Full Length Research

Usage and usability of websites in Higher Education Institutions: An empirical study

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Designing websites to have a professional look in HEIs is of great concern but its usage is of a greater concern among students. Therefore, if vital links and pages are non-responsive, frustrating and misleading, then its purpose is defeated and inconsequential. This study therefore, aimed to examine the usage and usability of websites in Higher Education Institutions (HEIs). It adopts descriptive research design to describe the issues surrounding usage and usability of websites in HEIs. The population of the study is 49,008 and the sample size is 593. The proportionate sampling technique and accidental sampling technique were adopted for this study. The instrument used was the questionnaire and user testing method. The instruments were tested using Person's Product Moment Correlation Coefficient, it employed the split-half technique and the Spearman Prophesy Brown Formula was used to step-up the test which yielded an index of 0.93. The test was conducted in the ICT centres of the HEIs studied. The instrument was analyzed using frequency counts, mean and standard deviation (SD). Out of 593 copies of questionnaires administered, 474 were successfully retrieved to produce a response rate of 80%. The result of the analysis revealed that the respondents made little or no use of the HEIs websites due to misleading links which could be apportioned to the IT professionals in charge of website design. It was also further discovered that some of the websites were not adequately populated with vital and relevant information to get the comprehend grip of what the institutions offers. The study therefore, recommends that IT professionals should trained in compliance with the modern techniques usability conditions by way of attending and organizing seminars/workshops and conferences within and outside African continents.

Keywords: Websites, Higher Education Institutions, Usability, Usage and Technology

INTRODUCTION

The evolution of the Internet had drastically modified the traditional approach to human-related problems of communication and daily transaction activities and HEIs are not sidelined. The Internet is a world-wide network of networks that enable users to communicate and work efficiently and effectively. A major part of the Internet is the world-wide web that allows individuals and organizations to establish websites offering information that can be viewed by anyone having access to computer and the Internet. In a bid to promoting intellectual services, HEIs keyed into the 21st century technology by designing website to be partakers in the global educational market. Website as suggested by Dada, Mishra and Joseph (2011) is a channel through which users can get general information about an organization or individual. It is a set of pages consisting of several pages containing information in the form of digital data in the form of text, images, audio and other animations provided in the internet (Laugi, 2020).

However, the low usage and usability of these websites have escalated continuously and their functionality is often

erratic. The problem became worsened due to the increasing competition between human and Artificial intelligence (AI). The rapid growth in the educational system is creating increasing need for functional and responsive websites in HEIs in Africa most especially in Nigeria which demands alternative power source.

In HEIs, functionality and usability of websites is generally feasible; therefore, it is not advisable to develop non-responsive web pages or links. Websites should have the key usability factors that focus on students' needs. It is not enough to have a website, but how functional are they to the end users? How usable are they? Although it was recommended to identify and use locally developed software to design web pages and links that are responsive and satisfying to the end users but must follow the key factors/principles like simplicity, availability, credibility, clarity and relevance as noted by Orange Crush (2021). Hence, any similar high cost of maintenance could partially or completely be used as a substitute for links and pages.

Recently, there had been interest in the accessibility of websites commonly called usability test. Usability test is a common technique used to evaluate the effectiveness of a user-centered design of a system. It is gaining popularity in academics as a means of improving the functionality of information gateways as it involves the end users who constantly make use of the website to conduct research, registration and interact with colleagues and institutions. It is crucial since access and usability of a system is dependent on users' success/satisfaction in accomplishing given tasks (Masood & Musman, 2015).

Designing websites to have a professional look in HEIs is of great concern but its usage is of a greater concern among African students. Therefore, if vital links and pages are non-responsive, frustrating and misleading, then its purpose is defeated and inconsequential.   Usability is one of the important characteristics of any user interface; it measures how easy the interface is to be used. It has been defined as "a measure of the quality of users' experience when interacting with a system be it a website, software packages, mobile technology or any operated device p.6" (Anonymous, 2016). To achieve the ideal usability level as stated by Laugi (2020), a website must be easy to learn, efficient in use, easy to remember, low error rate and easy to use (user's satisfaction).

Similarly, Aldwyn (2013) argued that in order to survive in internal environment, usability is an essential requirement which had assumed a great deal of importance in terms of satisfying website users' needs and expectations. Despite the high content of websites, its design is often driven by technology, organizational structure or business objectives rather than its usability from the perspectives of the end-users, especially as an alternative which has not been fully ascertained. The usage and usability of HEIs websites students have not yielded the desired result over the years, especially in this digitally-driven economy where the unconventional means of communication and business transactions are off the way. It was observed by the author that students in HEIs cannot make boast of efficiently and effectively interacting with their websites as it ought to be due to misleading links/pages, broken links and many   others. Consequently, this observation required an empirical approach to help understand the problem.   The aim of the research was to look into the usage and usability of websites in HEIs.

i. What activities do students execute to indicate their usage of HEIs websites?
ii. What are the basic information found on the website?

Literature Review

Websites have become the most commonly used medium of communicating with current and prospective students. It is the gateway to the HEIs information, products and services, as such, should be a reflection of the needs of the end-users (Calgar & Mentes, 2012). Websites are location or address on Internet, consisting of files which is called the server. Websites are outstanding application domain of information that clearly demonstrates its objectives. In addition, HEIs website aim at providing up-to-date information and services to students, lecturers, administrators and other users in efficient ways. Considering the innovations caused by internet technology, websites should be reviewed from time-to-time and other technological supports should be available in the websites of any institution.

Birol and Hassan (2014) examined the use of websites of universities for prospective students for the purpose of institution promotion and the study showed that some universities gives the institutional information to prospective students on their websites and devote a greater share of their resources to their websites and social media for promotion. Specifically, students browse to gain an overview of their institutions, monitor processes, share cognitive load (access their school portal), clarify an ambiguous information problem, develop a formal strategy, discover or learn, and respond to environmental invitations.

The study of Meyer and Jones (2011) indicated that higher education websites may be functional to insiders, but seems confusing to users who were new to the institutional website. Institutions have control on how their websites should look like and work. In the same vein Enakrire (2023) found that many students especially in developing nations

like Africa still struggles to make use of website due to their inadequate digital cost and responsiveness. This leaves the question on the usability of the website which tends to know the user's experience in interacting with the websites, how actual students judge it, is it functional for them? Does it provide the information they value or not? According to a survey by Newhouse (2016), 40% of users will abandon a website that takes more than three seconds to load. Based on this review, research must be conducted to investigate and test the usage the usability of websites in HEIs.

HEIs under study recognized their obligations to their students, staff and the wider communities to provide an environment that is safe, culture that promotes equity and administrations that adopts the highest standard of probity and accountability in all their operations and designed websites through which they can reach out to them. These websites aimed at providing up-to-date information to their users. In the websites, different links can be seen (home, pocket Stat, About such as brief history, mission/vision, faculties/departments, library, news/events, updates, staff login etc. These websites also contained information about the academic programmes of the institutions, staff and fm. In addition, there are also pictures of the various faculty buildings and a link to the school portal. To know the quality of these websites, it was required to conduct a usability test where students will be charged to undergo series of tasks and completion of pre-test and post-test questionnaires as usability tests tends to describe how effective users interact with a product with this users will be able feel the impact of the website (Hannah, Haider & Mirza, 2015).

Theoretical Framework

This research work was based on Herzberg's Two-Factor Theory to the Web Environment. This theory will be the most useful construct to guide this research to provide the conditions and environment that maximize user satisfaction and allow them to focus on and achieve high task performance. It provided some basic information on HEIs websites and the task respondents were likely to perform when tested. Also included were the links and pages credibility that would be navigated around the web environment. (See Table 1 below)

Methodology

In order to accomplish the above set of research objectives, a survey was conducted to some HEIs in Nigeria which was randomly and accidentally selected across disciplines.A usability test was conducted in the Information and Communication Technology (ICT) centres of the institutions on 7th , 27th and 31st day of March, 2023.The usability test of the websites were evaluated using heuristics method (user testing) by providing sets of tasks corresponding with the websites to the five hundred and ninety-three (593) undergraduates sampled in a controlled environment from the total population of 49,008 undergraduates. A total of 474 questionnaire were gathered and analyzed giving a response rate of 80%. The survey instrument was a structured questionnaire and a pretest metrics. The respondents were asked to fill out a pretest questionnaire, which the researcher used to gather their demographic information. The test consists of series of task that the respondents carried out while the researcher took note of the time each task was completed. After this, a post-test questionnaire was distributed to the respondents again to know how satisfied and efficient they can use and interact with the websites. Descriptive statistical indices, including frequencies, means, and standard deviations, were used for presentation of the data.

Table 1. The theoretical framework.

Herzberg's Hygiene Factors	Specific Examples of Herzberg's Hygiene Factors *	Theorized Application to the Web Environment	Theorized Examples of Possible Hygiene Features in Web Environment
Working condition	Light, temperature, furniture, office size, "tools or equipment" to get tasks done, first impression or general appearance	First impression or general appearance	1. Brightness of the screens/pages 2. Utilization of the screen size (viewable size of the screen) 3. Screen background color and pattern 4. Sharpness of displays (including images) 5. Eye catching image(s) or title on the homepage that makes you want to continue exploring the site
		Basic functions/features that help to get tasks done	6. Live/broken links 7. Consistent use of link colors within the web site 8. Existence of unloadable items that are not central to the task (e.g. non-found images are used as bullets or decoration) 9. Need to scroll to view the homepage 10. Need to scroll to view the detailed/content pages 11. Robustness of the web interface (user mistake-tolerant, few bugs) 12. Stability of the site: should be consistently available for access 13. Support for different platforms and/or browsers 14. Search function/engine to work with large amount of info on the web site
Salary	Wages	N/A	
Company policy and administration	Procedures or rules of doing things; pace of feedback from administration; privacy and proper use of employee's private information; in general the bureaucratic aspects of the working environment	Requirements for doing tasks	15. Length of the procedure to complete a task (e.g. steps/pages/actions to go through in order to get certain info) 16. Time on learning to use and becoming skillful at using the site
		Feedback or response	17. Length of a page's loading or responding time 18. Indication of system action time expectation (e.g. long loading time warning)
		Access restriction	19. Access restrictions (e.g. one needs to pay a fee, to sign on, to enter a password, or to provide some private info before one can access task-related info)
		Privacy and data confidentiality	20. Collection of user's data without user's knowledge (including using cookies, write to user's local machine) 21. Informing users that their information will be collected 22. Declaration of specific use of the information that users need to provide (e.g. declare for statistics only, not to provide to the venders, not for marketing purpose, etc.)
Interpersonal relations	Co-workers attitudes, perceptions and trust	Credibility of owners/designers and the website: trust and trustworthy	23. Identification of site owners/designers 24. Credibility of the website owner/designer 25. Credibility of the website (e.g. the site won awards) 26. Number of times the website has been visited (e.g. shown by a counter)
Interpersonal relations	Co-workers attitudes, perceptions and trust	Web owners/designers' attitudes and perceptions	27. Information about improper or controversial materials 28. Indications of gender or racial/ethnic biases and stereotypes
Herzberg's Hygiene Factors	**Specific Examples of Herzberg's Hygiene Factors ***	**Theorized Application to the Web Environment**	**Theorized Examples of Possible Hygiene Features in Web Environment**
Supervision	Authority; guidance & support; availability of the supervisor; technical support	Authority and availability of owners/designers	29. Authority of the web designer/owner 30. Indication of the purpose or objective of the web site or potential audience 31. Availability of designer/owner for further information (e.g. email)
		Navigation	32. Working navigation aids (buttons or links) where necessary 33. Be able to know where to get started with the site's primary features 34. Be able to determine current position within the site 35. Simple and clear directions for using the website

CONTINUATION OF TABLE 1

Herzberg's *Motivation* Factors	Specific Examples of Herzberg's *Motivation* Factors *	Theorized Application to the Web Environment	Theorized Examples of Possible *Motivational* Features in Web Environment
Work Itself	Work-related tasks are challenging, stimulating, interesting, meaningful, useful, creative, fun	The information seeking tasks	36. Interestingness of the browsing task 37. Challenge of the browsing task 38. Usefulness of the browsing task to job/work, school, etc. 39. Meaningfulness of the browsing task 40. Fun to explore
		Quality of the information content: what a website covers ** (relevant, timely and current, complete and accurate, objective and novelty, understandable, consistent)	41. Task-relevant information 42. Relevant links (to the task, context, or information content) 43. Amount of irrelevant information (such as online ads, meaningless images) 44. Up-to-date information 45. Indication of addition of new information in the future 46. Complete/comprehensive/inclusive/adequate coverage of information 47. Precise/accurate and referenced information 48. Objective, unbiased information 49. Indication of limitations of information (e.g. source, coverage, date last modified) 50. Novelty and interesting information 51. Understandable information 52. Appropriate detail level 53. Coherent content that supports the web site's intended purpose/objective
		Presentation/organization of information: how a website covers information ** (information architecture, aesthetic and affective, learning consideration)	54. Logical organization of information within the website (e.g. by topic, by date, from broad to narrow) 55. Familiar terminology 56. Consistent use of terms and graphics 57. Overview, table of contents, summaries/headings 58. Scannability of a page (incl. chunks, screen uncluttered, highlights, etc.) so that users can easily scan the page to get info without reading line by line 59. Visually pleasing screen layout 60. Visually pleasing color use 61. Multimedia that adds information value 62. Variety of media (audio, video), formats (visual oriented or analytical oriented), types (use of examples, questions, plain descriptions) for different learning or thinking styles 63. Use of humor
Achievement	Successful task completion.	Task completion	64. Achieved results for the task 65. Quality of the task results 66. Time spent on the task 67. Problems solved (e.g. users may encounter unexpected problems while conducting the task and eventually solve the problems)
Herzberg's *Motivation* Factors	Specific Examples of Herzberg's *Motivation* Factors *	Theorized Application to the Web Environment	Theorized Examples of Possible *Motivational* Features in Web Environment
Responsibility	Certain control or power over the environment; make job related decisions with a minimum supervision	User control	68. User control of amount of information accessed 69. User control of procedures/steps of accessing information 70. User control of difficult levels (or details/depth) of information to be accessed (e.g. headings and details in a page allows a user to decide to either read heading or go for more details) 71. User control of pacing (how fast to go through the website) 72. Opportunities for interactivity
Advancement & Growth	Professional advancement; Growth potential in task capability, knowledge or skills	Knowledge or skills gained	73. New skills, knowledge gained by doing the tasks on the website
Recognition	Recognition by peers or supervisors for performance; real skills and capacities are put to use on jobs	Recognition by owners/designers on knowledge and skill levels	74. Assumed/recognized audience's knowledge and skill levels

Results and Discussion

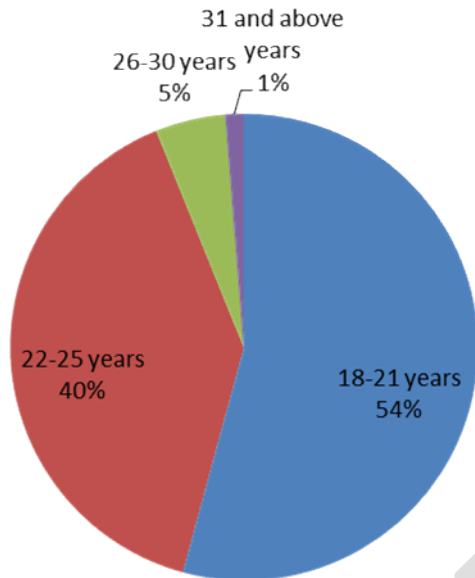**Background information of the respondents**

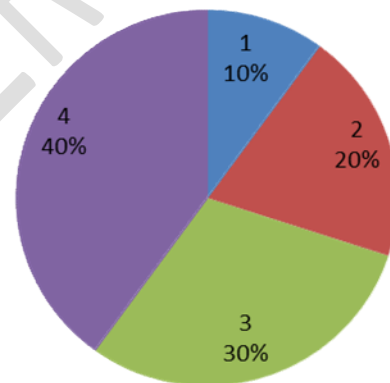figure 1: Age distribution of the respondents

Figure 2: Level of study of the respondents

   Figure 1 shows that there are more respondents within the ages of 18-21 years 257(54.2%). This is closely followed by those within the ages of 22-25 years 188(39.7%). This implies that majority of the respondents are within the ages of 18-25 years and can adequately use websites of their institutions.
   Figure 2 shows that there are 170(35.9%) of 100 level respondents in the study areas in Nigeria. Also, there are 135(28.5%) of the 200 level. It also shows that there are 112(23.6%) of the 400 level. This implies that 100 level students are more in the HEIs studied and happens to use the HEIs websites more often mainly for registration purposes.

Answering of the research questions

Research Question One: What are the information found on your HEI website?
The first research question was meant to find out the information found on HEIs website. The findings were represented in a graph to show the means and standard deviation of the responses.

figure 3: Information on institution-based website in universities in Nigeria
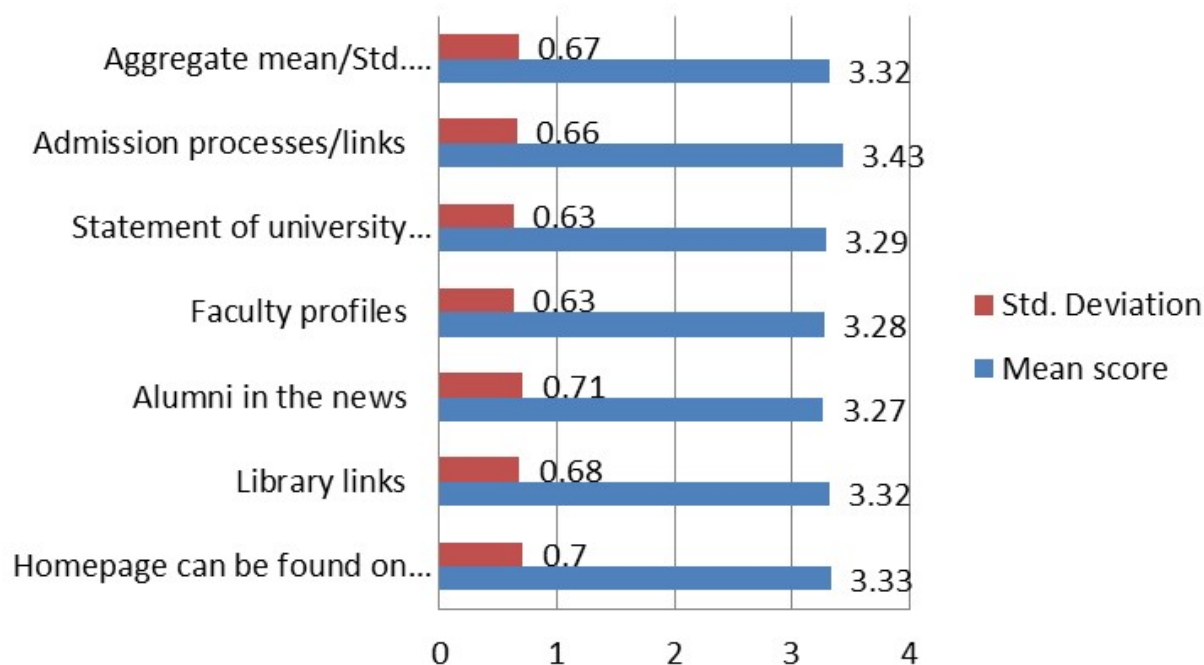
Results in the graph indicates that there were lots of information on HEIs website. This consists of Admission link(3.43, 0.66) was top in the the graph, followed by homepage (0.7, 3.33), library link (0.68, 3.32). it can be deduced that the information found to the respondents' view were drawn from different institutions and usage. Most of the commonest view could be attributed to the response rate in terms of satisfaction which is a condition of website usability.

Interestingly, one of the key factors in HEIs website is content management as opined by GPP 2020 which must be easy to use and secured with clear contents that creates impacts and attracts attention to users because lots of institutions are springing up. Though some institutions studied still struggles with their websites as regards to populating them with vita and useful information. This made Barikzai (2009) to suggest that a good website necessitates attraction. In line with Birol and Hassan (2014), HEIs should devote a greater share to information on their websites for promotion.

Research Question Two: What activities do students execute to indicate their usage of HEIs websites?

The next research question was meant to find out the activities respondents execute to indicate their usage of the websites. The findings obtained were represented in a table based on the activities performed.

Table 2: Common activities (Usage) on the website

FACTORS	Mean score	Std. Deviation
I navigate the university website to pay my school fee	3.43	0.72
I register my courses using my school portals	2.89	0.79
I use the website for news update.	2.86	0.82
I use it to check my departmental time-table.	2.97	0.76
I use website to search for information through the library link	2.42	0.90
I use the website to check my semester results.	3.17	0.75
I use the website to know the history of my university	3.10	0.82
I use the information on the website to update my knowledge	3.23	0.71
Aggregate mean/Std. deviation	**3.01**	**0.78**

Criterion mean= 2.50

Table 3: Task assigned and completed

Tasks	Mean score	Std. Deviation
Undergraduates payment of school fee	3.20	0.79
Registration of courses using their university websites.	3.15	0.83
Accessing library link to use the information resources	2.67	0.86
Location of Admission Link on the website	3.19	0.68
Location of malpractice link	3.11	0.71
Evaluation of website responsiveness	2.96	0.83
Navigation of the other links/pages	3.12	0.83
Aggregate mean/Std. deviation	**3.06**	**0.79**

Criterion mean =2.50

The result in the Table 3 shows the tasks assigned and completed among the undergraduates in the selected universities in Nigeria.

Findings in Tables 2 and 3 shows that respondents made use of the websites in diverse ways. These include payment of school fee (3.43, 0.72), knowledge update (3.23, 0.71), checking of semester result (3.17, 0.75) and history of university (3.10, 0.82). while the least use is searching for information through the library link (2.42, 0.90). it can be noticed from the findings that payment of school fee, knowledge update, checking semester results and knowing history of their universities were some of the common activities performed which indicates the respondents usage of the websites. Although other respondents uses their websites for other purposes. Website is an essential part of every institution for proper functioning. The usage of any HEIs website is determined by its quick response not a frustrating/misleading links.

Based on the views of the respondents, it can be stated emphatically that websites helps boost HEIs image. The author deduces from the findings that, most of the responses were meant for general purposes. This scenario could be likened to website usability test which seeks to know how satisfied a user is, in using a particular system (website). Considering the advancement of Information Technology, undermining the nature of usage, as noticed in the findings, some of the institutions met some of the criteria but not the conditions of usability stated by Laugi (2020).

The author established that since respondents were unable to perform some of the task assigned as seen in Table 3 in some of the HEIs, there was a problem with the website design from the back-end which made some of the links misleading/frustrating as stated by the respondents, this, therefore, calls for an immediate website redesign by the ICT professionals. Hence, Laugi (2020) recommended that to achieve an ideal usability level, website must be efficient for use, free from errors, satisfy users and easy to remember when navigating. Meyer and Jones (n.d) in consonants to this study, indicated that website may be functional for insider (ICT Professional), but seems confusing to the users (students) who were new to the website. Therefore, this leaves the question on how actual students judge the front-end (face) of the website; Is it functional? Does it provide the information needed?

Conclusion and Recommendation

Websites as specialized promotional tools being used to boost the image of an institution and to share information to the user community in an organized format has developed over the years. However, research conducted produced debatable result regarding the usability and the importance of websites in institutions which was measured by activities executed and the basic information found on the website.

The results of this study showed that HEIs websites were not properly designed to suit the respondents needs even though some of the respondents were able to perform certain activities like payment of school fee some links are misleading and frustrating. HEIs website users prefer more functional and satisfying website. It has been found that websites of the HEIs studied did not meet usability test criteria and conditions as such, it can be recommended that the institutions should employ capable IT professional or probably send them on a training to update their knowledge for a better website usability.

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