Enthusiasm or Skepticism? What Students Think about E-Learning

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Abstract: It is essential for the efficient implementation of e-learning that students have positive attitudes about this new approach. Existing literature indicates that students' attitudes about e-learning are mixed. To support the implementation of the e-learning platform TUWEL at Vienna University of Technology, we conducted a study using semi-structured questionnaires with open-ended questions. Students enjoy the flexibility e-learning offers, but some of them do not want to miss the personal contacts to other students traditional lectures offer. Students are also skeptical about electronic learning material. This might be due to the lack of quality of these materials which was also mentioned in the present study. Informal learning, supported electronically, seems to form an important part of students' learning activities and should be investigated in more detail.

1. Introduction

The use of e-learning systems plays an increasing role in university education. Students' attitudes concerning e-learning is a fundamental issue in this process because success or failure of the implementation of e-learning systems also depends on the adoption of such systems by students. Students are often enthusiastic and motivated by the new technical features of e-learning systems, but sometimes problems (often technical in nature) arise. These problems have to be understood and solved to ensure that e-learning systems become successful. Collis and Moonen (2002), for example, argue that students are not intrinsically motivated by the use of educational technology. When this technology is not integrated into the course-work, they will soon lose interest. As a consequence, the use of this technology will become less effective than traditional forms of teaching. More detailed information about students' attitudes concerning e-learning is, therefore, necessary. In recent years, this topic has attracted interest of researchers in that area, and several studies have been published.

At the Vienna University of Technology, there is ongoing research concerning this problem. In a previous study, we investigated this issue using focus groups (Pohl et al 2007). This study indicated that students' attitudes to e-learning are mixed. Some students enjoy it, but others complain about the lack of personal contact. Some features of e-learning seem to be quite attractive, others are not appreciated by the students. It also seems to be necessary to distinguish between formal and informal learning. Some e-learning features are only used by autonomous groups of students without supervision by university teachers. A very successful forum for computer science students has, for example, been founded several years ago where students exchange information about lectures and help each other. Investigating such informal forms of learning (for a discussion of this term see e.g. Livingston 2001) also seems to be a promising new area of research.

Using focus groups as a research methodology has many advantages, but also disadvantages. On the one hand, it is possible to discover controversial issues or topics not considered previously. On the other hand, many participants do not take part in the discussion intensively, and some participants may dominate the discussion. Therefore, we decided to also use the method of semi-standardized questionnaires to find out whether our results were valid. Questionnaires can give a more comprehensive overview of the attitudes in a target group because everybody's opinion is analyzed. Open-ended questions also have the advantage that they convey very detailed information about the issue which is investigated, although the analysis is very time-consuming. The results of this study are then compared to the results of the focus group study. Concannon et al (2005) also successfully combined focus groups and questionnaires. In the following, we will describe the results of a second study about the attitudes of students concerning e-learning based on questionnaires.

2. TUWEL

Vienna University of Technology is a university dedicated to teaching full-time students in a traditional face-to-face fashion. Nevertheless, providing e-learning facilities can enhance such a model of learning considerably. Some of the studies at our universities, e.g., attract a large number of students (especially computer science and architecture). Teaching large classes for these studies can be improved by using e-learning facilities. Until 2005, e-learning was provided individually by teachers. Those systems were very heterogeneous, and students had to adapt to every new system. In 2004, Vienna University of Technology founded an E-Learning Centre to overcome the problems associated with the uncoordinated attempts to introducing e-learning. The goals of this center are to:

- implement support services to teachers,
- provide easy-to-use e-learning tools to all teachers,
- network among the e-learning pioneers and other teachers,
- increase the number of lectures applying e-learning,
- develop a platform able to integrate the existing pioneering e-learning systems.

A project financed by the Austrian Ministry for Education and Science (Delta 3) provided funding for the development of an integrative platform for the whole university. This platform has to fulfill the following criteria:

- open source
- modular structure
- potential to interact with existing e-learning and administrative systems
- availability for communication
- usability

Based on these criteria, the open source platform Moodle was chosen and adapted to the universities' requirements. The system is now called TUWEL (see Fig. 1)

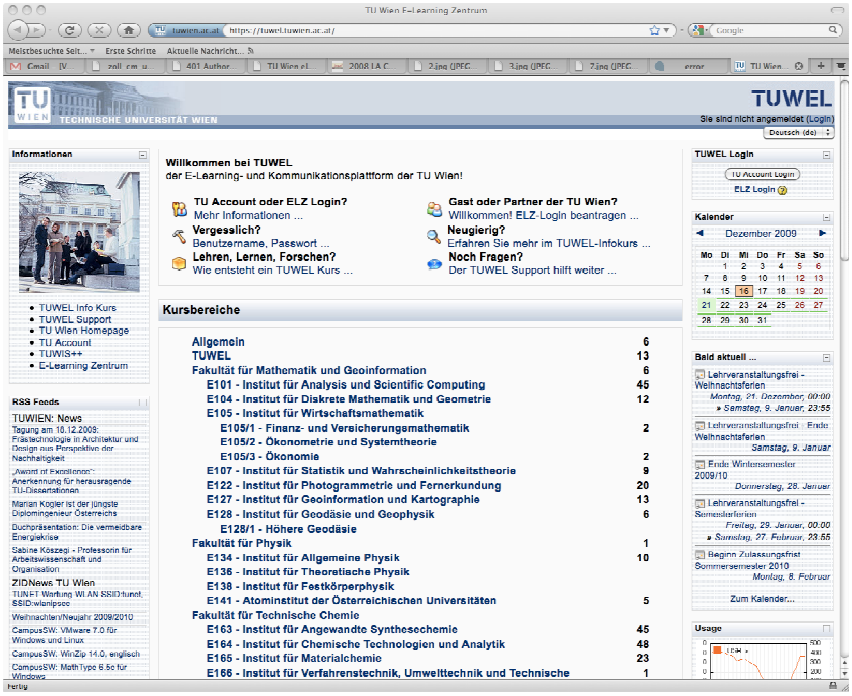

Fig. 1: Entrance screen of TUWEL

TUWEL has been fairly successful and is increasingly used by teachers and students. Students' attitudes to e-learning are predominantly based on their experience with TUWEL, although they still use other systems especially in informal learning.

3. Related Work

The question of students' attitudes to e-learning attracted more attention in the last few years than it did before. It must be pointed out, however, that the results are not entirely consistent, although some common characteristics can be detected. It is especially noteworthy that the learner experiences are in many cases different from those made by university staff, and that there are, furthermore, marked individual differences between students (Sharpe et al 2006). Therefore, generalizations across students are difficult. Detailed research in this area is necessary.

Hara and Kling (2000) investigated how students experienced e-learning in universities. They conducted a case-study to get detailed information about this topic. They emphasize the fact that technical difficulties and problems because of the lack of rules for communication distress students engaging in online learning. This study is relatively old, and it might be argued that some of the problems have been overcome by technological development. On the other hand, innovative technology (e.g. mobile technology, Web 2.0 etc.) is continuously introduced at universities. Therefore, it can be assumed that some of the problems Hara and Kling point out still persist.

Sharpe et al (2006) conducted a comprehensive study about blended learning in the UK. The authors argue that students' attitudes to e-learning are mainly positive. Nevertheless, there are significant individual differences. In general, frequent usage of online resources can be observed. One of the issues in e-learning seems to be that students get flexible access from home and from the campus. Students can study at their own pace and use their time more effectively. This seems to be one of the most important advantages of e-learning for university students. Another advantage is that students can access course notes whenever they want to. Electronic communication is an essential part of e-learning. In principle, students are excited by this form of communication. Nevertheless, they do not want e-learning to replace face-to-face communication. They see e-learning and face-to-face teaching as complementary and both valuable. Despite this positive attitude students tend to refrain from using electronic communication. Even when electronic communication is well integrated into a course, participation is still a problem. Another issue is online assessment and feedback. Online feedback seems to be very important and encouraging for students. Concerning online assessment there still seem to be some open questions. Individual differences may relate to nationality, gender, disabilities, learning style or other factors. These differences have to be taken into account although some of them seem to be more important than others.

The JISC conference proceedings (Minshull & Mole 2006) presents several different investigations to learners' experiences with e-learning, among others the LEX study. This study is based on a qualitative approach (interviews plus artefacts such as learning diaries etc.). The target group is not only university students but also participants of continuing education courses and others. In this study differences between novices and immersive learners were found. Experienced e-learners were generally positive about e-learning whereas novice learners often lack confidence. Important aspects which influence students' attitudes to e-learning are, e.g., possibility of distraction (which might be bigger at home) or the opportunity to work individually at one's own pace. Some students mentioned that computer-based assessments were a big advantage for them. Some students use communication software other than that provided by the e-learning platform. This might be a problem in some cases.

Concannon et al (2005) investigate students attending courses on 'Principles of Accounting'. They conclude that there is no straightforward answer to the question of the students' acceptance of using ICT. The students in their study did not have any technical problems with the system used, but had difficulties locating some resources offered by the teachers. They still prefer traditional lectures to e-learning, but use materials offered electronically quite extensively as a secondary source. There are several factors influencing the extent to which students use e-learning – e.g., encouragement through peers, teachers and tutors, an appropriate reward structure for students and the instructional design of the material. The authors mention an important aspect of e-learning – that is, the possibility to encourage students to learn continuously throughout the whole semester based on repeated online tests. This approach would not have been possible without ICT. In this study, questionnaires and focus groups are used in conjunction and seen as complementing each other.

There are other studies which emphasize some important advantages and disadvantages of e-learning. Tait (1998) describes a study in which the replacement of face-to-face lectures by rather comprehensive written material with pictures and videos presented on the computer is analyzed. In principle, the attitude to e-learning in this form was fairly positive. Students mentioned one important advantage of e-learning, that is 'learning at one's own rate'. A considerable minority also stated that they felt the lack of communication with other people (lecturers, other students) negative. Baker et al (2003) investigated almost 300 higher education institutions in the USA. In this study students as well as faculty were interviewed. An important result was that the members of the target group think that personal communication is still more effective than Computer-Mediated Communication. Another result is that faculty and students' attitudes about e-learning depend on the amount of support they get from their institutions. Keller and Cernerud (2002) also point out that support from the institution is a vital factor in the implementation of e-learning. They compare two faculties of their university – engineering and health sciences. One would assume that the engineering students would have more positive attitudes concerning e-learning, but the opposite is the case. This is due to the fact that the faculty of health sciences has a clear and formal strategie for the usage of e-learning, whereas the e-learning in the engineering faculty is neither organized nor systematic.

The concept of informal learning has attracted increasing attention in the past years. It is a very complex phenomenon encompassing very different activities. An important characteristic is that it is unofficial and unscheduled. Livingstone (2001) distinguishes between two dimensions: primary agency (learner, teacher) and knowledge structure (pre-established, situational). There are four relevant scenarios resulting from these dimensions:
- traditional education by a teacher with a pre-defined curriculum,
- self-directed learning with a pre-established curriculum,
- spontaneous teacher directed education (e.g. the unintentional conveyance of values of a profession to the students)
- self-directed learning without a pre-established curriculum.

Often, only the last form of learning where no influence of a teacher can be observed would be understood as informal learning. In contrast to that, Livingstone posits that self-directed learning with a pre-defined curriculum can also be called informal learning.

Informal learning is a very complex concept and in many cases difficult to investigate. There is still very little systematic information about the pedagogical principles underlying this phenomenon, especially the tacit and unintentional forms.

4. Description of the Study

The following study is based on similar work done with focus groups (Pohl et al 2007). For the focus groups we used a discussion guide based on an analysis of the literature described above and of literature about the design of e-learning systems (see e.g. Clark & Mayer 2003). Main questions were:

- What are the biggest advantages and disadvantages of e-learning?
- Do you prefer to work in a face-to-face group or in a virtual group? What are the advantages/disadvantages of these forms of cooperation?
- Which electronic media do you use for e-learning?
- Do you prefer an open learning approach or the strict discipline of pre-arranged courses?
- Do you prefer traditional textbooks or interactive, electronic systems?
- What role does the instructional design of electronic learning material play?
- Do you prefer virtual tests or traditional tests?
- Do you engage in informal learning with other students to a large extent?

We used these guidelines for the semi-structured interviews as well (for a description of semi-structured interviews see e.g. Przyborski & Wohlrab-Sahr 2008). Students gave their answers in written form. They filled in a questionnaire with 13 open-ended questions. The answers to all the questions were approximately half a page in length. Their answers were then intepreted according to the the questions in the guideline and a few other characteristics which came up during the interpretation process. The results are partly quantitative and partly qualitative. In this study, 45 students of computer science participated. Because questions were open-ended and students were not constrained to answer them in a pre-defined manner, there are less than 45 answers for some of the

variables described below. In general, the students' answers were elaborate and well argued. The study was conducted in the winter semester 2007/2008. The subjects of the investigation were undergraduate students of computer science. They all took part in a lecture called "Networked Learning". Most of these students are experts in using computers and have no negative attitudes about computers. All the students had some basic experience in using e-learning platforms.

5. Results

A more detailed description of the results of the following study can be found in Wieser (2008).

5.1. Advantages and disadvantages of e-learning

Students mentioned a large variety of advantages, the most important of which are independence of time (24 respondents) and place (15 respondents) and learning at one's own pace (12 respondents). This agrees with the results found in the literature described above. Other advantages are interactivity of the medium, barrier free access to learning material and improved communication with teachers and other students.

The students mentioned lack of quality of the software as the most important disdvantage of e-learning (18 respondents). This is probably partly due to the fact that e-learning is relatively new for many teachers. In addition, the development of sophisticated e-learning material is quite time-consuming. Therefore, the systems tend to be quite conventional. One of the students wrote:

"Many e-learning systems do not deserve this name because they do not have anything in common with e-learning apart from the 'e' – that means electronic. Lecture notes with some pictures, distributed among several HTML pages, is not an e-learning system for me, but it is often described as one." (translation MP)

Another disadvantage which was mentioned comparatively often (12 respondents) was lack of personal contact, especially to other students. Students argue that electronic communication cannot replace personal contact. Several other disadvantages were mentioned only by a few students (6 and less) as, e.g., the need to read long texts on the screen, lack of bandwidth, bad administration by professors etc. Lack of personal contact is a disadvantage which is also mentioned often in the literature.

Despite the advantages of e-learning, students still prefer traditional lectures (19 respondents) to electronic forms of teaching (16 respondents). 5 students wanted a mixture of both forms of teaching and learning. There are several advantages of traditional lectures. It is possible to ask questions during or after the lecture and the contents of the course is explained in more detail. The regular schedule of lectures provides more structure for the learning process, whereas in e-learning a strong motivation is necessary.

5.2. Social interaction and communication

When asked for the preferences concerning the form of communication, most students favor a mixture of electronic and face-to-face communication (24 respondents). 15 prefer personal communication and only 6 prefer electronic communication.The biggest advantage of face-to-face communication is that the social aspects of communication play a more important role than in electronic communication (25 respondents). One student remarked:

"For me, personal contact is very important, especially in the beginning. In this way, I can assess other students' character more easily and I can get to understand them better." (translation MP)

Face-to-face meetings also make the organization in workgroups easier. Brainstorming (19 respondents) and the allocation of tasks (15 respondents) are more efficient in face-to-face meetings. Face-to-face meetings also increase the motivation of the participating students (12 respondents).

Electronic communication is seen as more efficient (21 respondents). There are no problems in arranging appointments (15 respondents). Communication is faster (15 respondents) and independent of time (13 respondents) and place (12 respondents).

5.3. Media

When learning, students predominantly use the World Wide Web (16 respondents), Wikipedia (13 respondents), pdf-files (12 respondents), email (11 respondents) and videos (11 respondents). Although they use the internet quite a lot, they still prefer traditional lecture notes or textbooks to electronic media (see Fig 2.). In their view, the advantage of traditional media is the possibility for annotations and underlining/marking of text (25 respondents), their mobility/portability (21 respondents) and the fact that they are easier to read (19 respondents). The advantages of electronic media are the interactivity (19 respondents), links (17 respondents) and possibilities for search (13 respondents). The introduction of powerful and reliable e-books might change this attitude.

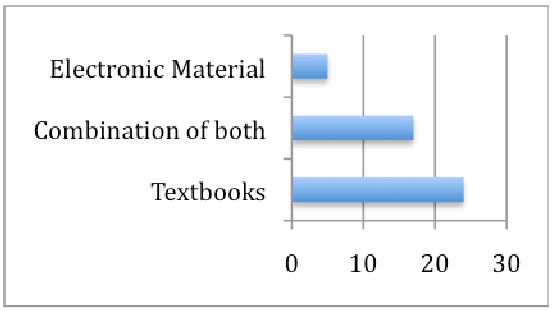

Fig. 2: Textbooks/lecture notes vs. electronic material (the x-axis shows the number of students who prefer certain media)

5.4. Informal learning

Computer science students apparently often learn with and from other students (31 often, 8 seldom, 5 never). The advantages of informal learning the students mention are predominantly that the explanations of other students are better than those of the teachers (13 respondents) and that inconsistencies can be resolved more easily (12 respondents). One student comments:

"A student acting as a teacher often has a better understanding why another student does not comprehend something and where the problems might lie than a professor who teaches the same course for years and years." (translation MP)

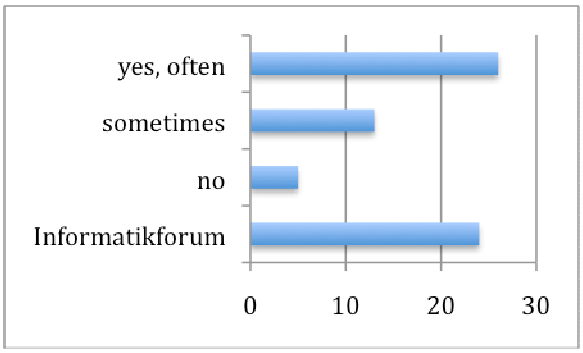

Fig. 3: Participation in learning groups and Informatikforum (the x-axis shows the number of students and their attitude towards learning in groups)

Students often learn in groups (see Fig. 3). There are only very few students who deny that they learn in groups (5 respondents). Many students participate in the Informatikforum which is a forum founded by students for students. In this forum they advise each other on the quality of lectures and give each other advice about what to learn for tests.

5.5. Assessment

Online tests do not seem to be very attractive. Most students have a negative opinion about such tests (29 respondents), a few are neutral (6 respondents), and only very few have a positive opinion (3 respondents). The most important disadvantage seems to be the possibility for cheating (31 respondents). The only advantage students see in electronic assessment is that they get the results quickly. These results differ slightly from the results gained by focus groups (Pohl et al 2007). In the focus groups, students argued that in online assessments teachers only see the results of a computation, not the way how a student achieved a result (at least that was their personal experience with online assessment). Therefore, they are against online assessment.

6. Conclusions

The aim of this study was to inform the implementation process of the e-learning platform of the Vienna University of Technology and, thereby, make design decisions easier and more efficient. It should be pointed out, however, that the results from this study are only valid for computer science students. It can be assumed that students from other faculties will react differently. In the future, we will also investigate these students to be better able to compare results.

In general, students seem to be motivated by e-learning, but there are still several problems. Some of the problems are also described in the literature, especially the problem that some students feel that they lose personal contacts to other students when they engage in e-learning intensively. Students tend to see the greatest advantage in e-learning in the flexibility it offers. They are very sceptical about online assessment. All this is also consistent with the literature. These are also opinions which were mentioned in the focus group study (Pohl et al 2007).

An interesting result was that students tend to favor traditional forms of teaching and learning. They prefer lectures and traditional media like textbooks and lecture notes. It is an open question whether this is due to the novelty and the experimental character of e-learning or whether these attitudes will persist. Students' critical attitudes concerning electronic learning material indicates that these views might change in the future when teachers and developers of e-learning platforms have more experience with these systems. Further studies investigating these issues would be interesting. The investigation also indicated that informal learning plays an important part in student learning and can be assisted by e-learning. In the focus group study (Pohl et al 2007) students mentioned that they cooperated using, e.g., Google Docs or Skype.

Students' attitudes about e-learning seem to be a relevant and complex topic. We intend to conduct further studies along the lines mentioned above (students from other faculties; replication of the study in a few years to find out whether the preference for traditional media persists). We also intend to investigate informal learning in greater detail, especially whether informal learning can be supported by teachers.

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