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Web site quality evaluation in Higher Education Institutions

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Abstract

There are increasing concerns about the degree of quality delivered on the Web. Considering the competitive environment where Higher Education Institutions (HEI) are inserted, they should, as other organizations do, use their Web sites as a marketing tool. To measure Web site quality we used Aladwani's and Palvia's instrument [2], which evaluates quality from the user's perspective. The main conclusion of our study relates to the fact that HEI aren't committed to using the Web site as an effective marketing tool and, therefore, much work still needs to be done. Academics are fundamental concerning Web marketing in HEI, since they may contribute to enlarge the knowledge in this area and alert HEI to the role that Web site quality may play in today's extremely turbulent and competitive environment.

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1. Introduction

Since the birth of the Internet, two-way communication via Web-based exchanges has become more and more popular in electronic transaction, publication, broadcasting, and other service applications [12], so the

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Web is an increasingly important resource in numerous aspects of life: education, employment, government, commerce, health care, recreation, and more [1]. Since organizations are realizing the possible implications of the Internet in their work [2], Internet has become a key strategic weapon, which is particularly important considering today's competitive business environment [8]. As a consequence, there are increasing concerns about the ways in which Web applications are developed and the degree of quality delivered [1].

However, the Internet is hosting hundreds of millions of Web sites varying widely in terms of quality, which means that Web site quality evaluation may provide a rapid and early feedback to organizations. The past Web quality research focuses mostly on the perspectives of Web developers and designers, and not the Web users. In this era of strong competition and customer responsiveness, the users are major stakeholders and should not be disregarded. On the other hand, only limited academic research exists, but it is fragmented and typically only discusses the meaning of some aspects of Web quality [2].

Many believe that when it comes to marketing, the Internet is the 'great equalizer', permitting service-based organizations, no matter how successful or well known, the ability to promote their products and services in a more or less equal way. Since Web-based marketing is low-priced and widely available, all organizations enjoy similar abilities to use the Internet to their marketing advantage. In reality, however, interactive technology has not 'leveled the playing field' when it comes to the marketing of universities and colleges [11].

In this sense, the main goal of our work is to evaluate Web site quality through the user's perspective, specifically the quality of Web sites belonging to Higher Education Institutions (HEI), through the students' perspective. HEI are characterized as autonomous (self-sufficient) establishments that provide services to the community (e.g. economic transfer of scientific and technological knowledge), and should comply with the codes of good management practices. On the other hand, they know a great deal about facilitating environments in which people collaborate to create, share and advance knowledge. HEI should, in this sense, be very well prepared to reap value from the new online tools [3]. Specifically, we intend to evaluate the Web quality on HEI, since Internet can be used as a marketing tool by HEI, and to verify if there are any differences between the type of institutions, the types of education, as well as considering the utilization or non-utilization of e-learning tools and distance education.

First, we briefly describe the Web to better frame the concept 'Web quality'. Then, we define Web quality, as well as its dimensions and its impact on other variables, relevant to organizations. We also report on quality and on Web quality, specifically in the context of HEI. Then, we identify the methodology used. To determine the quality of the Web sites, we used a 25-item instrument that measures four dimensions of web quality: specific content, content quality, appearance and technical adequacy. The instrument is useful to organizations and web designers as it provides an aggregate measure of web quality [2]. Finally, we discuss the results, draw the conclusions and limitations of the study and propose some perspectives for future research.

2. Web quality

Web 2.0 technologies represent a revolutionary way of managing and repurposing online information and knowledge repositories – including research information –, in comparison with the traditional Web 1.0 model [4]. With the propagation of the Internet and WWW applications, users are increasingly interfacing and interacting with Web-based applications. This wide interest in the subject is attributed to the fact that organizations are becoming conscious of the possible implications of the Internet in their work. Potentialities of Web applications are remarkable leading many organizations to spend great amounts of money on these technologies. Using web technologies, an organization can reach out to customers and offer them not only general information about its products or services but also the opportunity of performing interactive business

transactions. Organizations investing in Web technologies and applications are looking forward to realizing the benefits of these investments [2].

Today, Web sites that are useful, timely, accurate and rich in detail have become an integral part of our lives. Those attributes, in turn, determine whether and how frequent surfers will return the Web sites [13]. In order to provide better services for users, companies need to invest in Web site service quality, design and evaluation and, at the same time, to control the perceived risk associated with its use. Managers need to understand e-convenience from the consumers' perspective [25]. Perceived quality may be defined as the gap the gap between satisfaction and importance [20].

The Web site of a company is becoming one of the important tools in a competitive environment, but it's no guaranty that a company will get competitive advantage in the market by creating a Web site. Increasing turnover of e-commerce in the world points out the significance of research of the e-commerce Web sites evaluation, design solutions, quality assurance, consumers' behavior on the Web, and the factors influencing the consumers' behavior [8]. Using Internet as a marketing tool is considerably less expensive than using other media, such as television or print. Web-based marketing allows service-based organizations to equally compete with each other, regardless of differences that may exist. This 'equality for all' postulation finds some support in the world of business, where the recent success of 'dot com' companies suggests that with the help of the Internet, it is possible for small, relatively unknown businesses to successfully compete with large, established organizations [11].

Web site quality, by its nature, is complex [2], extremely fluid and dynamic, which places the onus on the seller to continually improve the quality of their Web site. Perceived shortcomings in comparison to a competitor's Web site could result in lost sales, even if the Web site is perceived to be of adequate quality [22]. On the other hand, the measurement of Web quality is expected to be multi-dimensional in nature. Current research seems to pay less attention to construct identification and measurement efforts. Only limited academic research exists, but it is fragmented and typically only discusses the meaning of some aspects of Web quality [2]. Evaluation with user participation provides direct qualitative observations information and quantitative data from actual Web site users. Several methods are adopted for testing quality. The most common test methods are questionnaires and focus groups. Evaluation without user participation is used to identify quality problems by checking a set of broad quality guidelines. As a consequence, there are rising concerns about the ways in which Web applications are developed and the degree of quality delivered [1]. Cristobal, Flavián and Guinalíu [7] refer that perceived quality is a multidimensional construct, including web design, customer service, assurance and order management.

Van Iwaarden et al. [19] state that the quality dimensions found applicable in the service sector are also applicable to Web sites. According to the authors, the dimensions that are most important in relation to the quality of Web sites are: tangibles (the appearance of the Web site, navigation, search options and structure), reliability (the ability to judge the trustworthiness of the offered service and the organization performing the service), responsiveness (the willingness to help customers and provide prompt service), assurance (the ability of the Web site to convey trust and confidence in the organization behind it with respect to security and privacy) and empathy (the provision of caring, individualized attention to customers, including user recognition and customization).

According to Davidavičienė and Tolvaišas [8], the first indicator of Web site quality is official page ranking. If this ranking is low, the owners should pay more attention and make more efforts to analyse quality (using a systematic approach), and after evaluation proceed the changes of weak elements of the Web site. Based on a literature review and on relevant trade press articles, Aladwani and Palvia [2] identified four dimensions of Web quality: technical adequacy, specific content, content quality and web appearance. According to Lowry et al. [13], the dimensions of Web quality are responsiveness, competence, quality of information, empathy, Web assistance and callback systems. Van Iwaarden et al. [20] mention that the web

quality aspects that are the most important on a Web site, considering the students' perspective, are: fast access, easy navigation on the Web site, presentation of a complete overview of the order before final purchase decision, and a simple registration process. According to Wells, Valacich and Hess [22], some dimensions of Web site quality may be worth an additional investment. Depending upon the nature of the product, online sellers may want to focus on specific Web site quality dimensions.

There is a need to develop user-friendly Web sites which ease consumer purchasing and searching, thus creating a suitable framework for the generation of higher satisfaction and loyalty levels. On the other hand, the Web site managers should enhance service loyalty, customer sensitivity, personalized service and a quick response to complaints. Also, the Web site should uphold sufficient security levels in communications and meet data protection requirements regarding the privacy [7].

3. Web quality and other variables

There is a positive association between e-service quality and customer satisfaction [25], [5]. Service convenience and risk are also significant factors affecting consumers' satisfaction level, which, in turn, affects intention [25]. On the other hand, customer satisfaction acts as an antecedent of customer loyalty [7], [10], [5], as well as trust [10], [13]. Web site quality also influences consumers' perceptions of product quality, which subsequently affects online purchase intentions [22]. Customer perceived value has a moderating effect on the relationship between customer satisfaction and customer loyalty [5].

In agreement with Young and Hyunjoo [24], Web site design quality has positive direct effects on pleasure, arousal, and perceived information quality and indirect effects on satisfaction. Wang, Tang and Tang [21] state that the customer satisfaction with information in Web sites that market digital products and services is measured through customer support, security, ease of use, digital products/services, transaction and payment, information content and innovation. According to Lowry et al. [13], content-oriented dimensions (e.g. Quality of Information and Web Assistance) are more related to satisfaction and dissatisfaction with the service quality. Managers need to understand e-convenience from the consumers' perspective [25]. In order to improve e-service quality, however, Web site owners need to spend much on maintenance and renewal, which may cost too much in order to earn a profit [5].

4. Web quality and HEI

Many factors influence the perception of quality in HE. When the object of the quality focus is, in itself, evolving, as it is the case with the use of Web 2.0 tools and processes, it can be predicted that inconsistencies in quality perceptions, even from those representing a single actor group, will result in barriers to a successful implementation. The rapid uptake of Web 2.0 tools and dynamics in society is no predictor of a similar uptake in formal learning practices in HE. Given the many mismatches in quality perspectives, as well as the difficulties in carrying out new pedagogies in HE, it can, unfortunately, be predicted that the empowerment offered by Web 2.0 tools and processes will not be able to overcome the inertia in HEI, when it comes to the mainstream uptake of new views of learning facilitated by new technologies [6].

Potential benefits of applying marketing theories and concepts that have been effective in the business world are gradually being recognized by researchers in the field of HE marketing. However, the literature on HE marketing is incoherent, even inchoate, and lacks theoretical models that reflect upon the particular context of HE and the nature of their services. The elements of globalization in HE are widespread and multifaceted and the HE market is now well established as a global phenomenon. In the context of increasing competition for home-based and overseas students HEI now recognize that they need to market themselves in a climate of international competition [9]. A question pertinent to the effective use of the Internet as

marketing tool for HEI relates to the willingness and ability of schools not to just build, but effectively maintain and successfully operate Web sites. Any organization can create a Web site, but not all are committed to making it an essential and effective tool for marketing [11].

Van Iwaarden et al. [20] found that there are no major significant differences in the quality perceptions of Web sites between students belonging to different cultural contexts (USA and Netherlands). There were, however, minor differences: (1) USA students made more frequent use of the Internet, and spent more time on it, both per visit and as per Web site; (2) USA students were more satisfied with their equipment and Internet connection; (3) USA students were more satisfied with aspects of Web site quality; (4) Students from the Netherlands more frequently visited university, company information, and stock exchange information sites and USA students more frequently visited Web shops: books, music and movie stores.

Existing work shows that Web 2.0 applications can be successfully exploited for technology learning enhancement [18]. HEI use methods such as e-learning and distance education. According to Xenos, Dermitzioti and Pierrakeas [23], Web-based educational material must be developed in such a way as to compensate as much as possible for the physical absence of the tutor. The 'expansion' of the educational Web sites has determined the need for quality assessment, since the quality of Web sites providing educational material is very important and influences, to a great extent, the overall quality of the educational material and, consequently, the quality of the education offered. Muilenburg and Berge [17] refer that there are some barriers to distance learning: administrative structure, organizational change, technical expertise, support and infrastructure, social interaction and program quality, faculty compensation and time, threat of technology, legal issues, evaluation/effectiveness, access and student-support services.

5. Hypothesis formulation

Taking Klassen's study [11] as a starting point – according to which not all organizations are committed to making their Web site an essential and effective tool for marketing –, we intend to verify whether Web site quality in HE is high or not. Specifically, we expect to verify that HEI don't invest much on the quality of their Web sites. Therefore, we propose the first hypothesis.

H_1: Web site quality in HE is not high.

Considering that the HE system is composed by three types of education – universitary, polytechnic and concordat – we intend to verify if there are differences between the three types, in what concerns Web quality. Thus, we formulate the following research hypothesis:

H_2: There are significant differences between the Web site quality of universitary, polytechnic and concordat HEI.

Taking into account that the HE system is composed by two types of institutions – public and private – we intend to verify if there are differences between the two types, in what concerns Web quality. Specifically, we expect that the Web site quality of private HEI is higher, considering that private HEI have more financial resources. It is commonly known that many institutions are able to achieve top ranking precisely because they are equipped with substantial financial resources [11]. Therefore, we formulate H3.

H_3: Web site quality of private HEI is significantly higher that Web site quality of public HEI.

We also intend to verify if there are significant differences between HEI that use e-learning and distance learning methods and HEI that don't use these methods. Supposedly, HEI that use both e-learning and distance learning should show higher concerns respecting to the quality of their Web site, since it's the main

tool to captivate potential students that intend to frequent e-learning or distance education. Thus, we formulate hypothesis 4.

H₄: HEI that use e-learning and distance learning methods have Web sites with higher quality in comparison to HEI that don't use both these services.

6. Methodology

6.1. Sample and data collection

The HE system in Portugal includes (1) the public HE system, constituted by the institutions belonging to the State, and (2) the private HE system, composed of institutions belonging to private and cooperative entities. The HEI integrate (1) the university institutions, which incorporate the universities, the university institutes and other university institutions, (2) the polytechnic institutes, incorporating the polytechnic institutes and other polytechnic institutes (Diário da República, 1.st series, N. 174, 10th September, 2007, Law 62/20074, article 4th and 5th). The education system also includes a concordat HEI (General Directorate of HE, Portugal).

The sample used in this study is constituted by 118 Web sites of HEI, 41 belonging to polytechnic HEI, 76 to universitary HEI and 1 to concordat education. 70 of the Web sites belong to public HEI and 48 to private HEI. Of the 118 HEI, two of them use e-learning and distance education methods.

We asked a group of students to evaluate the quality of the 118 Web sites, according to an instrument developed by Aladwani and Palvia [2], in order to assess Web site quality in HEI, according to the user's perception. The students' ages range from 20 to 23 years old and they all study Marketing in the same HEI and belong to the same class.

6.2. Instrument

While improvements are possible, the instrument we used exhibits excellent psychometric properties. It measures four dimensions of web quality: technical adequacy (9 items), content quality (6 items), specific content (5 items) and Web appearance (5 items). The 25 items are measured using a seven-point scale ranging from (1) 'strongly disagree' to (7) 'strongly agree'. The instrument is precise and easy to use. It can be utilized to evaluate Web quality at an aggregate level. The model/instrument can also serve as a starting point for a detailed evaluation of Web sites [2].

6.3. Data analysis

Data entry and statistical analysis were conducted through the IBM SPSS software for Windows, version 18.0. Cronbach's alpha was used to analyse the internal consistency of measures and to provide the needed credibility of the analysed instrument. In addition, several bivariate analyses were performed using t-student test analyses and ANOVA.

In this study, among other objectives, we intend to verify whether the means, for Web quality and its dimensions, are statistically different depending on the type of institution and the utilization/non-utilization of e-learning and distance education methods. In this case, the method used was the t-student test, for independent samples, which makes it possible to test whether the means of two populations are significantly different [14]. The ANOVA method was also used, with the purpose of making inferences on the true proportions occurring in k classes on the basis of information given by a sample [16], that is, to understand if

there are variations among different groups in the sample, specifically among the types of education – universitary, polytechnic and concordat.

7. Results

Cronbach's alpha allows us to analyse the internal consistency of a measure and provides a sub-estimate of the real credibility of the analyzed instrument [15]. The alpha value of Cronbach for the scale that measures Web quality is high (.936).

According to the mean values related to Web site quality in HEI, Web sites show a lower mean when it comes to the dimension 'appearance' of the Web site (4,7407). On the other hand, the mean for the dimension 'content quality' is the highest (5,4689). However, when considering the total mean for Web site quality, we verify that it's not high (5,1047), according to user's perception, since the scale used ranges from 1 to 7.

When using ANOVA to test the differences among types of Education (universitary, polytechnic and concordat), it's possible to verify that neither the mean values for the dimensions of Web quality nor the total mean are significantly different when considering the type of HEI – universitary, polytechnic or concordat (sig.> .05).

When using the t-student test to determine the differences according to the types of HEI (public/private), we verify that for the Levene's test, 'Sig.' is higher than .05 in what concerns all the dimensions of the instrument, and also considering the total mean. Consequently, at a level of significance of 5%, the hypothesis of homocedasticity cannot be rejected. Thus, the test statistic to be used is the one that assumes equal variances. It is possible to check, regarding the dimensions of Web quality that p-value > .05, so we don't reject H0, which means that there is no significant statistical difference between private and public HEI, in what concerns Web site quality.

When applying the t-student test to determine the differences between users and non-users of e-learning and distance learning methods, we verify that there aren't significant differences in Web site quality between HEI that use e-learning or distance education and those that don't, when considering the total mean. However, there are significant differences in what concerns the dimension 'technical adequacy'. For the Levene's test, 'Sig.' is higher than .05 in what concerns this dimension. Consequently, at a level of significance of 10%, the hypothesis of homocedasticity cannot be rejected. Thus, the test statistic to be used is the one that assumes equal variances. It is possible to check, regarding the dimensions of Web site quality, that p-value =.058 < .1, so we reject H0, which means that there are significant statistical differences between HEI that use e-learning or distance learning and those that don't use both methods, in relation to Web quality. This means that Web sites belonging to HEI that use these teaching methods have higher quality, when compared to the Web sites belonging to those that don't, specifically in what concerns technical adequacy.

Taking into account that the results found concerning the type of institution and education weren't satisfying, we thought it could be interesting to evaluate the differences considering each item of the instrument. We found that only the item related to interactivity showed significant differences between universitary, polytechnic and concordat HEI, at a level of significance of 10% (p-value=.07 < .1). When considering the type of HEI (public/private), only the item related to the availability of information concerning client policies showed significant differences between groups (at a level of significance of 10%). Web sites of private HEI have higher quality in what concerns this aspect, when compared to public HEI.

8. Discussion

Cronbach's alpha value for the scale that measures Web quality is high (.936), which allows us to conclude that the instrument is adequate to evaluate the quality of Web sites of HEI. Web sites belonging to HEI show

a lower mean when it comes to the dimension 'appearance'. On the other hand, the mean for the dimension 'content quality' is the highest. This could mean that HEI show more concerns regarding the quality of the information given in the Web sites, than their appearance. When considering the total mean for Web site quality, we verify that it's not high, according to user's perception, which could mean that HEI are not committed to use the Web site as an effective marketing tool. Although they have a Web site, they may not be effectively maintaining and successfully operating their Web sites, which is in agreement with Klassen's perpective [11]. Therefore, H1 is supported.

We found that neither the mean values for the dimensions of Web quality nor the total mean of Web quality are significantly different when considering the type of HEI – universitary, polytechnic or concordat. However, when considering each item of the instrument, we found that the item related to interactivity showed significant differences between universitary, polytechnic and concordat HEI. Nevertheless, we reject H2.

It was possible to check, regarding the dimensions of Web site quality that there is no significant statistical difference between private and public HEI, in what concerns Web quality. When considering the 25 items of the instrument, only the item related to the availability of information concerning client policies showed significant differences between groups, which means that Web sites of private HEI show higher quality in relation to this aspect, when compared to public HEI. The concern of private HEI with a quality disclosure of client policies makes sense, considering that private HEI charge a monthly fee to students, that's much higher than the fee paid by the students of public HEI. These results lead to the rejection of H3.

There aren't significant differences in Web site quality between HEI that use e-learning and distance education and those that don't, when considering the total mean. However, there are significant differences in what concerns the dimension 'technical adequacy', which means that Web sites belonging to HEI that use these teaching methods have higher quality, when compared to the Web sites belonging to those who don't, specifically in what concerns technical adequacy, so we partially reject H4. This result makes sense. However, it would be expected that HEI that apply the referred methods had more concerns with the other dimensions of Web quality, since the Web site may be the most important marketing tool they have to captivate students that don't have the possibility to know the institution personally and that only interact with it online. As mentioned before, in the context of increasing competition for home-based and overseas students, HEI need to market themselves [9].

9. Conclusion

One of the main contributions of this study is the use of Aladwani's and Palvia's instrument on HEI. No studies were found on this context using this instrument. Considering the reliability of the instrument on this specific context, we think that it might be useful for academics that intend to follow this area of research.

Since we verified that the means of Web site quality aren't high, considering all of the HEI of the sample, we conclude that HEI are not committed to use the Web site as an effective marketing tool. Considering the competitive environment in which they are inserted, especially due to the homogenization of Education shaped by the Bologna Process, HEI should invest more in enhancing the quality of their Web sites, so they could develop long lasting and loyal relationships with the students, through the high quality satisfaction of their needs, and attract more students to their institutions, as well as the interest from other HEI, academics and firms. This last aspect is extremely important, since partnerships may allow the enhancing of quality in education which, in turn, could lead to the development of a greater amount of academic publications, of superior quality, and, consequently, to the attainment of increased financing of investigation projects.

We found no significant differences on Web site quality, when comparing universitary, polytechnic and concordat institutions or private and public institutions. This may be merely a reflection of reality or it could

be explained by the use of an instrument that evaluates Web quality through the user's perception. Although Van Iwaarden et al. [20] found that there were only minor differences in the quality perceptions of Web sites between students belonging to different cultural contexts, perhaps we should also have evaluated Web sites in a different cultural context, in order to be able to compare these contexts and, maybe, find more relevant results. However, and bearing in mind that the technical adequacy is higher on Web sites belonging to HEI that use e-learning and distance education compared to those that don't, this study is of great importance, since it identifies the opportunity to explore the relation between e-learning and distance education and Web site quality.

In what concerns companies, they need to invest time and money on Web site service quality, design and evaluation, since nowadays Web sites may be one of the most important tools in a competitive environment. As mentioned before, Web site quality positively influences consumers' perceptions of product quality, which subsequently affects online purchase intentions, and customer satisfaction which, in turn, affects customer loyalty and trust.

One great limitation of the study is the small amount of studies we found in the context of HE. According to Abuali and Abu-Addose [1], there are some weaknesses in the questionnaire method since it gives just a general indication of the overall quality of the Web site without specifying the number or location of any problem and needs an extensive analysis. Considering this aspect, it would be important to complete the evaluation with qualitative analysis. Aladwani and Palvia [2] add that if a firm finds itself lacking in any of the dimensions, then it may do a more detailed analysis and take necessary corrective actions. Nevertheless, as mentioned by Wells, Valacich and Hess [22], depending upon the nature of the product, online sellers may want to focus on specific Web site quality dimensions. In this sense, it would be interesting to evaluate which of the dimensions of Web quality are the most valued in HEI.

Although the studies we mentioned reported value in relation to the user's perspective, it might have been a limitation, since the students that evaluated the Web sites belong to the same cultural context and, even, to the same HEI and class, so they might have a similar perspective on the characteristics of the Web sites evaluated. According to Van Iwaarden et. al. [19], possibly, language, culture, religion and a host of other factors may be important to a user's impression of the quality of a Web site. In this sense, it might be necessary to evaluate the Web sites according to an expert's perspective to confirm our conclusions.

According to the information we collected, there are only two HEI that use e-learning and distance education in Portugal, so it would be important to actualize this investigation in a different context, where these methods are most commonly used. Considering the results, it would be important to evaluate the quality of e-learning and distance learning platforms on HEI, although it may be difficult, considering that these platforms usually function as Intranets, so the access is limited to employees and students. In the future, it would also be interesting to evaluate Web site quality considering differences related to ranking, number of students, number of vacancies, region and quality certification.

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