

Evaluating WAP Usability: "What Usability?"

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Abstract

Some educational communities and organizations have recognized the possibilities of mLearning. mLearning may provide tools to respond to the demands of working life and information society. One way to enhance mLearning is to raise the usability of mobile terminals as good usability is the basis for the meaningful and effective learning. Poor usability disturbs the learning processes because the energy of users is directed to the use of the system instead of learning. In this paper the usability of Nokia 7110 mobile phone is evaluated. Researchers located the problem points of the user interface and navigation system. In fact, there were several obstacles in the user interface of the tested mobile phone that need improvement. First of all, the Navi Roller confuses users and they prefer to use it even in the tasks that could be done more easily with the other buttons. Secondly, the inconsistency of the Navi Roller and the shortcut button caused some problems. WAP services need improvement as well. The navigating structures were hard to understand and feedback of actions was insufficient. As a conclusion, there is a lot usability work to be done before mobile terminals can be effectively adapted as a part of education.

1. Introduction

Usability tells us how well the users can use the system productively, effectively and pleasantly to reach the defined goals in a certain environment. According to Nielsen (1993), usability is a multidimensional concept that is traditionally associated with five attributes: learnability, memorability, efficiency, errors, and subjective satisfaction. In this study usability of Nokia 7110 mobile phone is evaluated on the basis of learnability, memorability, and errors.

User interface is the visual part of usability that the critiques of users usually concern. The user interface is a communication channel between the user and the functional elements of a machine and applications. (Fleming, 1998.) Although the technology enables

possibilities to easier communication with machines, it does not guarantee high usability.

Navigation is usually the bottleneck of the usability (Sinkkonen, Kuoppala, Parkkinen & Vastamäki, 2002). Because navigation is a tool for accessing to information, it should be natural and easy. People have different backgrounds, learning styles, and prior knowledge, which make it challenging to design the navigation systems. The main principle of navigation is to point out the location of the user and possible navigation alternatives. The user can not understand the structure of system if he or she does not understand where he or she is. (Nielsen, 2000.) If navigation system is inconsistent, it may confuse users. Therefore, it is important to keep the navigation elements at the same place across the whole application. Elements should always operate the same actions. Thus, the users do not have to use their energy on thinking of the possible consequences of actions.

2. Research methods

In order to study the usability in of Nokia 7110 mobile phone, a case study was carried out in two schools in Finland in 2001. The classes that took part in the experiment were chosen in terms of judgement sampling. A randomized experimental group (n = 40) and a control group (n = 20) were formed from fourth and fifth graders of the Rauma training school and Nanus elementary school. The experiment consisted of three lessons of 45 minutes on the use of Nokia 7110 WAP mobile phone. The students worked in pairs and each pair had one mobile phone to use. In the first lesson pupils made tasks dealing with basic functions of the mobile phone such as sending messages and changing the settings. The second and third lesson consisted of one wide task. Pupils were bound to plan a holiday trip for they family with the help of WAP services. They sorted out possible overnight accommodations and spare time activities. Finally pupils performed their holiday plans to the rest of the class.

The test instrument consisted of four tasks. The first two tasks measured the basic functions of the use of mobile phones; sending a message to Aku (task 1) and changing the time of mobile phones clock (task 2). The last two tasks measured the use of WAP services; correcting

possible mistakes in connection settings of the banking WAP services (task 3), and finding out what is the time difference between Finland and Japan (task 4). Subjects had three minutes time to complete each task. The method that was used in collecting the data was structured observation. The data was observed from videotape by two independent observers. The researchers measured the used time per each task and counted the number of errors made in performing each task. An error was registered when participants exited the right path while performing a task or if participants hesitated and took a step backwards on the right path.

3. Results

In this study the usability of Nokia 7110 mobile phone was evaluated on the basis of learnability, memorability, and errors. Learnability was evaluated in the form of the number of successfully performed tasks. The first two tasks dealing with basic functions of mobile phone were easy to learn, and 81,25 % of subjects completed them in time. Last two tasks dealing with WAP services were much harder, and only 33,75 % of subjects completed them in time. In addition, the results of the experimental group were compared to the results of the control group. The difference between the mean of solved tasks per group was very significant ($p < .001$).

On the basis of these results, learnability of basic functions was very good but the use of WAP services was hard to learn. It is obvious that such unfamiliar function as WAP was hard to learn because the user interface did not offer as clear cues to WAP services as to basic functions. On the other hand, this is the problem of systems memorability. Subjects had to remember a long chain of events when performing WAP tasks. The cues of the user interface did not direct subjects to the right path and most of the subjects were confused because they did not have a clue what they should do. Another problem of WAP services was the lack of feedback. Users could not always tell the state of system.

The error rate of the mobile phone was measured by counting errors made by the subjects while performing the tasks. The mean of the errors made in successfully performed tasks was 1.224. Naturally the subjects made more errors in WAP tasks.

As a result of mapping the paths in the mobile phones menu structure used by participants the problem points of the menu structure were located. On the basis of these results some assumptions can be made on the need for improvement of the user interface. In fact, there were several obstacles in the user interface of the tested mobile phone that need improvement. First of all, the Navi Roller confuses users and they prefer to use it even in the tasks

that could be done more easily with the other buttons. This may be the consequence of the fact that people are used to work on graphical user interfaces. Such subjects who used the Navi Roller needed visual elements to support their interaction with the mobile phone. Visually directed subjects did not care that the use of the Navi Roller was time consuming. The most important thing for them was the visibility of the actions. Secondly, the inconsistency of the Navi Roller and the shortcut button caused some problems. Participants did not understand the logical difference between these buttons, which made the navigation confusing. These results reveal that the tested user interface needs improvement in which the user perspective of children would be taken into account. On the other hand, WAP services need improvement as well, as the navigating structures were hard to understand. Especially the exiting function of the services was difficult to understand. Without any kind of teaching these obstacles were significantly larger.

4. Conclusions

It is clear that there is a need for development for mobile services and terminals before they are widely approved as a part of education. The practical value of mobility in teaching will be greater in the future because mobile terminals are flexible to use and they enable real time and place independence. Nonetheless, the use of such terminals is not always so easy. Special functions are often hard to learn and some kind of teaching would be useful. A key question in applying mobile terminals to education is usability and the easiness of usage. Poor usability disturbs the learning processes, because the energy of users is directed to the use of terminals instead of learning. Thus one way to enhance mLearning is to raise the usability of mobile terminals.

10. References

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