

The Respondent's Haptic on Academic Universities Websites of Pakistan Measuring Usability

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Abstract—This study based on survey, by using four higher educational (Universities) websites were selected for the usability testing with the help of response to the experience of eighty students of same age group and investigated to make pre-survey and post-survey based on an eight questionnaire for websites usability. The source for the survey was Laptops of windows 8.1 operation system used. The questionnaires were depends on two factors: one factor contains gender, nationality, respondents and second factor contains strongly agree, Agree, Undecided, Disagree, Strongly Disagree. The factor structure replicated across the study with data collected during usability test respectively in survey. There was evidence of usability with existing questionnaires, including the website usability testing by applying guidelines of wecredible. The overall results were acceptable and more meaningful for future researchers and web-developers. The questionnaire can be used to understand of websites quality and how well websites work.

Keywords—Usability testing; survey; questionnaire; higher education websites; guidelines wecredible; operating system

I. INTRODUCTION

A. Human Computer Interaction

Now-a-days Information Technology has reached at advanced level in every field. Human-Computer Interaction (HCI) is also one of them, which shows the communication between peoples and computers in [1]. Usability is also part of the HCI in which user define their issues related to the computer applications in [2, 3]. Design of the websites (Information Design, Navigation Design, and Visual Design), preferences, colour of the web and many other functions were checked in usability of websites in [4, 5, 6].

B. Websites

Websites access is increasing day by day and now mostly peoples are using web to collect all kind of information such: as job advertisements, academic admissions, buy or sell products, read newspaper and so on. Author in [7] based on his research finding states that most of the users were diverse, websites were not organized in proper way according to user mentality and their wish. Users want easy and appropriate response from web sites they use for their purpose. Many design rules are available in literature to increase the usability on different domain. Authors in [8] worked on the educational websites and designed survey for the measurement of satisfaction of college websites users. Authors found 89.4% satisfaction ratio of the user team and they strongly agree on the college websites in [9].

C. Usability

Usability is a technique used to identify about the idea of users regarding websites by applying usability technique website how to work and find out errors where were occur in websites. Fig. 1 show the usability components and seven usability components which are following.

- 1) Navigation
- 2) Familiarity
- 3) Consistency
- 4) Error Prevention
- 5) Feedback
- 6) Visual Clarity
- 7) Flexibility and Efficiency

D. Usability Guidelines

Usability and accessibility of university website of Malaysia and used automatic evaluation by using WCAG 1.0 guidelines provide five steps to conducted research as under below in [9].

- One step is called by: Themes of accessible of design.
- Second step is called by: How the things are organized.
- Third step is called by: Check Priority Level.
- Fourth step is called by: Conformance of the documents.
- Fifth step is called by: Web contents Accessibility guidelines. The guidelines available are 14 present to access web contents which are:
 - Visual Contents on websites.
 - Don not rely on colour.
 - Use mark-up and style sheets.
 - Clarify the language usage.
 - Create tables that transform gracefully.
 - Support multiplatform or Ensure that pages featuring new technologies transform gracefully.
 - Ensure user control of time-sensitive content changes.
 - Direct accessibility of embedded user interfaces.
 - Design for device-independence.

- Use interim solutions.
- Follow the W3C guidelines.
- Provide informative Context.
- Provide clear navigate mechanism.
- Documents should be clear and simple.

There are many methods available for the usability testing such as novel cross-sequential method, cross-sectional method, longitudinal method, Retrospective method and Nielsen heuristics method [10] as shown in Fig. 2. Nielsen heuristics method is one of the appropriate methods for post-survey techniques in [11-14], before the post-survey, it is important to use pre-survey method for the testing usability of websites. From this type of survey issues related to the websites and users are identified, accordingly, these issues may be addressed in search, navigation and information required to the users in [6, 15].

Interaction of humans with computer is increased day by day. Due to increase of attention on computers by the majority of peoples (students) using search or getting information regarding education, jobs and news updates from educational websites, but they face many issues and problem. Survey is the best method to identify the issues/problems of computer users.

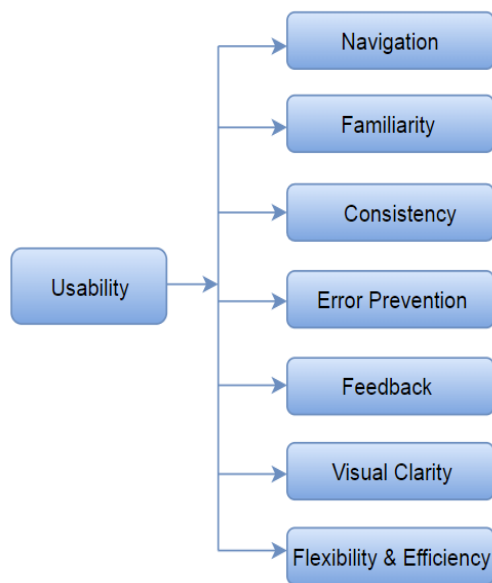


Fig. 1. Usability Snapshot.

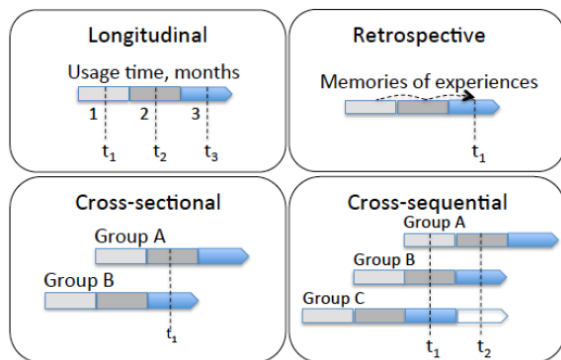


Fig. 2. Survey Methods for Measuring usability [10].

II. USABILITY TESTING BY USING SURVEY METHOD

Internet is the source in which usability testing is evaluated and find out all the parameters of usability [14]. The process of usability testing of engineering university websites of Sindh-Pakistan is shown in Fig. 3. In this figure process of collection of data, based on the selected websites of engineering universities as described in Table I is given. These four universities are the top ranked government universities of Sindh province in and Pakistan. Majority of engineering students' are studies in these universities. These engineering students and job seekers are using these websites on daily basis to check universities information and news, advertisements for jobs, admissions, results and other purposes.

In this study, experimental survey was carried out in two phases, one is pre-survey and other is post-survey. Pre-survey gives information of respondents (detailed information of respondents is shown in Table III). The same is used in post-survey. Following are the Pre-survey questionnaires was designed [6, 16] and details of these questionnaires are given in Table II.

- 1) What is your gender?
- 2) How old are you?
- 3) What is your nationality?

Eighty numbers of respondents were selected for this of survey. All respondents were of age group between 18 years to 25 years. All eighty respondents were the students of 3rd years in Bachelor of Science (Information Technology). Out of eighty respondents, 18 respondents were females and others were the male students. All respondents have same nationality (Pakistani) and belong to province of Sindh.

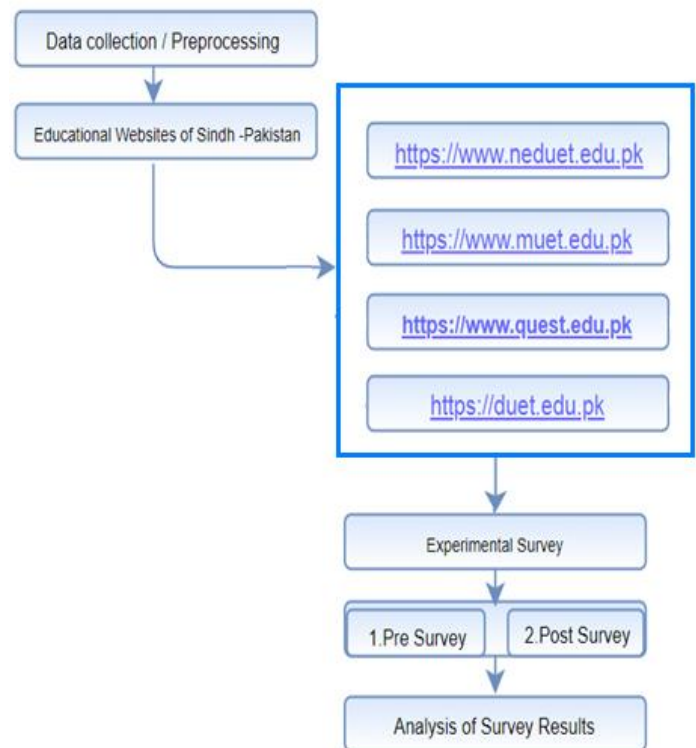


Fig. 3. Research Methodology.

TABLE. I. EDUCATIONAL WEBSITES OF ENGINEERING UNIVERSITIES OF SINDH

S. No	Name of University	University Websites
1	NED University of Engineering & Technology, Karachi	https://www.neduet.edu.pk
2	Mehran University of Engineering and Technology Jamshoro.	https://www.muett.edu.pk
3	Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah.	https://www.quest.edu.pk
4	Dawood University of Engineering & Technology Karachi.	https://duett.edu.pk

TABLE. II. PRE-SURVEY-QUESTIONS

Questions	Male	Female	Nationality	Respondents
What is your gender?	62	18	Pakistani	80
How old are you?	Between (18-25)	Between (18-25)	Pakistani	80
What is your Nationality?	62	18	Pakistani	80

TABLE. III. RESPONDENTS DETAILS OF AGE GROUP 18-25 YEARS

S.N.	Respondents Name	Study Year	Gender	S. No.	Respondents Name	Study Year	Gender
1	Anjum	3rd year	Female	41	Muneer Ahmed	3rd year	Male
2	Nida Sehar	3rd year	Female	42	Saeed Ahmed	3rd year	Male
3	Farzana	3rd year	Female	43	Adnan Eijaz	3rd year	Male
4	Chandini	3rd year	Female	44	Muhammad Awais	3rd year	Male
5	Laila	3rd year	Female	45	Mohammad Yousif	3rd year	Male
6	Aneela	3rd year	Female	46	Ubaid	3rd year	Male
7	Aisha	3rd year	Female	47	Nisar Ali	3rd year	Male
8	Ameena	3rd year	Female	48	Ashraf	3rd year	Male
9	Poonam	3rd year	Female	49	Muhammad Suleman	3rd year	Male
10	Dua Noor	3rd year	Female	50	Kashif Ali	3rd year	Male
11	Ilham khan	3rd year	Female	51	M.Farman	3rd year	Male
12	Humaira	3rd year	Female	52	Sajjad Hussain	3rd year	Male
13	Iqra	3rd year	Female	53	Muhammad Aamir Noor	3rd year	Male
14	Maheen	3rd year	Female	54	Haseeb Aziz	3rd year	Male
15	Nimra	3rd year	Female	55	Bilal Khan	3rd year	Male
16	Erum Muneer	3rd year	Female	56	Muhammad Zeeshan	3rd year	Male
17	Syeda Fizza	3rd year	Female	57	Manthar Ali	3rd year	Male
18	Nigarish	3rd year	Female	58	Abdul Nabi	3rd year	Male
19	Baqir Ali	3rd year	Male	59	Jazib Bilal	3rd year	Male
20	Allah Warayo	3rd year	Male	60	Abdul Samad	3rd year	Male
21	Muhammad Baig	3rd year	Male	61	Shahbaz Qureshi	3rd year	Male
22	Saifullah	3rd year	Male	62	Muhammad Awais Noori	3rd year	Male
23	Noshad Ali	3rd year	Male	63	M.Rajab Ali	3rd year	Male
24	Vinod Kumar	3rd year	Male	64	Abdul Hafeez	3rd year	Male
25	Muhammad Muneeb	3rd year	Male	65	Muhammad Adeel	3rd year	Male
26	Naseer Ahmed	3rd year	Male	66	Usama Jabbar	3rd year	Male
27	Saifullah Unar	3rd year	Male	67	Zubair Akram	3rd year	Male
28	Abdul Sallam	3rd year	Male	68	Sadam Hussain	3rd year	Male
29	Shakeeb Nasir	3rd year	Male	69	Sajjad Ali	3rd year	Male
30	Shahzaib	3rd year	Male	70	Anil	3rd year	Male
31	Zafar Ali	3rd year	Male	71	Awais Kareem	3rd year	Male
32	Muhammad Anwar	3rd year	Male	72	Farhan Brohi	3rd year	Male
33	Danish	3rd year	Male	73	Zubair	3rd year	Male
34	Mohammad Waqqar	3rd year	Male	74	Mehran	3rd year	Male
35	Tanveer Hussain	3rd year	Male	75	Abid Ali	3rd year	Male
36	Bilal	3rd year	Male	76	Ali Haider	3rd year	Male
37	Taimoor Ahmed	3rd year	Male	77	Bilal	3rd year	Male
38	Hassan Zaib	3rd year	Male	78	Saeed Rasool	3rd year	Male
39	Hamza	3rd year	Male	79	Masood Ali	3rd year	Male
40	Mohammad	3rd year	Male	80	M.Faizan	3rd year	Male

TABLE. IV. POST-SURVEY-QUESTIONS

Questions	SA	A	UD	D	SD
The site was easy to Navigate?	44	28	6	2	Nil
This site answered my questions?	12	52	12	4	Nil
I would like to visit this site again?	12	28	36	4	Nil
I would like to recommend this site to my friend?	24	44	10	2	Nil
Are you satisfied from this site visit?	14	54	9	3	Nil
SA	=	Strongly Agree			
A	=	Agree			
UD	=	Un-decided			
D	=	Disagree			
SD	=	Strongly disagree			

In Post-survey, an experimental procedure for the finding the usability issues related to websites is adopted. In this research work navigation related information, recommendations and satisfactions were studied for the usability testing. From the selected respondents forty four respondents were strongly agreed for the easy navigation of the websites and twenty eight showed agreed with the navigation but few of them were not clear (undecided) for navigational capabilities as described in Table IV.

Websites of engineering universities of Sindh-Pakistan used in this experimental survey had sufficient information for the majority of the users and they agreed that they found their information/news from the web but many of the respondents were undecided and were of the opinion that they would not like to visit again for information/news they require. Those who they showed satisfaction also stated that they will recommend these websites to their friends for useful information available and also majority of the respondents were satisfied from these websites.

Design methodology was divided in to four parts as shown in Fig. 2. First of all it was necessary to collect/select the data and then comes 2nd part of the methodology which also known as boundary lines of the research. After the deciding of boundary lines or limitation then it comes in 3rd round which is experimental survey and this survey was analysed in different ways.

III. RESULTS AND DISCUSSIONS

Post-survey is a technique used for the testing of usability of websites. In this study this technique was used for testing usability of websites of engineering universities of Sindh-Pakistan. Four university websites were selected. From the

survey it was observed that many respondents strongly agreed as shown in Fig. 4(a-e).

In Fig. 5 comparison of post survey questionnaires are presented. In this comparison majority of respondent were agreed to visit these site again, but they highlight the problem of navigation and they need to improve this issue and also related feathers.

From the experimental study most of the frequent issues were addressed by respondent by using usability testing techniques for websites of engineering universities. Almost all the websites had issues like size, font, and animation as described in Table V. Majority of websites did not update on daily basis and information/news regarding users was not enough. Website of NED University of Engineering & Technology, Karachi lacks back to home page option directly from deep navigated pages. Also same issue in Website of Mehran University of Engineering and Technology Jamshoro was observed.

TABLE. V. MOST FREQUENT USABILITY ISSUES

Engineering University	Most frequent usability Issues
NED University of Engineering & Technology, Karachi	<ul style="list-style-type: none"> • Not available home page option in links of different pages. • Font size, style and colors issue. • Animation problem. • Improperly managed information/news. • Information regarding previous, current and future projects of the study programs was not updated.
Mehran University of Engineering and Technology Jamshoro	<ul style="list-style-type: none"> • Quick Search option was not working properly and takes more time for searching. • Improper management information/news. • Animations on main page were very high for all news and it may increase mental stresses. • Information regarding previous, current and future projects of the study programs was not updated.
Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah	<ul style="list-style-type: none"> • Current information/news was not updated. • Information regarding previous, current and future projects of the study programs was not updated.
Dawood University of Engineering & Technology Karachi	<ul style="list-style-type: none"> • Improve layout of the Site. • Font size, style and colors issue. • Information regarding previous, current and future projects of the study programs was not updated.

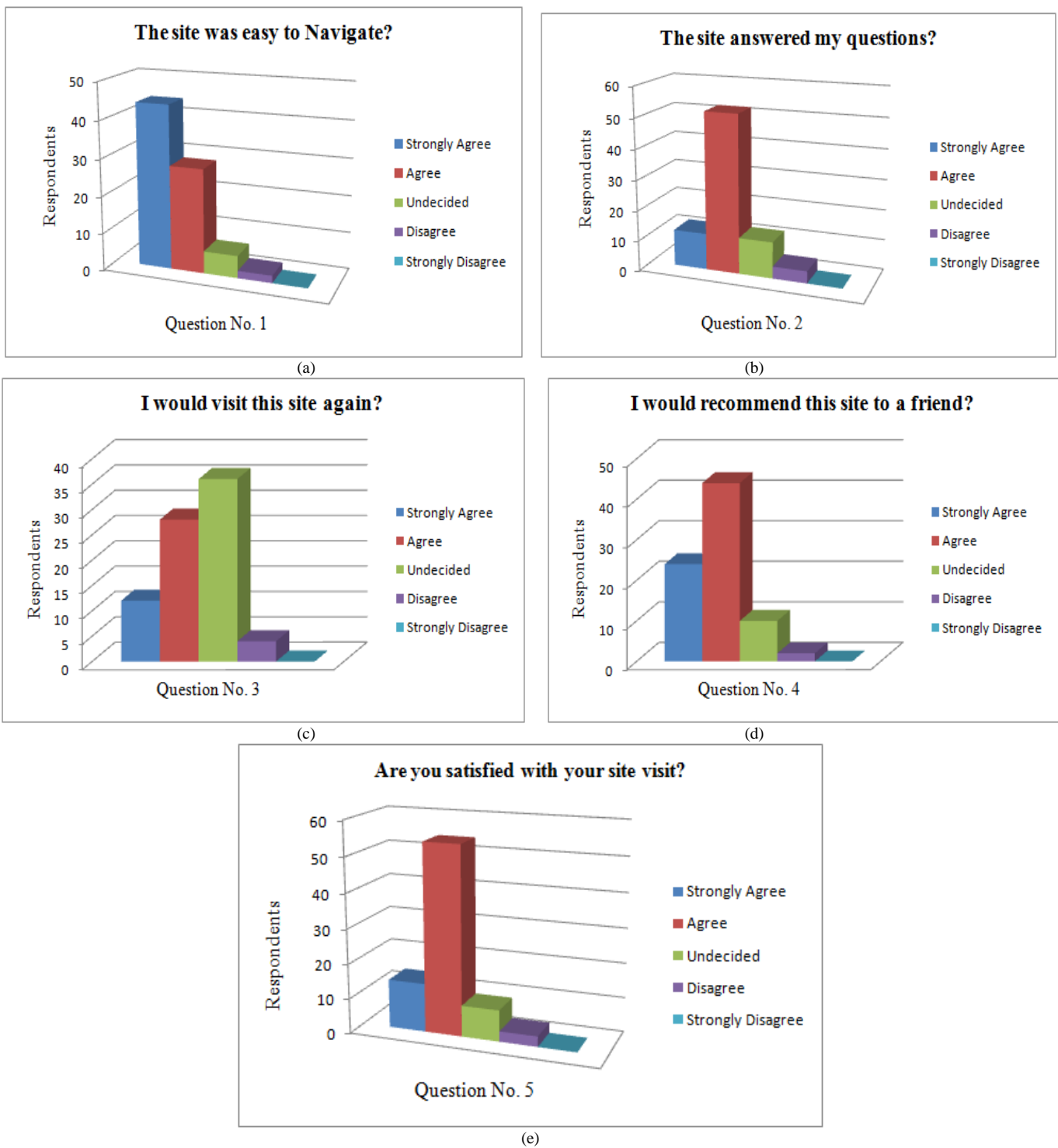


Fig. 4. Graphical Representation of Post-Survey Questionnaires (a) to (e).

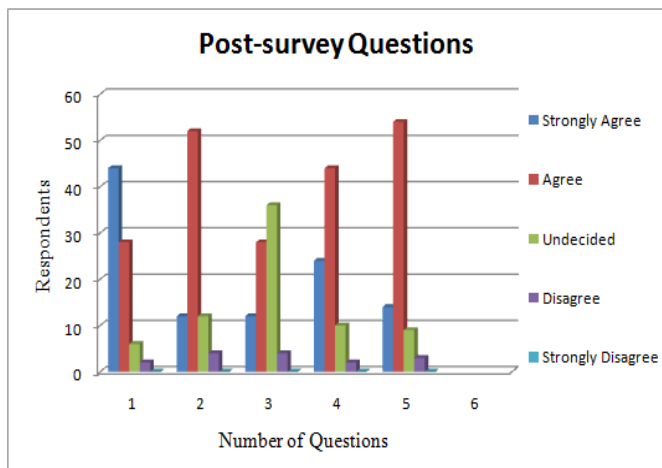


Fig. 5. Comparison of Post-Survey Questionnaires.

IV. CONCLUSION

The results suggest that the Nielsen heuristics method is useful in identifying the issues related to the usability of educational websites. This study gives an idea about the usability issues at different levels of website. Websites give information/news related to users but these websites have many issues like; proper update on daily basis, page layout, font size and style, colours and lots of links available on sites. It is also observed that Information regarding previous, current and future projects of the study programs was not updated. Quick Search option was not working properly and takes more time for searching and improper management information/news. This research provides issues in educational websites which are mostly used by the students. University should take follow this type of survey results and improve their websites for above survey results.

V. FUTURE WORK

In future researchers paid more attention to the usability of websites in different domains.

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