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TEACHING AND LEARNING AT THE VIRTUAL ACADEMY FOR CRAFTS TRADE – EVALUATION FINDINGS OF THE MERCUR-PROJECT

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ABSTRACT

The pilot project MERCUR investigated the potentials of E-Learning in the crafts sector in Germany. The focus of research and development was on the design of a virtual academy for the crafts sector and an internet-based learning environment. This article exemplifies the experiences of learners and teachers.

1. DEVELOPMENT AND TESTING OF E-LEARNING IN THE CRAFTS TRADE

In the passed years E-Learning was tested and developed within the area of the vocational education in various projects. At the moment only little concrete experiences are present [see Euler 2001, p. 30]. In the context of the MERCUR-project the possibilities and boundaries of E-Learning within the area of crafts trade were examined by the Research Institute for Vocational Education in the Crafts Trade at the University of Cologne [see also the description of the MERCUR-project in Esser/Twardy/Wilbers

2000, p. 6]. The crafts trade is one of the most important sectors of the economy of Germany. It covers approx. 835.000 enterprises and about 6,3 million employees. Furthermore it has a very large area of training and further education. About 600.000 trainees (approx. 40% of all trainees in Germany) spread themselves out on 93 occupations. In the further training of the crafts trade annually about 65.000 further training examinations are held, approx. 32.000 are master craftsman examinations and approx. 33.000 other examinations. Therefore the expectations, regarding the potentials for the use of E-Learning, are accordingly high.

In the centre of the project activities were

- the development of the virtual academy as an E-Commerce platform for the learning institutions of the crafts trades,
- the adaptation of the ILIAS learning platform¹ to the specific needs of these institutions and
- the development of multimedia learning units for the measures of further education to become "Betriebswirt/in des Handwerks (BdH)" (business administration in the craft trades).

The course contained 520 hours and dealt with topics of economics and business studies, human resource management, law and taxes. These measure was designed as an online course and divided into 40% E-Learning phases and 60% face-to-face sessions.

The online course was held twice and evaluated with the help of standardised questionnaires and problem-centralized interviews.² Some results are presented in the following passages.

2. PECULIARITIES OF E-LEARNING - SELECTED RESULTS

The modern information and communication technologies are often regarded as excellent support of self-controlled learning [see e.g. Dohmen 1998, p. 58; Stadelhofer 1999, p.153; reduced optimistically: Fischer 1999, p. 114]. Through forms of self-controlled learning within E-Learning measures, many liberties are granted to the learner for the planning and carrying out of the learning activities. The efficient use of these free spaces requires a high measure of intrinsic motivation, self-learning competence and self-discipline from the learner.

2.1. Motivation of the Learners

For the identification of the motivational prerequisites of the target group two aspects were examined in particular:

- To which extend were the learners motivated at the beginning of the E-Learning measures?
- Did motivation discrepancies exist between the face-to-face sessions and the E-Learning phases?

The learners expressed a large self-interest in the participation and were accordingly motivated at the beginning of the measure. The average value was 4,92.³

¹ ILIAS is an Internet-based training/learning platform, which was developed in the context of the VIRTUS-project at the Economics and Sociological Faculty of the University of Cologne (see also the presentation of the Virtus project in Kiedrowski 2001, pp. 47-51). ILIAS is in the meantime available as Open Source Software (URL: <http://www.ilias.uni-koeln.de>).

² At this point it is not dealt with the methodical difficulties of the evaluation of E-Learning in general [see for example Schulmeister 1997, p. 387]. The results which are represented in the following evaluation understand themselves as tendentious statements which do not replace representative realisations, but should be understood as suggestions for further conversions about E-Learning in the crafts trade.

³ The capture of the statements took place by means of equidistant, ordinal scaled response possibilities. The learners could select between the values 1 ("not correct at all") and 5 ("completely correct"). Equidistant scales assume that the distances between parameter values are

Apart from the basic interest in this course the motivation of the learners during the learning phases was analysed. Here a clear discrepancy could be found between the face-to-face sessions and the E-Learning phases. While the learners were proportionally high motivated within the face-to-face sessions (average value: 3,92), the motivation in the E-Learning phases was clearly lower (average value: 2,96). This obviously lower result was mirrored in the participation in the E-Learning phases and was confirmed likewise by the instructors. The detailed analysis however showed a significant, small positive correlation between the motivation in the face-to-face session and the E-Learning phase. The correlation between the satisfaction with the face-to-face sessions and the E-Learning phases was still clearer. A significant middle correlation was revealed.

If one consults an ex-post-analysis of the actual course process on the basis of the interviews, one could set up a carefully formulated thesis that a concatenation of negative influences can lead to a general disaffirmation of E-Learning phases by the learners:

Low motivation on the one hand and lacking self-learning competence on the other hand led to a low participation in the E-Learning phases. Due to the resulting poor communication between the learners during the E-Learning phases, the firstly active learners lost the motivation to work further actively. The tutors were therefore forced to repeat the largest part of the content in the face-to-face sessions again. This led again to a reduction of the motivation for the E-Learning phases.

Especially during the interviews it was remarked, that the lacking participation and the resulting poor communication during the E-Learning phases, led to a reduction of the added value which could have been achieved with the E-Learning.

2.2. Self-Learning Competence

Motivation and self-learning competence are important prerequisites for the success of an E-Learning measure [see Dohmen 1996, p. 49]. The learners have to clarify their needs, aims and prerequisites of learning. They have to specifically force their learning processes, plan their learning strategies and time schedules and localize obstacles as well as learning assistance. In the vocational further training one cannot be sure that many learners are equipped with such competences. In particular persons with limited previous knowledge have problems to set themselves targets, to activate their previous knowledge and to evaluate the learning as well as the own action critically [see Euler 2001]. At present this missing learning competence can be seen as a substantial obstacle for E-Learning. Accordingly this missing prerequisite of the target group must be taken into consideration as an additional target dimension when learning [see Euler 2001, p. 29 as well as Nuissl 1999, p. 37. This problem can be found in e.g. the investigations of Hagedorn 2001, p. 6 as well as Chatin/Roy 2001, p. 14].

The capture of the self-learning competence⁴ proved as being difficult. However, our results altogether covered themselves as far as possible with the findings in the literature. Thus the learners estimate their previous knowledge within the business management area moderately with an average value of 3,17. Thus the learners owned at least a fundamental component of the independent acquiring of business contents.

2.3 Self-Discipline

In the context of the MERCUR-project the learners agreed, that the spatial and temporal flexibility of E-Learning was an advantage but the individual arrangement possibilities were at least sometimes overstraining. The interviews showed that some learners need to have fixed time tables to feel "forced

identical, whereby, despite of the ordinal values of the categories, average values and standard deviations always can be calculated [see Bortz/Doering 1995, p. 164].

⁴ The investigation of competences is connected with fundamental difficulties. Strictly speaking these can be only be recorded through observations [see. Esser 1997, p. 28; Euler 1989, p. 104].

to learn". Accordingly the instructors have a great responsibility to motivate the learners in the face-to-face sessions. Simply arranging submission dates is not enough. The learners explained that they saw themselves only partly obligated to keep to the time schedule (average value: 3,0). Interestingly enough both instructors and interviewed learners stated that in the courses the craftswomen participated more actively and more disciplined in the E-Learning phases than the male craftsmen.

The necessity for a larger obligation of the learners was supported by the result, that well motivated learners felt tendentious obligated to a more active participation during the E-Learning phases. For this a significant, small correlation between the motivation and the obligation to learn actively in the E-Learning phase can be determined.

Considerations, in which way the learners can be more strongly obligated, came to no clear result. A more intensive monitoring by the instructor is promising little success in the opinion of the learners, since the regarded target group of the BdH are adult humans. They want to and should determine their qualification independently. Finally the instructor can cause extrinsic motivation with the help of a clear target e.g. in the form of final examinations as an effective means to achieve discipline. For this it is however important that instruction contents of the E-Learning phases are not completely repeated in the face-to-face sessions.

A further possibility of achieving discipline during the E-Learning phases is cooperative learning. If a participant feels under the obligation to the other learners in the group to work for example on an exercise, one has at least a concrete cause to be active in the E-Learning phases. Additionally, studies point out some advantages of cooperative learning in relation to isolated learning [see as an overview: Slavin 1990, p. 18].

In one of the evaluated online courses instructors formed groups at the beginning with the request to solve certain tasks in the E-Learning phases within a group. According to the instructors this form of cooperation started only very sluggishly. However no structured methods of cooperative learning were used [for those structured forms see Breuer 2001d]. Besides the learners criticized that the groups were set at the beginning of the course and that they could not form the groups themselves.

For further courses it remains to be said that the possibilities of cooperative learning, also in the E-Learning phases, have to be prepared and trained from the learners as well as the instructors.

2.4 Use of Multimedia Learning Units

Within the E-Learning phases multimedia learning units were used to support independent learning. The learning units were made accessible for the learners with the help of the training/learning platform ILIAS.

The learners were satisfied with the learning materials with a value of 3,48. The materials were intelligibly structured (average value: 3,95) and viewed to have good support for the learning process (average value: 3,85), even though the target group would have preferred a larger vocational relevance of the learning materials (average value: 2,92).

Almost all available learning units were used at least partly in the E-Learning phases. Especially the ILIAS learning units, which were created with the help of the actual instructors, were utilized. In the opinion of the instructors, their cooperation in creating the learning units was regarded as an important prerequisite for the use in the E-Learning phases.

2.5 Combination of Face-to-Face Sessions and E-Learning Phases

In the conception of the course and the time table management, the combination of the face-to-face sessions and the E-Learning phases was not fixed in advance. The individual instructors reached these decisions in a decentralized way. Previous to their actual activity in the online course, the instructors were prepared in a training course measure [see Kiedrowski/Schaumann 2001]. An objective of this

training was to prepare the instructors to plan, to carry out and to evaluate independently information-technology-based training measures. The instructors could decide about the use of face-to-face sessions and E-Learning measures quite independently [see Breuer 2001a]. A very large part of the lecturers did not require a larger proportion of the E-Learning phases in the course. The proportion in the individual subjects was placed between 21% and 44%, altogether about 36,78%.

The combination of face-to-face sessions and E-Learning phases was dependent on:

- didactical criteria (39.62%)
- organizational criteria (32.69%)
- the existence of learning units (24.62%) and
- other aspects of planning (3.08%).

3. CONSEQUENCES OF THE EVALUATION FOR E-LEARNING MEASURES IN THE CRAFTS TRADE

The analysis showed that with the help of E-Learning measures additional learners can be activated. Thus 84.2% of the asked learners in one course indicated that they would not have participated in this course without having had the possibility to learn part time with the internet. Working with E-Learning can be very useful in the crafts trade. The difficulties of the learners in particular within the area of motivation and self-discipline, must be however particularly considered. From the experiences of the project some concrete organization recommendations can be derived:

- The courses should be arranged practical.
- The advantages of E-Learning regarding the temporal and spatial flexibility should be exhausted. It is to be noted that some learners must still 'learn' the self-discipline necessary for these flexible course arrangements.
- The use of cooperative learning forms requires an intensive preparation of the learners in the face-to-face phases. At the beginning of the course the social relations between the learners should be supported. The instructor should insist on cooperation repeatedly.
- The different possibilities of communication should be introduced and used by the instructor. During the E-Learning phases communication should be strongly promoted and required.
- The motivation - also for the E-Learning phases - should be formed in the face-to-face sessions.
- The regular repetition of contents from the E-Learning phases in the following face-to-face sessions should be avoided, since thereby the readiness to participate falls off significantly in the E-Learning phases.
- The instructors have to be prepared for their new function in the course. In particular the problems of computer-mediated communication and the special features of E-Learning should be treated intensively.
- The instructors should cooperate in the creation of the necessary learning units. They should participate in particular in the definition of criteria for these learning units.
- Face-to-face sessions should be at the beginning of the course and each subject, as well directly before the intermediate and final examination.

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