix (2006) and Hedin, Bendix and Magnusson (2005) have developed a method of teaching that they call eXtreme Teaching, inspired by eXtreme Programming (Beck 1999), which is a method of teaching that highlights the importance of values such as feedback, communication, respect and courage. Andersson and Bendix (2006, p. 33) state that they were "struck by the highly iterative approach in eXtreme Programming and how much its nature resembles Kolb's learning cycle". They highlight that eXtreme Teaching approach demands a lot from the teachers, who are the main instruments of putting it to action. Despite of being demanding in a sense, eXtreme Teaching can increase dialogue between the involved teachers and the students. Students feel more committed to the course as they become more involved in it.

eXtreme Teaching thus combines fundamental concepts of teaching with practices from eXtreme programming. These include, for example, the idea that teaching in itself is the product in this context. Teachers, of course, aim at the best possible product, such as student passing their exams and getting a degree. Students, nowadays, are both customers and users of teaching. The students know their own rights, and capabilities or limitations, and the value of this should be put in the use in getting the students involved. According to Andersson and Bendix (2006) in university traditions, students are usually approached as teaching subjects. In the eXtreme Teaching approach, not only the teachers but also the students can be developers of the teaching product. The teacher's role involves not only teaching but also coaching.

Andersson and Bendix (2006) translate twelve of Beck's (1999) situated practices that are usable also in a teaching situation (see Table 1). As guidance for handling teaching situations five of universal background values in eXtreme Programming are also taken into consideration (see Table 2).

**Table 1: Background practices in eXtreme teaching**

Background practice and its description
On-site customer can add regular and reliable communication between the users and producers if he or she is added to the team. In eXtreme Teaching this would mean including the students on the teaching to form a dialogue. To do so, there should be immediate feedback that has no meaning of “punishment”.
Small releases have a goal of returning the customer’s investment at regular basis. Short iteration cycles help the customers’ to evaluate that they are provided value for their money. Shorter iterations mean faster reactions on customers’ feedback and possible changes ready in the product. In teaching, this would mean reflexive evaluation and iteration.
The planning game describes the scheduling and planning of the actions in a dialogue between the developers and the customers. In eXtreme Teaching context, this principle could provide that the amount of work or exercises is not based on guesswork but on knowledge created through negotiations between the participants.
Metaphor can provide a carrier of ideas and a medium for communication. A good metaphor can be used to clear up things to a certain degree. In teaching situation, a metaphor could provide common vocabulary and sharing of ideas.
Simple design makes inevitable changes possible. A simple design provides flexibility and ease of maintenance. A not too fixed course schedule makes it possible to adjust to changes, for example, to substitute a paper or make a change in the exercises.
Pair programming aims for transferring and sharing of knowledge, experience and ideas to help problem solving. In original eXtreme Programming, when a problem is solved the members form new pairs to enhance the spreading of knowledge across the whole team. This also enforces that the roles within the team are not fixed. In eXtreme Teaching, pair teaching provides flexible teaching and lower barriers between the associated members as, for example, lecturer can pair up with teaching assistant in certain parts of the course.
Collective code ownership makes the whole team to feel responsible for the product. It is important to fit this practical value in teaching context.
Continuous integration reduces the risks of divergence of the main product while several pairs are working in parallel on their tasks. In the view of eXtreme Teaching, this means that the relevant insights or improvements learned within a team would be integrated in the course content.
Coding standards emphasize clear communication through the code. If code is understood as a language or as a land map, in teaching context, this would mean a clearness of terminology and unified use of language especially amongst the teachers.
Test-first emphasizes the testing and benchmarking of the code. In pair teaching the other teacher could have a goal driven role and the other a test driven goal to develop further the content and the materials of teaching.
Refactoring means keeping the code and the design simple by “cleaning up the table” after each task. In teaching, cleaning up after each exercise would mean trimming the sails in a sense that everyone has a clear idea of the continuation.
40-hour week emphasizes the need to work hard, but not to overwork. In teaching this is an important practice but nevertheless, can only be roughly calculated by the teachers.

**Table 2: Background values in eXtreme teaching**

Value	Value in practice
Communication	Communication is a base if we want to provide any kind of teaching experience. The students can create solutions to more complex problems when information is shared between all the members. Communication value is shown, for example, in the planning game and student involvement principles.
Simplicity	Simplicity is a challenging value as it only works in a context. A simple solution in one context can be a complex solution in another. As a value simplicity is shown, for example, in constructive alignment of tasks and goals.
Feedback	Feedback is essential as everything we do, triggers change. We have a need for feedback and reflection in order to adjust ourselves to the changing situations. As a value this can be assessed in practices like pair teaching, continuous feedback, and formative assessment.
Courage	Courage is “effective action in the face of fear“ that can be anything from action taking to patient waiting. In eXtreme Teaching context the most important aspect of courage is the possibility to provide feedback without having to fear for the consequences. This value is shown in practices like collective course ownership and pair teaching.
Respect	Respect means quite simply that everyone is equally important and we should respect all the participants in the teaching team – at least as long as they act professionally. Respect shows in practices such as collective course ownership, explicit rules of the game, and student involvement.

## About the Study

During Spring 2006 we two acted as teaching assistants in the Implementation course. Our main task was to guide and grade students' course exercises. The students formed groups to produce four essays on different topics which contained a variety of theoretical approaches. These theoretical approaches included Diffusion of Innovations (Rogers, 1995), Technology Acceptance Model (Davis, 1989), Structuration Theory (Giddens, 1984), Duality of Technology (Orlikowski, 1992), Action Network Theory (Callon, 1991; Latour 1987; Law, 1991), Adaptive Structuration Theory (DeSanctis & Poole, 1994), and Institutional Theory (DiMaggio & Powell, 1983). In this section, we first describe shortly the exercises and other arrangements in the course, and then explore a survey we arranged for the students after completing the course.

### *Arranging the Student Exercises*

During the course, the students were expected to combine theory with real life experiences, implementation case examples and their own thinking. Our goal was to make the students reflect the usefulness of theoretical approaches, and to make the students to think over the relations between theory and actual organizational implementation and working life environment. After receiving a university degree these students are likely to work in various positions in an information systems implementation projects. An essential question in our course was whether theoretical approaches could give us all new ways of solving or thinking about problems and tasks, as diverse perspectives or “lenses”, which could help us to manage the complexities of an implementation project and managing such project towards successful ending.

To start with, we speculated with the students about different approaches to successful and unsuccessful implementation. As an example, we used the infamous London Ambulance -case

(Hougham 1996) that describes what happened with old and new information systems, with managers, and with employees during a major implementation project which actually failed to achieve its objectives. We also had a Finnish example, the Medivire-case as an example of a smaller, national level project which was successful in its implementation of a new information system. As the students progressed, in the final exercise, they were expected to introduce us an implementation case example of their own. To do so, the students received longer time for the last two exercises to complete observations on their chosen environment.

During the demonstration sessions, the students were expected to prepare and present their essays. The main focus on these demonstration sessions was to openly and freely discuss about various theoretical approaches in the context of example cases of implementation projects in order to deepen the students' understanding of the different approaches. We encouraged students also to evaluate or speculate whether different theoretical approaches had any meaning or usefulness in the real life context, in the context of actual implementation projects. Through these discussions we wanted to decrease the gap between the theories and real life tasks, because for us it seemed that some students tend to fail to grasp this connection.

Throughout the course, both during the lectures and the demonstration sessions, our intention was to motivate students to have interaction with us and with other students, not just to give and to get feedback from their essays but also to learn to argue constructively about different approaches from various positions. That is also a thing to learn as in Finnish culture shyness of expressing oneself is very common and in a sense allowed, although not thoroughly approved.

### ***Arranging and Conducting the Survey***

To better assess our success with the students, we decided to arrange a small survey that had eight questions. Besides this evaluation, there was a formal course assessment. Our empirical data is, therefore, a combination of the results from these two evaluations.

In the formal assessing of course success, the students were asked to fill in an evaluation questionnaire about the whole course and its aims as it had appeared to the students. This is arranged as a part of the Internet services for our department. Anyone that took part in the course could access the system and give feedback. We received 13 answers through the electronic system. These answers include both quantitative and qualitative parts, and the quantitative ones were automatically calculated. The questions are, for example, how many hours did a student spent for this course; how would a student evaluate his or her participation during the lectures or in demonstration sessions; how would a student evaluate the knowledge and educational capacity of the lecturer and the assistant(s). The latter questions are answered in a scale from 1 – 5.

The questions on our own questionnaire were based on eXtreme Teaching –method and on our interests with teaching or tutoring. We wanted the questionnaire to appear as a light and easy one to answer in order to receive more answers to it. We sent our questionnaire accompanied with instructions by e-mail to all 38 students who had been active participants during the teaching sessions. Besides these, we had two remote workers who participated only virtually. These two were left out of our evaluation. Of the 38 students 14 answered our study, which is 37 % of the total. The number of the answers to our questionnaire is small, and thus we decided not to use statistical methods.

We aimed to receive quite spontaneous impressions right after the course. Therefore, we asked questions in which the students could reflect on their attitudes, thoughts and feelings on how course was arranged, and whether the students got enough tutoring in writing their essays, and especially how the students experienced the discursive atmosphere during the demonstration sessions.

One important addition to data was formed by the discussions between the lecturer and the course assistants before and during the course. These, often quite practical speculations led us to inspect critically several matters related to teaching. Most interesting of these was how to coach the students to participate freely and constructively.

Students answered to all the questions in Finnish. After combining and arranging the data we translated the answers to English. All the quotes in the following sections are from the survey results.

## Experiences of the Students

In this section we explore the students' answers and feedback mainly based on the informal questionnaire. To illustrate our point, we use students own quotes and reflect these on our own observations during the course.

*In the first question* the students were asked to evaluate whether the lectures and the demonstration sessions together formed a complete whole. We interpreted the answers as positive, and felt like the construction of the course was successfully planned and negotiated. The course is quite heavy on theories, which presents a challenge to the lecturer and helping assistants to keep up the appearance of some kind of continuation throughout the course. As one student stated:

*"The matters considered in the lectures were quite theoretical. But you could handle them through exercises and these exercises made us to think about things on a more practical level - this way lectures and exercises formed a complete and natural whole. After the first exercise, I started to reflect on these new things more in comparison to real life."*

The demonstration sessions were found to be helpful. Quite early on, the students seemed to form the opinion that the lectures consisted mainly of theory while in the demonstration sessions the students could speculate more about the connection between real life implementation cases and some selected theoretical approaches. Also during every lecture, interaction between the lecturer and the students was prompted, but the lecture situation as such does not encourage immediate or spontaneous discussion. We noticed that during the lectures, it was mainly few self-selected "spokespersons", who continued to discuss more freely with the lecturer. But in the demonstration sessions, all the students were prompted to speak about their considerations, opinions and questions. As such, the demonstration sessions became for students the very opportunity to argue more about the things related to implementation of information systems.

One of the biggest problems throughout the course – or even throughout the studies – seems to be that in our students rarely participate with much enthusiasm during the lectures. This could be seen also on the answers to this first question. Many of the students had no opinion of the lectures, which are voluntary in this sense, since they participated only in the demonstration sessions, which are usually obligatory. The formal evaluation shows that 3.33 out of every five students participated in the lectures and 4.44 out of every five students participated in the demonstration sessions.

*The second question* enquired whether the students felt that they had possibilities to contribute to what happened in the course. Most of the students did not think that they would have been able to have a greater impact on the arrangements, although on the other hand, they had no desire for such a thing at the first place. This is not the whole picture though, as during the first lectures all the ones that were present, participated in negotiation about the small details of conducting the course. Some students even noted in later on, that "by being present" you could contribute to the course in different ways. But overall, the demonstration sessions meant an opportunity for the students to express their own thoughts more freely and to discuss not only the theories but also more generally what is happening in the course with the assistants and with other students.

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*"In a way yes, because in the demonstration sessions it was easy to tell your own opinion and lead the teaching situation towards our own goals. The teaching was clearly more interactive than in courses generally."*

Some students also visited the office rooms of the lecturer and the course assistants or sent us e-mails to express their opinions about the arrangements. We interpreted the more frequent contacts by the students as a success in creating an open atmosphere that encourages feedback and reflection.

*In our third question* we wanted to know whether students felt that they had received sufficiently clear guiding and advising about the course practices and other course of actions.

*"The course of actions was clear. The course formed a complete whole: lectures, exams and four exercises. You got sufficient instructions from the website. From the very beginning it was clear how this course would proceed."*

Besides just discussing these matters during the lectures and the demonstration sessions, we decided to write a small "help" about doing the exercises and placed it on our course website. We did so mainly because not all of the participants were attending the lectures and thus, would not have received information otherwise.

Although advice about conducting the exercises was available, we noticed that in future we should concentrate on defining the exercise questions with a more precise manner. All of the four exercises consisted of from 3 to 4 tasks or questions, which the students were expected to answer. The formulation of these tasks and questions seemed to be partly too complicated for the students to understand what was actually wanted in different parts of the exercises.

*"The course of action and general instructions were clear, but the questions in the exercises on the other hand not. In my opinion, the reason for this is the course material, which did not give straight answers to these questions. On the other hand, because of this, the questions in the exercises could have been more guiding."*

Actually, we were a bit skeptical of these opinions, because we do not want to let our students to have a free ride. We did not even want that they could find the answers straight from the lecture materials, but instead, encouraged theoretical thinking.

*The fourth question* was very important to us course assistants as we wanted to know whether getting advice was easy to obtain on our course. We felt that our first priority was to give students as much assistance as they would possibly need to accomplish the rather challenging course. In this matter students were satisfied and feedback was very positive.

During the demonstration sessions students were encouraged to express any possible discontentment with the course. We stressed on this matter, to not let the problems accumulate towards a point where they could hinder someone from completing the course. For example, the lecture material was usually found hard to understand since it was very theoretical and some of the materials, like all the research papers, were in English. In fact, to help the students to prepare to their exams, we as the assistants wrote an abridged presentation of some of the study materials in Finnish where we attempted to clarify some main points and to give concrete examples on the matter. Also the groups formed by the students became working units where you could receive help and support.

*"You got help for exercises from other members of the group. And in the demonstration sessions the teaching assistants gave us pointers if we couldn't remember the right things."*

*The fifth question* explored whether students felt themselves free to participate and discuss in the lectures and in the demonstration sessions. We emphasized that theories can be interpreted from



various perspectives and that there are no 'right' answers, only different kind of approaches to consider. We encouraged students to say their own opinions about the theoretical approaches and of the example cases we had chosen. In the demonstration sessions immediate discussion was our intention as we wanted to create an atmosphere where everyone's comments were welcome. Students' answers to our questionnaire showed that they had experienced the demonstration sessions as very discursive situations.

*"It was easy [to discuss], because we were encouraged to do it all the time. The atmosphere seemed to be "say something" and it was never inflexible. In my opinion, the assistants kept themselves "on our level", and they didn't try to keep an authoritative position in high academic ivory tower - this happens sometimes when experts meet novices."*

Students' answers illustrate well how they had difficulties in separating free discussion of the facts from the exchange of opinions between the students and the assistants.

*"In the demonstration sessions it was very easy to participate in the discussions and the atmosphere was nice and direct. The discussions were the best part of the demonstration sessions, but it felt unnecessary to present our own essays. [...] Now the presentations and the discussions with the opponents felt overlapping, because students agreed on the basic issues and the actual discussion emerged surprisingly often 'from the side' of the issues that we were considering."*

In the sixth question we wanted to know how students experienced their relationships with the teachers, and whether students felt that their relationship with the teachers was unreserved. The lecturer naturally had a more authoritative position, but we the assistants wanted to create a teaching environment where all the students' questions would be answered. Students' answers to the survey pointed out that they internalized spontaneity in our communication.

*"It was easy to approach the teaching staff with questions and otherwise too. So the relationship with teachers was direct."*

*"Yes. One's own opinions were more welcome than the "right" answers."*

The seventh question's concern was whether the students felt it easy to give feedback in our course. Sometimes students seem to think that they have no possibilities to contribute into what happens in courses or that their opinions are not welcome or even desirable. Students might think that the teachers decide one-sidedly the course's content and practices. Of course, this is in a way the case, but nevertheless the students' opinions should be utilized for a greater degree to ensure the satisfaction for all the participants.

*"Giving feedback was very natural during the whole course. The discussion about the exercises and about the issues we had discussed in the lectures was very open in the demonstration sessions, so one had a very good opportunity to give feedback there."*

The last question in our questionnaire was a little bit provocative in its nature. We asked whether the teachers felt like a friend or like an enemy. With this question we wanted to prompt the students to express their own interpretations of the relationship between the teachers and the students.

*"The relationship between the lecturer and student was naturally formal, but in a positive way. The teaching assistants felt more like friends, who were forced to reflect the same things many times more than an individual student. So you could feel compassion for them [the assistants]. Another positive thing was that after a couple of exercises the assistants knew students by their first names. This does not usually happen in these circles. Absolutely no one [of the teachers] felt like an enemy."*

This last question also gave way for the students to express their real feelings and thoughts about the teachers. All the critique that we received about our teaching methods can be used to develop the course in the future.

*"The teachers (in the demonstration sessions) felt friendly, even to the point that students would have hoped more specific analysis about their essays. This current "there are no wrong answers in the Information Systems" -talk has maybe gone too far. Unclear matters are easier to deal with concrete examples and with right and wrong answers."*

Overall, we interpreted the students' feedback as positive. Students expressed success both in the informal questionnaire and in the formal assessing of the course. They found the Implementation course and especially its demonstration sessions very discursive by nature. In the formal course evaluation, the students criticized only the amount of work in such a short period of time. Students felt that producing four essays did not leave enough time for reflecting and analyzing all the theoretical approaches equally. Also students grew tired of the London Ambulance –case. After group-negotiation with the participants, the case was not used after the two first exercises.

## Conclusion

Our main objective in the Implementation course was to encourage the students to take an active part into the learning process. With eXtreme Teaching approach we tried to create an interactive teaching environment to hinder passivity. Comparing the activity during the course in previous years, the atmosphere seemed to be more open and participative.

Through two-way process of interaction, the students became more motivated as they felt that they could really contribute to the course. For students, the active participation meant a challenge and a somewhat larger work load, but it was also rewarding in a sense that their contribution was more respected. For us, the teaching assistants, this meant a break from traditional education methods. Instead, we experimented with much enthusiasm, which demanded some courage but proved to be motivating also for the teachers. For spontaneity's sake we threw ourselves into different teaching situations without considering the possibility of not succeeding. Although we prepared ourselves well on the knowledge side, we didn't want our performance to appear rigid or formal. We allowed laughter, irony, and almost chaotic expressions to get most out of the students.

In the demonstration sessions, we took two roles that differed from situation to situation. We played the parts of a teacher and a coach, the expert and the master of ceremonies, or even the good cop and the bad cop. We acted so from goal driven and test driven motives in teaching: our goal was to succeed with these students and test out a new method of tutoring. Having two tutors was successful in a sense that it provided a possibility to express an exchange of ideas also between the assistants themselves in front of the students. The approach made possible for the other assistant to have a more demanding role and the other a more supportive role. If there would have been only one teaching assistant in the demonstration sessions, the diversity of the roles would have been harder to manage. For the students this provided not only an opportunity to receive better teaching, but also an opportunity to approach either of the teaching assistants – that is, the assistant that was more compatible with a student's own personality. These different roles enlightened our diversity of opinions and perspectives. Diversity does not hinder but broadens the students' viewpoints on theories in Information Systems.

As a summary, we conclude that on the positive side, we were able to keep the students as active participants throughout the course. As a weakness, such teaching method meant that two assistants were needed and there was much work in preparing and evaluating the study sessions.

We pursued toward an open and discursive atmosphere that would support continuous communication and feedback throughout the course. We ourselves have often felt teaching situations to be so formal that the actual learning process as an exchange of knowledge suffers. This can be observed as a lack of attendance during lectures, because no participation is either supported or expected.

One of our goals was also to decrease the biased thinking amongst the students about the supposed gap between theory and real life. Quite often, the students seem to have prejudices that learning different theoretical approaches does not necessarily help them to function in the working life. We prompted the students to consider how different theoretical lenses could help them in various problem situations that they could meet during their working career.

The analysis presented in this paper has its limitations. First, the number of the participants was small, and not all of them answered our evaluative questions. Hence, formal evaluation methods were of no use. Second, we haven't been collecting evaluation material systematically in previous years to do more accurate comparisons. Third, during the course our main objective was to support the students' activities and the idea to write this study paper came only during the last weeks of the course. Despite these limitations, we believe that sharing experiences of successful learning and motivating processes would also contribute to developing educational methods in the field of Information Systems. In future, teaching experiences such as this should be documented in a more systematic and analytical way to gain more insight of different methods in practice.

As teachers we learned that reflective teaching methods can contribute to the actual teaching situations in a sense of making them more discursive and less formal. Using participatory and iterative teaching methods demand that the teachers are well prepared and the course is fully planned. Successful learning experiences aren't achieved only by teachers' efforts, but also by students. Their active participation and interest in the course topics are essential factors for success.

## References

- Andersson, R., & Bendix, L. (2006). Towards a set of eXtreme teaching practices. In Salakoski, T., T. Mäntylä, and M. Laakso (eds.) *Proceeding of Koli Calling 2005*. 5th Koli Calling conference on Computer Science Education, November 17th-20th, 2005, Koli, Finland. TUCS General Publication 41, January 2006, 33-40.
- Beck, K. (1999). *Extreme programming explained- Embrace change*. Boston, MA, USA: Addison-Wesley.
- Ben-Ari, M. (2004). Situated learning in computer science education. *Computer Science Education*, 14(2), 85-100.
- Bruce, K.B. (2005). Controversy on how to teach CS 1: A discussion on the SIGCSE-members mailing list. *inroads – The SIGCSE Bulletin*, 37(2), 111-117.
- Callon, M. (1991). Techno-economic networks and irreversibility. In J. Law (Ed.), *A sociology of monsters: Essays on power, technology and domination* (pp. 132-161). London: Routledge.
- Carbone, A., & Kaasbøll, J.J. (1998). A survey of methods used to evaluate computer science teaching. In *Proceedings of ITiCSE '98*, Dublin, Ireland, 41-45.
- Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13, 319-340.
- DeSanctis, G., & Poole, M.S. (1994). Capturing the complexity in advanced technology use: Adaptive Structuration Theory. *Organization Science*, 5(2), 121-147.
- DiMaggio, P.J., & Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(April), 147-160.

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- Giddens, A. (1984). *The constitution of society*. Cambridge: Polity Press.
- Hedin, G., Bendix, L., & Magnusson, B. (2005). Teaching extreme programming to large groups of students. *Journal of Systems and Software*, 74(2), 133-146.
- Hougham, M. (1996). London Ambulance Service computer-aided despatch system. *International Journal of Project Management*, 14(2), 103-110.
- Jones, J.S. (1987). Participatory teaching methods in computer science. *AMC SIGCSE Bulletin*, 19(1), 155-160.
- Karsten, H. (2006). *Implementation of information systems in organizational context*. Lectures, Department of Information Technology, University of Turku.
- Latour, B. (1987). *Science in action*. Cambridge, MA, USA: Harvard University Press.
- Law, J. (1991). Introduction: Monsters, machines and sociotechnical relations. In J. Law (Ed.), *A sociology of monsters: Essays on power, technology and domination* (pp. 1-23). London: Routledge.
- McGuffee, J.W. (2004). Drama in the computer science classroom. *Journal of Computing Sciences in Colleges*, 19(4), 292-298.
- Oliver, D., Dobeles, T., Greber, M., & Roberts, T. (2004). Comparing course assessments: When lower is higher and higher, lower. *Computer Science Education*, 14(4), 321-341.
- Orlikowski, W.J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science*, 3(3), 398-427.
- Rogers, E.M. (1995). *Diffusion of innovations*. New York: The Free Press.
- Scharff, C., & Brown, H. (2004). Thinking through computing: The power of learning communities. *Computer Science Education*, 14(4), 297-320.
- Tourunen, E. (1992). Educating reflective system designers by using the experiential learning model. *IFIP WG3.4 Professional development of IT professionals*. Singapore, July 13-17.
- Wenger, E. (1998). *Communities of practice, learning, meaning, and identity*. Cambridge: Cambridge University Press.

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