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Transferring Learning to Practice with e-Learning – Experiences in Continuing Education in the Field of Ambient Assisted Living

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Abstract. The article describes an analysis of the use of e-learning to improve the learning transfer to practice in continuing education. Therefore an e-learning offer has been developed as a part between two attendance periods of a training course in the field of Ambient Assisted Living (AAL). All participants of the course were free to use the e-learning offer. After the end of the e-learning part we compared the e-learning users to the other participants. Using an online questionnaire we explored if there are differences in the activities in the field AAL after the training course. The results show that e-learning is beneficial especially for communication processes. Due to the fact that the possibility to talk about the learning content is an essential factor for the learning transfer, e-learning can improve the learning success.

Keywords. transfer of learning, continuing education, educational technology, biomedical technology, medical informatics

1. Introduction

Ambient Assisted Living (AAL) technologies have the potential to enhance quality of life and promote independence [1]. Therefore, it is necessary that care workers, health service professionals as well as technicians and craftsmen in the field obtain continuous training to become consultants for assisting technologies. Hence, in the project "MHH-QuAALi", funded by the German Federal Ministry for Education and Research (BMBF), an interdisciplinary training course for nurses, technicians and craftsmen has been developed [2]. The objective of the course is to inform participants about the possibilities of the use of assisting technologies. Similar to many approaches the transfer of learning content into the professional life of the participants is a particular challenge in MHH-QuAALi. This is complicated by the fact that an adequate job

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profile of a consultant in AAL has not been developed yet [3,4].

In general, the transfer of the learning content is a fundamental problem in continuing education. It is the transfer gap between the desired success and actual success according to Wilkening [5] says. In particular, this transfer gap arises after the end of the training course. There are at least three main barriers to the transfer of learning: the non-existence of a follow-up of the event, the lack of communication opportunities about the learning content and a lack of social support from colleagues and / or supervisors [6].

The aim of this work is to explore how homework tasks via an online platform can support the transfer of learning successfully. Our perspective of e-learning is based on the view of Kerres, Witt and Schulmeister: Beyond mere presentation of knowledge e-learning promotes communication processes and collaborative cooperation between the learners [7-9]. Therefore an e-learning offer was developed which was conducted as an online learning part between two attendance periods of continuing education courses for AAL consultants.

The qualification program for AAL consultants consists of two one-week modules in a classroom setting, the basic and advanced module. Case based group work is a central aspect of the didactic concept. To provide the participants with learning materials for the casework and to support their group work the web based learning platform ILIAS is introduced in the training [10]. Thus, the training course follows a blended learning approach that combines the traditional classroom sessions with web-based teaching and learning methods.

After the third basic module, the complementary online phase started to support the practice transfer of the learning content. Therefore specific learning tasks for homework were developed on the learning platform ILIAS. The participants received two work tasks in an interval of about one week: A central task of future AAL consultants is to continuously deal with relevant topics of AAL; not least because they are also promoters for AAL. For that reason, the first work order was to collect relevant articles on the topic AAL in print and online media, and to document the research results in a common forum in ILIAS. On the basis of the identified articles, participants were asked to discuss them among themselves and together with two lecturers from the training course. The second work task was to get information from the local health insurance companies which technically assisted service they offer.

The participation in this online homework was voluntary and did not influence the successful completion of the training course. Since not all participants took part in the online homework, comparative study results could be generated. All participants of the training program were interviewed about their experiences with AAL after the first teaching week. The learners who participated in the homework are compared with the participants, who did not take part in the online homework.

2. Methods

Between the basic and advanced module of the training course was a period of 2.5 weeks. In this time, the opportunity to participate in an online working phase in ILIAS was given. 13 of the 20 participants have taken part at this online phase on a voluntary basis. That means the formation of the two groups - online learners and non-online learners – did not meet the conditions of an ideal experimental design. The subjects were not randomly allocated to the two groups. Our priority was to give each

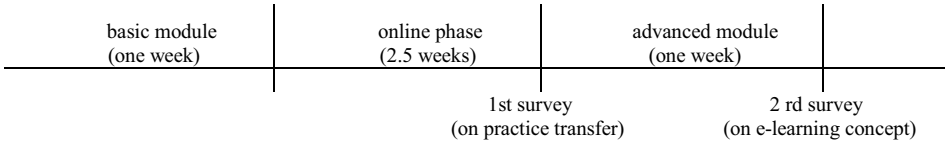

Figure 1. Process of the course

participant the chance to participate in the online phase, which consequently, from the research point of view, affects the comparability of the two groups negatively. This is a general problem in comparative studies on learning and teaching with technology [11].

To get some information about the learning activities of the participants, the usage statistics in ILIAS was evaluated. Furthermore, an anonymous survey using a quantitative, standardized online questionnaire was conducted after the online phase. All 20 participants of the basic module responded, meaning both the 13 users of the e-learning phase ("online learners") and the 7 participants who did not participate in the online phase ("non-online learners"). The group of online learners was compared to the group of non-online learners. Mann-Whitney-U-Test was used for testing significance of differences between the two groups ($p \leq 0.05$). The questionnaire contained eight items including aspects regarding the communication options about AAL topics as well as how they would like to use ILIAS after the course. For that, a five-point Likert scale (1 = applies completely, 5 = not correct at all/ 1 = strongly agree, 5 = strongly disagree) and two essay questions were used. For our analysis we regard the values 1 and 2 as agreement and the values 4 and 5 as no agreement.

After the advanced module, there was a further survey to the e-learning concept of the training course. Indicating the usage of ILIAS, some results of this survey will be presented in the context of this analysis as well (see Figure 1).

3. Results

3.1. Usage statistics

In the online working phase there were 539 access requests to the platform in total. Lowest amount of site visits per person was 3, highest 176.

Analyzing usage statistics in ILIAS at the end of the online phase, it can be seen that 8 out of 13 online learners have posted results for the two work orders. During online phase 33 posts to 11 different topics have emerged. Each topic gained an average of 27 views by the online learners. The usage statistics (see Figure 2) show the activity of the participants. When the participants got a new work order (first day and fifth day) the activity increased to the maximum. Shortly before the advanced module starts, the number of posts rose again.

At the end of the advanced module all participants had to take a final exam. All participants passed the exam. The online learners achieved 37 of 42 possible points, the non-online learners 36 points. There are no significant differences between the two groups ($p=.36$).

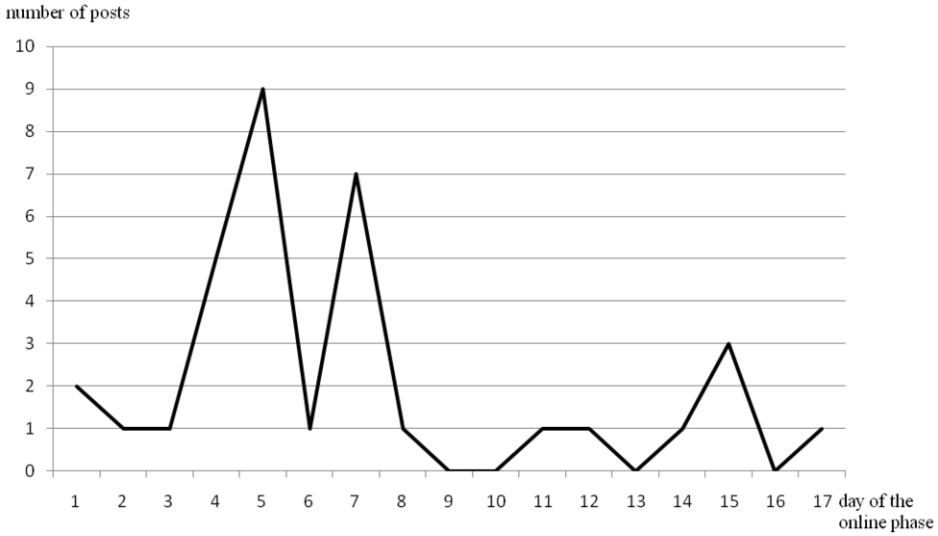

Figure 2. Usage statistics

3.2. Results from the survey on the learning transfer to practice

In total, 13 persons participated in the survey on the practice transfer: 8 online learners and 5 non-online learners. One questionnaire is invalid due to missing data and therefore unusable for the evaluation. Thus the number of questionnaires is 12. Among the responding online learners were 4 female and 3 males, the group of non-online learners consisted of 3 male and 2 females. The age of the online learners varied from under 30 years up to 65 years, and the non-online learners are between 31 and 65 years old. All respondents work in the health sector. For these reasons the online learners are similar to the group of non-online learners in terms of their socio-demographic characteristics.

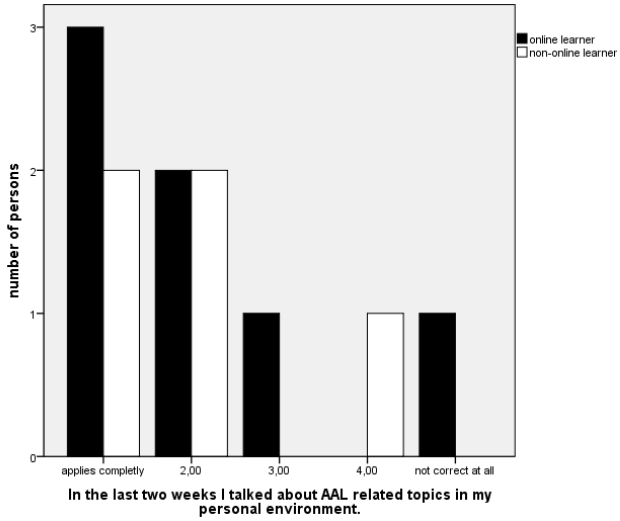

Figure 3. Talking about AAL related topics in the personal environment

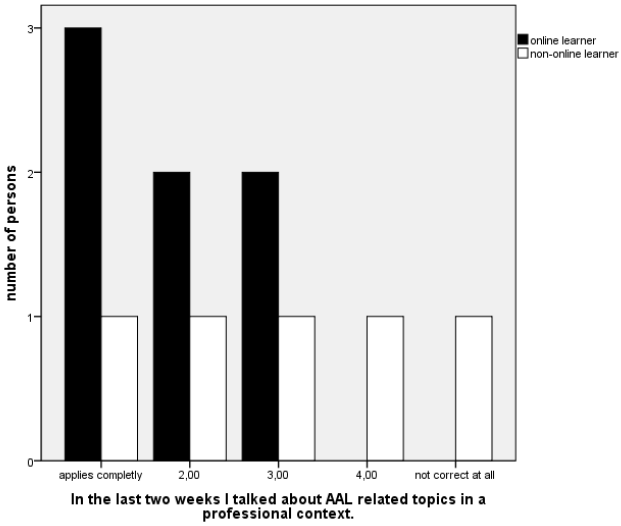

Figure 4. Talking about AAL related topics in a professional context

The majority of the online learners (5 of 7 persons) and the non-online learners (4 of 5 persons) said that they have talked about AAL related topics in their personal environment during the last two weeks. In this aspect there are no differences between the two groups (see Figure 3) (p=.877).

The vast majority of the online learners have talked about AAL related topics in a professional context (5 of 7 persons). In the group of the non-online learners is a large spectrum of responses. Two of the non-online learners indicated that they (rather) not talked about AAL related topics in their professional environment (see Figure 4). The difference between the groups is, however, not significant (p=.128).

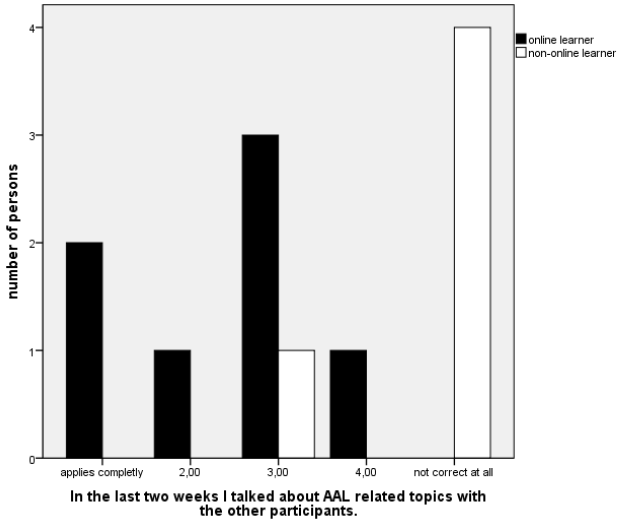

Figure 5. Talking about AAL related topics with the other participants

	online learners	non-online learners
information exchange	4	2
contact with other participants / lecturers	7	2
access to learning material	2	2

Figure 6. Usage needs of ILIAS after the course

3 of the 7 online learners said, that they talked about AAL related topics with other participants; 4 of the 5 non-online learners said, that they don`t (see Figure 5). This difference is significant (p=.013).

The participants were asked for which activities they would like to use ILIAS after the course. Their answers in form of free texts were grouped into three categories: information exchange, contact with participants and lecturers as well as access to learning material (see Figure 6).

The most frequent responses were in the category “contact with other participants and lecturers". All online learners and two non-online learners would like to use ILIAS to maintain contact with the other participants and lecturers. In addition, the participants answered that they would like to use ILIAS to create a network with the participants from past modules and to share their experiences as an AAL consultant. 4 online learners and 2 non-online learners said that they want to use ILIAS for the exchange of information. This involves aspects such as the exchange of information on current developments of AAL technologies and updates of information. Furthermore, the online learners as well as the non-online learners saw the opportunity to continue their access to learning material through the use of ILIAS.

3.3. Results of the survey on the e-learning concept

13 persons participated in the evaluation of the e-learning concept at the end of the advanced module. These are 6 online learners, who all participated in the survey for practice transfer and 7 other participants who took part in the advanced module.

As part of the survey, the online learners should evaluate the online work phase. 4 of 6 responding online learners said they had fun processing the tasks. 5 of 6 responding online learners indicated that for them the online learning phase was helpful to deal with the topic outside the course. Only one person neither had fun processing the tasks nor considered it as helpful.

Of the 13 respondents from the e-learning evaluation only one person was familiar with a learning management system (LMS) such as ILIAS before our course. The majority of the participants had used a LMS very rarely (6 persons) or never (6 persons). Not least because of this, we interviewed all participants on how they rate the use of a learning management system such as ILIAS in terms of a positive experience. All of the six online learners and three of the seven non-online learners saw the work with ILIAS as a positive experience. Both groups saw the use of ILIAS after the

advanced module positively: 5 of 6 online learners and all non-online learners would prefer to have access to the learning material after the course.

4. Discussion

The majority of the participants have used a LMS before our course very rarely or never. Against this background, the first positive aspect is that over half of the participants have decided to participate voluntarily in the e-learning phase after the course. In the end, only eight persons have taken an active part in the online phase and wrote a text post. These eight persons are the same eight online learners from our survey on practice transfer.

Comparing the group of the online learners with the group of non-online learners shows that both groups talked about AAL related topics in the private context with similar intensity. Regarding the professional exchanges, there is a slight difference: The online learners had more exchange of AAL related topics in a professional context. The most obvious differences are founded in question about the exchange with other participants: Almost all non-online learners said that they had no contact with other participants between the basic and advanced module. This trend is also reflected in a comparison of free text answers to the usage wishes of ILIAS: Primarily the online learners saw ILIAS as an opportunity to stay in contact with the other participants. In addition to the communication facilities, both groups see the advantage to exchange information and access to learning materials via ILIAS. Looking at the results from the e-learning evaluation, especially the online learners saw the work with ILIAS as a positive experience. Also both groups would appreciate it if they can continue to use the program after the training course.

Of course, looking at the results of the pilot studies there are slight differences between the two groups. Over the coming training courses we have the chance to make an extensive survey**.** Nevertheless, the results suggest that the practice transfer can be promoted by offering an online phase. It could be seen, that e-learning promotes the communication processes after a course. Given the fact that the AAL technology is still in its infancy, the experience exchange and a social support is particularly important for the future AAL consultants. Therefore, we are planning to establish a network for all participants of the AAL consultant courses.

Acknowledgments

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