

Students' Attitudes Towards Novel Interfaces in E-Learning

Margit Pohl¹, Ilona Herbst², Franz Reichl², and Sylvia Wiltner¹

¹ Institute of Design and Assessment of Technology, Vienna University of Technology,
Favoritenstr. 9/E187, A-1040 Wien, Austria

{margit, sylvia}@igw.tuwien.ac.at

² E-Learning Centre, Vienna University of Technology, Gusshausstr. 28/E0152,
A-1040 Wien, Austria

{reichl, herbst}@elearning.tuwien.ac.at

Abstract. There is still very little research about students' attitudes about e-learning. Such information seems to be necessary for a successful implementation of e-learning. Current research indicates that main advantages of e-learning are its flexibility and the provision of online learning material. A major drawback, as perceived by the students, is the lack of personal relationships. We conducted two focus groups to clarify these issues (N=54). The study supported the results from the literature. In addition, we found a few controversial issues as, e.g., preference for lectures/textbooks and tight schedules vs. preference for online learning and few deadlines. Another controversial issue was electronic assessment.

Keywords: students' attitudes, learner-centered design, academic teaching, university didactics.

1 Introduction

E-learning at universities becomes increasingly important. Nevertheless, it is sometimes not clear whether learners appreciate these novel forms of learning. Baker et al [1] and Sharpe et al [2] point out that there is still too little research about the attitudes of faculty and students about e-learning systems. Students are often enthusiastic and motivated by the new technical features of e-learning systems, but sometimes problems arise. When these problems are not fully understood and e-learning systems are introduced despite students' negative attitudes difficulties might come up. Collis and Moonen [3], 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 about e-learning seems to be necessary. The following text describes an investigation which was conducted at the Vienna University of Technology in autumn 2006 in the course of the Delta 3 project. This investigation tried to identify major issues concerning the introduction of e-learning systems at the university. The method used for this investigation were focus groups. Major results from a literature review could be confirmed, and other important issues were raised in the focus groups.

2 E-Learning at Vienna University of Technology

Until 2005, e-learning at the Vienna University of Technology was provided on an experimental basis by projects initiated and carried out by a limited number of individual teachers. What was lacking was an institutional strategy for the university.

When the new university law which provided additional autonomy to the Austrian universities came into effect in 2004, the Vienna University of Technology founded an E-Learning Centre 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,

However, funding for this E-Learning Centre was limited. Such funding became available through the Delta 3 project (<http://www.delta3.at/>). With the Delta 3 project, 3 partner universities (Vienna University of Technology; University of Natural Resources and Applied Life Sciences, Vienna; Academy of Fine Arts, Vienna) focus their e-learning and e-teaching strategies on 3 target groups (teachers, learners in initial & continuing education, general public) through progress and synergies in 3 areas of competence (didactics, technology, design & usability). Internal and inter-university co-operation as well as trans-disciplinarity generate "public awareness of the science and arts" through relations between the corners of the 3 "e-learning triangles" as mentioned above. The project partners aim at a significant increase in the proportion of online-lectures, thus increasing the quality of the curricula by intensifying the learning process and by applying innovative didactic strategies for teaching complex content – with the objective of enabling otherwise disadvantaged groups of students to participate in courses. Gender mainstreaming as part of quality assurance ensures that e-learning will not discriminate against women or men.

Vienna University of Technology does not intend to replace face-to-face teaching entirely by e-learning, but it aims at enhancing the majority of lectures by electronic means. This takes place in the form of blended learning.

As mentioned above, one of the main goals of the Delta 3 project is the development of an integrative platform for the whole university. This platform had to fulfil the following criteria:

- open source,
- modular structure,
- potential to interact with existing e-learning and administrative systems,
- availability of tools 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).

At the Vienna University of Technology there also exists an electronic system for administrative purposes (TUWIS). In contrast to this system, TUWEL offers the

The screenshot displays the TUWEL (TUWEL - TU Wien University Learning Environment) interface. At the top, it shows the user is logged in as Andreas Hruska. The interface is divided into several sections:

- Main Menu:** Includes links for TUWEL Nachrichten, Allgemeines öffentliches TUWEL Forum, and a search bar for forums.
- Administration:** Contains a link to Courses.
- TUWEL Toolbox:** Offers options to add a new course or link to TUWIS++.
- TUWEL Overview:** Features a bar chart showing connections over the last 30 days, with a total of 324 connections today. Below the chart are statistics for Users (Total: 11026, Active students: 8275, Active teachers: 386) and Courses (Total: 187).
- My courses:** Lists several courses:
 - LQM - Lern Qualitäts Management WS2006/2007:** LQM Lern Qualitäts Management WS2006/2007, coordinated by Andreas Hruska.
 - 188.211 Softwarequalitätssicherung (VU 2,0):** Vorbesprechung: 5.10.2006 17.00-18:00 im Informatikhorsaal (Treitlstrasse). Details include registration information and contact address (QSVU-Admin).
 - 188.366 Internet Security (VU 2.0):** Internet Security Please register in TUWIS++ for the (only) group. After some days (manual intervention from teacher), you can then access this course. Teacher: Edgar Weippl.
 - 265.066 Daten- und Informatikrecht (VU, 2.0):** Lehrveranstaltungsleiter: Markus Haslinger. Guter Geist: Michael Tesar, Klemens Wessely.
- Course categories:** A table showing counts for Allgemein (11), E-Learning (2), and TUWEL (7).
- learning zentrum:** A logo and text asking for questions and support.
- Calendar:** A calendar for January 2007 with a grid showing dates and some highlighted cells.
- Online Users:** A list of users who have been online in the last 5 minutes, including names like Andreas Hruska and others.

Fig. 1. TUWEL

possibility to upload complex material for lectures, to conduct tests, to develop WIKIs and to implement various forms of electronic communication (chat, forum, Weblogs etc.).

TUWEL conforms to the Vienna University of Technology’s corporate design, and it offers an interface to existing administrative software systems at the university. In spring/summer 2006 a usability study was conducted which identified problems in the following areas: inconsistent location of buttons and inconsistent use of wording and terminology. During the second half of 2006, TUWEL was redesigned to remove the most serious of these problems. Several features have been implemented into TUWEL to enable activities required by teachers of Vienna University of Technology, e.g. group submissions of practical exercises and specific formats of tests.

TUWEL has been fairly successful and is increasingly used by teachers at Vienna University of Technology (see Fig. 2). This figure shows that the number of lectures TUWEL was used for was about 50 in the summer semester of 2006 and about 160 in the winter term of the same year.

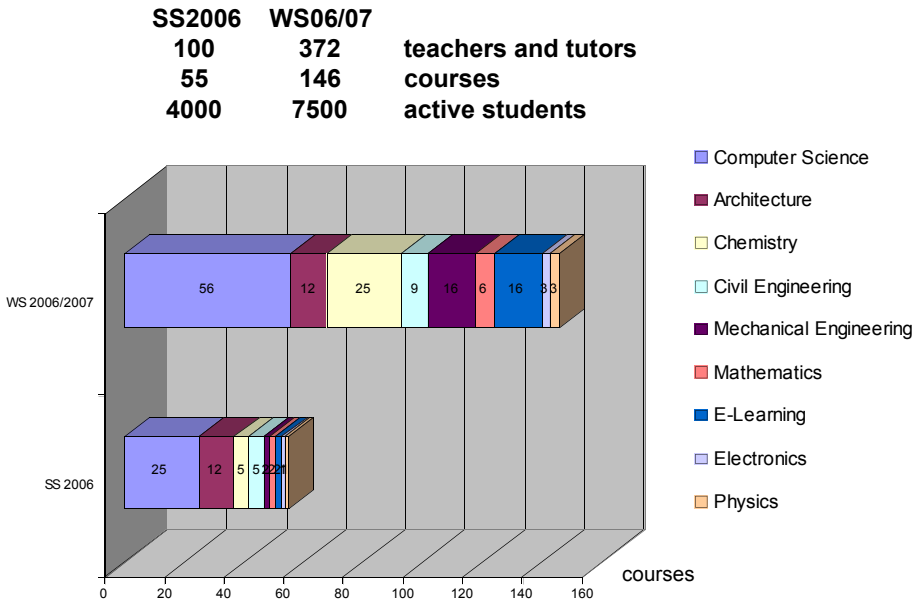


Fig. 2. Pattern of usage of TUWEL

3 Overview of the Literature

As mentioned above, there is still fairly little research about students' attitudes concerning e-learning. This is all the more surprising as many researchers in the area of e-learning adopt a learner-centered approach ([4], [5]). 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 individual students [2]. In addition, there is some indication that e-learning systems are not always used as intended by the designers and that learners often develop workarounds when they are not content with an e-learning system [6]. Therefore, it seems plausible to assume that speculation about students' attitudes and behavior will be problematic, and generalizations across students difficult. Detailed research in this area is necessary.

Although there is still too little research in this area, progress has been made in recent years. The study by Sharpe et al [2] is especially interesting in this context. The aim of this study was to get a comprehensive overview of experiences about blended learning in the UK. To reach this goal, the authors conducted, on the one hand, a literature search, and, on the other hand, an empirical study based on interviews in several universities. The authors state that student response to e-learning is mainly positive. Nevertheless, they find significant individual differences. In general, frequent usage of online resources can be observed. This conforms to our experience with TUWEL which shows that students also work during the night and on weekends.

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 significant advantage seems to be that students can access course notes at their convenience. In the literature study, the authors found that this is seen as more beneficial than online discussions and quizzes. It must be mentioned, however, that this raises the question of whether the availability of lecture notes and additional material does not have an unfavorable impact on attendance in lectures. The authors state that the reasons for attendance or absence in lectures is probably more complex and cannot only be explained by the availability of lecture notes.

Electronic communication is an essential part of e-learning. In principle, students are thrilled 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. The use of electronic communication as such seems to be quite difficult because often students cannot be engaged to participate. 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 [6] presents several different approaches to learners' experiences, 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 (e.g. MySpace or MSN messenger). This might be a problem in some cases.

Tait [7] describes an older study in which the replacement of face-to-face lectures by rather comprehensive written material with pictures and videos presented on the computer is analysed. In principle, the attitude to e-learning in this form is fairly positive. Students mentioned one important advantage of e-learning, that is 'learning at one's own rate'. This is related to a second, less important advantage: 'fit it into your timetable'. On the other hand, no single drawback was identified by a majority of the students. Some students mentioned that e-learning was boring which might be related to reading a large amount of text on the screen. A considerable minority also stated that they felt the lack of communication with other people (lecturers, other students) negative.

Baker et al [1] report the highlights of a comprehensive study of almost 300 higher education institutions in the USA. In this study students as well as faculty were interviewed. An important result was that the target group thinks that old-fashioned personal communication is still more effective than advanced technology. The authors of the

study argue that this might change with the implementation of more tools for electronic communication. Another result is that faculty and students' attitudes about e-learning highly depend on the amount of support they get from their institutions. For e-learning to work smoothly, regular communication between students and teachers is necessary.

Mason [8] describes an investigation made at the British Open University. She also reports general enthusiasm, but she also points out that there are several drawbacks. Paradoxically, she states that new media make learning less flexible. When learning with the materials offered by the Open University students have to use several different media in a prescribed way (tape, programming environment, conferencing system etc.). This sometimes makes it difficult for students to fit learning into their time-schedules. Another drawback is that learning communities are welcomed by a certain group of learners but refused by others (especially those with a very tight schedule who do not benefit from extended communication with peers). In addition, students tend to resist the substitution of face-to-face meetings by computer conferencing.

A report by the Learning Technology Support Service [9] of the University of Bristol relates several results concerning students' attitudes about e-learning. Again, students generally find e-learning positive, but are sceptical about aspects they had not experienced before. The most important features of e-learning are the Web (to look for supplementary resources), distribution of learning materials via the Internet and getting administrative information. Key benefits are more practice, learning at one's own pace and greater access to information, main concerns are the potential reduction of face-to-face contact and that learning might become more mechanical.

Motschnig-Pitrik [10] and Motschnig-Pitrik and Holzinger [11] experimented with new pedagogical approaches combined with e-learning. She reports that the students' motivation was very high, and that they felt they had had a very intensive learning experience in contrast to the rather superficial learning in traditional lectures.

The research described above indicates that students value the flexibility of e-learning as one of its major advantages. The lack of face-to-face communication is sometimes mentioned as a problem. Innovative forms of e-learning are seldom used and not always appreciated although if designed well are seen as advantageous. Electronic communication is sometimes seen as a problem although, if designed well, this also can be one of the major advantages.

4 Description of the Study

Students are one of the target groups of the Delta 3 project. Their positive attitude to e-learning is an essential condition for the success of this form of learning. Therefore, we decided to conduct a study to get more detailed information about this topic. As a method of investigation we used focus groups [4]. There are several reasons for this decision. One is that because of the lack of very systematic previous research a more open approach seemed to be advisable. In this way, we also wanted to get information about topics which were not anticipated. Based on the available literature and personal discussions with students, we also assumed that there are several controversial questions concerning e-learning (e.g. attendance at lectures, usage of electronic communication, electronic assessment). We thought it advisable to discuss these questions in groups to

get more pronounced opinions. In addition, focus groups are a possibility to get a broad range of opinions and a good overview of a topic in a relatively short time. For a study aimed at getting first basic information about an area of interest focus groups, therefore, seemed to be advantageous. The only problem was that the groups as such were fairly large (approx. 30 persons per group). At first, we thought that this might cause serious difficulties but in the end we realized that the group size was manageable.

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. It can also be assumed that a majority of students is interested in the topic of e-learning. All the students had some basic experience in using e-learning platforms as there is a fairly complex electronic administrative system used by the Vienna University of Technology (TUWIS). This system enables teachers to give information about lectures to students, to load up lecture notes, to mark assignments and to send messages to students. Students can register for lectures or tests in this system and they can take part in electronic discussions. Some of the students also had experience with TUWEL (which is connected to TUWIS but offers a broader range of features). Before the focus groups students got an introduction into this methodology and some information about the topics to be discussed. There were two focus groups. The total number of subjects was 54 (focus group 1 29, focus group 2 25). The single focus groups lasted about 90 minutes. One of the co-authors acted as moderator for the focus groups, the other three wrote protocols.

The focus groups were moderated according to a discussion guide. This guide was partly based on the literature described above and partly on literature about the design of e-learning systems ([12], [13], [14]). The topics of this guide were:

1. the students' opinion about the main problems and the main advantages of e-learning systems,
2. electronic communication and lack of face-to-face contact,
3. motivation (how to motivate students when learning is more open and flexible),
4. the design of learning material and lecture notes (use of pictures and videos, use of practical examples, hypertext, etc.),
5. goals of studying (personal development vs. preparation for a specific job)
6. electronic assessment,

The first question had to be answered by everyone. As expected, the students also discussed the other questions when they answered the first question (e.g., they said that one of the major disadvantages of e-learning was the lack of face-to-face communication). The other questions were answered in a free discussion. In the free discussion, about half of the students in both focus groups took part. The discussions were very lively, and the students were specifically asked to make critical remarks and not to hesitate to utter their personal opinions.

5 Results

A study based on focus groups cannot give representative results but only a first glimpse of relevant problems. Nevertheless, we did notice that some of the issues were mentioned

again and again. Greater flexibility of e-learning as an advantage was mentioned very often, and the lack of personal communication with other students or teachers was a very common argument against e-learning. This conforms to the results in the literature described above. In addition, a great variety of advantages and disadvantages of e-learning were discussed. The possibility to download lecture notes was mentioned fairly often. Some students also said that e-learning enabled them to access more information. It must be mentioned, however, that a few students found face-to-face lectures better. Some students remarked that taking notes in lectures forced them to think about the material presented there. Students also were aware of the problem that downloadable lecture notes motivated them less to go to lectures which might be a problem. Several students found e-learning platforms confusing. A problem which was also mentioned was that most teachers only used the Internet for uploading traditional lecture notes. They did not use it for innovative e-learning programs with interactive features. Some students also remarked that interactive examples would be very valuable to get more practice. Students also wanted more communication with other students or teachers. A problem mentioned by some students was privacy. They felt more observed by lecturers. TUWEL, in principle, allows lecturers to get information about usage patterns of students, although right now only aggregate data is provided to lecturers.

Electronic communication is very attractive for the students who took part in the study, but they use it only selectively. As mentioned above, personal contact is, in some situations, still important for them. To develop friendships or to coordinate complex group work, students still prefer to meet personally. One student mentioned that it is difficult to represent complex issues in the Internet. This is still easier with a pen and a piece of paper. Students also pointed out that too many participants make communication difficult. On the other hand, they do exchange a lot of information via Skype or instant messaging, for example, before tests. This information is apparently not so complex and related to the test for which they have to learn. One student also mentioned that in an electronic forum people only post answers when they are 100% sure. This is different in face-to-face communication.

Motivation was also a relevant issue. This issue was very controversial. Some of the students argued that they need the time schedule offered by regular lectures to remain motivated. Other students argued against that. They think that they are disciplined enough and do not need lectures. Some students suggested that in e-learning, deadlines for the submission of assignments are possible. In this way, motivation might not be such a problem. One student remarked that such deadlines are in conflict with the flexibility of e-learning (seen by many students as an advantage).

The design of learning material was not such an important issue. In this context, students predominantly discussed the problem that it is only possible to access information from lectures for which one is registered (This is also due to copyright reasons). This is contrary to the intentions of the Internet and completely different to the huge network of information offered by the World Wide Web.

There was also a controversy about online assessment. Students were rather critical. They think that online assessment might be viable for multiple choice tests or mathematics tests. Some students mentioned that they are nervous during tests which makes

typing difficult. They argued that automatic assessment makes typing errors problematic whereas lecturers might be more tolerant of such mistakes.

The topic 'goals of studying' was not discussed in both focus groups because of time restrictions.

6 Conclusion

Literature indicates that there is still too little research about students' attitudes about e-learning. The study described in this text tries to give a first overview about this topic. The aim of this study is to inform the implementation process of the e-learning platform of the Vienna University of Technology and, thereby, make design decision easier and more efficient. The study is not representative for all students at this university. It must be mentioned, however, that Computer Science students, who formed the sample in this study, make up a high percentage of students at our university.

Some of the results conform to what can be learned from the literature. Students think that main advantages of e-learning are an increase in flexibility and the possibility to access relevant information. An important disadvantage is the perceived loss of personal communication. Apart from that, students have differentiated views about e-learning. An example would be that some prefer tight schedules and a higher degree of face-to-face learning, others would prefer e-learning with few time constraints. Online assessment is also a controversial issue.

Students' attitudes about e-learning seem to be a relevant and complex topic. We intend to conduct further, more systematic research in this area using questionnaires and interviews.

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