Evaluation of Tesys e-Learning Platform's Interface

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ABSTRACT

Online educational environments became more and more popular as a method for implementing distance learning programmes at universities. E-learning platforms serve as means of interaction for online educational environments and so they need to be well optimized for offering a better user experience. In this paper is presented the methodology and results obtained after the evaluation of the Tesys e-learning platform. The survey was taken by a group of students that saw the first time the e-Learning platform and they did several actions. After that they had to complete three surveys, one for every testing purpose targeted in the paper and we analyzed the results. The results offered us an overview on the actual state of the e-learning platform; on one side there are still some improvements to be done and on the other some interfaces and controls were validated via this study.

Author Keywords

e-Learning platform; HCI; interface evaluation

ACM Classification Keywords

H.5.2. Information interfaces and presentation (e.g., HCI): User Interfaces.

General Terms

Human Factors; Design; Measurement.

INTRODUCTION

E-Learning platforms offer the environments that allow users to interact for learning purposes [4]. During the last decade more and more e-Learning platforms were developed and are used for distance learning programs. These online educational environments aim to lower the gap between e-Learning platforms and classical educational environments in terms of interaction as much as possible.

The core functionalities that are implemented in any online educational environment refer to learning resources management and evaluation techniques. Two main types of actors are always present in every e-Learning platform: students and professors. Each of these actors performs specific actions and needs to interact with others in order to accomplish their responsibilities.

At the University of Craiova, we use Tesys [9] as e-Learning platform at all of the distance learning programs from several faculties. This e-Learning platform was developed at our University and aims to fulfil all the needs for the distance learning programs. In Tesys we have three main actors: professors, students and secretaries. In this paper we aim to evaluate the usability of the interface from the professors and students view.

The interface of Tesys as designed more than 10 years ago and it aimed to fulfil specific needs from that period of time. Due to the continuous development process, the functionalities were upgraded over the time and now it offers most of the standard functionalities but the interface needs to be adjusted to the actual needs of both the students and professors. Not only the interface needed and evaluation but also the way the users interacts in the e-learning platform. Some of the design of the older functionalities still needs to be evaluated in order to see if it fits the most recent user's needs.

This paper presents a study conducted on the Tesys e-Learning platform using s group of users that had to test some functionalities seen for the first time and then fill three questionnaires. We aim to evaluate the interface in terms of usability [5] and find the key issues that need to be addressed on the next release in order to improve the user experience [6]. The paper describes the setup, the questionnaires and also the results obtained. These results will be used for redesign of the platform and improve functionalities in terms of usability.

RELATED WORKS

Evaluation in terms of HCI of e-Learning platforms is a constant problem referred in many papers. In 2005, Ardito et al. [1] presents a specific methodology for evaluating e-Learning applications. They specify that there are specific attributes for capturing the peculiar features of these applications and identifies them. There is also a preliminary user study involving a group of 'e-students' that were logged during their interaction with e-Learning platforms and a report is produced. They also propose specific evaluation patterns that are able to drive the evaluators in the analysis of e-Learning platforms.

Another paper that addresses the problem of the evaluation of the usability of e-Learning applications was written by M. F. Costabile et al [2]. They assume that there isn't a consolidated evaluation methodology for e-Learning platforms. The addressed problem is somehow common with the one addressed in this paper – the design of the interface that should provide a good usability so that the students interaction with the software are as natural as possible. We take this assumption and try to see using specific HCI evaluation techniques where do we need to work in order to get a more usable interface.

In a more recent paper [3], Vlado Glavinić and Andrina Granić, presents an overview of research being performed in the area of user interfaces for online educational environments. They address the efforts being done in providing suitable interaction for intelligent e-Learning platforms.

Design and evaluation of the e-Learning platforms was also addressed by Brad Mehlenbacher et. al. [7]. The paper's goal was to outline the challenges that face practitioners and researchers interested in usability and evaluation. They provide a brief overview and they share a heuristic tool that was developed for evaluation e-Learning environments and experiences.

Intuitive interfaces that imply flexible iteration suites different needs and becomes more useful for different kind of users and for several purposes [10]. These intuitive interfaces lead to user-cantered design [11] and user sensitive design [12] as the most appropriate methodology that was developed out of them. The aim is to be able to handle both uncommon users and typical users [13].

Other related research [14] present investigations on perceived satisfaction, behavioural intention and effectiveness of e-learning platform. In the study Blackboard e-learning platform is used and 424 university students were involved in answering a standard questionnaire. The obtained results showed that perceived self- efficacy is a critical factor that influences the satisfaction with the Blackboard e-learning system.

More general but also related research is presented in Evaluating E-Learning: A Case Study [15] where is presented the investigation over the experiences and perceptions of students who completed the study. The results presented in the paper, show implication for online learning design and future e-learning research.

METHODOOGY OF RESEARCH
For our experiments we used three questionnaires [8] that aims to test the communication module, the testing module and the interface from the professor and student views.

Figure 1 presents the evaluated modules from Tesys e-Learning platform. Each of the modules has his own survey and the results are presented in the next chapters of this paper.

Communication function embedded in Tesys covers a big part of the interaction between the entities that perform their activity on this e-Learning platform. The evaluation of the communication module is performed using 11 mixed questions. The aim of the survey is to find where we need to optimize the interface and the functionalities of the module. First questions aim to evaluate if there are problems with buttons and controls adjustment and the rest evaluate the functionalities of the module.

The module evaluation survey has 12 mixed questions that address both the interface and the functionalities. First we aim to evaluate if the questions from the testing

procedure are well presented then we evaluate the controls. Both of them are important because we don't want learners to waste time looking for a misplaced control or to have difficulties in question presentation. Other important aspects refer the modality for computing grades and how often students got a question repeated (questions are automatically chosen for the test).
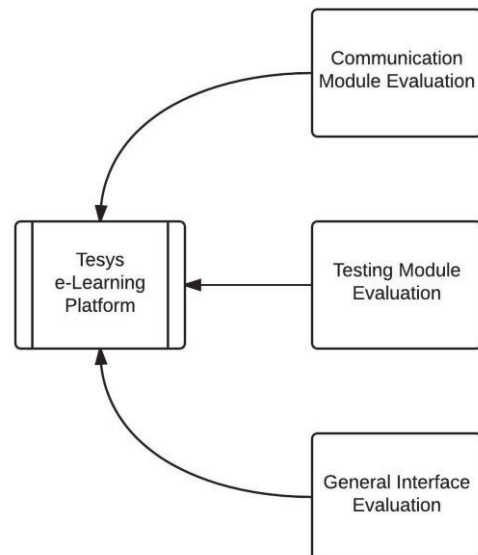

Figure 1. Tesys modules distribution.

The general interface evaluation survey has 14 questions divided in 7 for the student interface and 7 for the professor's interface. There are actually two interfaces for two different actors that are evaluated here. Every question from the student's interface and most from the professor's interfaces will get a mark from 1 to 10 regarding a specific control or functionality. On this survey we aim to find the best interface design in order to get the best usability results.

Group selection and setup
For this experiment we selected a group of 12 students from different years of study. No professors/tutors were involved in this study. The motivation for choosing them regards the academic results and a high level of trust. These students start using the platform for the first time and we aim to evaluate how well the e-Learning platform is optimized. The students are selected from different years of studies because the e-Learning platform is also used for every year of study from several faculties.

EXPERIMENTAL RESULTS
This section presents the results obtained from every questionnaire along with a short description. For every questionnaire we completed a table with the results which has on the columns the questions and on the rows the answers from every student that took part at the study.

For the first survey we used eleven questions and the results are presented in Table 1. Every question got a grade or a letter corresponding to a specific answer. The last three questions that got the same letter: *a,* were

referring if the dimension of the field of the message is big enough (question 9), if the dimension of the title of the message is big enough (question 10) and if the overall experience is good enough.

Communication survey

N o	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11
1	0	a	5	9	9	d	6	b	a	a	a
2	b	b	5	8	9	d	5	b	a	a	a
3	c	a	9	9	9	b	8	c	a	a	a
4	d	a	7	10	10	b	9	a	a	a	a
5	a	a	8	10	10	b	10	c	a	a	a
6	a	a	9	9	10	b	10	a	a	a	a
7	b	a	10	9	9	b	10	a	a	a	a
8	d	a	9	1	10	b	1	b	a	a	a
9	b	a	9	8	10	b	9	b	a	a	a
10	a	a	7	8	7	b	0	a	a	a	a
11	a	a	10	10	10	b	9	b	a	a	a
12	a	a	8	10	8	b	7	a	a	a	a

Table 1. Results for communication survey.

The communication module has two types of questions: grade driven and free choice (multiple complements answer). We present here just a example result for question one but we computed a chart like the one from Figure 2 for every question that had a multiple complement answer. Three of these questions got just one answer and the conclusion is that the fields dimension and the experience referring the communication module is a good one and we don't need to get any modifications.
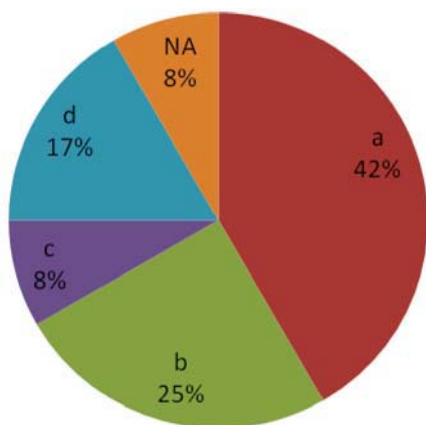
Figure 2. Question 1: How often do you use the communication function.

The placement of the "Communication" button is good, only 8% of the questioned students didn't found the button quick at first sight. Taking into consideration question 6 we can see that some students had problems at sending a message to professors. After a problem analysis

over the question 6 we found that there are some software implementation bugs and we need to make further tests and solve it.

From the second category we have only two questions which show grades above 8 for buttons placement on the interface. In conclusion, the buttons are well placed and the user's experience with this module is a good one. The overall analysis reveals some problems that need to be solved but the usability is pretty good based on the answer from question 11.

Testing survey

Table 2 presents the results obtained from the testing survey. Just like in the case of the communication survey, for the testing module we the same two types of questions. For the questions 1,3,4 and 6 which have multiple complement answers and these questions got a mark greater that 9 so there is no need for improvement on the verified aspects. From the question number 8 we conclude that we must optimize further the students searching results but a period of time close to 3s for searching professors is good enough taking into consideration that the functionality was first seen.

One aspect that was also important was that we need to adjust the checkboxes dimension and more exaclty they need to be enlarged.

No	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11
1	10	a	10	10	3	a	c	5	10	yes	b
2	9	b	10	10	3-5	a	a	8	9	yes	c
3	10	b	9	9	2	a	a	2	10	yes	c
4	10	a	10	10	2	b	c	2	10	no	c
5	8	a	10	8	3	b	a	4	9	yes	a
6	7	b	10	8	3	a	a	2	8	yes	a
7	9	c	10	9	2	b	a	1	9	no	d
8	10	a	10	10	.3	b	a	10	10	yes	c
9	8	a	10	10	.2	a	c	1	10	yes	c
10	10	b	10	9	10	b	c	1	10	yes	c
11	9	a	10	10	1	b	a	1	9	yes	a
12	8	b	10	10	9	b	a	4	10	yes	b

Table 2. Results for testing survey.

Las two quesrions refered the possibility to hack the testting procedure. This procedure is crucial for this module and we wanted to see if any of the students finds a procedure. We left them more time to see but no results. There is no question 12 in the table because the resuld sould have been a short description of the procedure. As a short example of question from the testing survey we choose the question no. five which validate the dimension of the check-boxes for the "answer" button. This question had a variety of results and the results may be somehow

unclear but taking into consideration the context of the question we can set a threadshold over the time spent for answering a question.
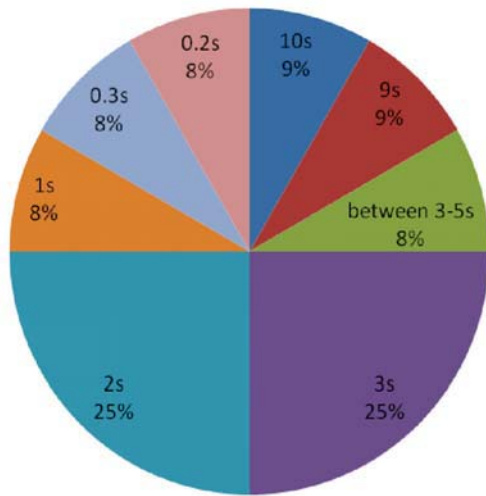
Figure 3. Question 3: How many seconds do you need to find the check-boxes for the answer button.

A student can't spend too much time finding the checkbox related to the correct answer so we certianly need to improve the dimensions. The moviation for taking such a conclusion is that in most of the cases he has 30s for giving the answer and 3s or bigger time means at least 10% of the total available time.

Professor and student survey

For Student							
No.	Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7
1	10	10	10	10	10	6	9
2	10	10	10	10	10	8	10
3	10	10	10	9	10	7	9
4	10	10	10	10	10	1	9
5	10	10	10	10	10	9	10
6	10	10	10	10	10	7	9
7	10	10	10	10	10	8	9
8	10	10	10	10	10	8	9
9	10	10	10	10	10	7	10
10	10	10	10	10	10	5	10
11	4	10	10	10	10	3	9
12	10	10	10	10	10	9	9

Table 3. Results for student's interface survey.

The last survey evaluated the buttons and controls placement for both student and professors. We have 7 questions that refer students, each of them requesting a grade from 1 to 10. Excepting the question number 6 that got an average grade a bit lower than 6, every question from this set got an average grade close to 10. The motivation for getting a lower grade on question 6 is the big number of clicks necessary for getting to the homework.
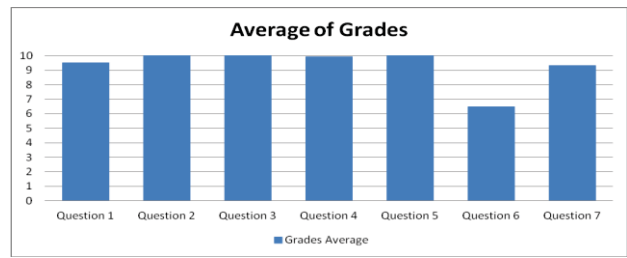
Figure 4. Average grade per question.

Figure 4 presents a chart with the results for every question from this interface. It helps us to have an overview of the results and to see on what items (in our case we take into consideration question one and six) we need to pay attention.

For professors the grades were also big, but some of the participants considered that learning resources need to be reviewed without a specific request. In this case we didn't found any improvements to do but we can take this survey as a validation of the professor's interface.

For Professor							
No.	Q. 1	Q. 2	Q. 3	Q. 4	Q. 5	Q. 6	Q. 7
1	a	a	10	10	9	10	10
2	a	a	10	10	9	10	10
3	a	a	10	10	8	10	9
4	a	a	10	10	10	10	10
5	a	b	10	10	10	10	10
6	a	b	10	10	10	10	9
7	a	a	10	10	9	10	10
8	a	a	10	10	10	10	10
9	a	0	10	10	10	10	7
10	a	a	10	10	10	10	10
11	a	a	10	10	10	10	10
12	a	a	10	10	8	9	9

**Table 4. Results for professor's interface survey**

There always can be a reorganize of the learning resources in order to see if there can be better results and then we aim to run the evaluation again.

CONCLUSION AND FUTURE WORK

The results obtained from the study described in this paper provide the feedback necessary for further development of the e-Learning platform. We presented the experimental setup, every survey that was used in this study and interpreted the results.

As final conclusions, that take into consideration the overall results, Tesys is well structured and the user experience is quite good especially for users that never used it before. The time needed to get used to the online educational environment is small (e.g., 3s as an average for most of the questions) and the usability is good. There

are also some bugs revealed as secondary effects which are very helpful because the e-learning platform is continuously developed are some new bugs can occur anytime.
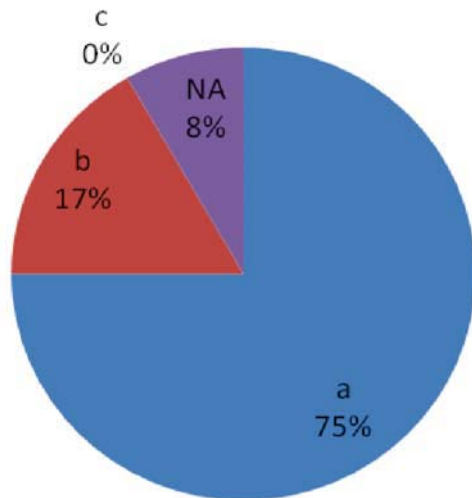
Figure 5. Question 2: Do you consider that the organizing of the learning resources is good enough?

Conducting the study revealed also some important problems that need to be addressed like reducing the number of clicks necessary for getting to homework from the students' view. Sending a message to the professors from the student's view is another interface problem that needs to be addressed because the button is sometimes hard to find and needs to be repositioned. Another important conclusion is regarding the check-boxes' dimension that are not big enough and need to be enlarged. As future work we take into consideration to try to solve the issues revealed by the surveys and then redo it in order to see if there is a results improvement. There are also some other modules that needs to be evaluated and optimized for better user experience.

A design of an adaptive interface that will suit better every type of user is also an important future work. The need for this kind of interface arises from the difference between users from different faculties that use the Tesys e-Learning platform.

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