

EVALUATION OF THE USABILITY OF EDUCATIONAL WEB MEDIA: A CASE STUDY OF GROU.PS

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Abstract

In this study, the evaluation process of the usability of a web media used for educational purposes is discussed. In 3 different undergraduate courses, the learners have evaluated the social network creating media called as GROU.PS used for supporting these courses. During the semester, the social network of each course has been used by the course instructor and by the students taking the course regularly for sharing the source files, carrying out the online discussions, and making the announcement related to the course. The usability of the media has been evaluated by eye-tracking, observation and think-aloud methods in the first stage. The usability problems were determined upon examination of the reports prepared by the users related to the usability of the media in the Human-Computer Interaction course. In the usability tests carried out in the first stage, the determination of the usability problems was not possible due to the familiarity of the users to the system. The method used in the second stage was successful for uncovering a portion of the usability problems present in the system. In this evaluation carried out with actual users, the training of usability personnel within the scope of the course has provided positive contribution.

Keywords: Usability, usability test, educational web media.

1. INTRODUCTION

1.1 Usability

Together with the fact that usability exists independent from the computer systems, its name has become more common with the developments in Human-Computer Interaction as an interdisciplinary field. The usability is an indicator which emphasizes the quality of a developed product. A product with a high level of usability enables a user to use that product easily and productively and to reach purpose after such use and to be satisfied from such use.

Dumas and Redish (1999) defines usability as the capability to complete a certain goal easily and quickly. The official usability site of the U.S. government explains usability as the degree of the usage quality of an individual using a product. The definition of the usability on the same website is as follows:

“Pursuant to ISO 9241-1, the usability is the capability to use a product efficiently and satisfactorily by certain users in order to reach to certain objectives.” (The official usability site of the U.S. government).

Nielsen (2000) emphasizes that there are millions of options for web users and in case a website is not usable, not easily understandable and includes technical errors, the user will leave that website and be inclined to another website.

A website can be visited by different users for different purposes. The purposes of use, ages, the equipment of the users, web browsers used for connecting to that website and many such features may exhibit difference and diversity. What matters is the capability to have a smooth experience despite all these different user characteristics. What matters for the users is to meet the requirements as a result of a smooth usage, and a website will only be deemed successful when it meets the requirements of its users (Lazar, 2006).

Krug (2006) mentions clear and understandable designs which will enable a user to think efficiently in line with reaching his/her purpose in order to deem the websites usable. The users should be capable of obtaining whatever they wish easily and should not think more than necessary on how to do what.

1.2 Methods for evaluation of usability

It is possible to understand whether a certain product is usable or not by means of usability tests. The usability test generally mentions the methods used for evaluation of an industrial product or system.

Rubin (1994) explains the usability test as evaluation of a product by a user group representing the target audience in accordance with the usability criteria to be determined.

Rubin (1994) emphasizes that the usability test has three purposes: To inform about the usability of the design, to eliminate the problems of a design and to increase the profit/benefit.

The basic issues which should not be disregarded for evaluation of usability are the requirement that the evaluation should be performed by means of a design reflecting the product and an exemplification to represent a user. Together with the fact that it is mostly accepted that reaching to actual users will provide the best results, in cases when it is difficult to reach to the actual users, it is emphasized that it would be sufficient to reach to a user or user group with similar features as the actual user and which can represent them.

The usability evaluation methods are classified by different researchers in different manners. Dix, Finlay, Abowd and Beale (2004) have collected the usability evaluation methods under two categories. These categories are called as expert analysis and user participation evaluation. The methods discussed under expert analysis are cognitive walkthrough, heuristic evaluation, model-based evaluation and using previous studies in evaluation. The methods discussed under user participation evaluation category are empirical methods: Experimental evaluation, observational techniques, query techniques and evaluation through monitoring physiological responses. A further classification for user participation evaluation is laboratory studies and field studies depending on where the usability test is performed.

Rubin and Chisnell (2008) have collected the usability evaluation methods under 4 groups:

- Exploratory or formative study,
- Assessment or summative study,
- Approval or verification test,
- Comparison test.

Nielsen (1993) lists the usability evaluation methods as heuristic evaluation, performance measurements, think aloud, observation, questionnaire, interview, focus group, logging actual use and user feedback.

The method to be chosen for evaluation of a usability study is significant. While making such choices, the criteria such as purpose, time, budget, the number of users to be reached, the resources available should be considered and the most appropriate method should be determined in line with these criteria. Every method has advantages and disadvantages compared to another and the data to be obtained as a result of the method to be applied may differ. The stage of the design process for the usability test also plays an effective role for determining the method to be chosen.

Jaspers (2009) has compared three methods used for testing interactive health technologies and has aimed to reveal the advantages and disadvantages of these methods based on exemplary studies. In this study which compares two specialized-based and one user-based methods, the following three methods are considered; heuristic evaluation, cognitive walkthrough and think aloud methods. While heuristic evaluation is the most efficient method in terms of price/performance among all the methods applied in the laboratory, the requirement for high level skills and usability experts are reflected as the disadvantage of this method. Cognitive walkthrough is beneficial in early usability studies but it is difficult to apply it for the improved versions of the product. The think aloud method is very efficient for directly obtaining deep information; however, data analysis requires a rather long time and expertise. Consequently it is emphasized in the study that each three methods has specific advantages and disadvantages but it is not possible to mention only one method which can be appropriate for all media. Using different methods together is underlined as the most powerful solution.

Koutsabasis, Spyrou and Darzentas (2007) have compared four different methods for evaluation of an academic website. The methods discussed in the study are heuristic evaluation, cognitive walkthrough, think aloud and co-discovery learning. While comparing the usability evaluation methods, the criteria followed includes reality, validity, thoroughness, efficiency and consistency. In order to evaluate the usability of a portion of a website developed for supporting the administrative and instructional tasks, post graduate students created 9 teams of 3 persons. These teams have selected

a method, which they felt comfortable with, and evaluated the usability of the website in line with two user tasks. At the end of the two month period for organization, application of the method, and reporting, the methods has been compared in light of the criteria determined via the gathered data. The most significant result of the study is the fact that no methods are sufficient alone for a comprehensive evaluation and the parallel evaluations are absolutely required. Upon examination of the obtained results, it is revealed that none of the methods is more efficient or consistent semantically. Another outcome of the study is the fact that all the teams have obtained considerably high points in terms of reliability and validity criteria.

Rosenbaum and Kantner (2007) have considered a method which handles the traditional methods all together as an alternative to the alone use of the traditional methods and examined the efficiency of this method by means of sample events. This method called as the area usability test is explained as handling the laboratory usability tests and intensive contextual interrogation techniques all together. The basis of the area usability test includes the application of the traditional laboratory tests in the media of the users with their own equipments. The examination of the sample events concludes that the area usability tests would be perfect choices in cases when the purpose of the usability test is specifically both obtaining structured data and understanding the actual context of the users.

2. METHOD

2.1 Media and Use of Media

GROU.PS is a commercial service provider in which users create their own social networks. The created media includes the possibilities for sharing files, pictures, videos, and links, writing blogs, participating in discussion forums and online chatting, and creating sub-groups for team work. The general operation logic of the media is similar to Facebook as one of the popular social media and this enables the users to easily get in harmony with the media. This media has been used for supporting 3 different graduate courses for educational purposes in the department of Computer Education and Instructional Technology at Hacettepe University In Ankara, Turkey. These uses have been particularly realized by means of blog, discussion forum, file sharing and online chat components of the media. The courses using the media are Computer Hardware, Information Design, and Human-Computer Interaction.

The students taking the courses have registered as users to the social networks created and designed by the instructor for each course. During the semester, the social network of each course has been used by the course instructor and by the students taking the course regularly for sharing the source files, carrying out the online discussions, and making the announcement related to the course.

2.2 Evaluation of the usability of the media

The usability of the media has been evaluated using the eye tracking, observation and think aloud methods at the end of the Computer Hardware course given in the fall semester. In line with the determined scenarios, 3 users with eye tracking method and 3 users with observation and think aloud methods have participated in the usability testing process. In each session lasting 15 minutes for average, the users were asked to perform 6 tasks. The tasks have been completed by 6 users without any problems. Based on the familiarity stemming from the regular usage of the media by the users for a semester, very low number of usability problems could be determined in the conclusion of these evaluations.

Later, the usability of the media has been determined within the scope of the Human-Computer Interaction course given in the spring semester. The students have taken training related to usability within the scope of the course. In the middle of the term the students were asked to evaluate the usability of the media considering their own uses. As a result of the studies first carried out individually and then in teams, each team has prepared a report. These reports have been examined and the usability of the educational web media has been evaluated.

27 students have registered to the Human-Computer Interaction course. 5 teams were created from 27 students. The usability problems stated in the reports prepared by 5 teams have been analyzed.

5 teams were able to find 80 usability problems in total. After the elimination of identical usability problems, the number of unique usability problems was reduced to 51. 36 out of 51 unique problems could be found only by one of the teams. The number of unique usability problems which could be

found by 2 of the teams is 5, the number of unique usability problems which could be found by 3 of the teams is 7, the number of unique usability problems which could be found by 4 of the teams is 2, and the number of unique usability problems which could be found by all teams is only 1 (Table 1).

Table.1 The number of teams which could find the unique usability problems

Number of teams	Number of unique usability problems	%
1	36	70,5
2	5	9,8
3	7	13,7
4	2	3,9
5	1	1,9
	51	100,0

The team that was able to find the highest number of usability problems was able to find 21 problems and 14 of them were unique. These numbers were 18/8, 16/8, 15/3 and 10/3 for the other teams (Table 2).

Table.2 The total number of the usability problems and the number of unique usability problems found by the teams

Team	The number of the usability problems	The number of unique usability problems	%
T1	21	14	66,7
T2	18	8	44,4
T3	16	8	50,0
T4	15	3	20,0
T5	10	3	30,0
TOPLAM	80	36	61,3

Upon examination of the problems found in terms of educational purposes, it is observed that 11 of the 51 problems will affect the training process directly, and 22 of them will be related to the process. It is considered that other problems may only affect the training process indirectly or will not have any effect.

3. DISCUSSION AND CONCLUSION

In the usability tests carried out in the first stage, the determination of the usability problems was not possible due to the familiarity of the users to the system. Furthermore, in order to evaluate the usability of such media with many components, the usability tests have to be conducted in a longer time frame and with more tasks. The traditional usability tests carried out only with one user at once may remain limited for such media based on interpersonal interaction. When such kinds of complicated systems are of concern, comprehensive scenarios should be prepared for a detailed evaluation, and usability tests should be carried out with many users.

The method used in the second stage was successful for uncovering a portion of the usability problems present in the system. In this evaluation carried out with actual users, the training of usability personnel within the scope of the course has provided positive contribution. Being informed of what the usability is, why it is important and what features the usable systems should have, the usability personnel were able to mention the problems they have encountered during the usage of the system.

Although the method applied in the second stage can be assumed as an evaluation with participation of users, It also shares common aspects with expert analysis. Accordingly, this method can be considered as a union of the user participation evaluation and the expert analysis.

By continuing the evaluation of the usability of this system with different methods and different users, the efficiency level of the aforementioned method can be shown more realistically.

REFERENCES

- [1] Dumas, J.S., & Redish, J.C., 1999. A practical guide to usability testing. Intellect Books, Wiltshire.
- [2] Dix, A., Finlay, J., Abowd, G.D., & Beale, R., 2004. Human-computer interaction. Pearson Education, Harlow.
- [3] Jaspers, M.W.M., 2009. A comparison of usability methods for testing interactive health technologies: Methodological aspects and empirical evidence. *International Journal of Medical Informatics*, 78, pp. 340-353.
- [4] Krug, S., 2006. Don't make me think. New Riders Publishing, California.
- [5] Koutsabasis, P., Spyrou, T., & Darzentas, J., 2007. Evaluating usability evaluation methods: Criteria, method and a case study. In J. Jacko (Ed.) *Human-Computer Interaction, Interaction Design and Usability* (pp. 569-578). Springer, Heidelberg, Berlin.
- [6] Lazar, J., 2006. *Web usability: A user-centered design approach*. Pearson Education, Boston.
- [7] Nielsen, J., 2000. *Designing web usability: The practice of simplicity*. New Riders Publishing, Indiana.
- [8] Nielsen, J., 1993. *Usability engineering*. Sunsoft, California.
- [9] Rubin, J., 1994. *Handbook of usability Testing: How to plan, design, and conduct effective tests*. John Wiley & Sons, Canada.
- [10] Rubin, J., & Chisnell, D., 2008. *Handbook of usability testing: How to plan, design, and conduct effective tests (2nd ed.)*. Wiley Publishing, Indiana.
- [11] Rosenbaum, S., & Kantner, L., 2007. Field usability testing: Method, not compromise. *IPCC 2007 Proceedings*, Seattle, WA, pp. 1-7.
- [12] The official usability site of the U.S. government. Retrieved May 29, 2010, from <http://www.usability.gov>