An Exploratory Study of the Factors Affecting the Perceived Usability of Algerian Educational Websites

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ABSTRACT
Nowadays universities pay considerable attention to the use of websites to enhance the education process through the delivery of important information. The general aim of a website is to attract more target users. However, a poor website leads to fewer visits, less efficiency and less satisfaction from users. The present study explores the effects of four key factors including system usefulness, interface quality, content and satisfaction of users on the perceived usability of Algerian educational websites. A total of 200 students were tasked with four interaction tasks and subsequently asked to complete a usability questionnaire, consisting of 19 usability questions. Results indicate that the website usability perceptions amongst university website users are significantly affected by all four factors. In particular, website usefulness, information quality, interface quality and overall satisfaction all require more attention for the design of effective Arabic educational websites. Improvements to speed of Internet, structure of the website and quality of website contents were also advised.

Keywords: Usability, Algerian Educational Websites, Factors, System Usefulness, Information Quality, Interface Quality, Satisfaction

INTRODUCTION
The usage of Internet by the education sector has become increasingly important nowadays ever than before. The growing of Internet around the world allows the universities to give more considerations to the use of websites during the education process. The general aim of a website is to attract more target users. Hence, a poor website leads to less visits, less efficiency and less satisfaction from the users and as a consequence, the website will fail to reach the target and the expectations of the users. Therefore, usability is the supreme solution for attracting and satisfying the targeted audience for educational website use. According to Hasan only one study investigated the evaluation of usability within Arabic educational websites. The results showed that students preferred the following area which included: navigation support, logical structure of a site, quick downloading of web pages, aesthetic design, and up-to-date (Hasan, 2014). According to our research there are no prior studies that have investigated the usability and usefulness of Algerian educational website. Therefore this study enriches the usability research landscape related to Arabic websites and enhances the understanding of the factors that encompass the concept of usability within educational websites. The contribution of this paper is thus to explore the effects of usability factors on Algerian higher education websites.

LITERATURE REVIEW
Algeria is a country situated in North Africa (Maghreb) where the majority of its residents are young people. There are more than 39 universities with 17 dispersed university campuses under the control of the minister of education. The number of Algerian Internet users has risen from 50,000 users in the beginning of 2000 to 11,000,000 in November 2015, with a proportion of 27.8% of the total population (Internet World Stats, 2015). The Internet users and especially students remain to face many barriers to gain a higher speed Internet access. The main problems which discourage the student from accessing education websites is the cause of a limited reach of AT's fixed-line network and the inflation in the cost of Internet usage, the third generation (3G) has been operating only in December 2013, despite other countries (e.g. Saudi Arabia 2011) already launched their 4G (Chaabna & Wang, 2015).

In the year 2015, there were more than 3, 36 billion users of the Internet around the world. This significant increase of Internet usage opens various opportunities for the universities around the world to benefit from this

type of technology. Many universities have a web presence which must reflect the level of services that are provided to the students and staff. Nielsen (1994) defines the usability of a website as the ability of the user in becoming familiar with the website and how errors can be reduced when using the website. The key elements for a successful website can be measured by the efficiency of the website design, the remembrance of how to navigate through the website and the overall satisfaction of the website.

In modern education websites usability is regarded as a key component for survival in the Internet world; however, the website designer must consider the users requirements and allow the users to accomplish their tasks efficiently (Nielsen, 2000; Yan, & Guo, 2010; Teo, & Liu, 2003). According to Flavian, Gurrea, and Orús (2009) usability enhances the understanding of the tasks and contents whereby tasks need to be completed with minimal errors. Usability is also notably affected by the connection of the Internet and a poor Internet connection can limit the number of website users. Furthermore, the speed of Internet from one country to another can provide various measurement scales of usability and if the users can't achieve their target in a specified time frame they will refrain from visiting the website in the future (Tractinsky, Katz, & Ikar., 2000).

Several studies have considered the usability of university websites. Sengel and Öncü (2010) investigated the usability of Uluda University website and extracted differences in the responses of females and males. Results show that the students' interpretation of web usability drastically changes between the two genders, with females have considerably higher ratings for 23% of the predefined reasons to visit the usability. The author implies that the websites audience seems to be directed at the females more than the males.

Mentes and Turan (2012) evaluated and explored the usability level of Namık Kemal University website, the findings showed that website usability perceptions is positively affected by five of the six factors (attractiveness, helpfulness, efficiency, learnability and demographics are accepted) however, controllability is rejected. Demographic factors (gender and web experience) have major effects on the on the individual user' usability perception. Adrian, Duncan, and Durrant (2015) aim of their research was to provide an assessment of the usability of the University of the West Indies and found that the challenging areas are detected in the site's navigation, user satisfaction and learnability. Caglar and Mentes (2012) investigated the usability of European university of Lefke website in regard to student utilization and discover the effects of the information age on university websites using a website analysis and measurement inventory (WAMMI) questionnaire. To examine the data the authors used non-parametric and regression methods. The results show usability problems of a EUL website, situated in Cyprus as well as discontentment.

Tuch, Presslaber, Stöcklin, Opwis, and Bargas-Avila (2012) formulated users' first impressions via examining two parameters, namely visual complexity and prototypically as design features of web pages. Two studies were conducted, for the first study using 119 screenshots of real websites, apparent aesthetics were used to rate VC (three levels included: low V, medium V and high V) and PT (low Vs high) variations. VC and PT influenced the subject aesthetics scores within 50ms of exposer to real websites. Moving on to the second study the duration of screenshot presentation was reduced (17ms, 33ms and 50ms). Results suggested even within 17ms duration PT and VS both influence aesthetic perception despite PT being less pronounced than the one of VC. The correlation between PT and VC are proportional, the outcome of PT becomes as significant as the VC effect. Furthermore, having a low and high VC was considered being unattractive whereas highly appealing web pages were seen to have low VC and high PT. Subjects have a fondness of websites with a PT and a low VC. However, aesthetic judgments are affected by both features after a short exposure time of 17ms. Subjects have a fondness of websites with a PT and a low VC. After a short exposure time of 17ms, aesthetic judgments are affected by both features PT and VC. Cyr, Head, Larios, and Pan (2009) used questionnaires, eye-tracking systems and interviews in their study. Human images with facial features on websites tend to be more appealing to the Internet users. This allows the users to perceive social trust and having warmth; In contrast with human images without facial features and images with no human image at all (where no direct relationship was observed.) High human condition was the most favorable, had greatest image appeal and social presence. Another similar research used eye-tracking method, where adjectives were used to describe high-human treatment as having higher emotional draw. By using an eye-tracker this enabled us to calculate how long the participant spent on viewing images and calculated the number of fixations too. It was found that the users spent the greatest proportion of time looking at human images without facial features and as a result it hard more fixations.

Islam and Tsuji (2011) investigated 20 Bangladeshi university websites in terms of usability. To evaluate these websites, they used a questionnaire and online automated tools (html toolbox and web page analyzer) which can be used to determine the internal features of the websites. Moreover, the design of the questionnaire was designed to fit the 23 usability criteria which were eventually classified into five categories. Thowfeek and Abdul Salam (2014) examined Shackel's usability model to determine usability features and to improve the

survey by creating a questionnaire. They studied undergraduates from the South eastern university of Sri Lanka who were in their final year of study. A selection of both experienced and non-experienced users of e-learning websites were used. The authors found that both students whom are experienced and non-experienced do not necessarily carry much connotation in this research, this is due to the theory of perception and experiences are usually at the same level. However, the usability attributes are necessary for the unprompted and natural interface with e-learning websites. Furthermore, outcomes of inexperienced users show that there's a higher expectancy concerning the features of usability of an e-learning website and new users are already wary about all the features which support them to use web pages for their own learning. In contrary, experienced users said that there's room for improving the features of the usability as the greater scales aren't influenced. Abdul Aziz, Mohd, and Nordin (2010) used a sample of 120 from higher education institution websites from the online portal of the ministry of higher education, to study the usability of Malaysian university websites. The main areas of focus were dedicated to broken links, web performance, page size and usability features. The results indicated that these websites still have some issues which need to be revised.

Al-Qeisi, Dennis, Alamanos, and Jayawardhena (2014) studied 216 users of Internet banking in their study. These users demonstrated that the technical, general satisfaction and layout dimensions of a banks website are significant to the user. The dimensions such as organization, clarity, access and loading time are associated with the usage behavior directly and in directly. Lee, Bahn, Kim, and Yun (2010) analyzed the relationship between perceived usability before actual use, time taken to complete task and the effects of design features on user preference for e-commerce web sites. The results showed a correlation between pre-use usability and task completion time was apparent; (2) the relationship between task completion time and preference was less than that of pre-use usability and preference; (3) aesthetic aspects such as color and typography did not have a significant effect on user preference like organizational structure and layout had. Papadopoulos and Xenos (2008) looked at the evaluation of the new edition of Hellenic Start School (HOU) website. They adapted the heuristic evaluation method which consists of several evaluators evaluating whether the user interface is similar to a set of performance measurement which have been adapted in generic-type application, along with a set of usability concepts. The study shows a pattern of usability errors and dissatisfaction from the users which been overlooked in the developing stages of the website. Both authors suggest that an effective way in which the website can advance to develop into an efficient, useful, effective and satisfactory to all the users is to the revealed imperfections. However, there are no studies which investigate the usability on Algerian education websites and from this point onwards it would be important for this study to fill in the gap in the field of usability research.

RESEARCH METHOD

This empirical research was introduced to analyse and improve usability for Algerian education websites which represents the initial stages of a wider study program. As mentioned before, the main goal of this research is to evaluate and measure the effects of the four factors (efficiency, learnability, web content and satisfaction) on usability of Algerian education website. In the second stage, usability guidelines for Algerian education websites were deduced from the evaluation of the data.

The top four universities in Algeria were examined in this research and they are as follows: University of Tlemcen university of science and technology Houari Boumediene (Algiers), University Kasdi Merbah of Ouargla and Université d'Alger 1 (Algiers University 1). Further details are given in the methodology section. These universities were selected based on their ranking in Algeria. The aim was to gauge user perception of students towards the best universities in Algeria and understand the potential problems they face during their interaction with education information. In this research, four research hypotheses are formulated and addressed based on the usability factors:

H1: Algerian students find their university website useful.
ISO 9241-11 defines efficiency as "the resources expended in relation to the accuracy and completeness with which users achieve goals" (Lee et al., 2010). Efficiency provides the designer a chance to examine the speed of completion of a particular task and the components of it comprise competence time and accuracy of task.

H2: Algerian students are happy with the content of their university website.
One of the most affected components of a website is the content decision which can be classified into two categories: information and design. (Rahimnia & Hassanzadeh, 2013) When the relationship between information and design are very strong, more users will be attracted to the website.
The designer must take into account information type, how to retrieve information and which information has the priority to be displayed on the website (Thakor, Leach., Gillham, & Esterman 2011; Proctor et al., 2009). The content includes font, font size, color, images, videos, text, icons, links and logos.

H3: Algerian students like the interface quality of their university website.
The interface quality factor is a key element to a successful use in the usability criteria. Interface quality can define as the feeling of users about interfaces and interactivity which include appearance, navigation, proximity, layout and compatibility (Pang, Suh, Hong, Kim, Lee, 2010).

H4: Algerian students are satisfied when using the university website.
Satisfaction is another key in usability aspect. Usually the target of any website is to meet the satisfaction needs of its users. Therefore, it is recommended to allow the users to be comfortable when navigating through the website. ISO 9241-11 defines satisfaction as "the freedom from discomfort, and positive attitudes towards the use of the product" (Lee et al., 2010).

RESEARCH METHODOLOGY

This section provides background information about the selection of Algerian university websites, participants, questionnaire development and data collection process.

Algerian University Websites

Top Four Algerian universities whom are ranked nationally in the year 2016 were chosen for this study. The top university being the University of Tlemcen followed by the University of Science and Technology Houari Boumediene (Algiers), University Kasdi Merbah of Ouargla and Université d'Alger 1 (Algiers University 1) being the fourthly ranked university. The programs and courses which are offered at these universities include: undergraduate degree and postgraduate degree across the areas of study.

These websites were examined due to them being from the top Algerian universities as well as the students' accessing them to accomplish their needs. Sample screenshots for the websites are presented in the following Figures. Through use of the existing websites, this research intends to assess the Algerian student's response to a variety of usability features on Algerian university websites.

Figure1. Algiers University 1 Home Page

Figure. 2. University Kasdi Merbah of Ouargla Home Page

Figure 3. University of Tlemcen Home Page

Figure 4. University of Science and Technology Houari Boumediene Home Page

Participants

The collected sample of this research involved a total of 200 students from the four Algerian universities, in order to assess the usability features discussed in the previous section. From each university, 50 students volunteered to participate in this study. The participants were female and male students from undergraduate and postgraduate background and came from various faculties. Each university student was given access to their university website to evaluate perceived usability features by using questionnaires and experiment tasks. Convenience sampling was used in order to reach as many participants as possible. This technique is a non-probabilistic method that allows recruiting volunteers that are easily accessible to the researcher. The only restriction in our study was that the participants would need to be students at these universities.

Pilot Study

The importance of conducting a pilot study is to eliminate any errors when evaluating usability factors and to ensure the original research will work successfully (Van Teijlingen & Hundley, 2001). A similar set of steps were followed to that which would be used in the actual research. This pilot study comprised of ten undergraduate and postgraduate students in order to refine tasks and questionnaires. However, few concerns were detected in relation to the Internet connection speed. To reduce the same problem from reoccurring in the experiment, peak times will be avoided to ensure Internet availability.

Data Collection

Certain points need to be outlined in this study before starting with data collection; such as data collection used, appropriate data collection methods and the type of stakeholders in order to identify the required data. A number of steps have been carried before the experiment took place. At the start of the study and upon arriving, the participants were provided with a brief description of the experiment and were requested to read and sign a consent form. Next, all the participants in each of the four universities were gathered in one place at their available timings. The first part of the questionnaire was completed by users asking questions in relation their

age, gender and reasons for visiting the website. Every participant is given five minutes to explore the website in case some students haven't used the site before and to ensure that the students have accessed all the levels of website. Following that, the students were handed two papers, first paper consisting of four experiment tasks (to ensure reliability and validity) and the second being a questionnaire to precisely measure usability factors.

Questionnaire

Previous research confirmed that the questionnaire mode is the most popular way to collect data on website design (Al badi, Okam, Al Roobaea., & Mayhew,2013; Cyr et al., 2009). Furthermore, questionnaires can be used to rate users satisfaction (Holzinger, 2005) and is one of the most effective way to gather users opinions about systems. One the most widely used questionnaires to measure usability is the Computer System Usability Questionnaire (CSUQ). CSUQ was developed by IBM to evaluate the computer system usability. Moreover, the questionnaire consists of 19 questions (IBM computer usability satisfaction) (Lewis, 1995), each question rated from one to seven and the scale ranging from "strongly disagree" to "strongly agree" and a "not applicable" option is present.

The questionnaire is categorized into four key factors: system usefulness (questions 1 to 8), information quality (questions 9 to 15), interface quality (16 to 18) and overall usability (questions 1 to 19).

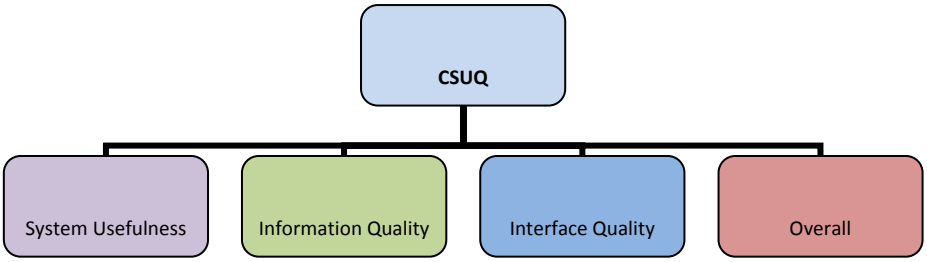

Figure 5. Components of CSUQ to evaluate key factors of usability

System usefulness questions evaluate the effectiveness, learnability, ease of completing tasks, and time completion of tasks. Information quality questions evaluate the quality of the information of the website usability, errors, and information clearness, and how satisfied are the users with it. Interface quality questions evaluate the interface quality of the website (Ozacar, 2016). At of the end of questionnaire the users can list three most negative and positive aspects of the website.

CSUQ has been chosen as a primary source of the data collection due to its high reliability score (= .95) and construct validity (Lewis, 1995; Ozacar, 2016). Moreover, the questionnaire was translated from English to Arabic language for the Algerian website users, in order to accommodate the language needs of the participants.

Data Analysis

Quantitative data were collected through CSUQ questionnaire and an additional questionnaire was used to measure the demographic information of participants as shown in table 1. Across all the examined universities (200 participant students) the female respondents were 49.5% and the male respondents were 50.5% and more than 55% of respondents have used the Internet for three years or more. Moreover, around 50% of students rarely or occasionally use the university websites. These results indicate that half of Algerian students do not use the university website regularly despite more than half of the participants having good experience in Internet use.

Table 1. Demographic data of participants

		Tlemcen university	**USTHB university**	**Ouargla university**	**Algier1 university**	**Average**
Gender	Male	52%	40%	65%	45%	50.5%
	female	48%	60%	35%	55%	49.5%
Years Using the Internet	<3	20%	20%	33%	18%	22.75%
	3-5	60%	55%	52%	54%	55.25%
	>5	20%	25%	15%	28%	22%
Usage of university website	Every day	23%	25%	30%	19%	25%
	Few times a week	20%	18%	24%	30%	23%
	Occasionally	50%	42%	40%	35%	41%
	Rarely/ never	7%	15%	6%	16%	11%

Task Performance

In this section, the performance of different tasks between the Algerian university websites has been examined using two main usability metrics: average task completion time and average number of clicks; both measuring in seconds. Statistical analysis showed that the average completion times and number of clicks for task two across the Algerian university websites were the highest (110s, 14 clicks) and users spent the least amount of time in completing task one (54, 13 clicks). Participants took 69 seconds and a total of 7 clicks to complete task three; meanwhile, participants took 77 seconds and a total of 11 clicks to complete task four.

Table 2. Average Completion Time (in seconds) and Number of User Clicks

	Average Completion (Seconds)					**Average Number of clicks**				
Task	Tlemcen Uni	USTHB Uni	Ouargla Uni	Algiers 1 Uni	Average	Tlemcen Uni	USTHB Uni	Ouargla Uni	Algiers 1 Uni	Average
One	40	62	55	60	54	13	11	7	19	12
Two	118	97	98	127	110	14	12	15	14	13
Three	60	40	100	78	69	4	7	11	4	6
Four	82	69	93	65	77	10	8	10	14	10

Qualitative data were collected from the second part of the CSUQ questionnaire, where users gave opinions and feedback on the negative and positive aspects of the Algerian university websites. On average, 408 negative comments and 145 positive comments were received (see table below). These feedbacks were categorized after undergoing a qualitative content analysis; they were then grouped in accordance to the four factors that have been described earlier in this paper (Overall satisfaction, system usefulness, information quality and interface quality).

In the USTHB website (Arabic version), users reported that there is no search engine (18). In addition, poor language usage (40) has been reported as a negative feature of a website. This pattern occurs across all four Algerian university websites where a combination of the Arabic as well as the French language has been used; for example, some of the content on the USTHB website (Arabic version) is written in French and vice versa. In particular, the Ouargla university website does not provide any other language option apart from French as their main language; despite the first language of Algeria being Arabic. Meanwhile, broken links (48) can be found in all Algerian university websites.

Furthermore, the content quality across all Algerian university websites are fairly poor (50); whilst some pages provide no information, other pages tend to overload the user with a lot of information (45). Apart from the Tlemcen University website, the remaining universities use unclear font types (35) as well as a small font size (48). Furthermore, negative feedback was reported 25 times for the image use on websites and color use was reported only 5 times across all four university websites. In terms of overall satisfaction of the websites a total of 72 have regarded the Internet and website speed as a negative aspect of using the university website.

On the other hand, very few positive aspects of the university websites were detected. Relevant information was classified as the most desirable feature on the university websites (41). The users also desired the use of social media links (30), layout (24), background color (25) and the number of available languages for accessing the university websites. No positive characteristics were provided in terms of the users with the overall satisfaction of the Algerian university websites.

Table 3. User Feedback Categorized into Negative and Positive Themes (number of occurrences between brackets)

Theme	**Negative**	**Positive**
System usefulness	language use (40), search engine (18), broken links (45)	Social media links (30), number of languages (25).
Information quality	Content (50), finding required information. (45)	Relevant information (41)
Interface quality	font size (48), font type (35), images (25), link to homepage (25), color usage (5)	Layout (24) , background color (25)
Overall satisfaction	Internet and website speed (72)	

Factor Analysis
The metric scale of the questionnaire is out of 7, any rating from the participants observed above 50% (>3.5) is an indication of a good usability system; whereas, any ratings below 50% (<3.5) from the respondents indicates a poor usability system, in accordance with CSUQ scale. The scale had good reliability, with a high Cronbach's alpha of 0.88. Furthermore, the four factors will be analyzed in this section to evaluate the effect of usability for each factor.

System Usefulness
The mean CSUQ score for system usefulness was 3.27 (46.7%) in all universities that were examined in this study. Algiers university 1 had the highest score of 3.54 (50.57%) and the lowest score was given by Ouragla university students 3.09 (44%). Meanwhile USTHB and Tlemcen university scored 3.2 (46%) and 3.25 (46%).

Information Quality
The results shown in the information quality factor in all four universities were 3.03 (43%). Once again Ouargla University had the lowest ratings for this factor 2.68 (38%); the highest score was given by Tlemcen University students for their website, 3.36 (48%). However, Algiers University 1 website had 3.2 (45%) and USTHB scored 2.89 (41%).

Interface Quality
In terms of user response, the interface quality factor assessed using CSUQ scale had an average of 2.68 (38%) across all four university websites. The lowest ratings were for USTHB website 2.37 (33%) and the highest ratings for this factor was for Tlemcen university website. Algiers 1 University and Ouargla University websites had close ratings 2.59 (37%) and 2.56 (36%).

Overall Satisfaction
In terms of overall satisfaction of the website, the average CSUQ factor score across all four Algerian university websites was 3.14 (44%) this factor had the highest score amongst all other factors. Moreover, students from Tlemcen University had the highest ratings (3.25, 46%) for their university website followed by Algiers University 1 (3.22, 46%), whilst Ouragla University website had the lowest ratings (2.96, 40%) from its users. USTHB had scores of 44% (3.14). Fig. 1 displays the average scores and sub scores for each Algerian university website.

Table 4. Average rating of usability factors across the four educational websites

Usability Factor	Tlemcen University	UATHB University	Ouargla University	Algiers 1 University	Average
System Usefulness	3.25	3.20	3.09	3.54	3.27
Information Quality	3.36	2.89	2.68	3.20	3.03
Interface Quality	3.23	2.37	2.56	2.59	2.68
Overall Satisfaction	3.25	3.14	2.96	3.22	3.14

DISCUSSION
To the best of our knowledge, this study is the first study to test the usability of Algerian websites in this field. In the results section, the four factors (system usefulness, information quality, interface quality, and overall satisfaction) of the CSUQ questionnaire were examined; as well as the written opinions and feedback from users on the Algerian university website after the completion of tasks. In this section, a detailed discussion of these results will be provided.

System Usefulness
In the CSUQ questionnaire, the first eight questions measured system usefulness. Of the three categories, system usefulness was rated below the average by the users (3.27). The overall trend for Algiers 1 University is positive (metric score > 3.5/7) in comparison with Ouargla university, Tlemcen and USTHB (metric score <3.5/7). This shows that users from Algiers 1 university are satisfied with the website in regard to the system usefulness and are able to efficiently and effectively complete their work when using these websites. Furthermore, question 7 was rated the highest (4.27) amongst other Algerian university websites in terms of system usefulness from users of university of Algiers 1. However, question 4 had the lowest ratings (2.5) from university of Ouargla website users. This indicates major problems within the Ouargla university website and shows that the users struggled to complete their work and found some difficulty in using the website. Problems such as broken links and no search engine (USTHB, Arabic version) in the website resulted in the slow navigation and ineffectiveness of task completion as shown in completion times and the number of clicks in tasks three (Average of 69.5, 6.5 clicks). Moreover, an undesirable feature which has been frequently flagged as a negative aspect of the website is the

inconsistent use of the Arabic and French language on the websites. For example, in the Tlemcen University homepage Arabic and French language is used for the content information; in addition, when a new page is opened, the user finds content in written in French only and vice versa. Such errors made by the designers discourage users from visiting the website again. Overall, Algerian students feel that the Algerian university websites were inefficient and therefore H1 is rejected.

Table 5. Average Rating of Website Usefulness Factor

Questions	**Average Rating (on a 7-point scale)**			
	Tlemcen University	USTHB University	Ouargla University	Algiers 1 University
1. I am satisfied with how easy it is to use this system	3.06	3.26	3.54	3.72
2. It was simple to use this system	3.75	3.2	3.1	3.2
3. I can effectively complete my work using this system	3.1	2.92	2.68	3.46
4. I am able to complete my work quickly using this system	3.1	3.28	2.5	3.5
5. I am able to efficiently complete my work using this system	3.56	3.06	3.2	3.12
6. I feel comfortable using this system	3.19	3.35	3.26	3.66
7. It was easy to learn to use this system	3.05	3.5	3.25	4.27
8. I believe I became productive quickly using this system	3.23	3.06	3.2	3.42
Average Website Usefulness Rating	3.25	3.20	3.09	3.54

Information Quality

The second usability metric attained from the CSUQ (questions 9-15) provides the score for the perceived information quality on the system. The information quality had an average rating of 3.03 (<3.5/7), which indicates a poor usability system of the Algerian university websites. The users are satisfied with the organization and the clarity of information found on the university website as it was rated the highest, 4.1 (Tlemcen University); followed by the effectiveness of the information in helping the user complete the tasks (Tlemcen University,3.69). In addition, the information quality score consists of an item relating to error messages, the users felt that the system didn't provide error messages which explains to them how to fix issues they were experiencing; therefore, a low score of 1.8 (Ouargla University) was given. This could reduce the time completion tasks and hence why the users considered finding required information as a negative aspect of the Algerian university websites. A total of 41 respondents suggested that relevant information implemented by the sites were a positive aspect of the Algerian university websites; whereas content information was regarded as a negative aspect by 50 users as demonstrated in tasks one (54.25s, 12.5 clicks) and task two (98s, 13.75 clicks). This is due to some universities providing the required information for the users (Algiers 1 University and Tlemcen University) and others providing no information at all (Ouargla University and USTHB) as shown in the table below (question 12). Overall, The Algerian students found that the information quality on the Algerian university websites were below average; therefore, H3 is rejected.

Table 6. Average rating of website information quality factor

Questions	**Average Rating (on a 7-point scale)**			
	Tlemcen University	USTHB University	Ouargla University	Algiers 1 University
9. The system gives error messages that clearly tell me how to fix problems.	2.56	2.1	1.8	2.68
10. Whenever I make a mistake using the system, I recover easily and quickly	2.87	2.1	2.5	2.96
11. The information (such as online help, on-screen messages, and other documentation) provided with this system is clear	3.2	3.1	2.56	3.55
12. It is easy to find the information I needed	3.62	3.26	2.48	3.46
13. The information provided for the system is easy to understand	3.49	3.36	2.86	3.25

14. The information is effective in helping me complete the tasks and scenarios	3.69	3.26	2.94	3.54
15. The organization of information on the system screens is clear	4.1	3.09	3.62	2.98
Average Website Information Quality Rating	3.36	2.89	2.68	3.20

Interface Quality

Questions 16-18 of the CSUQ questionnaire is used as a way of measuring users' satisfaction with the interface quality of the Algerian university websites. Usually website users assess the website interface instead of its functionality; therefore, Interface quality was rated the lowest (2.68) amongst other usability factors. This rating was below 3.5/7 (50%), this indicates a poor usability of the websites. The layout and the background were reported as positive features of the websites. However, users have indicated that the font size, font type, color usage and lack of images on the website were the most disliked aspects of the websites. USTHB users were dissatisfied the most with the overall interface of their website (2.37) as opposed to Tlemcen University (3.23). Overall, the users felt like the Algerian university websites did not provide all the functions and capabilities that they were expecting it to have and eventually this will cause a decline in the usage of these websites. The final results showed that Algerian students found the interface quality on the Algerian university websites were poor; therefore, H3 is rejected.

Table 7. Average rating of website interface quality factor

Questions	**Average Rating (on a 7-point scale)**			
	Tlemcen University	USTHB University	Ouargla University	Algiers 1 University
16. The interface of this system is pleasant	3.38	2.36	3.38	2.63
17. I like using the interface of this system	3.42	2.52	2.18	2.26
18. This system has all the functions and capabilities I expect it to have	2.89	2.23	2.12	2.88
Average Website Interface Quality	3.23	2.37	2.56	2.59

Overall Satisfaction

The final usability metric provides scores for the overall satisfaction of the websites from the users. Users from Tlemcen rated their university website similarly, 3.25 (43%). Meanwhile, USTHB users gave a score of 3.14 (44.8%) and Ouargla University had a score of 2.84 (40%). These scores are all below the average ratings of 3.5 (50%) which is a strong indication for the poor usability and the dissatisfaction of the Algerians users with the university websites. Users reported that low Internet and website speed was a major problem when carrying out tasks. This was reflected in the completion times as well as number of clicks in task four (100.25s, 10.5 clicks). The final results showed that Algerian students were unsatisfied with their university websites were poor; therefore, H4 is rejected.

Table 8. Average rating of website overall satisfaction factor

Questions	**Average Rating (on a 7-point scale)**			
	Tlemcen University	USTHB University	Ouargla University	Algiers 1 University
19. Overall, I am satisfied with this website	3.25	3.14	2.84	3.22

CONCLUSION

Usability is an essential factor for predicting the reaction of users when using the system. A good design and a well-structured website ensure a high level of usability and can have positive effects on the users' satisfaction (Petrie, & Bevan, 2009, Flavian, & Gurrea, 2008). Many universities adopt the use of an effective and higher quality education websites, in order to reach these goals, the designer must consider all factors of usability.

This study highlights the significance of the four factors of usability which can influence university websites from the perspective of students as users. However, Algerian students expect a well-designed, easy to use and good information quality in order to be satisfied with the website. Nevertheless, the general view of Algerian users in this study shows dissatisfaction with the university websites. Many problems on these websites have been detected in all four factors.

Interface quality is one of the major problems that has been detected, this includes broken links that can easily be found in many pages and other links cannot be used at all. In addition, the structure of some websites are very poor; this consists of color, icons, search engine, font and font size and these all should be given priority for high interface quality. This means the designer of the Algerian university websites should keep in mind that it is crucial to use the relevant design in order to keep the website more attractive for the users.

The results show that the information quality needs more attention as the given score was second lowest. One of the reasons for this finding is that there were no messages given to the user when an error occurred in the system. As a result, users will struggle to overcome such problems or to avoid it, leading the user to not being able to complete certain tasks. An example for this was during the tasks completion phase when the students were not able to find the required information. Thus, the designers must recognize the importance of the quality of information which can assist the users to complete their tasks. Hence it is essential that basic usability testing should be carried when developing the website.

Although system usefulness factor was rated the highest amongst other usability factors, areas of improvement were still needed. Broken links were reported as the most negative aspect of the Algerian university websites as well as the inconsistency in language use. These deficits make it problematic and less efficient for the users to find relevant information on the Algerian university websites, as detected in the study. Many of the errors on the websites can be solved fairly simply; our results reinforce the need for accurate and precise planning during the development stage where one language must be consistently used throughout the website with no disruption of other languages.

Furthermore, the overall satisfaction of the users reflected the usability features of the Algerian university websites. Slower websites have been anticipated to be less interesting for the Algerian users; usually, user experience doesn't depend only on the performance of the websites but also the connectivity of it. However, in this study, Internet speed had a large impact on the performance and completion of tasks, as the results of task four shows. This pattern is noticeable across the Algerian websites where there's an overuse of unnecessary large images which can hamper website loading. The larger the image files, the longer the site will take to load. Therefore, designers must compress and resize images without affecting the quality and most importantly use only images which are relevant to the site. Adapting these methods together ensures a better-performing, efficient and for more pleasant and effective website for the users.

In conclusion, Algerian university websites need significant amendments and enhancements by taking into account the four usability factors (system usefulness, information quality, interface quality and overall satisfaction). The designers of Algerian university websites ought to test the system before launching to disregard any errors and must also integrate the users' needs to retain users towards the site.

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