

Usability Evaluation of Mobile Learning Applications

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Abstract- Mobile learning is creating new opportunities for learning anytime, anywhere by using the mobile device. Mobile learning supports, continuous access to the learning process and with the arrival of mobile learning, educational systems are changing. The availability of mobile applications is increasing speedily and with the increased process power accessible on moveable devices, developers are increasing the variety of services. The interface of the mobile educational(apps) ought to be compatible with the cognitive skills of children to supply higher learning expertise. In mobile learning apps, the students are provided audios, videos, texts related to the study material with the help of which they can learn their respective subjects and can acquire more knowledge and understanding about the concept. Therefore, this paper will provide feedback for mobile learning applications using the testing method i.e., think-aloud testing methodology.

Usability evaluation is used by practitioners to gather feedback from users about a website or application and it focuses on how well users are satisfied and how well they can use the product to achieve their goals and how well they can learn from the product and how well they can discover and explore the content. Usability evaluation has a variety of methods to gather feedback from the user. In this paper, we are focusing on the usability evaluation of mobile learning applications using Think Aloud Testing which is one of the most preferred methods. Think Aloud Testing is the one in which the test users are said to verbally express their thoughts, feelings, opinions while interacting with the mobile learning application, and direct observation can be made as the users are asked to think out loud. If the task is complex, then the user can make a periodic report to think aloud while performing the task at the same time. Think Aloud is a cheaper method as no special equipment is required in this and the test user can simply sit next to the user and can gather feedback

Keywords- Mobile learning Applications, Think Aloud Testing, Usability Evaluation, Feedback, Cognitive Skills

I. INTRODUCTION

Mobile technologies will give key support in education and facilitate users to develop new skills. Various results show that students are excited to use mobile devices. For developing mobile learning applications number of design challenges are to be faced. The interface of M-learning applications ought to be user-friendly and additionally compatible with their cognitive skills.[3] The widespread use of mobile applications can solely be accepted by users if their comprehensibility is of an acceptable level. Clear and visual navigations, consistent designs and colors, concise content, appropriate help, and simply accessibility are numerous usability factors to affect the end user's satisfaction. A large variety of learning applications are offered in the market, targeting young kids, and also the increasing quality of mobile has prompted a replacement wave of mobile learning in student education.[4]

Computer professionals require strong, easy-to-use usability analysis strategies to assist them and systematically improve the usability of pc artifacts [5]. Conducting a usability evaluation could be a crucial step in taking a website to the next level when it involves the target market and involves getting ahead of the competition.

When visitors view the site at that time the usability evaluation helps to eliminate the various mishappening like where the style, categorization, and layout is lacking. Usability evaluation provides us a more robust understanding of how the target market thinks and then shows the best way to develop and optimize the website.

By usability of the mobile app, we exactly meant to have an effective, efficient, and client satisfaction via possible use of the apps[6]. If the usability of applications is of valuable standard, the users of those mobile applications will effectively attain all their tasks. People who want to develop expertise in usability measure and analysis will examine usability methods, find out how to use them, and become skillful in determining whether or not an interactive system or device is usable, and if so, to what extent.

To conduct usability, test the first task is to find out the participants who are representative of the target market and telling them to use the site with few set tasks in mind. Invigilators are then able to observe, raise questions, and then can make the notes. The data gathered after the testing is then used to rate the site for the customer's satisfaction.

Therefore, we can say that the usability evaluation is said to have any one of the sets of methods that allows a user experience expert to evaluate the usability of a system or a production with varying levels of detail. form a core part of the Ph.D. curriculum. Research scholars publish their research work in leading journals to complete their grades. In addition, the published research work also provides a big weight-age to get admissions in reputed varsity.

II. REVIEW OF LITERATURE

The literature review for the paper is done by reviewing research paper based on keywords like "usability evaluation", "mobile learning apps", "think aloud testing", "feedback", "mobile interface", and "interface design". A total of 9 research papers and books were studied for the analysis that has been made to select the relevant material for the research paper.

According to [1] the usability and accessibility and the overview for mobile application has been studied. A case study of mobile learning apps in k-12 schools has also been studied from [2] to make a clear understanding of the topic.

The criteria for the design of the user interface of mobile applications have been drawn out from [3] in which the paper focuses on the user-friendly interface for apps. From [4] and [5] the usability methods and various criteria used for the evaluation of application have drawn out.

The following points the effectiveness, efficiency, customer satisfaction that has been focused on in [6] Duce's research. The way to conduct the usability test using think-aloud is also there. From the [8] and [9] the think-aloud method is explained in detail that how it is carried out, who are required to carry out the testing, and how the feedback is gathered, and the results are drawn.

III. METHODOLOGY USED

Usability evaluation consists of the number of methods to evaluate the product or the system. But in our paper, we are using the Think-aloud testing methodology among the several usability evaluation methods.

Using the think-aloud method the invigilators will get the answers to their questions by getting direct insight into how users think. Think aloud testing provides direct data on the ongoing thinking process.

In a think-aloud process, the users or the targeted group are asked to verbalize what they are thinking, doing, and feeling while they complete a task and the users are also able to explain or justify their thoughts using this technique.

The most important advantage of using this methodology is that it provides real-time feedback of the targeted group or the users and helps in gathering data on how to improve the user interface.

To run a think-aloud test there should be a moderator and a group of test users, the test users are told to say everything that they think throughout the test and are also told to say why he or she is doing it.

This will assist the moderator to visualize how the test user might use the technology in various ways than how they anticipated and also interprets the reason behind this. The product will then be reformed based on the feedback.

Think aloud testing provides numerous benefits like it's cheap as no special equipment is needed to conduct testing, robust, flexible as can be used at any stage in the development lifecycle, convincing, and easy to learn.

In this research paper, we are performing think-aloud testing on application X. The app X is being tested by considering some test users and moderators. The students from various colleges are taken to conduct the test. The results of the test are as follows.

IV. RESULTS

	Very Good	Good	Average	Bad	Very Bad
Ability to share the link of downloading the app	13	5	2	4	8
Ability to mark subjects as favorites	14	5	7	2	4
Ability to mark videos as favorite	14	4	3	0	11
Ability to download the videos	10	4	5	5	8
Ability to chat on screen with others while watching a video	8	5	3	6	10
Ability to access videos related to a subject	12	3	6	4	7
Ability to add videos to playlist	7	5	5	5	10
Ability to share the videos	12	4	5	3	8
Ability to search for a particular subject	12	7	2	2	9
Ability to search for a lecture	13	4	5	3	7
Account setup	9	13	8	2	0
Login process	8	11	7	4	2
Visual interface ("look and feel" of the application)	8	5	12	5	2
Icons for video downloading and sharing	8	6	10	5	3
Icons for adding to favorites and adding to playlist of videos	4	9	9	7	3
Icons for Home, Navigation, Notification, Settings	8	9	5	7	3
Enrolling in a course	8	11	7	6	0
Rating a video	9	10	9	3	1
Rating the application	11	9	6	4	2
In-class activities and assignments	11	10	7	1	3
The relationship of the virtual instructor with students	8	12	7	3	2
Your understanding about the subject	10	9	6	4	3
Your ease of using a mobile learning application	10	7	6	7	2
Your ease of using the application	7	11	5	3	6
Using the downloaded videos for later reference	5	11	8	3	5
Sharing the videos with your friends	6	9	10	4	3

V. CONCLUSION

In this paper the think-aloud testing is carried out on an app X. We took 32 students from various colleges for carrying out the testing. Among these 32 students, 90% of them are female and 10% of them are male, 84% of people are bachelor students, 12% are master's students and 3% are doctorate students.

Among 32 students 83% of students belong to the age group 18-24 and 13% belong to the age group 25-34. The students who accessed the app X from home are 38%, from work are 9%, from campus classroom are 28%, from other campus are 15% and from another place are 9%. Of 32 students the people who used the app X rarely are 46%, regularly are 31%, frequently are 18%, and never are 3%. 53% of students among 32 students rate the experience of using app X as good.

Among these 32 students 40% of students find that the ability to share link of downloading app is very good, 44% of students find that the ability to mark subject as favorite is

very good, 44% of students find that the ability to mark video as , favorite is very good, 31% of students find that the ability to download videos is very good, 31% of student find that the ability to chat on screen with others while watching a video is very bad, 37.5% of student find that the ability to access video related to a subject is very good, 31% of student find that ability to add video to playlist is very bad, 37.5% of student find that ability to share the video is very good, 37.5 of student find that ability to search for a particular subject is very good, 40% of student find that ability to search for a lecture is very good, 40% of student find that account setup is good, 31% of student find that login process is good, 38% of student find that visual interface is average, 31% of student find that icons for video downloading and sharing is average, 28% of student find that icons for adding to favorites and adding to playlist of videos is good and average, 28% of student find that icons for home, navigation, notification, setting is good, 34% of student find that enrolling in a course is good, 31% of student find that rating a video is good, 34% of student find that rating the application is very good, 34% of student find that in-class activities and assignments is very good, 37.5% of student find that the relationship of the virtual instructor with students is good, 31% of student find that understanding about the subject is very good, 31% of student find that ease of using mobile-learning application is very good, 34% of student find that using the downloaded video for later reference is good, 31% of student find that sharing the videos with the friends is average.

Therefore, from the above observations using usability evaluation, we can conclude that app X is useful as the percentage of the app on basis of the criteria 'very good' is the highest in the maximum number of questions.

From the above results based on the various criteria, we can say that the maximum students found the app useful. Many students rated the overall features of the app as good and they found that the interface is also good and average.

So, in totality, this mobile learning application X is found useful by many students from various colleges.

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