

# AN EMPIRICAL STUDY OF THE EFFECTIVENESS OF UNIVERSITIES' WEB SITES

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## ABSTRACT

*Having an inviting Web site that is easy to navigate and provides necessary information is vital to any organization. People who go online have high expectations regardless of whether they are online for work or personal reasons. In the academic world, many colleges and universities use the Internet as a tool for recruiting students. These educational institutions know that parents and high school students use the Internet as an initial tool to shop around for the best college. The goal of these organizations should be to present the academic programs and opportunities they can offer on their Web sites. A major concern of these educational institutions should be whether their Web sites are presenting their schools effectively in the eyes of their audience. The focus of this study is to determine what features and elements the target audience are looking for in a university Web site when they are surfing the Internet.*

**Keywords:** University Web site elements, target audience, design usability, instrument

## INTRODUCTION

The world of business has been revolutionized by the Internet. Today, many organizations are engaged in e-commerce using the Internet in addition to the traditional methods of doing business. The growth of e-commerce is attributed to many factors. Some of the factors are convenience, availability of vendor information, no pressure from sales people, and saving time (13).

Recently, with the growth of e-commerce, business organizations' management have shown interest in measuring the success of their companies' Web sites. This interest has led to the subject of what are the determinants of an effective business Web site and how can they be measured. A number of factors play crucial roles in developing a good business Web site. Several studies have investigated the characteristics of a good business Web site. One factor that all experts agree on is that a Web site needs to be customer-centric (6, 8), which means that the Web site must be designed to meet the needs of the target audience. As another factor, in a recent study, as one of the determinants of an effective e-commerce Web site, interacting with customers online, was investigated by International Venture Research, a market consultant for high-tech companies (5). The study showed that nearly half of the Fortune 100 companies fail to even respond to basic online inquiries. One of the major problems pointed out in this study was the poor customer service and lack of responsiveness by the companies. The conclusion was that these large organizations lack the awareness that the Internet generations are the future customers and all it takes to lose customers is to disappoint them once.

In other studies, a number of the usability problems for e-commerce sites have been explored. For example, Tilson et al (13) in their study discussed major issues such as ineffective communication with shoppers, ineffective feedback given to the users, and lack of easy

navigation tools throughout the site. The authors suggested that a good e-commerce site design must provide features such as support for the users' control with proactive assistance, simplicity that doesn't compromise usability for function, obviousness to make objects and their controls visible and intuitive, feedback to create a feeling of progress and achievement, accessibility to all objects at all time, and flexibility that allows users to customize.

Having an inviting Web site that is easy to navigate and provides necessary information is vital to any organization. People who go online have high expectations regardless of whether they are online for work or personal reasons. As a result, an organization, whether it is a business firm or an educational institution, needs to be very careful about the image that is projected through its Web site. In the academic world, universities use the Internet as a tool for recruiting students. These educational institutions know that parents and high school students use the Internet as an initial tool to shop around for the best college. The goal of these organizations should be to present their academic programs, services, and opportunities they can offer through their Web sites effectively. A major concern of these educational institutions should be whether their Web sites are projecting their schools effectively. To address this concern, the initial step is to identify the features and elements of an effective university Web site. As it was mentioned earlier, an effective Web site is evaluated by whether it meets the expectations of its target audience.

Very few articles have addressed features and elements of colleges and universities' Web sites. No empirical study has been done to substantiate whether the suggested characteristics mentioned in these articles truly targeted the audience effectively. Thus, this study is designed to address this issue and provide insights about the target audience of colleges and universities. This research identifies the features of an inviting university Web site considered to be important by students. The focus of the paper is to determine the features that students are looking for in a university Web site when they surf the Web. The objective of this study is to help educational institutions, to achieve their goals by designing an attractive and effective Web site to win students.

The next section presents the development of the research question. Thereafter, designing a Web site and research methodology are presented. Finally, several suggestions are made to help educational institutions in the development and design of their Web sites.

## **RESEARCH QUESTION**

Educational institutions were among the first organizations to develop Web sites (12). In earlier days, they wanted simply to have a presence on the Web. Now, many colleges and universities are attempting to include a strong content combined with information about the school and their educational resources (14). According to Lynch and Horton (6), there are two parts in planning a Web site: 1) determine the goals and resources needed to achieve them, and 2) specify the target audience, site details, technology needed, and an assessment of the results. Thus, first, developers need to determine what the organization wants to accomplish on the Web. For example, does it want to increase student recruitment or provide a teaching resource for lectures. Next, they must think about the audience and their requirements. A university Web site has two

types of audiences (10). The primary audiences are academic and general staff and students, the secondary audience comes from general public and other educational institutions.

A well-designed Web site should accommodate a range of users' skills and interests. Ironically, those very users are the people least likely to be present and involved when the site is designed and built (6). There is ample evidence to suggest that more and more educational institutions are using the Internet as a tool to recruit students (12). Colleges and universities are trying to meet students' expectations by designing interesting and inviting Web sites to attract them. But a study done by a marketing firm focusing on student recruitment showed that colleges have failed to meet students' college search requirements; rather their Web sites are geared for the campus community (12). The study concluded that colleges have been passive sources of information and need to increase their communication with students. Steele (12) explained that currently, students must go through many pages of information to find what a school has to offer. He warns the universities that students will not be patient with schools' Web sites since the latest statistics show that each month, 17.3 million kids and teens use the Internet and spend only 8 seconds viewing a Web site to determine whether it contains what they are interested in.

Today's students are media savvy and have adapted to the current media-saturated environment by learning how to scan through massive amounts of information quickly and filter the ones they are searching for. In a marketing research done on behalf of various colleges and universities, 15,000 college-bound high school students were surveyed (12). The results showed a clear trend of increasing usage of the Internet among this segment of population, which was not unexpected. However, an interesting conclusion was that the higher achieving students use the Internet more than their peers to search for a college. Over 75% of all students indicated that college sites either "greatly increased" or "somewhat increased" their interests. Thus, the focus of this study is on students, prospective and current college students. The research question here is: What are the expectations of students of a typical university Web site? To answer this question, it is necessary to truly understand the target audience's needs and meet them. Ultimately, colleges and universities can improve their Web sites and increase recruitment of prospective students. Therefore, the objective of this research project is to collect information from students to help colleges and universities in their recruiting effort. This can be achieved by gathering information from the students themselves and analyzing it to develop the understanding.

### **DESIGNING A WEB SITE FOR USABILITY**

As mentioned earlier, after the goal and the audience for an organization's Web site are determined, the next step for developers is to implement the site (6). For example, designers consider the technical requirements and the tools needed for development. Building a Web site is not a one-time project with static content, rather an ongoing process which needs long-term editorial and technical management. Many organizations are trying to determine how viewers react to their Web sites and what attracts them. Experts believe that it is the content that brings users to a Web site (3). They suggest that a more valuable, dynamic, and updated content can attract more viewers. But, the difficulty is that many Web site designers have little knowledge of user interface design and usability engineering (6), therefore wasting users' time and causing unnecessary traffic on the Internet. In the following section, a summary of the elements for a good Web site design that have been identified in the literature will be reviewed.

As a general rule, in designing a Web site the goal of developers should be to minimize the amount of information that must be kept in short-term memory of users due to the limitations in the human brain, a well-known principle by cognitive psychologists (4). A typical user will not spend time reading long passages of text on-screen; therefore, the long text needs to be divided into discrete chunks of information in a logical way using the hierarchy to structure relationship among chunks. This needs to be done carefully to make sure that content camouflage is avoided. This means that the message should not be buried deep in the hierarchy of a site's structure, rather be two clicks away (11). Less critical information should be put at the bottom of the page, and a text-only option needs to be offered for people who are using a slow network connection or are impatient (9). Experts caution designers about the slow network connection of the majority of the users and suggest allowing a loading time of 7-10 seconds for a page (2, 6, 8, and 11).

As developers plan the structure of a site, they need to keep in mind that many people have difficulties as they browse through a Web site (navigational problem). They get lost within the structure. Research shows that as many as 58% of users will make two or more navigational errors while searching for information, and 66.8% stated that they have trouble finding the information they are looking for (1). The basic navigation links should be present consistently on every page in the same location. A logical and successful Web site organization matches the users' expectations and will allow them to make predictions about where to find information (2, 6, 8, and 14). Measures of flexibility need to be embedded into a site to let visitors use their past experience from familiar pages for unfamiliar ones. Misleading Web site structures could result in frustrated users.

One of the experts who has published many articles on designing a good Web site is Jakob Nielsen (8). He suggested several usability heuristics for measuring effective Web sites and warned developers about design pitfalls such as using bleeding-edge technology, scrolling text and graphics, complex URL, lack of navigation support, and outdated information on the Web sites. In a recent study, designing an effective academic library Web site was explored and a check list was developed based on the usability heuristics of Nielsen and other experts (10). The check list in that research is used as a guide for this present study.

## **RESEARCH METHODOLOGY AND DATA ANALYSIS**

The check list that was developed by Raward (10) was selected (with some modification) as a basis for this study because it seemed to be the most relevant and was based on credible previous studies. A preliminary list of a Web site's elements was developed, which was composed of four major categories. This provided a benchmark for developing the final instrument. The first step in developing the preliminary instrument was to collect information from students about their expectations from a college Web site. Two independent samples of students ( $n = 22$  and  $n = 17$ ), in their second and third year of college, were involved as subjects in this study. Students first read different articles about elements and features of Web site design. After reviewing the literature, they were asked to propose features that they thought should be on a university Web site and weren't included in the reviewed literature. Several elements that were submitted by students were added to the preliminary list of features. This procedure produced 77 Web site elements and was used as the preliminary instrument for determining which features were important to students.

**Table 1. University web site design elements**

<p><b>A. Finding the information</b></p> <ol style="list-style-type: none"> <li>1. Online admission application.</li> <li>2. Giving feedback and asking questions are facilitated.</li> <li>3. Online course catalog is included.</li> <li>4. The site has simple domain name.</li> <li>5. Phone number, fax number, e-mail, and postal address are included on each page.</li> <li>6. Help facility is provided.</li> <li>7. Information about services, departments/units, and programs are clearly described.</li> <li>8. Staff contact for the page is included.</li> <li>9. Capitalization, spelling, and punctuation are correct.</li> <li>10. School's sports' options are included.</li> <li>11. Class schedules are provided.</li> <li>12. Link to campus current events is included.</li> <li>13. Index is included.</li> <li>14. Entries are in alphabetical order.</li> <li>15. Site map is included.</li> <li>16. Links to site map are correct.</li> <li>17. The home page contains main category headings that are descriptive and short.</li> <li>18. Headings within page are labeled correctly.</li> <li>19. Headings are brief and informative.</li> <li>20. Headings stand out on the page.</li> <li>21. At least one heading exist on every page.</li> <li>22. Headings accurately reflect task or information.</li> <li>23. A search tool is included on the site.</li> <li>24. The topic was easy to find.</li> <li>25. A user can find an answer within 10 seconds.</li> <li>26. The date of the last updated is included at the bottom of every page.</li> <li>27. Links to outside are appropriate and reliable.</li> <li>28. Resources are current.</li> </ol> <p><b>B. Understanding the information</b></p> <ol style="list-style-type: none"> <li>29. Headings are user friendly and intuitive.</li> <li>30. Headings are task based.</li> <li>31. Structure of lists is consistent.</li> <li>32. Each paragraph has main idea.</li> </ol>	<ol style="list-style-type: none"> <li>33. Presentation moves from general to specific and simple to complex.</li> <li>34. Presentation is limited to appropriate and necessary topics.</li> <li>35. Presentation is in correct sequence.</li> <li>36. Style is consistent throughout the site.</li> <li>37. Paragraphs and sentences are used correctly.</li> <li>38. Readability level is acceptable.</li> <li>39. Text is simple, concise, and clear.</li> <li>40. First occurrences of abbreviations are followed by spelled out words.</li> <li>41. Level of technical terms is appropriate to the audience.</li> </ol> <p><b>C. Supporting user tasks</b></p> <ol style="list-style-type: none"> <li>42. Reply forms are shorter than one page.</li> <li>43. Forms are easy to follow.</li> <li>44. Frequently Asked Questions (FAQ) is included.</li> <li>45. Help facility is included.</li> </ol> <p><b>D. Presenting the information</b></p> <ol style="list-style-type: none"> <li>46. Home page displays within 10 seconds with dial up connection.</li> <li>47. There is advance notice before downloading large files.</li> <li>48. The pages display on an average sized screen.</li> <li>49. The pages work on different browsers.</li> <li>50. The page provides a text equivalent for every non-text element.</li> <li>51. The page meets at least Bobby Priority 1 standards for accessibility.</li> <li>52. Clear Navigation tools are included.</li> <li>53. There is Navigation back to home page on every page.</li> <li>54. There is Navigation up and down within a page.</li> <li>55. Format is consistent throughout the site.</li> <li>56. Figures and tables are aligned correctly.</li> <li>57. Information is presented in readable blocks.</li> <li>58. Sentences are complete within Web screen.</li> <li>59. Pages are printable with an average size paper.</li> <li>60. Images are relevant, interesting, and not crowding.</li> <li>61. Colors are used appropriately.</li> <li>62. Layout is sharp and not crowded with words.</li> </ol>
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**Table 2. Highest rated web site features**

<u>Web site element</u>	<u>Rating</u>
Online admission application is included	4.7
A search tool is included on site	4.6
Resources are current	4.5
<u>The text is simple, concise, and clear</u>	<u>4.5</u>

**Table 3. Lowest rated web site features**

<u>Web site element</u>	<u>Rating</u>
Copyright and disclaimer are info are included	2.8
Site has purpose statement	2.7
School history of excellence is included	2.7
Site includes major local businesses and interests	2.6
<u>There is a link to region's weather pattern</u>	<u>2.3</u>

A 5-point Likert scale was used to rate the importance of a Web site element (5 = highly important and 1 = not important at all). The preliminary tool was administered to the two independent groups (a total of 39 students). They were asked to rate the importance of the Web site elements individually. For each Web site element, the average rating was computed. The data were analyzed and any Web site element that was rated below 3 (average importance = 3) was interpreted as not being important to students and eliminated from the list. A total of 15 items were deleted from the preliminary instrument. The rest of the items (those rated average importance and above) consisted of 62 items that were important features of a university Web site from students' perspective. This final list of features constituted the final instrument for evaluating the university Web sites. Table 1 shows the final instrument that will be used in the future to evaluate university Web sites as the second part of this research project.

The final instrument consisted of 62 Web site elements that were organized under four categories: 1) Finding the information, 2) Understanding the information, 3) Supporting user tasks, and 4) Presenting the information. The data analysis revealed that four elements were rated the highest by students. In designing a university Web site, developers need to take the following elements into consideration because they are very important in attracting students: 1) online admission application, 2) a search tool, 3) simple and clear text, and 4) current resources. The number one rated element was "online admission application," not very unexpected. It is interesting to note that three out of four highest rated features are under the first category, "Finding the information." Overall, this category was rated higher than each of the other three. This supports the fact that was pointed out in the literature that students don't want to waste any more time than necessary on a Web site and expect to find information they are looking for very quickly. Furthermore, search tool, site map, and navigation tools, that are Web site features allowing a user to find information fast and not get lost in the structure of a site, were rated very high (4.6, 4.4, and 4.3 respectively). Table 2 and 3 show the four Web site features rated highly important, and the five elements rated lowest respectively. Interestingly, among the low rated elements were the "site's purpose statement" and "copyright and disclaimer information," two features mentioned in the literature and recommended by experts. This may not be surprising since young people normally don't think about this sort of things.

## CONCLUSION

To understand what features are important from students' perspectives, the developers should involve this segment of the population in the process of development of a university Web site. Students are one of the primary audiences of a university Web site. Regrettably, in reality, at the time of Web site development the very audiences for which the site is being developed are absent. The designers develop the site according to their perceptions of what the target audiences' expectations are.

It is suggested that a set of common guidelines can be achieved in which there would be consistent design and navigation facilities to improve the users' experience with the university Web sites in a way that will not suppress creativity and distinctiveness. This would ensure a pleasant experience, easy access to information, and a time-saving experience for the users. Also, this may minimize the time and effort to access information on similarly laid out Web sites. Ultimately, these would improve the quality of university Web sites and bring greater benefits to the institutions.

In addition, to assess the success of a Web site, organizations can take measures to evaluate their presence on the Web. Web server software can provide information about Web site's visitors. Quantitative data can be obtained from the server log and analyzed to evaluate the success of a Web site. These logs can reveal the most popular pages visited, the browsers people used, and the geographic regions the visitors are located (6). Finally, this study attempted to reveal the actual expectations of students from educational institutions' Web sites, so colleges and universities can meet the target audiences' needs and improve their online recruiting. The future plan is to use the developed instrument and investigate how the existing colleges and universities' Web sites are meeting students' expectations.

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