Student's Perception and Assessment of the Dennis Osadebay University Asaba Website for Academic Information Retrieval, Improved Web Presence, Footprints and Usability

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ABSTRACT

With an upsurge of data by global brands to interact/reach prospective clients, the birth of the Internet has today bridged the information gap. Usability is a webometric feature that seeks to ascertain the experience and convenience level of users who interact with a web-based system. It solicits user perception about a digital product and scores vital aspects therein, based on certain criteria. With the website as the digital product of choice, it will seek to score the design and architecture. Thus, the website's deployment must change, reshape and refocus a user's image while satisfying the user's search quest for data about the institution. Our study is an investigation of website usability based on some criteria that describes usability of academic websites with a focus on the Dennis Osadebay University Anwai-Asaba, Nigeria. Result shows the strengths and weaknesses (problems cum prospects) of the websites in relation to redesigning and improving the university website. Its major strength is in its content and architecture; While, the site struggled to ensure effective search, navigation, design and others. Findings suggest that the FUPRE websites is lacking in various usability areas.

1. INTRODUCTION

With the advent of the global pandemic in late 2019, most organizations around the world embraced a work-from-home approach (i.e telecommuting or remote working) in the field of computing or information technology. This approach was adopted to stem the spread of covid-19; while, ensuring organizational activities were not ground to a halt (Bruinen de Bruin et al., 2020; Ojugo & Nwankwo, 2021b). This work-from-home policy has thus, increased use of computing systems in workplaces, homes and academia (Akazue et al., 2023; Brindlmayer et al., 2022; De' et al., 2020; Pedro, 2020).

To avoid the inherent challenges that are now experienced by education and Nigerian institutions (with loss of an academic session and most institutions were at a loss

on strategies to address the issue) (Agostinelli et al., 2022; Nguyen et al., 2022), the Federal Government of Nigeria in collaboration with Tertiary Education Trust Fund (TETFund) have begun an extensive engagement with other relevant agencies of government and the organized private sector to create electronically driven techs for registration, learning (Learning Management Systems), library services (Chen et al., 2022; Haipinge et al., 2022; Patrinos et al., 2022), result computation and transcript generation. This sought to ensure that global and natural challenges of this nature can be contained in the event of another pandemic. The decision to adopt technology as a means to advert the devastating effect of a global pandemic in the education sector saw an enormous leap in allocation to ICT from about three hundred and thirty million naira in 2019

(Tetfund, 2019) to over two billion naira in 2020 (Ananga, 2021; Christian & Author, 2022; Ojugo & Eboka, 2021; Ojugo & Nwankwo, 2021a; Ojugo & Otakore, 2021; Tetfund, 2020; Ugochukwu-Ibe & Ibeke, 2021).

System Usability ratings were developed to address the issue to ensure user satisfaction from the use of software applications and digital devices. Different regulatory bodies have developed various rating scales but the System Usability Scale has been the most widely used (Lewis & Jeff, 2009; Ojugo & Otakore, 2018). The System Usability Scale (SUS) is well-researched and broadly utilized survey instrument owing to its apparent ease of use in the evaluation of digital devices (Armbrust et al., 2009; Fabriz et al., 2021). Many usability evaluation tools intend to analyse user's subjective appraisals are quite accessible right at a fee (Albert & Tom, 2013; Brooke, 1996; Komolafe et al., 2020; Ojugo & Eboka, 2019). Many studies have adopted System Usability Scale (SUS) – as a reliable means of soliciting users' feedback – because, it is concise via its ten (10) items evaluation that is based on a 5-point scale system used to analyse users' responses. Furthermore, the remarkably robust nature of SUS makes its evaluation efficient both in large and little sample sizes (Amelia et al., 2020; Crawford et al., 2020; Nilam et al., 2020; Ojugo, Eboka, et al., 2015; Tullis & Stetson, 2004).

1.1 Web Usability

Website usability aims to investigate the quality or degree of a user's experience, and corresponding convenience while interacting with the site. Improving a website's usability dramatically help users gain great knowledge. Critical analysis into the usability of a site can help designers and site owners also cut down the number of errors in their system delivery, improve precision, and user support uplifting attitude, etc. Its adoption in educational sites, help engage students to increase the learning experience,

confidence and encourage to use the site more. Thus, we define usability of a website from a user's standpoint (Björneborn & Ingwersen, 2004; Borgonovi & Ferrara, 2022; Divayana, 2021).

Ojugo and Otakore defines 'usability' as the study of how productive, consistent, easy to use, efficient, organized, intuitive, and straightforward it is to accomplish tasks within a web-page via eased user navigation. Users often have expectations based on prior knowledge and past experience within same or similar website. Thus, it is imperative for designers to develop an understanding of the users' expectations through task analyses and research. Studies have also shown that very often, users act on their own expectations even with onscreen indications to counter such expectations. Thus, imperative to use familiar formatting and navigation schemes and themes, which makes it easier for users to remember and learn the layout of a site. It is best to assume that a certain percentage of users will not use a website frequently enough to learn to use it efficiently. So, it is best the designer uses familiar conventions that a user is accustomed to. This works best (Ojugo et al., 2014; Ojugo & Otakore, 2018).

Web-designers create links to their site or page based on the data content relevance and certain interests. Often, websites and pages are grouped based on hyperlink relations and the site's structure. A link *www.abc.com* is a set of pages under the journals section. They, all fall under a single unique class. It is often assumed that a user will preferably visit the next page, which belongs to the same class as that of the current page. Thus, developers must create a fine structured dominant links that point to pages that define a particular category. All the pages followed by that particular link remain in the same class. The pages are then further categorized into levels based on page ranks in the initial period and later, on frequency of users' access. Also, many of the prediction models perform this based on history data or logs; while, others are built

up using ranking of pages and dynamically updated as HTTP requests from the users arrive at the server (Chevalier et al., 2003; Yoro, Aghware, Akazue, et al., 2023; Yoro, Aghware, Malasowe, et al., 2023).

The development of a website system is a continuous process with an iterative life cycle of analysis, design, implementation, and testing. In analyzing websites, De Bruin et al. (2020) distinguished between 3-basic measurements on: (a) ***structure*** (organization and navigation links), (b) ***usage*** (frequency of visit to page, page view, sessions, unique users, and duration), and (c) ***contents***. They grouped the assessment pattern into evaluator, user, and tool-based user evaluation methods – noting that the different view and focus on evaluation methods with new categorization system based on the purpose and platforms of evaluation. They proposed the distinction as a measure limited to the number of websites based on assigned criteria to achieve high-quality site. Its manual evaluation includes experts testing; while, automatic assessments uses various software-testing tools (Agarwal & Venkatesh, 2002; Ojugo et al., 2014; Ojugo, Eboka, et al., 2015).

The output yields a list of issues and recommendations to improve tested website. These classifications are grouped into (Gray & Salzman, 1998; Ojugo & Eboka, 2018; Ojugo & Otakore, 2018; Palmer, 2002; Pearson et al., 2007; Pedro, 2020; Peterson, 2006; Tarafdar & Zhang, 2005):

1. User Evaluation aims at usability design for user test with user-centric measures. İt describes all tests from planning to the evaluation, and its result presenting. Its aims to measure product usability and identify the associated problems that lead to user confusion, errors, or dissatisfaction. Example include method where users execute some tasks on a selected system. Users' performance and satisfaction with the interface is recorded. The most common, valuable and useful method here is user-testing. Other suggested methods include field observation, think-aloud, questionnaires, and interviews (Gray & Salzman, 1998; Kantner & Rosenbaum, 1997).

2. Evaluator-based Evaluations are expert's assessment of the products' interface and accessibility using interface guidelines, design standards, users' tasks, or their own knowledge, depending on method, to find possible user problems. The inspectors can be usability specialists or designers and engineers with special expertise. Here, the inspection methods may include the cognitive walkthrough, guideline reviews, standard inspection, and heuristic evaluation (Palmer, 2002).

3. Heuristic Evaluation is a very efficient, and valuable if time and resources are scarce. It assess an application and judge whether it conforms to a list of usability heuristics. Nielsen's heuristics are easy, fast, and inexpensive. Each evaluator individually goes via system interface at least twice, to yield an output list of usability problems with reference to the violated heuristics. Heuristic evaluation can be conducted by only one evaluator, who can find 35% of usability problems; But, another view holds that better results are obtained using 5-evaluators with no fewer than three for reasonable results (Ojugo & Eboka, 2019; Xing & Shen, 2004).

4. Automatic Website Evaluation Tools are software used to automate collection of interface usage data and identify potential web problems. The first study of automatic tools was by Ivory and Chevalier in 2002. They conclude that more research is needed to validate the embedded guidelines and to make the tools usable. Thus, professionals cannot rely on these alone to improve websites. Web-testing tools include: accessibility tools (e.g. Bobby), usability tools (e.g. LIFT), performance tools (TOPAZ), security tools (e.g. WebCPO) and

classifying tools such as WebTango (Akazue et al., 2022, 2023; Ibor et al., 2023). He stated that adoption of tools is limited, due to the absence of established methods for their comparison. Thus, he suggests the effectiveness of automatic tools must be evaluated. Automated tools are available as services or applications. Free accessibility tool such as cynthia-says (www.cynthiasays.com) allow users to enter the URL to be analyzed in to the sight and get a report on how it complies with section 508 standards.

Kortum and Bangor (2013) investigated the views of 178-users from 5-design criteria: navigation, download speed, personalization, ease of use, and accessibility of commerce sites. The objective was to find which criteria is most relevant to success in web design and if gender plays a role. Results showed that, navigation and ease of use were the most important feats; whereas, personalization and customization were least important. Female participants gave more emphasis on of these web usability criteria than males (Eboka & Ojugo, 2020; Kortum & Bangor, 2013).

Orfanour et al., (2015) investigated the views of users on the relative significance of site design in 6-distinctive areas: financial, e-business, education, government, medical, and commerce. Some feats were important for all sites; Some sites were only ranked high for particular type of sites. Educational and Medical websites prefer comprehensiveness of data; while, other websites do not (Allenotor et al., 2015; Orfanou et al., 2015; Oyemade & Ojugo, 2021).

Ojugo and Otakore studied webometric as the experience and convenience level of users who interact with a web-based systems. It scores vital aspects of the website based on certain criteria. Thus, the website's design, architecture and deployment must be poised to change, reshape and refocus a user's image while

satisfying the user's search quest about the institution. Our study is an investigation of website usability based on some criteria that describes usability of academic websites with a focus on the Federal University of Petroleum Resources Effurun. Result shows the strengths and weaknesses (problems cum prospects) of the websites in relation to redesigning and improving the university website. Its major strength is in its content and architecture; While, the site struggled to ensure effective search, navigation, design and others. Findings suggest that the FUPRE websites is lacking in various usability areas (Ojugo & Otakore, 2018, 2020; Ojugo & Yoro, 2020).

Ojugo and Eboka (2018) extended Ojugo and Otakore (2018) investigating usability of some selected Nigerian Universities based on expert review guideline with a focus on the Federal University of Petroleum Resources Effurun (FUPRE), and compared the scores achieved in each criterion among selected university websites. Result shows common strengths, common weakness, unique strengths and unique weakness of these university websites. Some websites were found to have unique characteristics which separated them from the other ones. Most universities' websites successfully ensured that the trust and credibility section as well as their homepages received the highest scores in their usability analysis. Some of the sites on the contrary, struggled to ensure good search usability and form, and data entry criteria, as many of the websites did not even include the mentioned essential functions in their web design. Findings suggest that even the top ranked universities have websites which is lacking in some different website usability areas (Ojugo & Eboka, 2018).

After a critical analysis of the existing system, our study seeks to (Oyemade et al., 2016; Oyemade & Ojugo, 2020, 2021; Pearson et al., 2007; Peterson, 2006):
1. Interrogated various templates or rating scales that will be appropriate to solicit

the students' perception in relation to the required modifications (to be) made in lieu of corresponding navigation cum use, of the present website and portal for academic and informative purposes. For this purpose, the study adopts the System Usability rating owing the plethora benefits it offers.

2. Develop research questions in line with the SUS questions to effectively evaluate participants' responses in line with global best practices. The pandemic outbreak has permanently altered the lives of both individuals and organizations alike. Developed countries of the world have proceeded with most of their activities virtually and developing nations with deficiencies in skill and infrastructure have continued to struggle in a bid to be globally compliant and relevant.

3. Ascertain student perception towards the adoption of the varsity website and portal for academic and informative purposes respectively. It also seeks to determine students' perception of the website as a complementary platform for pedagogical purposes while rating ease of use of the current university website and portal.

4. Use the usability expert review guidelines to evaluate the DOU website.

5. Compare the overall performance and ranking of Dennis Osadebay University (DOU) website at: www.dou.edu.ng

6. Display individual result for the website's criteria like design process, architecture, navigation, hardware/software etc.

2. MATERIAL AND METHODS
2.1. Research Instrument

From usability guidelines that are based on the criteria of Expert Review guidelines for evaluating educational sites available in userfocus.co.uk/resources/guidelines.html, we choose to scores the website in focus based on selected criteria namely (Chevalier et al., 2003; Ojugo, Aghware, et al., 2015; Ojugo & Eboka, 2014; Ojugo & Otakore, 2018; Okobah & Ojugo, 2018; Tarafdar & Zhang, 2005):

a. Design Process Evaluation – relates to visual display and attractiveness of a site. The use of appropriate design of a website's pages, and the appropriate use of images, fonts and colors in the design of a site. It also includes the aesthetic design, appropriate use of images, choice of fonts, choice of colors, page design and its consistency.

b. Architecture relates to the structure of the website's data and how it is divided into logical, clear groups – such that each group is associated with its related information. The logical structure of a website is such that there is no deep architecture; But, simple navigation menus to aid users through the pages and documents in the website.

c. Hardware/Software needs describes the website design considering the browsers on which it is to be run, and the device platform in terms of portability, mobility, speed, operating system etc.

d. Navigation relates and assesses if a site include tools such as navigational menus, internal search facility; And, if these links helps to ease and facilitate users effective navigation around the pages of a website. It thus provides navigation support, effective internal search, working links, no broken links, no orphaned pages.

e. Homepage relates to the nature of the page tagged homes, its aesthetic design, colour choice and the user's ability to navigate through the pages of the website. Also, users should be able to easily differentiate the homepage from other pages of the website. Other necessary characteristics includes its being easily perceived as homepage via the use of effective menus and action buttons, search option such that users experience satisfaction with just 1-click of the homepage from their desired information.

f. Credibility relates to data contents housed in the website pages being authenticated by renowned personnel.

g. Help, Search and Error tolerance – relates to the user being able to place requests for data, not really navigating all the pages and documents on the website in order to safely acquire desired info. It includes the introduction of a search option (on the homepage) that can return the desired values (data) appropriately to the user.

h. Content quality relates to authenticated research, teaching, employability (from student's view) with international outlook. These also refers to the various citations, references to scholarly journals, staff profile outlook amongst others.

2.2. *Data Collection / Questionnaire Used*

There are about 123-rules in the checklist that is scored to evaluate a website's usability. These were used in developing and deploying a 5-likert format questionnaire for the study. It will guide both experts and non-experts in observance of the website along with filling out the questionnaire (Ojugo & Eboka, 2018; Ojugo & Otakore, 2018). A total of 40-students were involved in the data collection chosen from selected departments in Dennis Osadebay University Anwai-Asaba.

The questionnaire is divided into: **Part-1** which focuses on demographic data such as gender, department etc. and **Part-2** consists of 6-section-items in relation to extent of the participants' awareness of a varsity website usability with support for both academic and informative purposes. Parts 1 and 2 adopted the response with values of Strongly Agree (5), Agree (4), Undecided (3), Disagree (2), and Strongly Disagree (1) respectively. For the analysis of the data, all negatively worded items were reversed so that a higher numbered response on the Likert scale would represent positive attitudes.

2.3. *Selected Academic Website*

Academic institutions were amongst the early developers of websites to present themselves on the Internet . However, the aim of their websites differed over time due to technological advances, and the increasing number of Internet users. The site in focus is the Dennis Osadebay university website with uniform resource locator at www.dou.edu.ng.

3.RESULTS FINDING AND DISCUSSION

3.1 *Design Process Usability Section*

For the design process usability features, the study used a total of 7-items to express the dimensions in relation to the design process usability features as below.

Table 1: Design Process Usability Attributes

| Design Process Evaluation	SD	D	U	A	SA
Does web-page meet set goals to include success rate and time taken to find specific information on the page?	21	15	2	2	0
Does page provide useful, engaging contents that are relevant and appropriate for the target audience?	21	18	0	1	0
Does the page improve your performance as a user?	15	22	1	2	0
Are there necessary resources on page to improve user experience in the deliverables of this web-page?	0	26	0	13	1
Does page format meet your expectation as regards contents, navigation, and organization?	0	26	2	8	4
Does the page employ a User-centered design by involving users to improve completeness and accuracy?	10	10	3	7	10
Is site easily found amongst the top 30 references as presented from a major search engine?	0	9	3	12	16
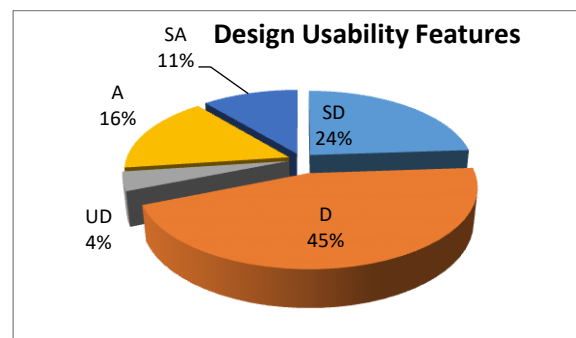
Figure 1: Design Usability Features

Figure 1 shows that a total 45-percent of all

the participants disagrees that the design feats does not meet the required website usability criteria level that will aid user experience satisfaction and convenience as the user navigates the website.

3.2 Trust and Credibility Section

For the trust and credibility usability feat, the study used a total of 8-items to express the dimensions related to the trust and credibility usability features as below.

Table 2. Trust and Credibility Usability

| Design Process Evaluation	SD	D	U	A	SA
Is page up-to-date to increase site credibility in relation to the rich-ness of contents for both academic and informative purposes?	0	6	0	22	2
Is task standardized, performed by users in same sequence and manner across same conditions?	0	5	7	23	5
Does site reduce users' workload via functions to perform tasks	2	16	1	19	2
Does flow-screen request users to recall data from page to page?	1	10	19	4	6
Is page easily readable and in printable format.	0	7	0	23	10
Does page have feedbacks as the user waits for task to complete?	2	6	1	28	3
Does page require users to multitask while reading the page?	0	7	5	28	0
Does page have useful assistance to users as they navigate the page?	0	7	0	23	10
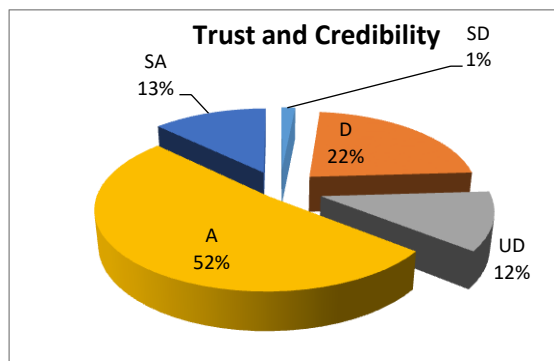
Figure 2: Trust and Credibility Usability

Figure 2 shows 52% of participants agree the website meets the credibility criteria as info retrieved is up-to-date and can be trusted.

3.3 Navigation Section

For the navigation usability section, the study used a total of 6-items to express the dimensions related as below.
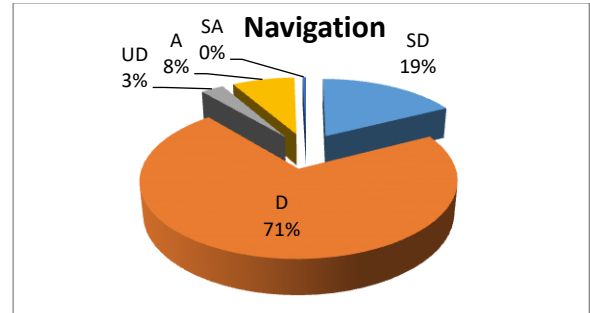

Figure 3. Navigation Criteria

Table 3. Trust and Credibility Usability

Design Process Evaluation	SD	D	U	A	SA
Page has the much-needed navigation options to ease user accessibility of pages and website	0	3	1	23	13
Website has enough feedback mechanism to indicate user's location on site via the use of maps	0	2	0	27	11
Site has primary navigation menu placed on the left – making it quite similar to other related sites and pages	0	0	0	32	8
Menu tabs are well represented via descriptive labels	0	0	1	31	8
Are menus appropriate for the website and pages	0	5	5	30	0
Users cannot navigate effectively with breadcrumbs. Thus, site uses glosses to provide data as users place mouse over menu	1	9	0	28	2

Figure 3 shows that about 71% of participants disagrees the website meets the navigation criteria to guarantee an increased level of user satisfaction as the user traverses the pages.

3.4 Architecture and Website Organization

For the architecture and organization feat, the study used a total of 4-items to express the dimensions related to the usability below.

Table 4: Architecture Usability

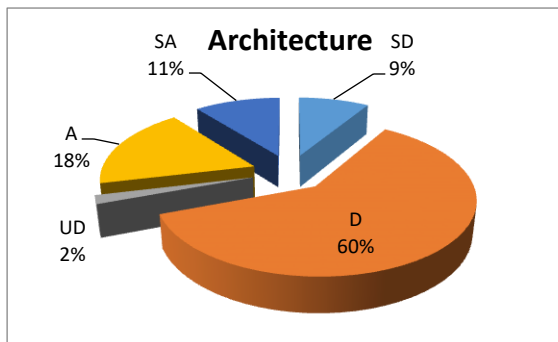| Design Process Evaluation	SD	D	U	A	SA
Task form has assistive technologies	0	4	2	30	4
Page allows users to skip repetitive (some or all) navigation links	2	7	0	25	6
Page provides equivalent text and graphic elements for the site	2	9	1	24	4
Page uses appropriate plug-ins and applets for ease access to links functions	13	9	0	18	0

Figure 4. Architecture and Organization

Figure 4 shows that about 60% of participants disagrees that the site meets the architecture and organization criteria that guarantees for an increased level of user satisfaction as the user goes through the pages of the website.

3.5. Overall Performance Ranking

Table 5. Overall Score of Selected Nigerian Universities (and in Delta State)

RWU (World Uni Ranking)	Nigeria University Ranking	University Name (Abbreviated)	Relative Score (0 -1)
1129	1	UI	0.89817
1317	2	OAU	0.88915
1357	3	Covenant	0.88772
1391	4	UniPort	0.88332
1438	5	UNN	0.87818
1560	6	UniLag	0.86720
1840	7	LAUTech	0.86540
2002	8	ABU, Zaria	0.86201
4144	30	FUPRE	0.56302
4320	32	DELSU, Abraka	0.48973
11702	111	Edwin Clark Uni	0.42012
19003	182	Western Delta Uni	0.28932
20169	193	DSPG. Ogwashi	0.20193
22702	226	FECOTEC Asaba	0.10391
27890	268	COE-Agbor/UniDEL	0.10118
Nil	Nil	DOU	Nil

With the case study in focus (i.e. Dennis Osadebay University Asaba) has not been ranked via www.webometrics.info as of May 2023 both on the World and Nigerian front. Table 5 shows overall score of some websites.

The place and importance of DOU as a frontier trainer and developer of manpower in Delta State cannot be over-emphasized cum overestimated. It is imperative thus, to first make known usability criteria to all DOU stakeholders (management, staff and students) as an effective means to engage and promote the university's position among her peers as well as other universities. Thus, the ICT unit must be poised to enhance DOU's website quality and usability as is seen from figure 6 and 7 respectively. This will in turn increase its footprint and webometrics value as well as improve its visibility on World University's Ranking (RWU).

To achieve this goal, it is necessary to motivate staff and authorities to have greater web presence (with scholarly publications in high impact journals) that reflect accurately their activities so as to promote the position of the university both in university ranking and webometrics ranking also.
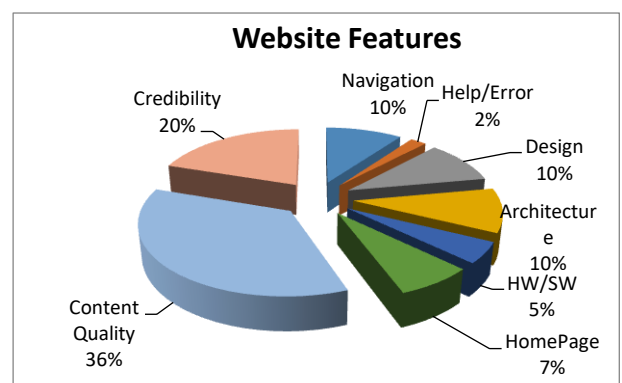

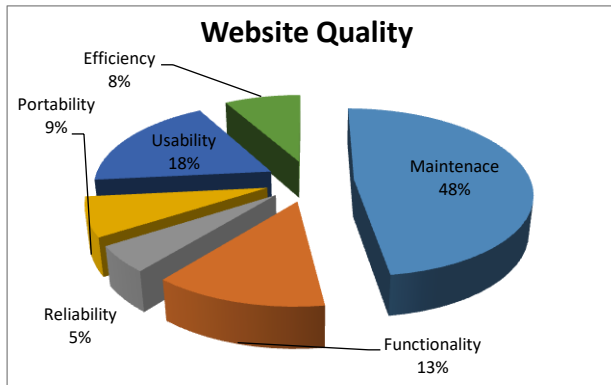Figure 5. Overall Website Usability for DOU

Figure 6. Quality feats for the DOU website

3.6. Recommendations

a. To ensure high credibility, a site's pages: (a) provide useful FAQ with answers that are intuitive, (b) there should be logical arrangement of pages that makes up the website, (c) pages should not be more than 1-click away from the website's homepage, (d) articles with citations and references in high-impact journals should be incorporated, (e) there should be a display of article author's credentials and other relevant details, (f) all web-pages should be up-to-date, (g) website archive and repositories of past content, (h) looks professionally designed, (i) have links to outside sources and materials useful to users, and (j) ensure site is frequently linked to by other credible sites.

b. Pages should focus on user performance more; rather, than preference. It implies user performance is of utmost importance, then the designers and developers should make content (data contained therein), its format, user interaction and navigation is far more important than deciding which color themes and decorative graphic to employ.

c. Use of meta-content and page titles, the number of links to the website and updated registration with major search engine. Example of a meta-content for can includes:
<meta name="description" content="The Official Website of the Dennis Osadebay University Asaba,

Delta State in Nigeria">
<meta name="title" content="Dennis Osadebay University Asaba">
<meta name="subject" content="Dennis Osadebay University Asaba, D.O.U.,">

d. Most users spend a considerable amount of time scanning through the page rather than reading. Thus, well-designed headings can help facilitate both scanning and reading written materials. Designers should also use descriptive headings as necessary to enable users find what they are looking for. Thus, we can have more headings as possible rather than scanty through: (a) effective categorization of labels, (b) unique and descriptive page titles, (c) highlight critical information, and (d) provide users a great way to reduce options as they peruse through your pages. Also provide meaningful links and links to related contents on the site. Also avoid misleading cues to click (i.e. ensuring that items that are not clickable do not suggest the ability to be clicked to users). Ensure to use pointing/clicking. Indicate and differentiate internal from external links.

e. Text coloration and casing should be adhered to ensure visual consistency. Use bold text only when important to draw user's attention to specific information. Use familiar fonts and use color coding to help users accomplish tasks faster. Use formatted lists to order the elements for easy scanning.

f. Pages should use screen-based controls (or widgets) that users are familiar with. Also, minimize user-data entry. Anticipate typical user errors.

4. CONCLUSION

Websites now play prominent roles in education and training as millions of users visit them, searching for relevant data to meet their various research needs. The FUPRE website also plays key role in the interaction between students, instructors,

other staff and administration. The emergence and challenges in university ranking has made usability an imperative study in the qualitative assessment – since, the quality of university's website influences its whole ranking. Its primary aim is to help students make informed comparative choice about their local and/or international studies. The ranking compares universities across 4-broad areas of interest to a prospective student: teaching, research, employability and international outlook.

4-areas are assessed using 4-indicators with different percentage weight. Some indicators use 'hard' data; while, others employ major global survey like: (a) academic reputation of varsity (40%), (b) article citations per faculty member (20%), (c) student-faculty standard ratio (20%), (d) international faculty ratio (5%), (e) International student ratio (5%), and (f) employer reputation (5%).

Web presence is often a trustworthy mirror that avails the developer or client of positive feedbacks and direct relevance to a university ranking. A university that wishes to improve its position must enrich her website. This importance is seen both in university ranking criteria and website ranking, because there are both direct and indirect relevance between these two items.

Conflict of Interest

The authors declare that there is no conflict of interest.

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