Web Design Trends And Their Usability By A|B Testing Method

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ABSTRACT: A good design makes more attractive website's interface. Various designs are used according to the need and nature of organization. In order to improve website's interactivity, current design trends should be used in its design. In this research, design trends are applied on the Website of Quaid-e-Awam University of Engineering, Science and Technology (QUEST), Nawabshah, Sindh, Pakistan to make it more interactive for students. The usability of old version and new version was measured in order to recommend better design trends. The study was designed with pre-test and post-test questionnaire designed using system usability scale (SUS) measuring three attributes of usability that are effectiveness, efficiency and satisfaction. The sample of undergraduate and post-graduate students were 260 for four various tasks. In pre-test questionnaire, demographic data of students were recorded. Afterwards four usability tasks were performed by students that are: 1. to find quick access bar menu, 2. to find the undergraduate results, 3. to find the postgraduate results and; 4. to find the tender notice on the both versions of website. The efficiency of tasks, were recorded automatically and post-test questionnaire data was collected for both versions of website. Results showed that new version was found better in terms of efficiency, effectiveness and satisfaction. It can be concluded that current design trends should essentially be followed while designing the website to improve its usability.

Keywords: Modern Design Trends, Usability, System Usability Scale (SUS).

1. INTRODUCTION

Now days, there are many design trends available and used in various websites in Pakistan. Some of the current design trends are, flat design, infinite looping videos, detailed cut-out images with solid light background, custom illustrations and icons, grid design, fixed header bar, unique geometric shapes [2]. This research applies four design trends that are briefly discussed here. Flat Design is the design trend suitable to design the three dimensional layout. Many websites are using this trend for the better interface for the end user. Flat design trend shows the shades and features of graphics trends of websites. It takes less code and pictures, as a substitute including more free space, larger buttons and different front because of its reliable silver planetary, updated images [1]. Infinite looping videos, is the trend very suitable to create the history of the organization on the index page. There is no need of button to play or pause, images and videos are used to create the slides show videos. It is very simple to apply but makes the website more interactive. [2]. Grid Design, is the trend that includes various blocks to hold the different data/file of website [2]. Fixed header bar is the design trend applied to hold the main menu on the top of the website, if any user want to scroll down he/she should not be confused to go back or change the page [2]. These design trends are used by many other websites to give better layout and response for the end users. This research focus on the impact of design trends of website of any organization which have different category of users who use the website on daily basis. Usability tells the user that how much the website is effective/attractive, efficient, learnable, and memorable or satisfied [1]. In this research, the usability of website is measured based on the three attributes which are calculated through different techniques. In order to improve the accessibility of QUEST website, the modern website design trends are applied and newer version of the website was designed and developed. In order to measure the effectiveness, efficiency and stratification of these design trends, the A|B Testing method was applied [3]. A|B Testing Method is used to measure the usability of two different groups, one group used existing version of QUEST website and other group used newer developed version of the website. Both groups consist of undergraduate and post-graduate students of all years. Four tasks were assigned to participants during experimental study which are: task 1. To find quick access bar menu, task 2.To find the undergraduate results, task 3.To find the postgraduate results, task 4.To find the tender notice. The post-test questionnaire was designed using System Usability Scale (SUS). SUS promotes "quick and dirty", strong way to measure the usability including 10 questions with five answer alternatives for respondents; ranging from strongly agree to strongly disagree and allowing participants to score the 10 items with one of five responses strongly disagree to strongly agree. The survey parameters of scoring are classified in the SUS Template [4].

2. State of art

Kuan et al. observed that the Impact of website is great in improving customer conversion and retention. Although several contingent website attributes have been recognized within the extant internet website excellent studies, there is no unified framework to classify these attributes and no contrast achieved between client conversion and retention in keeping with the extraordinary website nice attributes and their varying effect [5]. Kohavi et al. have reported that in software development, multiple techniques are used to define product requirements; controlled experiments provide a way to assess the impact of new features on customer behavior. The Data Mining Case Studies workshop calls for describing complete implementations related to data mining [6]. Gardner has observed the web testing is remotely experimented through the more traditional interacted ways. Randomly web testing gives services to huge of the experienced users, it is safe the travelling time and also can be make a low cost usability experiments provides access to a larger pool of potential testers, cuts out travel time, and can significantly lower the cost of usability testing. Though advantage of direct communication is missing, their study describes the way to active defining the usability problems in traditional experiment [7]. Comber and Maltby, have examined the applications of layout complications metrics to examining the usability of various designs of the screen-monitors. The application installer was designed through one

of the editing tool in Visual Basic that measured complications and usability material as well [8]. Hansen and et al. have explained the different ways to experiment the more than one website differentiations and also provide the service to that data within analytics surfaces of the web. The development facilitates a way to transform webpage element of analytics platform of webpage of a second analytics platform of webpage which is simply try to new analytics solutions of webpage as well [9]. Davide et al.'s findings indicate that main part to improve the conversion rate is an approach that focuses upon either quality or promotion and avoids mixing such attributes within the web website offer [10].

3. METHODOLOGY

The design trends were applied on the QUEST website and new version of website was designed and developed and was hosted on a domain to provide the access of the website to the participants. An experimental study was performed to measure the usability of both versions of the QUEST website. All experimental tasks were performed online. Participants were free to use any of the devices such as PC's, tablets, and mobile phones. Two hundred undergraduate students were randomly selected from QUEST, Nawabshah to participate in the experimental study. Students were divided into two groups, each groups consisted of hundred students. Sixty Participants of postgraduate students were also divided into two groups, each group consisted of thirty students. When participant firstly open the website, a page consisting of a pre-test questionnaire was appeared requiring demographics data and filled by participants of the both groups. The demographics data of the participants was stored in the database. After submitting the demographics data, users had to select the group. Half of the participants were asked to select group1 who were provided the new version of the QUEST website, the other half were asked to select group 2 who were provided the old version of the website. Participants from each group have to perform four tasks on the website, the task completion time for each task was calculated and stored automatically. After completion of all the four tasks, a post-test questionnaire was appeared on the screen. Participants filled the questionnaire based on their experience. Figure 1 shows the existing version of QUEST website.

***Figure 1**: Existing version of QUEST website*

Figure 2 shows the new designed and developed version of QUEST website on which four selected design trends have been applied.

***Figure 2**: Newer version of QUEST website*

4. RESULTS OF USABILITY TEST

Three attributes of usability were measured during the usability test. The efficiency was measured through the task completion time. The four tasks were given to the participants one by one and time was auto recorded for each task. The effectiveness was measured by recording the task completion rate. The purpose of this measurement was to find out which current design trends is easiest to use. Then satisfaction was measured through post-task questionnaire.

4.1 Task completion rate (Effectiveness)

As the effectiveness was measured by the task completion rate, Figure 3 depicts that the task completion rate of four tasks of undergraduate students using existing version of the website. The result showed that the highest task completion ratio is of task 1 that is about 87%.

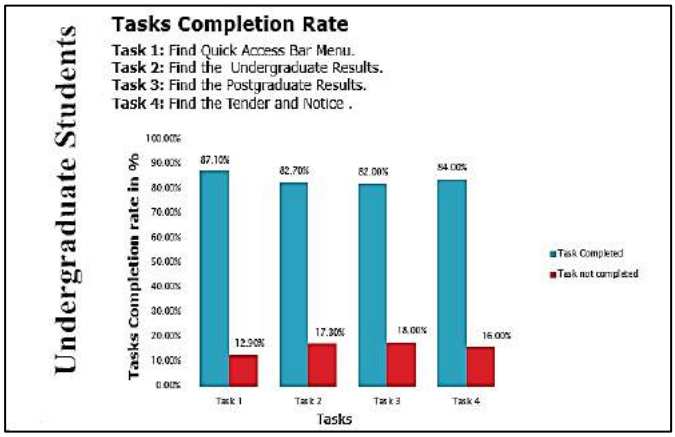

Figure 3: *Task completion rate undergraduate students (Existing website)*

Figure 4 shows the task completion rate of four tasks of post-graduate students using existing version of the website. The result showed that the highest task completion ratio is of task 3 that is about 89.30%.

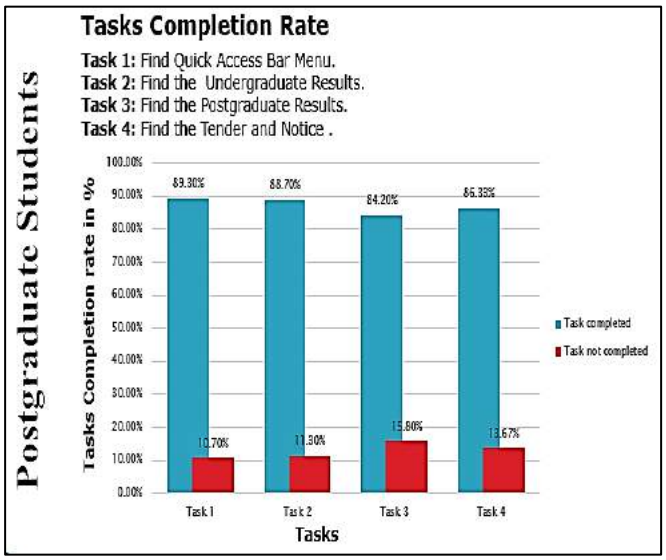

Figure 4: *Task completion rate postgraduate students (Existing website)*

Figure 5 shows the task completion rate of four tasks of undergraduate students using new version of the website. According to the results, maximum task completion rate is of task 2 and task 4 and minimum is of task 1.

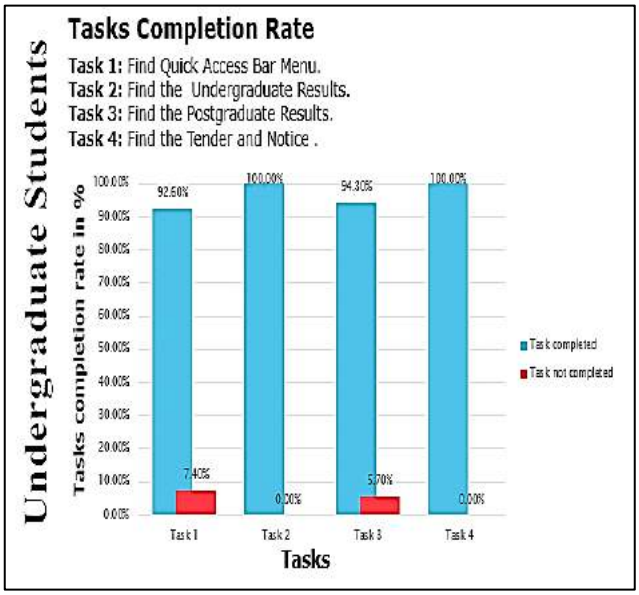

Figure 5: *Task completion rate undergraduate students (Newer website)*

Figure 6 shows the task completion rate of four tasks of postgraduate students using new version of the website. According to the results, maximum task completion rate was observed in task 2, task 3 and task 4 and minimum in task 1.

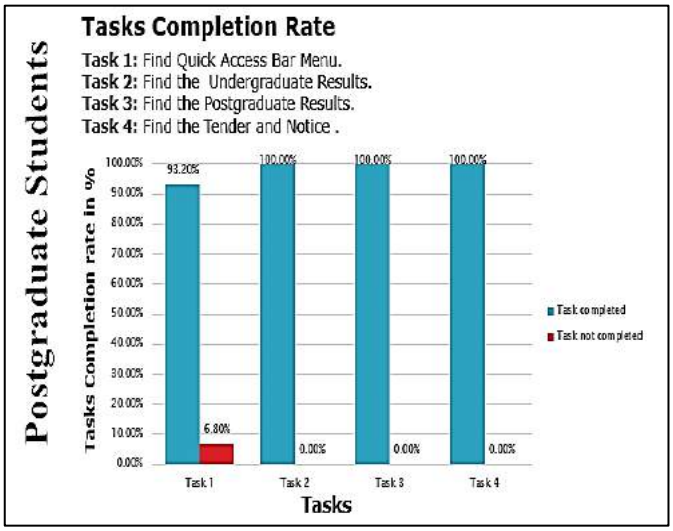

Figure 6: *Task completion rate postgraduate students (Newer website)*

4.2 Task completion time (Efficiency)

Figure 7 shows task completion time of undergraduate students in seconds for new version of QUEST website (Treatment group) and existing QUEST website (Control group). According to the result, control group takes more time to complete the task as compared to treatment group. Task 1 takes less time in treatment group

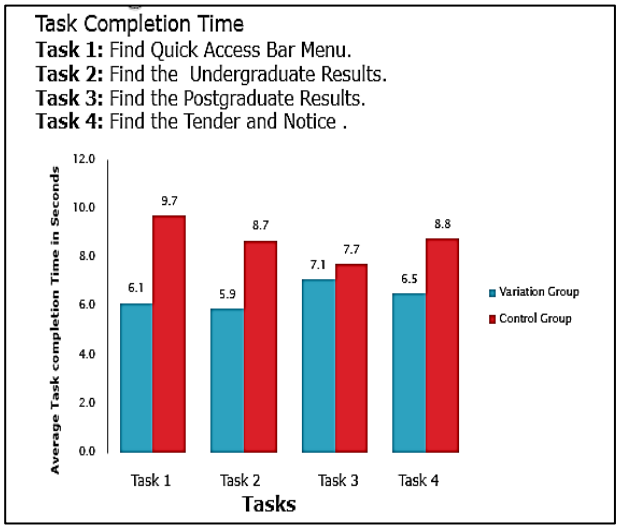

***Figure 7**: Result of tasks completion time for Undergraduate students*

Figure 8 shows task completion time in seconds of postgraduate students for new version of QUEST website (Treatment group) and existing QUEST website (Control group). According to result, control group takes more time to complete the task as compared to treatment group.

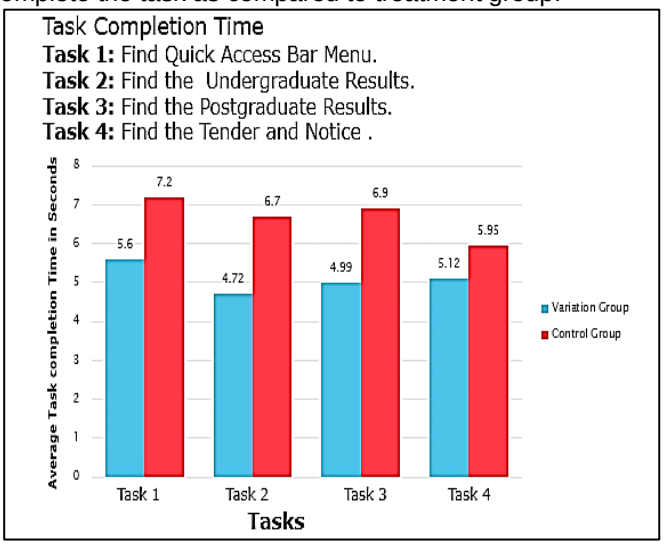

***Figure 8**: Result of task completion time of postgraduate students*

4.3 Satisfaction

System usability scale (SUS) developed by John Brooke (1986) was used to measure the user's satisfaction. It contains 10 questions and its threshold score is 68. Figure 9 shows the overall SUS score of undergraduate students who used existing QUEST website. According to the results, overall SUS score is 74.

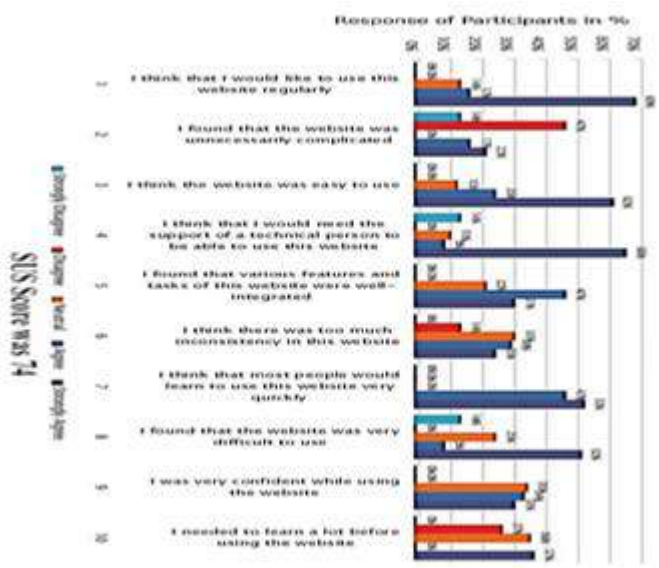

***Figure 9:** Overall SUS score of existing QUEST website by undergraduate students*

4.4 Existing QUEST website postgraduate students

Figure 10 shows the overall SUS score of postgraduate students who used existing QUEST website. According to the results, overall SUS score is 77.

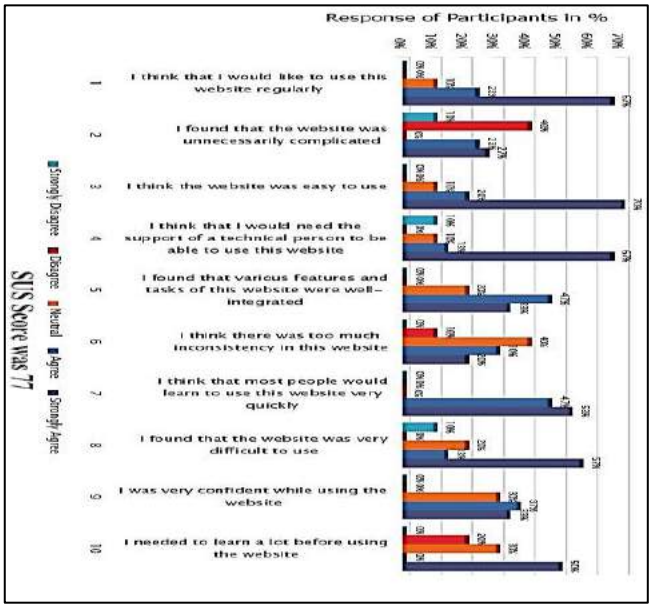

***Figure 10:** Overall SUS score of existing QUEST website by postgraduate students*

Figure 11 shows the overall SUS score of undergraduate students who used new version of QUEST website. According to the results, overall SUS score is 84.

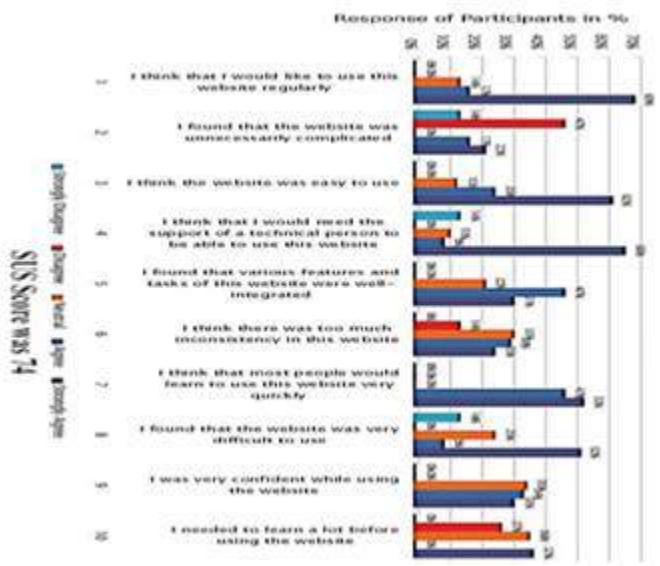

Figure 11: *Overall SUS score of new version of QUEST website by undergraduate students*

Figure 12 shows the overall SUS score of postgraduate students who used new version of QUEST website. According to the results, overall SUS score is 88.

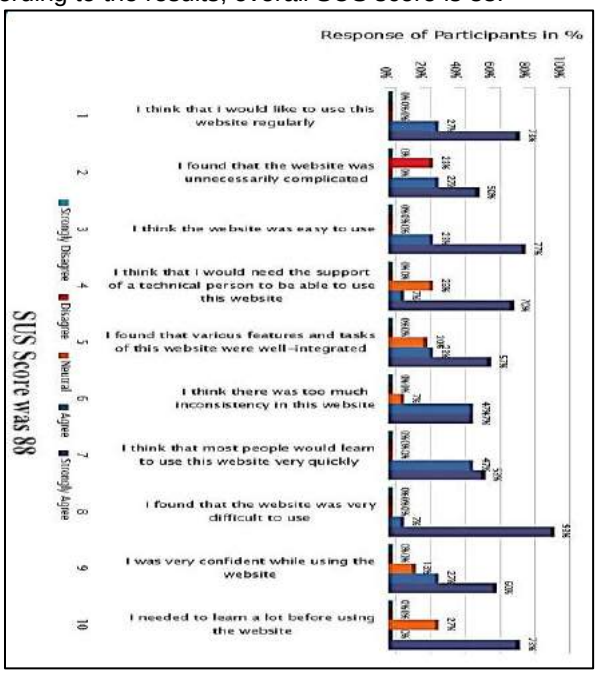

Figure 12: *Overall SUS score of new version of QUEST website by postgraduate students*

It can be observed from the results that students were more satisfied from the new version of QUEST website as compared to existing version of the website.

5. CONCLUSIONS

The aim of this study was to apply the modern design trends on QUEST website and compared new version and existing version of QUEST website from usability perspective in order to recommend the better current design trends for the websites. The primary objective of this research was to design and develop a website according to modern design trends. In this research four design trends were considered to evaluate. In order to analyze the usability factors, experimental study was performed in four departments of QUEST, Nawabshah. In this experimental study, three usability attributes were measured namely; effectiveness, efficiency, and satisfaction. The usability test was conducted from the undergraduate and postgraduate students. In the experimental study four tasks were performed to analyze the usability of the existing version of website and new version of website. It can be concluded from the results that the new version of website was found to be more effective as measured by the outcomes of tasks completion rate as the group A (treatment group) completed more tasks as compared to group B (control group). Also new version of website was found to be more efficient as measured by the outcomes of task completion time as group A (treatment group) completed all tasks faster than group B (Control group). Also from the SUS score, it can be concluded that group A (treatment group) was found to be more satisfied from the new version of the website as compared to students of group B who used existing version of the website. Therefore, it can be said that new version was found better in terms of efficiency, effectiveness and satisfaction. It can be concluded from the study that current design trends should essentially be followed while designing the website to improve its usability.

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