A Survey on Usability Satisfaction of Selected University Websites in Pakistan

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Abstract- **Due to the rapid increase the use of educational websites, the need arises to evaluates these websites from usability point of view for the improvement purpose. This study evaluates some selected university websites in Pakistan from the usability perspectives. Questionnaire based evaluation method is used for the said purpose. Six different features "Navigation", "Interface Design", "Performance", "Information", "Ease of use" and "Organization" are mentioned in the Questionnaire. Data were collected through surveys from 120 students, 25 faculty members, and 20 administrative staff from each university, ensuring a comprehensive representation of actual website users. The results indicate varying levels of satisfaction across different usability features among the evaluated websites. While some features received positive feedback, significant issues were identified in areas such as navigation and performance. The findings suggest a need for targeted improvements to enhance the overall user experience of these educational websites.**

Index terms-- **Usability; University websites; Questionnaire-based Evaluation**

I. INTRODUCTION

Usability is one of the most important goal of Human Computer Interaction (HCI). " Human Computer Interaction(HCI) is a study of how humans use computers to perform certain tasks and use it in such a way that the interaction is being enjoyed and effective about designing a computer system that supports people so that they can carry out their activities productively and safely" In educational field the usage of websites is increasing due to latest technologies[1].

The term "Usability" is defined as "It is a web design approach, by which we decide how difficult for a user is learning and accessing an application"[2]. Usability is defined by International Standard Organization(ISO) 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"[3].

Usability can be defined by the five main components that were given bellow[4, 5]:

- Learnability – How much easy for new users to perform fundamental tasks?
- Efficiency –How fast the user can find the required information?
- Memorability – How much difficult to execute previous tasks by the users?
- Error rate – How many errors the users made.
- Satisfaction – How comfort and ease the users feel while using the website's design.

Websites are collections of online resources like multimedia content and web pages, all under a common domain name and hosted on a web server. University websites, for example, use this technology to share information with students and staff and to advertise events. To attract users, these websites need to look appealing [16]. The basic purpose of these websites are that the users can find information from the website in an easy and simple way. Due to rapid increase in the use of educational Websites, it is necessary to evaluate the usability of educational websites. The evaluation can help us to improve the quality of these websites.

This research evaluates the usability of five university websites in Pakistan, aiming to identify strengths and weaknesses in their design and functionality. Using a questionnaire-based evaluation method, the study gathers feedback from students, faculty, and staff on six key usability features: navigation, interface design, performance, information, ease of use, and organization. The goal is to provide insights and recommendations for improving these websites to enhance user satisfaction and effectiveness.

The paper is organized as: in Section II, Literature Review of usability evaluation of some university websites of different countries are expressed. Section III, tells about the aims and objectives of this research. Methodology of usability evaluation is explained in Section IV. In section V, results of evaluation are explained. Conclusion is given in the last section.

II. LITERATURE REVIEW

This section provides some previous work that have been done about the evaluation of usability of educational websites in different countries.

Anwarul[6] evaluated the usability of twenty university websites of Bangladesh. "Questionnaire-based Evaluation Method" and "Online Automated Tools" were used to evaluate the usability of different features. The Questionnaire method evaluate 23 different usability features. In "Online Automated Tools" two techniques "Web page Analyzer" and "HTML Toolbox" were used. The results show that the people were not satisfied by the features of these educational websites. Some issues in design and performance were mentioned and some comments were provided to increase the usability of these educational websites.

Hina[7] evaluated the usability evaluation of "King Abdul Aziz University" website by using Heuristic evaluation. Five different features, "Navigation", "Content", "Design", "Ease of use" and "Supporting User Task" were evaluated. A survey was conducted among the students of university based on Questionnaire. The usability of above mentioned features were evaluated based on that survey. Some problems were also described for that particular university.

Layla Hassan[8], evaluated the usability of university websites of Jordan. Nine different universities were selected for usability evaluation. "Navigation", "Ease of Use", "Design", "Architecture" and "Content" were the features evaluated. Each feature assign weights and evaluation was done on the total weight of all features. It then categories among universities was that which university have better features than other. Most of the Students were show satisfaction with the usability of these websites. Some of them were not satisfied with design.

Toit[9], evaluated the usability of a department "Marketing and Retail Management" of University of South Africa. "Content", "Navigation and Links", "Effectiveness", "User interface Design" and "Educational Information" were the features evaluated by them. Weights were assigned to each category of evaluation. Then heuristic evaluation was applied and at last the result of this evaluation were compared by them.

Layla Hassan[10], evaluated the usability of website of "University of Jordan". The Heuristic Evaluation Method was used for evaluation. "Navigation", "Ease of use", "Architecture", "Design" and "Content" were the features that evaluated. The problems of above mentioned features were also being explained. Almost 28 problems were allocated which belongs to different usability areas which will help to improve the usability of website.

Alaa El-Halees[11], evaluated the usability of "Alazhar University Gaza". Automated usability evaluation method was used for evaluation. Data mining techniques and tools were used for automation purpose. Questionnaire method was used first and automated tools were used to measure the remaining attributes. Different rules for automation was produced and improvement areas were also discussed.

Marzanha[12], evaluated the usability of university websites from user's perspective. Five Usability factors "Attractiveness", "Controllability", "Helpfulness", "Efficiency" and "Learnability" were discussed. WAMMI Questionnaire based method was used to find which the most important factors were that focused while designing the websites of educational purposes. This will help the designers and developers for designing more affective websites.

Ohaju[13]. Explained that university websites are like online hubs where students can easily get information, talk to others, and stay connected throughout their time in school. However, many of these websites aren't very easy to use or accessible, meaning they may not work well for all students. This study compared how well European and African university websites perform in terms of being user-friendly and accessible. The results showed that none of the websites met a certain standard, but most were better than average. The University of Szczecin in Poland had the best website among those studied. The study suggests ways to make African university websites more user-friendly based on these findings.

Akgül[14], evaluated the university websites of Turkey .University websites are really important for sharing information and services, especially for students with disabilities. As more students with disabilities go to college, it's crucial for universities to make sure their websites are easy for everyone to use. This research looked at how well Turkish state and private university websites do in terms of being easy to use and accessible. Sadly, most of them don't meet the basic accessibility standards. Only a few of them meet the basic requirements. This means Turkish universities need to put more effort into making their websites easier to use and accessible for everyone.

Benaida[15], examined issues with Saudi university websites compared to UK ones from the viewpoint of Saudi students. The goal was to make sure students can easily use their university websites. Using methods like testing and feedback, the study found significant problems in Saudi universities, including inconsistency, integration, and low confidence. The research suggests that Saudi universities can learn from the UK to improve their websites for better user satisfaction and confidence.

TABLE 1
COMPARISON OF PREVIOUS WORK

Author	Country	Number of Universities	Methodology	Key Features Evaluated	Key Findings
Anwarul [6]	Bangladesh	20	Questionnaire-based Evaluation, Online Tools	23 Usability Features	Users were dissatisfied with the features; design and performance issues highlighted.
Hina [7]	Saudi Arabia	1	Heuristic Evaluation, Survey	Navigation, Content, Design, Ease of Use, Supporting User Task	Several usability problems identified, specifically in design and performance.

Layla Hassan [8]	Jordan	9	Weighted Feature Evaluation	Navigation, Ease of Use, Design, Architecture, Content	Overall satisfaction with usability, but some dissatisfaction with design.
Toit [9]	South Africa	1 (Department)	Heuristic Evaluation	Content, Navigation, Effectiveness, UI Design, Educational Information	Issues identified and compared; recommendations for improvement provided.
Layla Hassan [10]	Jordan	1	Heuristic Evaluation	Navigation, Ease of Use, Architecture, Design, Content	28 usability problems identified, offering improvement areas.
Alaa El-Halees [11]	Gaza	1	Automated Usability Evaluation, Questionnaire	Various Usability Features	Usability issues identified using automated tools and data mining techniques.
Marzanha [12]	-	-	WAMMI Questionnaire	Attractiveness, Controllability, Helpfulness, Efficiency, Learnability	Identified important usability factors for educational website design.
Ohaju [13]	Europe, Africa	-	Comparative Analysis	Usability and Accessibility	European websites performed better than African ones; specific recommendations for African websites.
Akgül [14]	Turkey	-	Evaluation of Accessibility	Usability and Accessibility	Most Turkish university websites failed basic accessibility standards; improvements needed.
Benaida [15]	Saudi Arabia	-	Testing and Feedback	Usability	Significant usability problems in Saudi universities; suggestions for improvement based on UK universities.

III. AIMS AND OBJECTIVES

The aim of this research is to evaluate the usability of universities websites in Pakistan. Five universities are selected for the said purpose.

The objectives for the research are:

- Prepare the criteria for the evaluation of usability of university websites.
- Evaluates the usability of some university websites in Pakistan.
- Ask the students for ratings the five Universities websites of Pakistan based on the "Questionnaire Based Evaluation Method".
- Weights of each feature are combined to evaluate overall usability of the university websites.
- Find out the weaknesses of these websites
- Give suggestions for improving the usability.

IV. METHODOLOGY

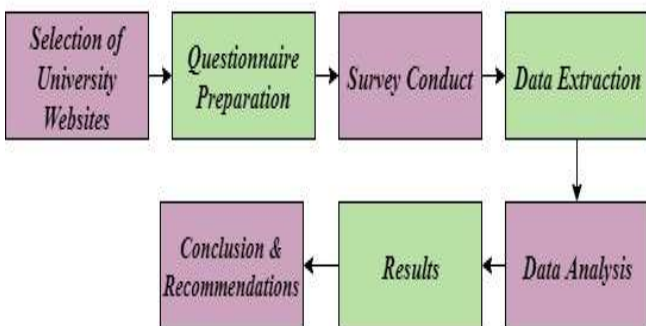In this study, the following methodology based on Questionnaire based evaluation is used:

Figure 1. Methodology of research

A. SELECTION OF UNIVERSITY WEBSITES

In order to select Pakistan's educational websites, five university websites are choose for usability evaluation. The University of Lahore (Fig. 2), University of the Punjab, Gujranwala Campus (Fig.3), University of Central Punjab(UCP) (Fig. 4), University of Gujrat(UOG) (Fig. 5) and Gift University, Gujranwala Campus (Fig. 6). The five universities with their websites are given in table 2.

TABLE 2

THE PAKISTAN'S UNIVERSITIES INCLUDED IN RESEARCH

	University	Websites of University
1	The University of Lahore	www.uol.edu.pk
2	University of the Punjab, Gujranwala Campus	www.pugc.edu.pk
3	University of Central Punjab(UCP)	www.ucp.edu.pk
4	University of Gujrat(UOG)	www.uog.edu.pk
5	Gift University, Gujranwala Campus	www.gift.edu.pk

Figure 2. University of Lahore Home Page

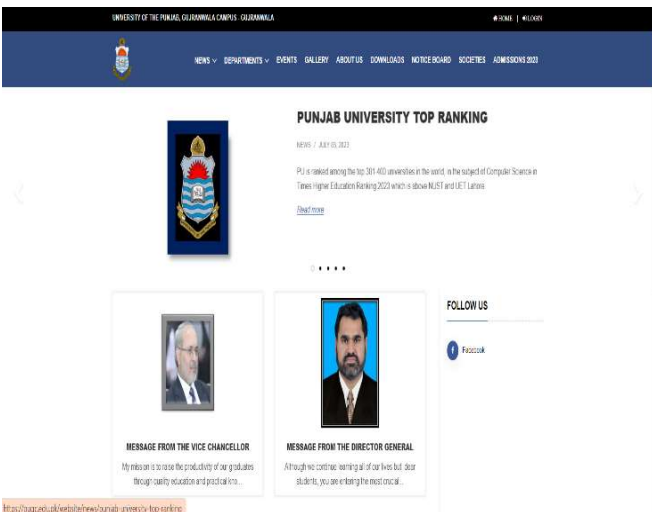Figure 5. University of Gujrat(UOG) Home Page

Figure 3. University of the Punjab, Gujranwala Campus Home Page
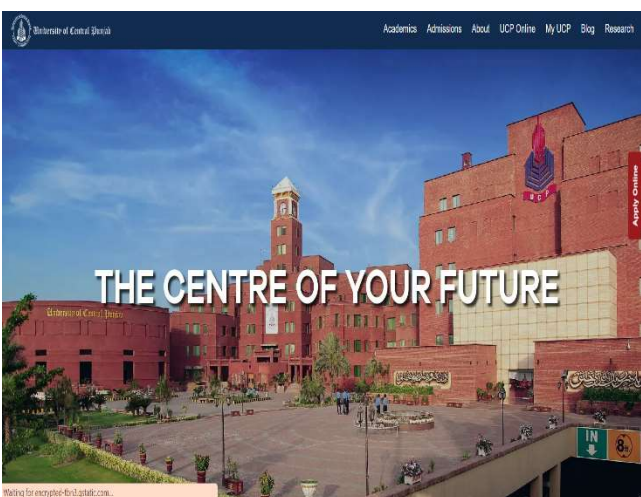

Figure 6. Gift University Home Page

FIGURE 4. University of Central Punjab(UCP) Home Page

B. QUESTIONNAIRE BASED EVALUATION METHOD

In order to evaluate the websites usability a survey is conducted based on the questionnaire in the selected universities in Pakistan. Six different features, "Navigation", "Interface Design", "Performance", "Information", "and Ease of use" and "Organization" are focused in the survey.

The following questionnaire is prepared to be filled by different students, faculty members and administration staff of selected universities of Pakistan to evaluate the usability of five above mentioned universities of Pakistan.

Figure 7. Questionnaire for Survey

C. SURVEY

A survey is conduct based on the above mentioned questionnaire among the students, teachers and official staff members of the five selected universities of Pakistan. Our focus is to target the students and other people which are actual users of these websites. For this purpose, we visit our five selected universities and conduct the survey for the accurate results. Questionnaire is filled by 120 students, 25 faculty members and 20 official staff members of the each selected university of Pakistan. Both types of users male and female are selected in the survey and most of the users have knowledge of computer. Then we also target both graduate and undergraduate students and new and old users of these websites for more accuracy.

D. DATA EXTRACTION AND ANALYSIS

The Data extracted from the questionnaire based survey is analysis by using bar chart (graph). Bar graphs usually presents the category and the numeric values along its horizontal and vertical axis. Double vertical bar graph is used for the comparison purpose. We compare the two series of data: number of users agreed and number of users disagreed with the usability features. One bar represents agreed and second bar represent disagreed percentage of users.

V. RESULTS

From the above survey and analysis following results are found:

A. UNIVERSITY OF LAHORE

TABLE 3
CATEGORIES OF UNIVERSITY OF LAHORE

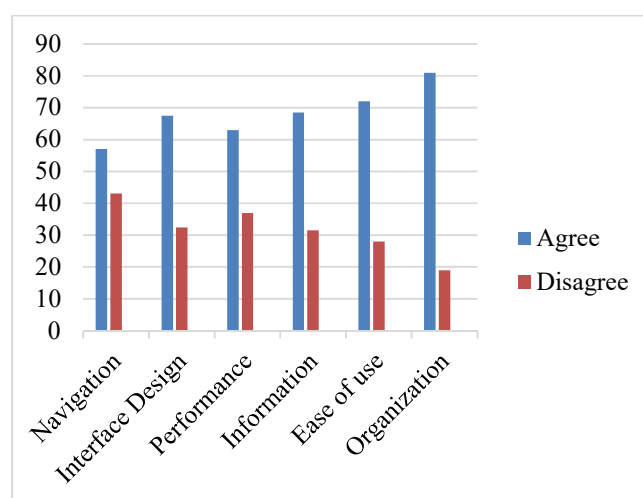| Category	Agree (%)	Disagree (%)
Navigation	57%	43%
Interface Design	67.5%	32.5%
Performance	63%	37%
Information	68.5%	31.5%
Ease of use	72%	28%
Organization	81%	19%

Figure 8. Categories of University of Lahore, Gujrat Campus

From the above figure and table, most of the features are agreed my most of the people. Two features Navigation and Performance are disagreed by almost 43% and 37% people. But the overall most of the people are satisfied by its overall performance.

B. UNIVERSITY OF THE PUNJAB, GUJRANWALA CAMPUS

TABLE 4
CATEGORIES OF UNIVERSITY OF THE PUNJAB

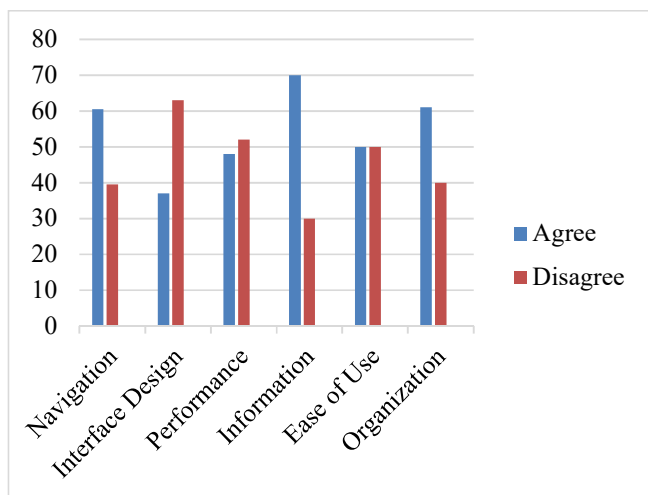| Category	Agree (%)	Disagree (%)
Navigation	60.5%	39.5%
Interface Design	37%	63%
Performance	48%	52%
Information	70%	30%
Ease of use	50%	50%
Organization	61%	39%

Figure 9. Categories of University of the Punjab, Gujranwala Campus

From the above figure and table, some of the features are agreed my many people. Design is disagreed by most of the people. Performance is also disagreed by more the 50% users. But many people are satisfied by its overall performance.

C. UNIVERSITY OF CENTRAL PUNJAB(UCP)

TABLE 5

CATEGORIES OF UNIVERSITY OF CENTRAL(UCP)

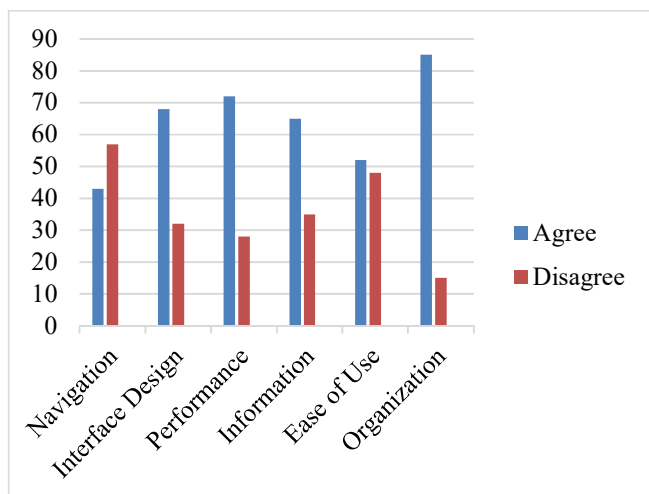| Category	Agree (%)	Disagree (%)
Navigation	43%	57%
Interface Design	68%	32%
Performance	72%	28%
Information	65%	35%
Ease of use	52%	48%
Organization	85%	15%

Figure 10. Categories of University of Central Punjab(UCP)

From the above figure and table, some of the features are agreed my many people. Navigation is disagreed by more people. But most of the people are satisfied by the remaining features. So its overall performance is satisfactory.

D. UNIVERSITY OF GUJRAT

TABLE 6

CATEGORIES OF UNIVERSITY OF GUJRAT

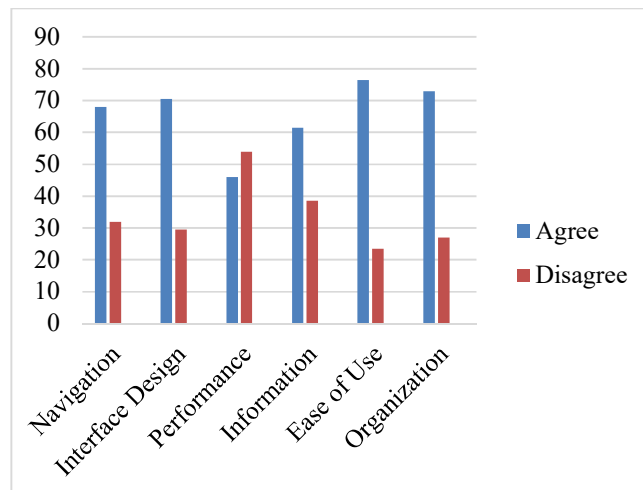| Category	Agree (%)	Disagree (%)
Navigation	68%	32%
Interface Design	70.5%	29.5%
Performance	46%	54%
Information	61.5%	38.5%
Ease of use	76.5%	23.5%
Organization	73%	27%

Figure 11. Categories of University of Gujrat

From the above figure and table, most of the features are agreed my many people. Anyhow some features are disagreed by few people. But the overall many people are satisfied by its performance

E. GIFT UNIVERSITY, GUJRANWALA CAMPUS

TABLE 7

CATEGORIES OF GIFT UNIVERSITY, GUJRANWALA CAMPUS

Category	Agree (%)	Disagree (%)
Navigation	56.5%	43.5%
Interface Design	48%	52%
Performance	70%	30%

Information	62%	38%
Ease of use	77%	23%
Organization	58%	42%

Figure 12. Categories of Gift University, Gujranwala Campus

From the above figure and table, most of the features are agreed by many people. Anyhow some features are disagreed by few people. The feature of interface design is disagreed by over 50% people. But overall many people are satisfied by its performance
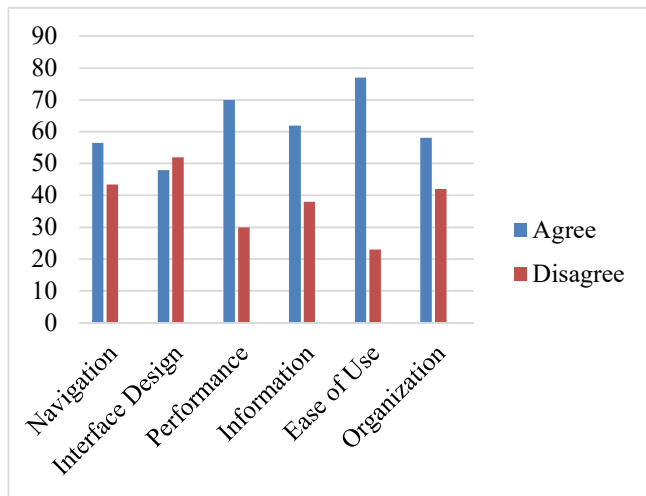
TABLE 8
COMPARISON OF RESULTS

Category	University of Lahore	University of the Punjab, Gujranwala Campus	University of Central Punjab (UCP)	University of Gujrat	Gift University, Gujranwala Campus
Navigation	57% (Agree) / 43% (Disagree)	60.5% (Agree) / 39.5% (Disagree)	43% (Agree) / 57% (Disagree)	68% (Agree) / 32% (Disagree)	56.5% (Agree) / 43.5% (Disagree)
Interface Design	67.5% (Agree) / 32.5% (Disagree)	37% (Agree) / 63% (Disagree)	68% (Agree) / 32% (Disagree)	70.5% (Agree) / 29.5% (Disagree)	48% (Agree) / 52% (Disagree)
Performance	63% (Agree) / 37% (Disagree)	48% (Agree) / 52% (Disagree)	72% (Agree) / 28% (Disagree)	46% (Agree) / 54% (Disagree)	70% (Agree) / 30% (Disagree)
Information	68.5% (Agree) / 31.5% (Disagree)	70% (Agree) / 30% (Disagree)	65% (Agree) / 35% (Disagree)	61.5% (Agree) / 38.5% (Disagree)	62% (Agree) / 38% (Disagree)
Ease of Use	72% (Agree) / 28% (Disagree)	50% (Agree) / 50% (Disagree)	52% (Agree) / 48% (Disagree)	76.5% (Agree) / 23.5% (Disagree)	77% (Agree) / 23% (Disagree)
Organization	81% (Agree) / 19% (Disagree)	61% (Agree) / 39% (Disagree)	85% (Agree) / 15% (Disagree)	73% (Agree) / 27% (Disagree)	58% (Agree) / 42% (Disagree)

VI. CONCLUSION

The present study shows that the usability features of the selected university websites in Pakistan are good. Most of the users satisfy with the available features of the selected university websites. While features like Organization and Ease of Use generally received high satisfaction ratings, significant issues were identified in Navigation and Performance across multiple universities. Notably, the University of Lahore and University of Central Punjab were praised for their overall organization, whereas the University of the Punjab and Gift University faced criticism for their interface design. Anyhow some users are disagreeing about the goodness of some available features. The purpose of university websites is to provide educational information in an easy way to variety of users. By evaluating the six usability features of these selected university websites of Pakistan, we can improve the usability of these websites. This study also provides the open source of future work in this area. Enhancement can also be made in the available features.

REFERENCES

[1]   B. Shackel and S. J. Richardson, *Human factors for informatics usability*: Cambridge university press, 1991.

[2]   T. Hustak and O. Krejcar, "Principles of Usability in Human-Computer Interaction," in *Advanced Multimedia and Ubiquitous Engineering*, ed: Springer, 2016, pp. 51-57.

[3]   Z. Jančíková, P. Koštial, D. Bakošová, I. Ružiak, K. Frydrýšek, J. Valíček*, et al.*, "The study of electrical transport in rubber blends filled by single wall carbon nanotubes," in *Journal of Nano Research*, 2013, pp. 1-6.

[4]   A. Bartuskova, O. Krejcar, and K. Kuca, "Evolutionary Approach of General System Theory Applied on Web Applications Analysis," in *Advanced Computer and Communication Engineering Technology*, ed: Springer, 2015, pp. 411-422.

[5]   M. Behan and O. Krejcar, "Modern smart device-based concept of sensoric networks," *EURASIP Journal on Wireless Communications and Networking,* vol. 2013, p. 155, 2013.

[6]   A. Islam and K. Tsuji, "Evaluation of usage of university websites in Bangladesh," *DESIDOC Journal of Library & Information Technology,* vol. 31, 2011.

[7]   H. Gul and M. Saqib, "Usability evaluation of an educational website in Saudi Arabia," *VAWKUM Transactions on Computer Sciences,* vol. 8, pp. 1-9, 2015.

[8]   L. Hasan, "Evaluating the usability of educational websites based on students' preferences of design characteristics," *International Arab Journal of e-Technology,* vol. 3, pp. 179-193, 2014.

[9]   M. Du Toit and C. Bothma, "Evaluating the usability of an academic marketing department's website from a marketing student's perspective," *International Retail and Marketing Review,* vol. 5, pp. 25-37, 2009.

[10]   L. Hasan, "The Website of the University of Jordan: Usability Evaluation," *International Arab Journal of e-Technology,* vol. 3, pp. 258-269, 2014.

[11]   A. M. El-Halees and I. M. Abu-Zaid, "Automated Usability Evaluation on University Websites using Data Mining Methods," *Automated Usability Evaluation on University Websites using Data Mining Methods,* vol. 6, 2017.

[12]   M. Jabar, A. Usman, and A. Awal, "Assessing the usability of university websites from users' perspective," *Australian Journal of Basic and Applied Sciences,* vol. 7, pp. 98-111, 2013.

[13]   L. O. Ohaju, "Comparative Evaluation of the Usability and Accessibility of Selected University Websites," 2022. [Online]. Available: SSRN 4118355.

[14]   Y. Akgül, "Accessibility, usability, quality performance, and readability evaluation of university websites of Turkey: a comparative study of state and private universities," Universal Access in the Information Society, vol. 20, no. 1, pp. 157-170, 2021.

[15]   M. Benaida, A. Namoun, and A. Taleb, "Evaluation of the impact of usability in Arabic university websites: comparison between Saudi Arabia and the UK," International Journal of Advances Computer Science and Applications, vol. 9, no. 8, 2018.

[16]   P. Sukmasetya, A. Setiawan, and E. R. Arumi, "Usability evaluation of university website: a case study," *Journal of Physics: Conference Series*, vol. 1517, no. 1, p. 012071, Apr. 2020.