Websites Usability: A Comparison of Three University Websites

S.A Adepoju* &   A.O. Osofisan **

*** Department of Library and Information Technology, Federal University
of Technology Minna**

**** Department of Computer Science, University of Ibadan**

ABSTRACT

Usability testing is a means of measuring how well people can use some human-made object such as a web page, a computer interface, a document, or a device. This study was carried out to perform usability study on three universities websites in order to know the ease with which users can obtain information on them. The websites tested are futy.edu.ng, futa.edu.ng and futonigeria.net. Twenty-two users from a university volunteered to participate in the study. The participants were given five tasks to perform on the three web sites under a close observation of observer to determine their efficiency, effectiveness and satisfaction with the web sites. Questionnaires were also used to get the users' demographic data, users' satisfaction, overall performance and recommendation on the web sites. The results indicate that futa.edu.ng performed best in terms of users' effectiveness and efficiency with the sites.

Keywords: Website, WebPages, Usability, Users, internet

INTRODUCTION

The World Wide Web was developed from a scientist's interest to explore communication

methods via the computer network (Robert, 2006). The web dates back to the early 1980's at

CERN, (*Centre European pour la Recherché Nucleaire)* an European high energy physics

research facility. Since the early 1980's, the web has developed at a very rapid rate and is now

used by education, business, government and any other body interested in transferring electronic

media around the world (Tim, 1996). Many companies and organisations already have a site on

the Internet or maintain an Intranet. Web sites are becoming critical for companies and

organisations. Either they are seen as part of a marketing strategy (Internet sites) or as a tool to enhance the internal communication and as such the efficiency of the organisation (Intranets) (Karat, Broche, Karat, Vergo & Alpert, 2003).

As the Web grows, websites continue to come up with ways that are not pleasing to the users. Every year brings new mistakes, which affect the usability of the sites (John, 2002).Among the teaming growth in website is the institutional or educational websites which are being owned by schools or institution. These types of websites are very important considering the type of services they render viz; informing the populace about the school, online registration, giving guidelines to students seeking admission either for undergraduate or post graduate students (academic or research), showing research areas for those interested in research, displaying admission list among others The motivation is as a result of the difficulty users (students as well as staff) experience (especially novice users) while accessing most institution websites.

Different types of user access these sites namely:

Candidate students who are looking for general information about the university and the content of the different curriculum;

The enrolled students who need detailed information about the different courses, timetables and contact information of the lecturers

Researchers who are looking for information on research projects, publications, and general information concerning the researchers (full address, research interest, research activities).

Considering the growing importance of universities websites in a country like Nigeria and the absence of clear usability guidelines on most websites, it is therefore imperative that this study should be conducted. Hence, three university websites namely futy.edu.ng, futa.edu.ng and futonigeria.net which are the official websites of the Federal Universities of Technology Yola, Akure and Owerri respectively are used for the study.

The objectives of the study are:

(1)   To know how usable, efficient and effective the websites are.

(2)   To discover their features and the usability problems.

(3)   To carry out a comparative analysis on their usability with the view of showing ways of improving their usability as well as given recommendations for their improvement.

LITERATURE BACKGROUND

Human Computer Interaction refers to the design and implementation of computer systems that people interact with. It includes desktop systems as well as embedded systems in all kinds of devices (Farlex, 2006). Although the user interface is the primary element between user and computer, HCI is a larger discipline that deals not only with the design of the screens and menus, but with the reasoning for building the functionality into the system in the first place. It is also concerned with the consequences of using the system over time and its effects on the individual, group and company.

USABILITY

There is not one agreed upon definition of usability and usability certainly cannot be expressed in one objective measure. In the ISO 9241-11 standard a rather abstract definition is given in terms of efficiency, effectiveness and satisfaction (Bevan, 1994). It 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".

According to Nielsen (1993) "Usability is a quality attribute that assesses how easy user interfaces are to use". The word *usability* also refers to methods for improving ease-of-use during the design process.

Usability also defined by Bainbridge (2003) is "a user interface aspect of a website (or application) that the user interacts with and experiences first-hand"

BASIC USABILITY ATTRIBUTES

Usability is a quantitative and qualitative measurement of the design of a user interface, grouped into five key factors based on Nielson's (1993) five attributes. These are discussed as follows;

Learnability has to do with how quickly and easily users can begin to do productive work with a system, which is new for them. Ease of learning is another wording for this usability attribute, as it is mentioned by most sources (Dix, Abowd, Beale,& Finalay, 1993) (Nielsen, 1993) (Shneiderman, 1998). This attribute is linked to the speed of a user's evolution from being a novice in his/her usage of the system to being an expert (or expert enough so a certain level of performance has been reached). Learnability is how quickly and easily users can reach a level of proficiency in using the system (website).

Efficiency: Nielsen (1993) defines efficiency refers to an expert user's steady-state level of performance at the time when the learning curve flattens out. (Dix, Abowd, Beale,& Finalay, 1993) and Wixon (1997) specify efficiency as long-term performance, therefore associating it somehow with expert users as well.. Efficiency is the number of tasks per unit of time that the user can perform using the system.

Memorability: This refers to the ease of remembering the way a system must be operated. Nielsen (1993) describes this as the characteristic of a system that allows the user to return to the system after some period of not having used it, without having to learn everything all over again.

Error rate: This refers to the errors made during the use of the system and how easy it is to recover from them (Nielsen, 1993). According to Shneiderman (1998) and Nielsen (1993), errors can have an impact on efficiency, by slowing down performance.

Satisfaction: is the subjective opinion that users form about the system (or about some parts of it). It is the most elusive usability attribute, as it is completely dependant on subjective opinion of users.

Effectiveness: Bevan (1994) in ISO924 standard states that effectiveness is the extent to which the intended goals of users are achieved. It is the *accuracy* and *completeness* with which users achieve specified goals. Shackel (1991) describes effectiveness as performance in accomplishment of tasks, considering both speed and errors. To measure this we need an accurate description of the task and goals the user wants to achieve.

METHODOLOGY

The test consist of a performance test made of four sections: The test was conducted in a laboratory setting where there are desktop computer with an internet connection. Participants were brought in two at a time with the monitor present. Each participant was made to feel comfortable and relaxed. The participants were asked to fill out a short pre-study questionnaire, which gathers background information about the websites. They each received a scripted, verbal introduction and orientation, which explained the purpose and goals of the test. They were assured that the website is what is being tested, not themselves.

Participants were mostly undergraduates' students at the Federal University of Technology Minna. Only a very few Post graduate students and staff were involved.

Performance Test

The performance test consisted of a series of tasks that the participants carried out while being observed. These tasks were conducted in the following manner:

a. Participant were handed a script, which they were asked to read out loud, detailing the task to be accomplished. They then attempted the tasks.

b. After concluding the tasks, the participant completed a short survey to gauge their responses to the tasks. During the performance test the monitor made notes on elapsed time and participant errors.

Below are the set of tasks that the participants completed on each of the websites.

(1)   Locate information about the university history.

(2)   Locate the School of Science.

(3)   Locate Mechanical engineering department in the school of engineering.

(4)   Identify the University library so as to know their collections.

(5)   Locate the school of postgraduate studies

RESULTS

A total of 22 uses volunteered for the study which comprises 14 males (64%) and 8 females (36%). Also 77.2% of the participants ages between 16 and 25 years out of which 9 (40.9%) and 8

(36.4%) are males and females respectively. 4 participants (18.2%) all male are between 26 and 35 years while only 1 (4.5%) who is male falls into the age bracket of between 36 and 45 years. This is shown in the pie chart below.
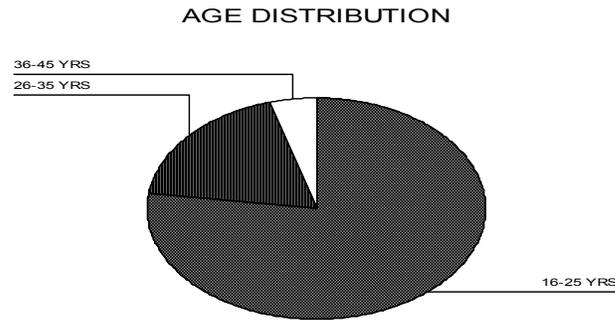
AGE DISTRIBUTION

Fig 1: Age Distribution of the Participant

INTERNET EXPERIENCE:

Most of the participants, (68.2%) used for the study have between 1 and 3 years experience with the Internet, 22.7% have between 3 and 5 years experience while 4.5% and 9.1% have less than one year and more than five years experience respectively. Only one user claims to have visited either of the sites before. This is shown table 1

Table 1   Internet Experience by the Participants

Yr of experience	Frequency	Percent	Valid Percent	Cum Percent
<1 year	1	4.5	4.5	4.5
Btw 1 and 3 yrs	14	63.6	63.6	68.2
Btw 3 and 5 yrs	5	22.7	22.7	90.9
More than 5 yrs	2	9.1	9.1	100.0
Total	22	100.0	100.0	

Task Scenario

Each of the participants was told to perform five tasks on each of the three websites. They were observed carefully as the tasks were being performed and timed so as to know the time spent on each of the tasks.

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Table 2 shows the average time to complete each of the tasks by participant across the three websites

Table 2: Average Time to Complete Each Task

schools	Task1(s)	task2(s)	task3(s)	task4(s)	task5(s)	ave(s)
futy	27.82	43.14	23.39	69.08	29.03	38.9
futa	17.81	33.55	13.01	25.05	19.3	21.74
futo	18.46	23.9	-	19.04	23.33	21.18

The average time to complete the five tasks on each of the websites is shown in the last column of table 3. So in terms of efficiency both futa.edu.ng and futonigeria.net participants are nearly the same though futonigeria.net is not as effective as futa.edu.ng. So futy.edu.ng is less efficient.
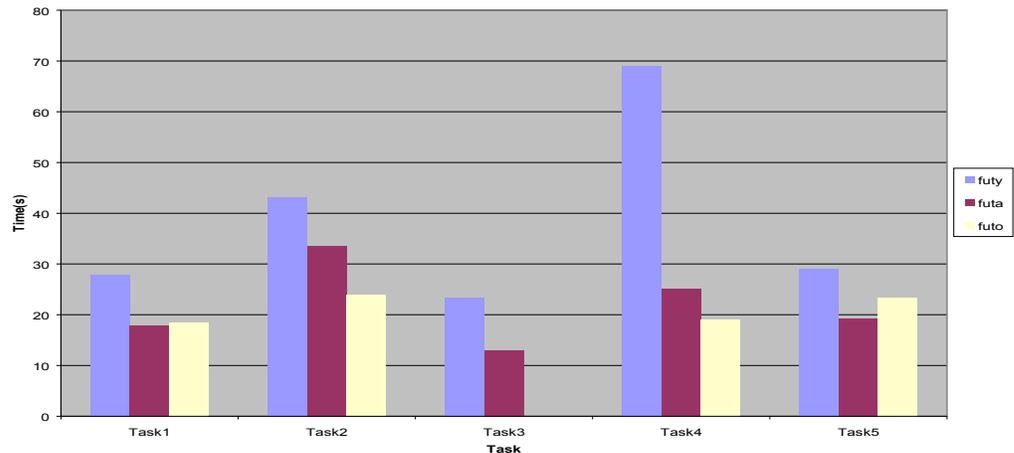It is depicted clearly in Fig 2

Fig 2: Time to Complete Task

It could be deduced that it takes longest time to complete the entire tasks in futy.edu.ng. This is closely followed by futa.edu.ng, which perform better than futonigeria.net in completion of tasks 1 and 5. Averagely the tasks are easiest to perform on futonigeria.net but all users could not perform task 3 on it because the page is not available this tends to annoy most users. Also some users find it very difficult to perform task 4 in futonigeria.net because it is very difficult for them to locate.

SITE PREFERENCE

This is collected after the test to find out which of the three sites tested is admired most by the users based on its design, navigation, ease of use, color, layout, etc. On the overall analysis about half of the participants (54.5%) preferred futa.edu.ng websites to the remaining websites. futy.edu.ng has 9.1% while futonigeria.net has 31.8%. It is shown in table 3.

Table 3: Site Preference

Site	Frequency	Percent	Val %	Cum %
FUTY	2	9.1	9.5	9.5
FUTA	12	54.5	57.1	66.7
FUTO	7	31.8	33.3	100.0
Total	21	95.5	100.0	

PARTICIPANTS' SATISFACTION

Table 4 gives the overall satisfaction of the participants as regards each of the websites. The maximum satisfaction for any user is 30 based on the scale used. It gives a measure of the effectiveness of the Websites futy.edu.ng has an overall satisfaction of 18.32 while those of futa.ng.edu and futonigeria.net are 22.71 and 17.21 respectively.

Table 4: Overall Satisfaction With the Sites

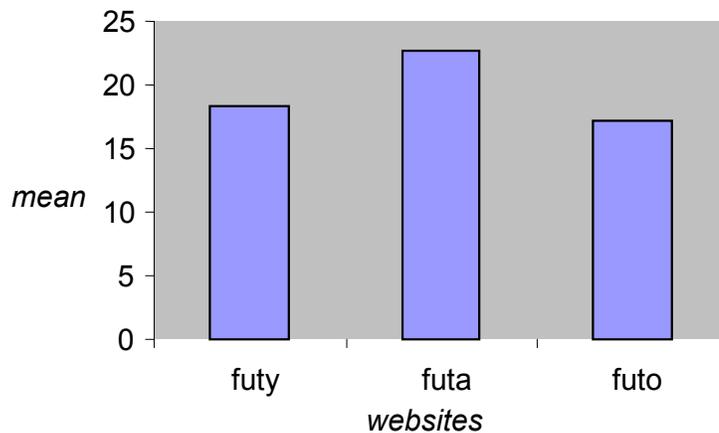| SITE	N	Minimum	Maximum	Mean
FUTYOVERALL	22	8	30	18.32
FUTAOVERALL	22	4	30	22.71
FUTOOVERALL	22	7	30	17.24

This is indicated in the bar chart below

Fig 3: Users' Satisfaction with the Sites

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So, generally futa.edu.ng performs best from based on users' satisfaction with the sites.

DISCUSSION

In addition to the results of analysis above, the following are also observed in the course of the study. Generally users complained about the time it takes for the images used in futy website to load anytime they want to access page(s) to perform tasks. This account for the longest time it takes for users to perform tasks on it. Futa website though has animated images but still could load fast likewise that of Futo.

Some users suggested that Futo and Futy should change their background color so as to make their text more readable. Futa use of faculty instead of *School*s tends to make it difficult for some of the users to locate the school. This is due to the fact that most users used for the study are used to schools instead of faculty in the specialized university where the study was conducted. Likewise **academic** used as a menu item does not show anything about the school. Futo use of **graduate** instead of **postgraduate** also makes it difficult for some users to locate school of postgraduate studies easily. So it is suggested that both should be changed or both options provided on the site.

Futy font size is very small and as a result some users find it very difficult to read. So it is suggested that it should be made bigger. Some users also suggested that Futy and Futo should make their home page more attractive by changing it.

In Futo website users could not perform two tasks successfully because the pages are still under construction. This makes the users not comfortable with the site. Likewise in Futa website Users often encounter error (Error 404) which prevents the home page to be displayed any time the back button is clicked. This led to frustration on their part. It is therefore strongly appeal that thus errors should be corrected.

CONCLUSION AND RECCOMENDATIONS

The study has shown that most users preferred Futa website to both Futy and Futo websites. This is as a result of their ability to perform tasks easily on it, its attractive homepage, fast down load time, easily readable text, and good background color among others. Also Despite the fact that

more users prefer Futo website to Futy website (table 3) yet there is no much difference in the overall satisfaction between the two sites (table 4). So users' preference does not necessarily determine the website performance based on users satisfaction.

It is therefore recommended that designers of institutional websites in this country should carry out thorough usability studies on their site at every stage of development. This is necessary so as to follow the global trends which emphasis usable, readable, efficient and effective websites through a thorough, comprehensive and user-center usability testing.

Also Nigeria as a nation should have usability and accessibility guidelines which should be strictly followed when designing websites so as to keep pace with international standard.

There should also be provision for standard usability laboratory in institution of higher learning with well equipped state of the art technology where usability studies can be conducted. Lastly Human Computer Interaction as a course should be incorporated into the curriculum of Computer Science, Information Technology and other allied disciplines.

Acknowledgements

We want to extend our sincere gratitude to the students and staff of the Federal University of Technology Minna who volunteered to participate in the study.

N.B. The study was conducted between April and September 2006, so web contents and layout might have changed since that time.

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NB: This article appeared in Journal of Science Mathematics and Science Education, (JOSMED), Vol 1(1) Pp114-122
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