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Alexandra Tsarik, graduate student

USABILITY EVALUATION OF ELECTRONIC LEARNING APPLICATIONS FOR EDUCATIONAL PURPOSE

Aeronavigation Institute of NAU, e-mail: staffer@bigmir.net

Abstract

Despite recent advances of electronic technologies in e-learning, a consolidated evaluation methodology for e-learning applications is not available. The evaluation of educational software must consider its usability and more in general its accessibility, as well as its didactic effectiveness. This work is a first step towards the definition of a methodology for evaluating e-learning applications.

Introduction

In times of information and communication technologies should be possible to study, being "far" from the sours of teaching, and this is the unique advantages of distance learning - its "anytime, anywhere" can be part of a winning strategy for specific needs such as unloading overcrowded schools, support for students and teachers who live far away from colleges and universities, incessancy of education.

E-learning is the latest way to make distance learning, disseminating educational materials and processes over the Internet. Creation remote data and tools available to users requires to take into account their different properties and characteristics such as cultural background, technical expertise, equipment, and physical / cognitive abilities. It is important to ensure the widest access to electronic learning tools in order to avoid the phenomenon of digital divide in this, socially and culturally fundamental applications. Providing convenience and accessibility for the greatest number of users, should be a major objective for the development of e-learning, and a necessary condition that allows users to leverage these tools.

The purpose of educational software is to support training. The main challenge for developers and researchers of human-computer interaction is the development of software tools which are able to attract first-time students and support their learning at a distance. It is clear that educational software should take into account the different ways to teach students and to ensure that the interaction of students, which is the most natural and intuitive as possible. This may lead to revision of traditional interaction paradigms to provide a new level of flexibility and adaptability that satisfy the specific features of the application. In addition, there should be a mix between the educational process and student interaction with the software.

Usability features should not only enable people to effectively manipulate interactive software, but also be appropriate for the intended learning objectives. Researchers do not fully consider the impact of usability features educational tools in achieving educational goals. Therefore there is a need to help evaluators consider how usability interact with learning [1].

Consolidated methodology for evaluating electronic learning tools for educational purposes does not exist, or at least it is still not widely accepted. For example, Drinhus suggests using heuristics without further adaptation to the context of e-learning [2]. In [3] evaluated electronic learning tools for educational purposes using usability evaluation methods have been developed to meet the needs and objectives of the users of interactive systems that are not specific to e-learning. In [1] proposed an approach adapted to e-learning is available but need further development and empirical validation. In conclusion, the development of electronic media for educational purposes deserves special attention, and developers need appropriate guidance, such as an effective methodology for the evaluation of "usable" interfaces [4].

Usability of electronic learning tools for educational purposes

From the perspective of people who need to use any interactive software system, usability - is the most important aspect of this system. This section examines some issues in e-learning, and provides a brief description of the problem.

Purpose - to justify the importance and the need for usability evaluation of electronic media for educational purposes.

Usability Issues

The ISO 9241 defines usability as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" [5]. Usability plays an important role in achieving the success of electronic learning tools for educational purposes. If the electronic system for educational purposes is not enough convenient and practical, this prevents the learning of students: they will spend more time learning how to use the software than on learning teaching material [6]. If the user interface is very hard, slow and unpleasant, users experience frustration and reluctance to use such programs.

One of the main goals of any education system is to avoid distraction, it is good to remember and keep in memory all students study material. In the case of e-learning, the task is to to create an interactive system that will not confuse learners. Often it appears that electronic educational purpose is a simple electronic transfer of conventional materials provided through tough patterns of interaction and inconvenient interface. When students complain about e-learning or prefer auditory learning is not just through training, but through confusing menus, unclear buttons or illogical links that scare them. The success of any training program is largely dependent on the attitude of the student and his motivation. If poorly designed interface makes them confused, confused and frustrated, it will hinder effective teaching and remembering of information. In addition, the technology should not be a barrier. Users with different hardware and software should be able to use e-learning artifacts, possibly due to Adjust access to the procedures.

Norman argues that formative software applications have to [7]:

- Be interactive and provide Feedback
- Have specific goals
- Motivate discussions continuous sense of problems
- Provide suitable tools
- Avoid distractions and unpleasant factors interrupt the flow of learning.

Usability issues take an extra dimension in the educational environment, but it is not enough to ensure that the electronic learning systems. They should also be effective in achieving the educational goals of teacher [8]. It is important to evaluate the pedagogical design of eLearning [9]. Here, the term pedagogical usability. Instruments to indicate that, content, interface and objectives of e-learning support teaching different students in different learning contexts according to the chosen pedagogical purposes. Obviously, the assessment of pedagogical design should not be replaced, and integrated with the assessment of usability. In fact, the e-learning system should be pedagogically useful and attractive and interesting. This means that the instrument is secured type of interaction should be designed to support learners in specific educational objectives, and should be clearly defined for them and not just be the introduction of advanced technologies. They should be developed based on processes and activities offered clearly established pedagogical models and results. For example, the use of multimedia tools must be carefully planned to avoid counterproductive overload of sensory channels. The use of new technologies does not constitute a waiver of traditional and successful learning strategies, such as systems modeling and problem-based learning. Thus, the training system should allow the integration of these strategies.

Looking for a set of features specific to the interfaces of electronic learning systems, we can say that they have to provide a complete picture of the organization of the content and functionality

of the system, a simple and efficient navigation, enhanced personalization of content and a clear solution.

However, a system that provides a new and flexible functionality that supports the new strategy and allows successful integration of traditional methods, can still suffer from poor usability. There is a need for a clear and consistent interface that can engage users in the educational process without overloading her / him. Distractions prevent learning new material and general conservation studied. In other words, the development of effective and inducing educational strategies need to focus on the needs and goals of learners.

The key to developing a system that would meet the above criteria of usability, making methodology is centered on learners. While "design focuses on user" allows users overall culture and similar experiences in the use of [10], the "design which focuses on learners' need to be considered different categories of students through personal learning strategies, different experiences in learning and motivation in implementing various educational tasks. In general, those who do not learn very experienced in the field of education. They may not even know which area they approach learning, or know only partially or even have misconceptions about it. In addition, not all students can be encouraged as one and the one motive in pursuing the problem, rather motivation may largely depend on the successful experience in teaching. Then it will be necessary to pay special attention to the tools provided and the recognition achieved improvements.

While for the "design aimed at users" their focus is only on the development of a new instrument to perform known tasks in the "design aimed at learners" must be considered a lack of experience among students and area studies. The purpose of "design aimed at learners 'can be defined as the completion of the marriage, by all the possibilities of students' knowledge and skills related to the topic. In the case of "design aimed at learners' arises dual problem - study in unknown areas using known means.

Usability evaluation methods

The concept of usability evaluation emerged more than a decade ago. Different authors define it differently. Hartson defines the term usability evaluation methods, like any methods or techniques used to perform usability evaluation with emphasis on the formation of iterative usability evaluation design at any stage of its development. Fitzpatrick argues that the method of usability evaluation is a systematic procedure for collecting data related to the interaction of end users with a software product or system. These estimates measure usability as the effectiveness, efficiency and satisfaction are critical to identify significant problems with the system at various stages of its life cycle. Since there are several different approaches to evaluating the usability of interactive systems, in our case the electronic learning systems, as is the need to analyze and evaluate these methods.

Review of the literature shows that different researchers have different usability evaluation methods are classified according to different criteria, such as the assessment mechanism and system development process.

Key usability evaluation methods defined as follows:

- Experimental evaluation
- Model-based Evaluation
- Query techniques
- Observational evaluation
- Review-based evaluation
- Expert evaluation

Criteria for usability evaluation

The above presented methods for usability evaluation. As already noted, the development of methods for assessing the usability is a requirement to determine the preferences, needs and user productivity or to evaluate the design submitted by the interface and interactivity. Usability of electronic systems for educational purposes and should be carefully designed to meet the needs of its

users. The two main users are those who teach and those who learn. Thus, the role of evaluation is to provide an understanding of these needs throughout system development life cycle.

The method is often determined by factors such as time and money, or the time and cost-effectiveness [3]. In order to avoid errors usability evaluation methods should be taken into consideration when choosing the appropriate method of evaluation. In order to choose the appropriate method of valuation is important to note the factors that distinguish these methods together.

The main factors influencing the choice of the appropriate method for assessing the usability, based on various criteria, such as:

- Stage of system life cycle development, which assesses
- Time Limits
- Budget constraints
- Necessary Resources
- Advantages / disadvantages of each usability evaluation methods, previously applied in practice
- Accuracy of the information (results)
- Quantitative / qualitative indicators

These factors should be considered when choosing a usability evaluation method. In some cases it may be necessary to use two evaluation methods, but financial constraints may force appraisers to use only one method instead of two, or even the results of previous research to make changes to the system to improve its usability.

Some assessment methods are subjective in that largely depend on the interpretation of the appraiser. Such techniques, if properly used, provide information that can be obtained using objective methods. Also, the indicators can be quantitative and qualitative. Overall, subjects active methods ensure quality. However, we can quantitatively provide quality information, displaying it on the scale or similar measures.

The accuracy of the information provided, the use of usability evaluation methods, one of the most important factors that should be considered when selecting the method.

Usability evaluation of e-learning applications for educational purposes

Electronic learning applications for educational purposes should be assessed as from the perspective of usability, and to and from the position of teacher effectiveness.

Usability is connected with:

- Provided functions
- A visual applications and content elements
- Modes of operation with features and elements of the program content
- Navigation program elements and content elements
- Application of the program elements and content

Didactic performance includes aspects related to:

- Educational planning elements content
- Educational technology that made
- Adequacy of the proposed pedagogical content
- The level of detail proposed content
- Level of the proposed update content
- Correctness and accuracy of the proposed content

For example, according to aspects of usability, e-learning tools to provide different users with the ability to navigate, organize and use of educational content in accordance with their own cognitive styles. In addition, there must be easy communication possible with teachers and peers, both for training and for collaborative learning.

It is also important to distinguish between the platform and teaching modules. E-learning platforms are more or less complex environment with integrated tools and services for training, communication and management of educational material. Didactic module - an educational content provided through the platform. Usability attributes for the platform as a whole differ from those typical of didactic module (content) and therefore different characteristics should be considered.

However, some characteristics of the content presented platform connected and limited functionality of the platform. As a result, evaluation of educational electronic should consider both components.

In determining the criteria and parameters for the evaluation of e-learning applications for educational purposes must be consider the features of e-learning, the main task is to enable students to learn didactic material, while paying a minimum of effort to interact with the system.

Conclusions

In developing electronic systems of educational purpose must use methodological approaches of human-computer interaction to make the system more attractive to users.

Usability is essential for the development of electronic media for educational purposes and includes technical and teaching staff. It has been classified both components of usability aspects.

There have been presented different methods and criteria for evaluating usability.

Further provided to assess the usability of e-learning system, choosing one of these methods, and following basic criteria for its selection.

Outlined in this paper is a great material contribution to the development of pedagogical usability, as well as a basis for further research.

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