A Usability and User-Centered Approach to the Design of E-Learning Environments for Full-time Employees in the Silesia Region - Poland

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Abstract—The best way to assess the importance of e-learning technologies and systems is to evaluate their application in the learning process. Investigations about the use of e-learning in the workplace and Institutions of Higher Education are taking place worldwide, to see how it is used and if it has positive or negative effects on the learning process. E-learning comprises several forms of electronically supported learning and teaching to implement the learning process. The goal of this research is to find out which methodology should be used for delivering the training content. We wanted to assess whether full time workers are interested in following 100% online training courses or they prefer to have the courses in a traditional way (attending normal lessons at a university) or a mixture of both methodologies (attending lessons, but having these complemented by e-learning). To find answers to these questions, we did a survey among 102 employees from different enterprises of the Silesian region in Poland who work full time.

Index Terms— E-learning, Higher Education, Methodology, Workplace training.

I. INTRODUCTION

E-learning offers solutions for companies’ education and training objectives, as it makes learning available from any place in the world at any time. It makes possible for companies to distribute training and information to multiple locations in a very easy and cheap way. Employees have not enough time to attend all the courses and read all the reports they need to keep up to date in their work, so companies worldwide have resorted to a more modern, efficient and flexible alternative: e-learning.

E-learning has a series of advantages, such as that the students can control their learning process, learn at their own pace and review the course materials as often as they want. But it has also disadvantages, as some people do not have access to a computer while others need to have interaction with a teacher to motivate themselves.

At our university were are developing courses for employees as a way to combine work and studies, so that these people can improve their skills and keep up to date with all their work area.

With this research we wanted to know the opinion of full time employees about e-learning and if they prefer this methodology to the traditional one. To take part in this survey the participants had to answer an online questionnaire through Encuestafácil.com. Encuestafácil is an Internet tool which allows users to create surveys both internally and externally.

II. RESEARCH RESULTS

We asked 102 full time employees at different enterprises of the Silesian region in Poland their opinion about e-learning courses, the positive and negative aspects to be taken into account when planning the courses and if they would be interested in following them. 40% of the full time employees were male and the other 60% were female working at local enterprises in the Silesian Region. The ages of the research participants are varied, ranging between 20 and 54 years old.

Figure 1: Age of participants

A. Advantages of E-training

• Possibility of multiple use of the lectures: it provides students with the possibility of viewing information at any time through any connected computer, which is very convenient as they can have access to the lessons whenever they want and as many times as they need it.

• Saving time: one of the key benefits of e-learning is that it offers flexibility of time and study. It offers a flexible time span for completing the course. It also saves time because the students do not have to commute to the university. They can study from any place.

• Minimization of costs (e.g. travel): e-learning is significantly cheaper than traditional education as some of the costs, such as travel, are eliminated.
while some others are reduced, for example, tuition fees, child care, residence, etc.

In our research we found that 48% of the participants in the survey found the possibility of using the lectures several times as a very positive characteristic of e-learning, while for the 23% the minimization of costs is of great importance. The remaining 29% believe that the most positive outcome of e-learning is that allows them save time.

- Compendium of knowledge: documents from around the world are available through search engines such as Google, which allows a great range of resources that the student can use in their researches and works and they would never be able to use in a traditional learning environment.
- Accessibility for people who cannot participate in traditional lectures: it provides a way of getting an education to those people who due to work or other commitments cannot attend lessons at the university. Courses do not need to be placed or time-based anymore. According to Maddux and Johnson: “e-learning is willing to deliver instruction to learners who are unable or unwilling to participate in a traditional learning environment”.
- Systematic monitoring of the progress / ability to correct answers: it creates interactivity learning environments for teachers and students. It also allows for less inhibition, time for reflection and more equal contribution of response from the students.

In our research we found that most of the participants (63%) find the accessibility for people who cannot take part in traditional lessons the biggest benefit of e-learning. The possibility of controlling their progress is the greatest advantage for 28% of the participants and the rest (9%) find that the best advantage of e-learning is that it is a compendium of knowledge.

- Independent choice of the time, place and pace of learning: because learning materials are available at any time, students have the possibility of learning at their own pace, scheduling their learning process without the time restrictions of traditional learning.
- To reach a wider audience: Internet has broadened up the possibility of acquiring an education to people who are unable to attend traditional lessons. Any person can have access to e-learning from any part of the world at any time of the day. This is also convenient for some students who do not learn well in the traditional learning environment but can benefit from a more flexible setting.
- Increasing popularity: e-learning is becoming more and more popular among students due to all the benefits it provides. They can follow the courses from any place at any time, the costs are lower than those of traditional education, they can schedule their learning process at their own convenience, etc.
- Student more active: it allows students interact with the teacher and with other students. They must be active participants in the virtual classroom, sharing ideas, works and knowledge and answering to their course mates.

The participants find the choice of time, place and tempo of learning as the most important characteristic of e-learning. 14% of them believes that e-learning allows students participate more actively in the learning process, while 7% agrees that e-learning reaches a wider audience that other traditional methods and the remaining 7% think that e-learning is gaining popularity.
B. Disadvantages of E-training

- Problems with equipment: some students may not have access to a computer or Internet connection which makes it difficult for them use the medium required for homework and keep up to date with the lessons.
- Problems logging in: if the students have any problems logging to the page they will not be able to follow the course and this may lead to them abandoning it.
- Many hours in front of a monitor: e-learning is text-based and therefore, students have to spend a lot of time on the computer studying or communicating with their teacher or with other students, which can be very tiring.

Most of the participants agree that having to spend a lot of hours in front of the computer is a disadvantage of e-learning. 32% sees the problems they may have with the equipment necessary to follow e-learning courses as the greatest disadvantage and the remaining 25% believe that the most negative thing about e-learning are the problems when logging in.

- No direct contact with the trainer: there is a lack of interaction between the teacher and the student and this can make the students feel isolated or get lost and confused about course activities as the teacher may not be available when needed by the students.
- Greater amount of time spent on learning: the students must be disciplined and schedule their learning process. They must spend a lot of time learning as they have to do it by themselves and need to be highly motivated. Students with low motivation may fall behind and give up the course.
- Low reliability of evaluation: while studying at their own pace and scheduling their own learning process may be an advantage for the students, it can also be a disadvantage, as they sometimes have no way of evaluate the progress they are making.

Another big disadvantage for the participants in the survey is that with e-learning they cannot have a direct contact with the teacher and 66% of them agree with this answer, while for 20% of them a negative thing is the long time they have to spend learning. The rest (14%) complain about the low reliability of evaluation that e-learning provides.

For 72% of the participants in the survey the problems with Internet access are a negative aspect of e-learning. 17% believes that the lack of ability in the use of modern technology is a great disadvantage of e-learning and the remaining 11% agrees that the lack of ability in the use of instant messaging is the biggest disadvantage.
C. Blended Learning

Blended Learning refers to a combination of different types of learning. It consists of a mixture of traditional lessons and e-learning, that is, a percentage of the lessons are face-to-face and another percentage are online. It comprises a series of advantages, such as:

- It has the advantages associated to e-learning: the students can study at their own pace, the costs are reduced, they can study when and where they want and they have access to an unlimited number of resources.
- It has also the advantages of face-to-face tuition: the teacher is available during the lesson, they can interact with their course mates and they can do more complicated activities because they have the aid of the teacher while they are doing them.

Blended learning gives learners and teachers a potential environment to learn and teach more effectively.

50% of the participants in this research found that blending learning is a more effective way of learning than e-learning (29% of them finds it better than the other methods) or traditional learning, which is preferred by 21% of the participants.

![Figure 8: Training preferences](image)

III. CONCLUSION

One of the aspects that the participants like the most about e-learning is the possibility of reviewing the lessons as many times as they need it. They also think that it saves time and money, as you can use it anywhere and you can choose where, when and how to use it. For people who cannot attend traditional lessons, it is a good way to improve their skills and it gives also the possibility to control their own progress. Other advantages they find in e-learning are that it reaches a wider audience and that it is increasing its popularity.

However, they also find disadvantages and the most important of all for the participants in this survey is that e-learning does not allow a direct contact with the teacher. Another one is that sometimes they have problems with the computer or they cannot log in and therefore, cannot follow their lessons. Other disadvantages they find is that they have to spend too much time in front of the computer, which according to them is tiring and this also means that they have to spend a lot of time learning. Another problem when using e-learning is that some people lack ability to use either a computer or modern communication technology, such as instant messaging, chats, forums, etc.

Asked about what methodology they would choose, the big majority of the participants (50%) chose a mixture of e-learning and traditional lessons. 29% chose e-learning and the rest (21%) chose traditional lessons.

According to the answers of the participants, e-learning teaches self-reliance and encourages systematic learning. It also motivates to enhance skills in computer technology and it is a good way to improve their education. However, they do not rate it very highly as a way to minimise the gap age between the people who use it and they do not believe either that it has a positive effect on self-esteem and self-respect.

E-learning is a comfortable way of learning, which is more and more used everyday worldwide. Though people who use it do find disadvantages on it, they agree that it is a good way to improve their education and to keep up to date with their work.

We can conclude that most of the participants in this survey which we carried on would prefer a mixed methodology (blended learning), that is, a mixture of e-learning so they can study at a convenient time and place for them and traditional lessons where they can have the aid of a teacher. This is why we developed some courses for employers of Silesian enterprises which consisted of 60 hours, 30 of which were computer aided learning and the other 30 were traditional lessons that the employees had to attend at the university.

The outcome of these courses was a very positive one. The participants could control their own learning process through e-learning, but they also have the aid of a teacher who guided them through this process.

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