E-LEARNING AS A SUPPORTING TOOL IN EDUCATION FOR COMPUTER SCIENCE STUDENTS

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Abstract

E-learning is a modern technology used in many universities for training, evaluation or assessment of the students. It has opened new opportunities for distance learning and virtual laboratories. The purpose of this paper is to assess the usefulness of the e-learning platform for Computer Science students at the Lublin University of Technology, Poland. The architecture of the platform is described. The survey examined the students of the first and second degree of the Information and Communication Technology (ICT) field. It verified the students’ knowledge about e-learning systems. The respondents indicated the advantages and disadvantages of e-learning platforms. They assessed the usefulness of individual components of the course and pointed out which should be reduced or expanded. The research results indicate the directions of development of this form of teaching in further education in this field. The students were also asked to evaluate the frequency of use of individual components of the course. The results obtained indicate that an e-learning platform is a huge help in higher education, both for students and lecturers.

Keywords: e-learning platforms, advantages and disadvantages of distance learning.

1 INTRODUCTION

E-learning is a widely used tool supporting teaching in many fields of higher education. This method of learning does not need sophisticated equipment: a computer or a mobile device and Internet connection are enough for attending courses. E-learning is something more than a traditional method of teaching. It may be used as an additional didactic tool, as a way of storing materials for students, their test results as well as creating quizzes, taking exams, a way of attendance verification or an ability to send students’ homework [1]. The use of the platform decreases competency gaps of students [2]. E-learning courses are dedicated both to practical and theoretical classes [3]. This method is also used in corporate training [4].

Many universities all over the world use Moodle as an interactive e-learning tool to motivate students and to involve them to strengthen knowledge and do homework [5], [6], [7], [8]. The moodle platform was implemented at the Lublin University of Technology (LUT) in 2011. It contains many courses for mandatory classes, both for the Information and Communication Technology (ICT) students of Bachelor’s and Master’s degrees, both for stationary and non-stationary students. Moreover, the courses provided and stored for students on the platform extend knowledge areas in the form of workshops and additional materials for self-study. E-learning platforms may also be used for exchanging knowledge among various universities, including overseas ones [9].

The implemented e-learning platforms are assessed for whether they are helpful in education [10]. The study was performed in order to verify the impact of e-learning readiness of students on their satisfaction and motivation in flipped classroom model context [11].

The aim of this paper is to assess the usefulness of the e-learning platform for ICT students at the Lublin University of Technology in Poland. A paper survey was created both for verifying the students’ knowledge about various e-learning systems and finding their opinion whether the moodle platform is used during their study efficiently. The respondents were asked to assess the selected components of the moodle courses. They also indicated if the contact hours with the lecturers should be reduced.

2 RESEARCH METHOD

2.1 Participants

One hundred and two Lublin University of Technology ICT students of the Bachelor’s and Master’s degree, of both the stationary and non-stationary modes, took part in the research. The detailed
information about the responders is given in Table 1. The students filled in the paper survey handed in by the lecturers.

<table>
<thead>
<tr>
<th>Study mode</th>
<th>First degree</th>
<th>Second degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>stationary</td>
<td>21</td>
<td>-</td>
</tr>
<tr>
<td>non-stationary</td>
<td>63</td>
<td>18</td>
</tr>
</tbody>
</table>

2.2 Survey

The survey was prepared in a paper form. It consisted of three parts. The first item was for statistical purposes. The participants were asked to indicate their year and degree of study. The second part was for verification of the students’ knowledge about various types of e-learning systems according to different parameters. The responders were also asked to specify the e-learning platforms they were familiar with. They were to select the advantages and disadvantages of using this kinds of platforms. The final part consisted of questions about the moodle platform, implemented at the university. The students had to assess the usefulness of selected components of the course using a five-step scale, where 1 stated that the component was not useful, and 5 that it was very useful. The respondents had to decide whether the platform was a facilitation or not. They had to write how many courses they participated in, if they would like to have more materials stored on the platform by lecturers. They also assessed which components of the course were the most frequently used.

3 E-LEARNING PLATFORM

Moodle is referred to by its authors as a Course Management System (CMS), Learning Management System (LMS) and Virtual Learning Environment (VLE) [12]. Moodle LMS is the world’s most popular and the most used learning system. The most important benefits of moodle are:

- open source software on GNU licence;
- support by a global community of developers;
- configurability, high flexibility and hundreds of moodle plugins [12].

The e-learning platform is a place that allows to place content-rich items, e.g. plain text, HTML pages, multimedia presentations, lessons, wikis, audio clips, video clips, links to other web pages. Moodle is the perfect LMS for higher education because it allows a steady stream of communication between teachers and students. Moodle has forums, messaging, chat, comments, and blog posts which are available for communication when you have time. Its use contributes to improving the education of students.

One of the concept of Open Educational Resources which is getting more and more popular is Massive Open Online Course (MOOC). It provides both free access to course materials and resources. The interactive user forums is its main goal. Nowadays, they are often launched in collaboration between dedicated organizations and universities. MOOCs are usually supported by e-learning platforms [9] [13].

4 EVALUATION OF USING E-LEARNING IN HIGHER EDUCATION

A paper survey was created both for verifying the students’ knowledge about various e-learning systems and finding their opinion whether the moodle platform is used during their study efficiently. All survey results (102 items) were used for the analysis. All respondents said ‘yes’ to the first question asking “Do you know what an e-learning system is?”. The next two questions, extending the first one, confirmed a complete lack of knowledge of the types of systems and e-learning platforms. These answers are presented in Tables 2 and 3.
Table 2. The answers about the types of e-learning systems with regard to the course time running

<table>
<thead>
<tr>
<th>Type</th>
<th>Correct answer</th>
<th>Incorrect answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>synchronous</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>asynchronous</td>
<td>7%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 3. The answers about the types of e-learning systems with regard to the hardware usage

<table>
<thead>
<tr>
<th>Type</th>
<th>Correct answer</th>
<th>Incorrect answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>m-learning</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>blended-learning</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Eighty-seven percent of the respondents stated that they did not know the types of e-learning systems according to the time they were running. Ninety-one percent of respondents said they did not know the types of e-learning systems regarding the devices they used.

Another question was about the knowledge of various e-learning platforms. Eighty-one percent of the respondents stated that they knew the moodle platform that is used in the LUT. Several other platforms were also mentioned. The numbers of responses are depicted in Figure 1.

![Fig. 1. Students’ knowledge about e-learning platforms](image)

The next two questions concerned the advantages and disadvantages of learning by using e-learning systems. Five advantages and six disadvantages were given to evaluate. Eight percent of the respondents did not indicate any disadvantages, while other students indicated two disadvantages on average. Every student pointed out at least one advantage of this kind of teaching. On average, 3 advantages were given. The average grades given by students to the individual’s advantages and disadvantages are shown in Figures 2 and 3, respectively.
All respondents used the Moodle platform implemented at the LUT, and everyone stated that it was a great facility for them. The average number of courses for which they were signed in was nine. However, five students (5%) did not answer this question, claiming that they did not remember the number of the courses they used.

Students assessed the suitability of the components that could be stored on the platform. The evaluation of these components is shown in Figure 4. The rating scale was from 1 to 5. Note 5 indicates good suitability, note 1 – very low or no usefulness. The average frequency of using the particular components of the e-learning system by the students is shown in Figure 5. The rating scale was also from 1 to 5. Note 5 indicates a very high frequency of using the platform, whereas 1 – very rare (occasional) access.

Sixty six percent of the respondents indicated the need to increase the numbers of materials stored at the e-learning platform. Many students stated that there were deficiencies in the following courses: programming tasks - 10%, theory of algorithms and data structures - 6%, embedded systems and operating systems - 3%.
The last question the respondents answered was about what was missing on the moodle platform. Only nine percent of responses stated that the video materials should be included on the platform.

5 CONCLUSIONS

E-learning has undoubtedly a positive impact on the image of the university, as distance learning is a valuable supplement and enrichment of traditional learning methods. The great advantage of combining traditional and virtual learning is meeting the needs of the information society. Using moodle software to deliver an e-learning platform guarantees to both lecturers and students a wide range of state-of-the-art tools for learning and communication.

The results of the survey confirm a high usage of the e-learning platform at the LUT – all respondents stated that it was very helpful in the education process. The moodle platform at the LUT is frequently used by both teachers and students. The students’ evaluation also indicates a high frequency of using various components of moodle courses.

REFERENCES


