

The Website of the University of Jordan: Usability Evaluation

Layla Hasan

Department of Computer Information Systems, Zarqa University, Jordan

Abstract: *Using the heuristic evaluation method, this research comprehensively investigated the usability of the website of the University of Jordan, the largest and oldest university in Jordan. The evaluators considered in their investigation the most frequently visited pages on the university's website from the viewpoint of 237 students. The evaluators were also asked to visit all pages on the website related to all faculties and their corresponding departments. The results showed that the total number of usability problems found on the University of Jordan's website was 2,926; these related to 28 specific usability problem areas. The results describe the specific usability problems identified on the University of Jordan's website in terms of their type and location.*

Keywords: *Educational websites, evaluation, heuristic evaluation, usability, Jordan, the University of Jordan*

Received June 23, 2013; Accepted November 16, 2013

1. Introduction

The tremendous developments in information technology and communications witnessed by the 21st century have resulted in an increasing use of the Internet in all areas of life as the primary source of information [5]. Academic institutions (e.g. universities and colleges), which were among the early developers of websites to present themselves on the Internet, have been affected by the revolution in information technology and communications. Such institutions have changed the aims of their websites in an attempt to respond to technological advances and the increasing number of Internet users. In the early 1990s, university websites started as informational websites aiming simply to be a presence on the web [3, 20]. Nowadays, academic websites have become a vital part of academic institutions and one of their most visible faces [20]. Therefore, the aim of these websites for the academic institutions changed. Research indicates that educational websites now aim to:

- Recruit major stakeholders for the institutions (e.g. prospective students, prospective faculty, alumni, parents) [2, 3, 21];
- Provide a cost-effective and timely method of communication with stakeholders [13];
- Provide a way to present their image on the Internet (e.g. academic offerings, programs, services, student resources, etc.) [2, 3, 13].

In order to achieve the above-mentioned aims, and to respond to the new generation of students who have grown up with technology, educational websites need to consider usability when designing and improving their websites. Usability is one of the most important

characteristics of any user interface; it not only evaluates the quality of a website, it also provides managers with insights into potential problem areas [1, 18]. Usability has been defined 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" [9].

Earlier research has proved that addressing the usability of educational websites can help students to enjoy the learning experience, increase their confidence, and encourage them to use the website [12]. Unfortunately, a university website design is often based on the perceptions of web designers and/or managers in a university instead of students' needs. Furthermore, many website designers have little knowledge of user interface design and usability engineering, subsequently wasting users' time and causing unnecessary traffic on the Internet [3].

There is a lack of research that comprehensively investigates and evaluates the usability of educational websites using the heuristic evaluation method. Noiwan and Norcio [19] explained one reason behind this, which related to the fact that educational websites are large and contain several sub-sites. They concentrated in their study only on the home page of the tested university website, and three or four steps away from it. Also, earlier research which employed the heuristic evaluation method did not consider the pages most frequently visited by students on universities' websites [3, 11, 19, 21, 24]. Furthermore, these studies used quantitative data based on questionnaires in order to identify usability problems on the tested educational websites from the evaluators' point of view. Therefore, these studies did not provide details regarding specific types of usability problems

that could be found on educational websites. Finally, there is a lack of research which evaluates the usability of educational websites using the heuristic evaluation method in the context of Arabic websites.

The aim of this research is to evaluate comprehensively the usability of the website of the largest and oldest university in Jordan, The University of Jordan, in order to identify common usability problem areas within it. The specific objectives for the research are:

1. To investigate types of frequently visited pages on a university website from the viewpoint of students;
2. To use the heuristic evaluation method to assess to what extent the University of Jordan's website has conformed to usability principles, taking into consideration the results obtained from objective 1;
3. To identify the number of common usability problem areas in the case study website in terms of their type and location.

This paper is presented as follows. Section Two presents an overview regarding the context of this research: The University of Jordan while Section Three reviews related work. Section Four describes the method used for the purpose of this research to investigate the frequently visited pages on a university website; the results of the investigation are also presented in this section. Section Five describes the heuristic evaluation method used in this research and Section Six outlines the main results and discusses them in the light of the literature. Finally, Section Seven reviews and presents some conclusions.

2. About the University of Jordan

The University of Jordan (UJ) is a public university located in Amman, the capital of Jordan. Jordan is one of the Arab countries which has been noticeably affected by the revolution in information and communications technology, despite the challenges it faces as a developing country (e.g. lack of payment systems, lack of trust, the high cost of personal computers, the high cost of connecting to the Internet, cultural resistance). The latest statistics show that the number of Internet users in Jordan has grown from 127,300 in 2000 to 2,481,940 in 2012 [8]. Jordan has 10 public and 19 private universities [14].

The UJ was established in 1962; it is the oldest and largest institution of higher education in Jordan. The university has the highest admission averages in the country and is considered the premier university in Jordan. The university currently employs about 1,400 faculty staff and has more than 38,000 students enrolled in undergraduate and graduate programs [23].

At the undergraduate level, students are able to select from 63 different programs offered by 18 faculties: Arts, Business Administration, Science, Shari'a (Islamic Studies), Medicine, Nursing,

Agriculture, Educational Sciences, Engineering and Technology, Law, Physical Education, Pharmacy, Dentistry, Humanities and Social Sciences, Rehabilitation Sciences, Information Technology, Foreign Languages, and Arts and Design.

For those interested in graduate education, the university offers 30 doctoral programs, 81 Master's programs, 16 programs in Higher Specialization in Medicine, one program in Higher Specialization in Dentistry, Professional Diploma Programs, and interdisciplinary Master's programs across a wide spectrum of academic disciplines.

From an international perspective, the University offers 63 international programs at undergraduate level and 130 international programs at graduate level in all fields of specialization.

3. Literature Review

Various usability evaluation methods have been developed to evaluate the usability of websites. These methods can be categorized into three areas in terms of how the usability problems are identified: for example, by evaluators, users, or tools. Evaluator-based methods are aimed at finding usability problems that users might encounter while interacting with an interface from the evaluators' point of view. Heuristic evaluation is one of the most frequently used evaluator-based usability evaluation methods. It involves a number of evaluators assessing the user interface and then judging whether it conforms to a set of usability principles, namely heuristics [16].

The studies which employed the heuristic evaluation method to evaluate the usability of educational websites used either the ten usability heuristics suggested by Nielsen [17, 11, 21], or specific heuristics that were designed for educational websites [3, 19, 24]. The most common usability problems that were identified by these studies in the tested educational websites related to:

- Old content [3, 19, 24];
- Lack of navigational support [11, 19, 21, 24];
- Inconsistency problems [11, 19, 21];
- Ineffective internal search [11, 19];
- Language problems (e.g. misspelling of words) [19];
- Inappropriate page design [3, 21];
- Incomplete information [24]; and
- Inappropriate design of menus [11].

Other studies which employed users in the evaluation and identification of usability problems on educational websites were found in the literature. Kasil and Aucikurt [10], for example, employed 54 students to investigate 132 websites of tourism departments at universities in Turkey. Similarly, Christoun *et al.* [4] investigated students' overall satisfaction with an academic website, with regard to its technology,

usability, aesthetic, and content, using an online questionnaire. These studies shed light on the usability problems that were found in the tested academic websites from students viewpoints. These included:

- Old content [10];
- Missing information (e.g. academic calendar, FAQ, programs) [10];
- Not supporting more than one language [10];
- Ineffective search function [4]; and
- Difficulty in finding information [4].

Few studies, however, were found in the literature that focused on Arabic websites. The study conducted by Mustafa and Al-Zou'bi [15] is one example. They employed a questionnaire given to 252 students to evaluate the usability of nine Jordanian university websites. The results showed that the overall usability level of the websites was acceptable. However, there were some weaknesses in some aspects of the sites; these were related to design, interface, and performance. However, the study did not provide details regarding specific types of usability problems that users identified on the university sites. Similarly, Hasan [6] asked 237 students to provide ratings for nine Jordanian university websites using usability criteria. The students were also asked to report qualitatively what they liked and disliked regarding the design of the websites. The results showed that the most common weaknesses on the websites included: the design of the sites, the fact that most of the sites were inconsistent in terms of colors and fonts, the Arabic and English language interfaces, the design of the pages, and the lack of support for the Arabic language.

Interestingly, other studies were found in the literature that identified the relative importance of design issues in the design of usable educational websites from a student viewpoint [2, 7, 22]. Specifically, these studies identified the most and least important/liked features on a university website from the perspective of students. The results of these studies showed that the most important features were related to: the availability of online admission applications, internal search tools, simple layout, useful information, good use of graphics and color, simple and comprehensive menu, well organized information, ease of navigation, and user-friendliness.

However, the least important features, as found by Astani [2] and Sandvig and Bajwa [22], were related to the site's inclusion of: a purpose statement, the school's history of excellence, major local businesses and interests, a link to the region's weather, outdated links, incomplete and outdated information, confusing menus, inability to find information, cluttered and disorganized information, slow download time, and small fonts.

Regarding Arabic websites, only one study was found; this was conducted by Hasan [7]. She

investigated the relative importance of design criteria in the evaluation of the usability of educational websites from the viewpoint of 237 students. The results identified those design features which students most preferred for a usable educational website. These included: navigation support, logical structure of a site, quick downloading of web pages, aesthetic design, and up-to-date information.

The literature outlined above sheds light on various types of usability problem that were identified on educational websites from the point of view of evaluators and users using heuristic evaluation and questionnaire methods, respectively. Furthermore, the literature summarized the most and least important/liked design aspects for usable educational websites from the viewpoint of students.

4. Frequently Visited Pages on a University Website

In order to achieve the first objective of this research, which related to investigating types of frequently visited pages on a university website, a specific questionnaire was designed. This was divided into two parts: the first aimed to collect demographic information from the participating students while the second part aimed to collect information, using an open question, about the frequently visited pages on a university website from the viewpoint of the students.

The questionnaire was given to undergraduate students from various faculties at one of the universities in Jordan. The total number of students who provided usable responses was 237; 149 males and 88 females. The student participants were, in general, experienced computer and web users; 91% had more than three years of computer experience and 75% had used the Internet for more than three years. The 237 students listed a total of 540 frequently visited pages. The pages they specified are shown in Figure 1. For example, the available courses page was the most frequently visited page listed by the students (21.11%). Five pages, however, were listed only once or twice; these are presented in Figure 1 under 'Others'. These pages include: Photo album, annual book, university newspaper, university conferences, and library.

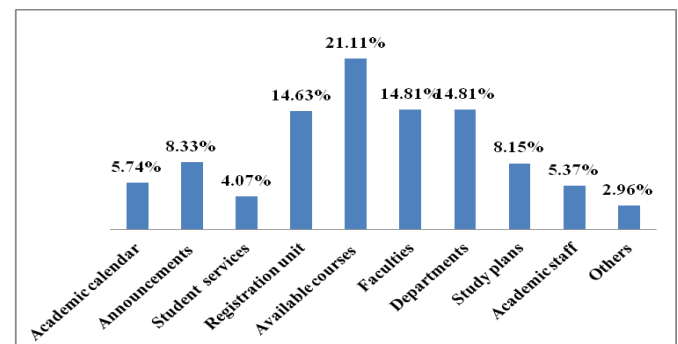


Figure 1. Pages frequently visited by students on a university website.

5. Methodology

The University of Jordan website was selected as a case study for this research since this university is the largest and oldest in Jordan. In order to evaluate the usability of the university’s website using the heuristic evaluation method, two documents were developed: heuristic guidelines and a list of tasks. The heuristic guidelines document included a set of comprehensive heuristics, specific to educational websites. This was developed earlier by Hasan [6, 7] and was used as criteria in the evaluation of educational websites in Jordan. The adopted heuristics were organized into five major categories. Table 1 displays the categories and sub-categories of the adopted heuristics. The list of tasks document included ten tasks which represent the pages students usually visit on a university website (Figure 1).

Table 1. The categories and sub-categories of the adopted heuristic guidelines.

Category	Sub-categories
Navigation	Navigation support; effective internal search; working links; no broken links; no orphan pages.
Architecture/organization	Logical structure of site; no deep architecture; simple navigation menu.
Ease of use and communication	Quick downloading of web pages; easy interaction with a website; contact us information; foreign language support.
Design	Aesthetic design; appropriate use of images; appropriate choice of fonts; appropriate choice of colors; appropriate page design; consistency.
Content	Up-to-date information; relevant information; no under-construction pages; accurate information; information about the university; information about the colleges; information about the departments.

Five evaluators participated in this research: two usability specialists and three web experts. The evaluators were asked to visit all pages included in the list of tasks and to use the heuristic guidelines while evaluating the website. They were also asked to visit all pages related to all faculties and their corresponding departments on the studied website. The evaluation was carried out independently by each evaluator and completed over four months (July to September 2012).

The heuristic evaluators’ comments on the compliance of the site to each heuristic principle were grouped together and listed under the categories and sub-categories of the heuristic guidelines. Each heuristic sub-category was examined to identify problems with the site. These problems were classified and similar problems were grouped together to identify common usability problems on the website. Consequently, 28 common areas of usability problems

were identified which suggested identifying 28 problem sub-themes. These 28 problem sub-themes suggested identifying four main problem themes, based on the types of the identified problem. The four main problem themes related to: navigation, design, content, and ease of use and communication. The list of problem themes and sub-themes is explained in the results.

The identified problems were categorized into three levels in terms of their location on the websites. The first level is 'university'; this includes pages related directly to the main university website, such as: academic calendar, university services, and pages related to the registration unit. The second level is 'faculty'; this includes all pages related to a faculty sub-site. The third level is 'department' which includes pages related to a department sub-site. The 28 specific usability problems, with regard to these three levels, are described in the results.

6. Results and Discussion

This section presents the results obtained from the analysis of the evaluators’ comprehensive comments. It is divided into five sub-sections. The first section describes the number of usability problems identified on the University of Jordan’s website in terms of their type and location. The next four sub-sections present the usability problems identified in the website with regard to the four problem themes which emerged from the analysis of the data. At the end of each of these four subsections, the results are discussed in the light of the literature review.

6.1. Number of Usability Problems

The results show that the total number of usability problems identified by the evaluators on the University of Jordan’s website was 2,926. Figure 2 shows the distribution of these problems in terms of the four usability problem areas identified in this research. It shows that the largest number of usability problems relates to design problems, while the lowest number of such problems relates to ease of use and communication problems.

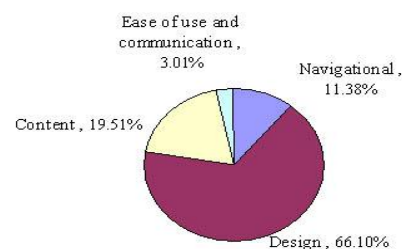


Figure 2. Distribution of usability problems with regard to the four areas.

Figure 3 shows the distribution of the number of usability problems identified on the University of Jordan’s website, with regard to the four usability areas, in terms of their location. It shows that the navigational problems were identified on pages of the website related to the faculties and departments of the University of Jordan. It shows also that most of the design, content, and ease of use and communication problems were found on pages of the website related to the departments.

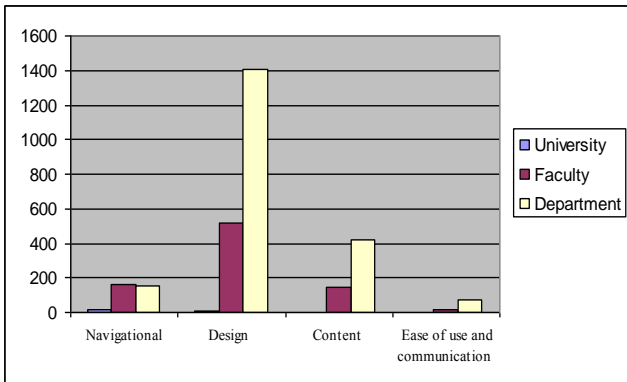


Figure 3. Distribution of usability problems identified on the website in terms of their location.

6.2. Navigational Problems

A total of seven navigational problems were identified on the University of Jordan’s website on pages related to its faculties and departments. Table 2 shows and describes the seven specific navigational problems, together with their number in terms of their location.

The results show that the largest number of navigational problems found on the University of Jordan’s website was related to broken links. For example, the telephone directory link, which was one of the items on the main menu for all the faculties and departments of the university, was broken. Also, the links to two faculties of the University of Jordan (Faculty of Law and Faculty of International Studies) were broken. Furthermore, the evaluators found that the programs’ page, relating to many departments on the university’s website, had broken links (e.g. Management Information Systems Department, Foundations of Religion Department, Counseling and Special Education Department, Arabic Language Department, Computer Engineering Department, Computer Science Department).

Also, the results show that there were other links on the University of Jordan’s website that were not working properly. These links were classified into three specific problems (Problems 2-4, Table 2). Examples of these three problems are:

- The photo gallery link, which was located on the main menu of the Faculty of Engineering and Technology, was misleading. This opened an

unexpected page: the photo gallery of the Faculty of Agriculture.

- The faculty calendar link related to the Faculty of Medicine opened a page which displayed the calendar of the main university. Therefore, the main menu of the faculty disappeared.
- The proficiency exam, faculty reports and figures and facilities links, which were related to the Faculty of Medicine, did not open the corresponding destination pages; they remained on the same page (the home page).

Table 2. Description and number of navigational problems in terms of their location.

Navigational Problems	Description of the Problem	Occurrence of the Problem			Total
		U	F	D	
1. Weak navigational support	A page did not have a navigational menu or links to other pages in the site.	4	10	3	17
2. Misleading links	The destination page, which was opened by the link, was not expected by users because the link name did not match the content of the destination page.	4	28	17	49
3. Links causing the menu to disappear	The link, when selected, caused the disappearance of the corresponding main menu.	4	22	3	29
4. Links not opening the destination pages	The link did not work; it remained on the same page.	0	20	0	20
5. Broken links	The site had pages with broken links.	3	74	131	208
6. Orphan pages	The site had dead end pages that did not have any link.	2	4	0	6
7. Ineffective internal search	The internal search did not work properly.	2	1	1	4
Total Number of Navigational Problems		19	159	155	333
U: University; F: Faculty; D: Department					

Furthermore, the evaluators indicated that the University of Jordan’s website had two internal searches which were ineffective, failing to provide useful results. The first one was the main internal search of the website, while the second was the faculty staff search which was designed to search for names and ranks of the faculty staff of the University of Jordan.

Finally, however, the evaluators found relatively few weak navigational support problems and orphan pages. One example is that the self-registration system sub-site did not have a link to the main university website (the University of Jordan’s website). Examples of orphan pages are the course schedule and the “Calculate your GPA” pages.

Two out of the seven navigational problems that

