THE ROLE OF USABILITY IN THE COMPETITIVENESS OF HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

The increasingly competitive environment of the Portuguese higher education system stresses the need of a market-oriented offer, coordinated with the institutional websites. In this paper we describe an attempt to integrate marketing and webdesign techniques, supported by usability studies. A usability study was performed on the website of the Instituto Politécnico de Bragança (IPB), employing guerrilla usability techniques focusing different target groups. The following redesign tried to address usability problems found, and involved the inclusion of affective and emotional multimedia contents, added to the usual objective and rational information. The response of the target groups to the changes was assessed by means of a new round of usability testing.

KEYWORDS

Higher education websites, target groups, guerrilla usability, multimedia, differentiation, affective information.

1. INTRODUCTION

The Portuguese higher education system is going through a transformation process which reflects changes also endured by other fields of activity and production systems.

The enterprises and businesses, being past the processes of mass marketing, are trying to cope with the need for a marketing segmentation approach and the corresponding product and public differentiation, by taking advantage of sophisticated information and communication systems, as is the case of the Internet (Brito, 1998; Kotler & Fox, 1995). The higher education system is under similar influences which forces it to move from a granted "mass education" status towards an increasingly aggressive and competing scenario where a diminishing community of clients (e.g., students, sponsors) is disputed and must be captivated by appealing and well promoted education and investigation products. This change of circumstances, along with demographic issues and government education policies, made the organizations of higher education shift from a position of passive student admission to a very different one, of student recruitment (Dehne, 2002).

Some studies point out that the choice of media used to promote the products of the higher education institutions (Lopes, 2002) differs from those favored by the prospective students assessing these offers (Torres, 2004). Moreover, the Internet approach is considered as the media to be chosen in the framework of institutional communications.

The complexity of publics and services embraced by higher education institutions leads to a similar complexity in the definition of their image and positioning. Therefore, it becomes necessary to identify the strengths and weaknesses of the organizations in order to produce selective and tactically effective promotional campaigns. Building a website coherently integrated with a good corporate image tends to be overlooked by the higher education institutions and, in our opinion it is not more difficult to accomplish than by other media and channels.

The aim of this paper is to present the assessment of the value of an institutional website of a higher education school as a means of communication and promotion of the corporate values and personality. The assessment is based on a usability study centered in representative target groups and typical tasks that may establish the promotional value and leverage power carried by the affective and emotional image to these organizations.

The paper is organised as follows. First it presents a broad approach to usability issues in the website of the Instituto Politécnico de Bragança (IPB), surveyed by following the optics of guerrilla usability. Then it synthesizes a few key tests aimed at two target groups of public defined in the initial approach and performed on the present website. Finally, based on the results of the usability tests, the paper presents an alternative design of the website, including multimedia contents, that was developed and tested by the authors.

2. USABILITY STUDY

As in any human-computer interface, the webdesign follows well-known interaction principles, such as user-centered design, identification of needs and requisites, empirical evaluation and iterative design (Preece, J. *et al*., 2002; and Rubin, 1994). Stating the importance of content as the main reason for a user to visit a site, Nielsen (2000) also considers the design as a tool to make the access to contents easier. Under these perspectives, it is mandatory to know the needs and difficulties experienced by the target group while using the product.

2.1 Usability analysis of the current website

We undertook several tests aiming to identify problems likely to affect the experience of visitors representative of different target groups. The reason to analyze different user profiles was, given the heterogeneity of the higher education publics, to avoid test results biased towards irrelevant subjects due to arbitrary selection. Another reason was the interest in obtaining a complaint record from specific and overlapping sample groups, which could set a priority basis to the analysis. The testing suite employed exploratory interviews, usability tests and post-test questionnaires.

2.1.1 Exploratory interviews

The exploratory interviews were performed with three visitors with different profiles, whose sensitivity and interests, predictably different, could contribute with useful clues to identify identically experienced problems. These interviews also provided us with a view over the interests of the target-groups which could be used as relevant requisites for further shaping the site redesign.

These interviews were semi-structured and conducted separately with a high school student, a biotechnology trainee and a computer programmer. After being informed on the purpose of the interview and the anonymity of their identity, the participants were invited to openly express their feelings about the experience of using the website. During the interviews a computer with an Internet connection was available. As expected, the participants tended to report aspects they disagreed with, in spite of the neutral attitude and equal interest on negative or positive aspects kept by the test monitor. Surprisingly, they expressed strong feelings against aspects of the site they did not like, especially resenting those which led to frustration and loss of time.

Spontaneously, they insisted on showing in the computer the unsuccessful steps they had taken, thus permitting to observe their procedures and to listen to their “thinking aloud”, and to keep timing records as well. The problems reported more than once included: difficulty in finding technical and scientific documents known to be freely available in the site, difficulty in finding the internal directory of phones and e-mails and too much prominence given to elements, considered by them as merely of “internal interest”.

Given our limited resources and scarce of time, this approach proved to be very useful in finding a broad set of problems, spanning different user experiences and diverse scopes of interest.

2.1.2 Participant recruitment

Proceeding towards a more detailed analysis, the information obtained with the exploratory interviews was used to design usability tests around specific tasks aimed at two distinct target-groups, namely high school and higher education students, of both genders. Although there could be other usability problems and different target-groups relevant for the analysis, the testing focused on a reduced number of tasks, given the need to rapidly reach for results under critical limitations in resources and recruits. The two target-groups may be considered as part of the priority publics to whom the institutional message should be preferentially addressed.

Under the perspective of guerrilla usability testing, the tests were performed in conditions as close to the users reality as possible. The participants were recruited following different strategies, according to the specificity of each target-group. Five higher education students were invited to participate in the usability tests, carried out in the premises of the IPB campus. The recruitment was made through the student's union, the teaching staff and also personal contact. After obtained their informed consent, a laptop computer was set up and the testing initiated. In every instance, advantage was taken from the relative calm and familiarity of the premises, as well as the existing wireless communications network which eased the mobility of the testing and the access to the test subjects, lodged on Web servers.

The recruitment of five high school students was made through direct contact with a participant which volunteered to recruit other four colleagues and scheduled a meeting on a specific date and place convenient to all of them. As it turned out, the meeting took place in a weekend at the volunteer's residence, who gave access to his computer and Internet connection. This arrangement had the advantage of a distended working environment, given the mutual knowledge of the participants and the familiarity with the colleague's residence, which also preserved the privacy of testing and the occupation of idle/waiting time.

2.1.3 Usability testing

Both the usability tests and the post-test questionnaire were based on tasks performed around utilization scenarios. These followed the strategy of choosing a reduced number of tasks, which could be completed without taking too much time of the volunteers, all participating for free. The guerrilla usability approach provided useful insights under narrow time conditions and with small test groups. On the other hand, this approach contributed to the flexibility of the process of setting a test without notice, when given the opportunity.

Following practice recommendations (Pearrow, 2000; Rubin, 1994), participants were informed on the purposes of the tests, the kind of interaction to be expected and the approximate time to be taken in the whole process. The tests exploited the "thinking aloud" technique, during which the participants were invited to provide running commentaries on their thoughts while performing the tasks of the test.

For each task, the test monitor recorded the comments and behaviors of each participant, the number of mouse clicks, the path followed to perform the tests, the success or failure, and the time consumed in either case. Although it could be convenient to have the tests recorded in video, such technique was put aside, due to the incompatibility with operation agility. In addition, the extra time for setting a video camera could contribute to somewhat chill down the goodwill of the participants. Moreover, carrying more equipment than the portable computer could compromise our strategy of performing test opportunities as soon as they presented themselves. For such reasons, only one session was recorded in video, being that method left aside from then on.

Four tasks were proposed to each participant, to be performed in the IPB website using the "thinking aloud" technique:

Task 1 – *Find admission conditions for a course*;

Task 2 – *Obtain a technical or scientific document*;

Task 3 – *Locate the e-mail address of one laboratory*;

Task 4 – *Know details about the IPB campus.*

For each task proper motivation was used, stimulating the imagination of the participants in order to simulate needs that could be satisfied trough the use of the site.

2.1.4 Post test questionnaire

After performing the tests, every participant was asked to answer an attitude questionnaire concerning each task separately. It consisted of a series of statements on the form of a Likert scale, to be classified in a 1 -5 scale. It also included a space allowing an open comment. These questionnaires supported a quantitative analysis of the site usability, complementary to the qualitative information acquired with the "thinking aloud" technique. The quantitative data are a convenient way to show and compare the improvements obtained in a process of iterative design. Figure 1 shows the results of the questionnaires related to each task, and discriminates the differences of attitude found between both target-groups. The scale of classification ranges from 5 to 25 points, representing respectively the minimum and maximum values that each group of 5 participants could give to each questionnaire item.

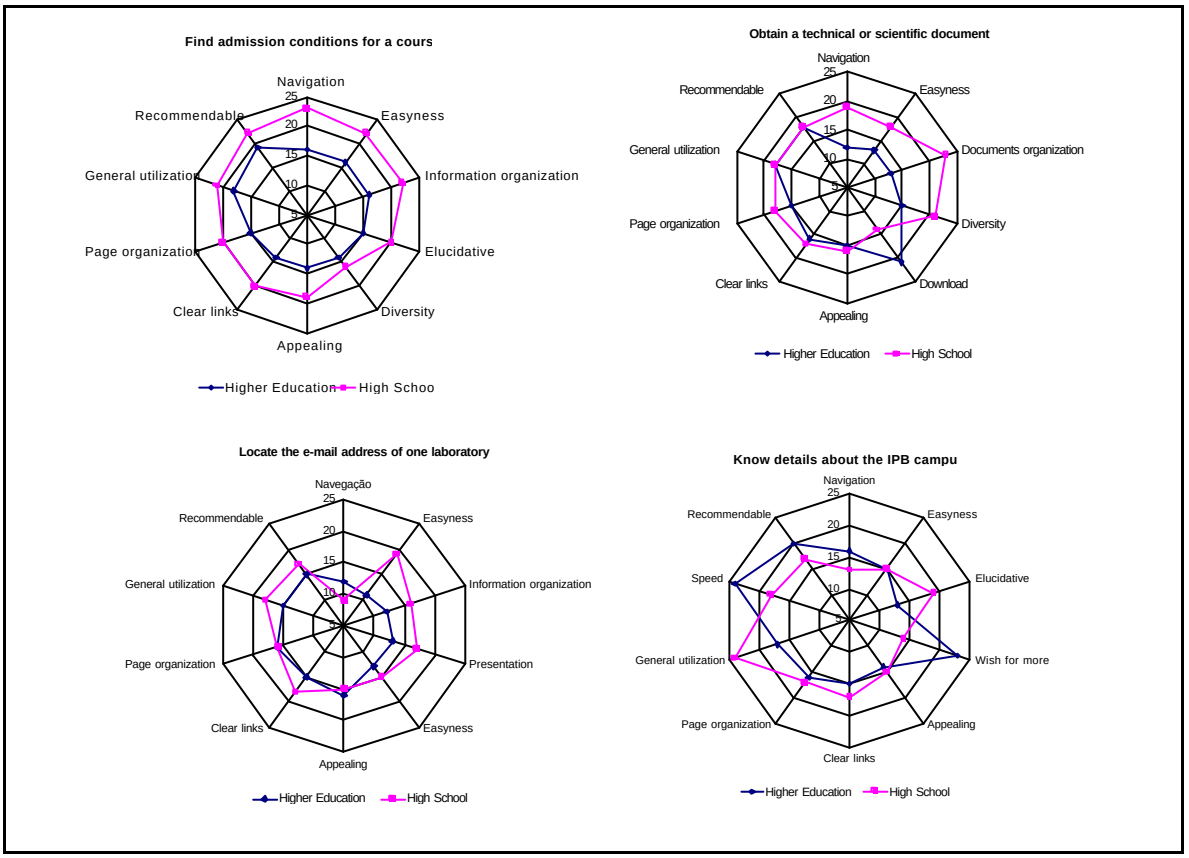

Figure 1. Attitudes expressed by quantitative questionnaires.

These graphs confirm the perception of usability problems felt by the participants. A clear depression shown in the task "*Locate the e-mail address of one laboratory*", concerning the navigation, gives supporting evidence of the difficulties found performing the usability test.

This contrasts with the graph corresponding to the task "*Find admission conditions for a course*", which presents values almost uniformly high, expressing the user satisfaction towards its ease of use.

In the task "*Know details about the IPB campus*" high values are evident on the items "Wish for more" and "General utilization". Actually, the tendencies represented by these values might be interpreted as an interest for information considered "Elucidative" along with "Download speed", which may contribute to balance the problems exposed by the relatively low faring of "Navigation" in this task. These tendencies point out aspects whose exploitation may be of interest in future projects.

2.1.5 Synthesis of the usability analysis of the actual website

Both positive and negative usability issues were assessed by this study of the IPB website. The perceived concerns may affect, in different ways, the heterogeneous publics of the site. More precisely, the positive aspects included the availability of clear and varied information about the courses imparted by the institution

and its admission conditions. Also positive is the offer of services, including a repository of scientific and technical information freely available in PDF format. Effective internal search engines were also accounted for positive. These engines permit the location of information and documents within the site, as well as data provided by the internal directory of staff and department contacts.

On the negative side, some of the problems were so severe that compromised the access to the wealth of information. The worst problem found was link labeling, further complicated by an inefficient page and navigation design, ending up in the incapacity of accessing the information which in theory is within reach of the visitors (table 1). Another issue was the affirmation of the corporate identity, which was not consistent throughout the site, leading the visitors to feel that sometimes they had left the institutional site. Visitors also showed disappointment for the scarce information available on the subject of the campus facilities, and expressed interest in more suggestive information on that theme. After evaluating these results, a redesign proposal was devised to address these usability issues.

Table 1. Sample of current website testing report. "*Locate the e-mail address of one laboratory*" task.

Percent successful: 30%	
Mean of clicks to succeed: 3	
Findings	**Recommendations**
• Unique access link to directory search engine. • Design flaws, causing invisibility of link in site context. • Seven participants gave up searching, after trying for time lenghts ranging from 4 up to 19 minutes.	• Navigation redesign towards improvement in links visibility. • Make both search engines evident.

3. REDESIGN PROPOSAL

The following redesign proposal was intended to solve usability issues exposed by prior testing of the actual IPB website. A prototype was designed and tested, focusing on the site navigation system, on those segments whose functionalities were to be changed and on the implementation of new functionalities. At this point, instead of following a mending approach by gradually tweaking the design and introducing slight changes into the product (Krug, 2000), a new design approach was undertaken, in order to make evident the modifications (Tognazzini, 1990) and validate this option. Three conditions were taken into account for the redesign:

- Target-group centered redesign: aimed at obtaining an affective adhesion at first contact, coordinated with the corporate identity aesthetics;
- Restructuring the information and link labeling: solving the usability problems observed and improving the perception of the availability of contents;
- Enrichment of the site with multimedia contents: adding informative elements with suggestive and emotional value, complementary to the existing information.

3.1 Target-group centered design

To fulfill this condition, the visual appearance of the site was modified, changing its rigidity and austerity given by its present structure (i.e., "1 heading and 3 columns"). In order to render the site coherent with a line of institutional communication, the composition takes elements belonging to the present corporate image of the IPB (symbol and logo), as well as some graphical elements existent in some promotional pieces already in use (figure 2).

Figure 2. Left, present site homepage. Right, prototype homepage.

At the homepage level images that could adequately express the unique reality of the institution were utilized, given the interest to transmit at first contact the impression of warmness and friendliness. The expression of the reality and resources of the IPB was devised under the shape of multimedia contents.

The design of the pages went through the iterative design approach, with frequent and informal consultation of different people along the process. Low fidelity prototypes were made and exposed to volunteers who were asked to examine the project on the screen and give their opinions. This procedure permitted successive improvements in a more expedite way than by implementing *HTML* pages from the beginning.

3.2 Restructuring of information and link labeling

The solutions sought for the site usability problems aimed to improve the usability of some of the tested tasks. The task of finding admission conditions for a course was not covered, since it raised no usability problems and reached good faring during the tests.

The structuring of information involved a different sorting of contents and the implementation of cross-linking. With this approach a page can be accessed from different places/pages, like for example, the "Virtual visit", which can be proposed via links placed in related pages.

In all cases the prototype employed underlined text links, thus avoiding the confusion of the visitors generated by the double criteria existing in the current website.

3.3 Enrichment with multimedia contents

Given the multidimensionality of the higher education products, it was suggested that some benefits to the image of higher education institutions could arise by providing candidates with information other than courses, curricula, and aspects viewed as objective in the choice of a school (Capraro, Patrick & Wilson, 2004; Klassen, 2000; Kotler & Fox, 1995). It could be helpful to the process of choice if the candidates could have a glimpse at what they are committing to, before compromising to a given course/institution.

The participants in the usability tests, undertaken on the current IPB website, showed disappointment with the available information about the facilities and environment. A few examples of virtual visits were devised and inserted in the prototype. The QuickTime technology was used in the production of various multimedia pieces, including panoramas with audio tracks and a movie with a personalized skin. We have selected QuickTime after surveying about 250 web pages and comparing the different approaches to virtual visits provided by websites belonging to 18 Portuguese, 30 English and 30 French speaking universities.

4. USABILITY TESTING OF THE PROTOTYPE

The prototype described above was submitted to the same usability analysis performed on the original IPB site. The only differences were: the elimination of the exploratory interviews (unnecessary at this stage), the recruitment of the same number of new participants belonging to the same target-groups, and the limitation of the analysis to three of the four tasks performed with the actual website.

The prototype was built around the utilization of scenario tasks and then installed on a webserver. The proposed tasks were the following:

Task 1 – Obtain a technical or scientific document;

Task 2 – Locate the e-mail address of one laboratory;

Task 3 – Know details about the IPB campus.

4.1 Results of the prototype usability testing

The usability study of the prototype showed clear usability improvements against the current site (table 2 and figure 3). The strategy of including cross-links enabled the visitors to use different ways/paths to access the information, thus not being limited to a unique access link.

Minor navigation difficulties were easily bypassed by the participants, therefore, not impeding the conclusion of the tasks. Another distinguishable result was the good faring of the virtual visit, whose various items included in the prototype were voluntarily examined by the visitors, beyond the requirement of the test protocol.

The general results showed a clear interest in the addition of interactive contents to the virtual visit. The users feedback pointed out their interest on illustrative and attractive elements indicating the academic atmosphere which otherwise would be scarcely perceived by the visitors.

Table 2. Sample of prototype website testing report. "*Locate the e-mail address of one laboratory*" task.

Percent successful: 100%	
Mean of clicks to succeed: 3	
Findings	**Recommendations**
• The label "*Pontos de Encontro*" (meeting place) seems irrelevant to the users. • Three participants picked the link "Sítio de A a Z". • Three participants picked the link "Webmail". • Two participants picked the searchbox. • Two participants picked the link "Serviços e Recursos".	• Substitute the expression "Pontos de Encontro". • Make evident the functionalities of the search boxes.

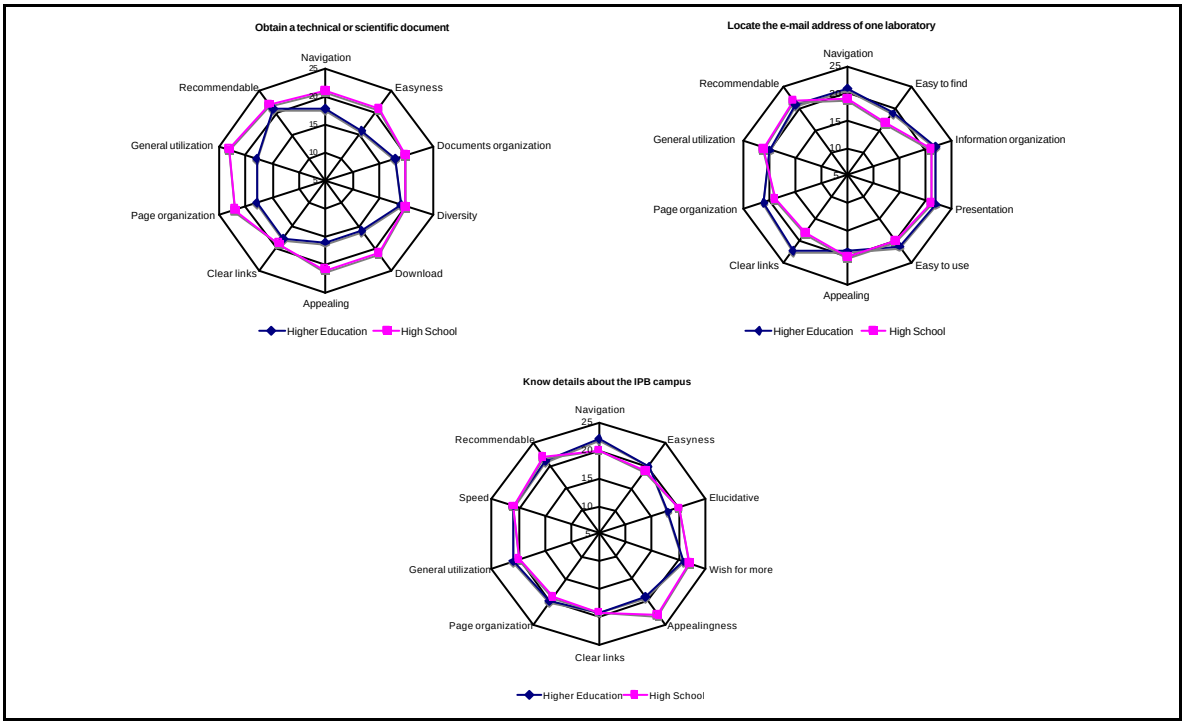

Figure 3. Attitudes expressed towards the high-fidelity prototype.

5. CONCLUSION

The competitive context of higher education calls for an effort in identifying and segmenting its clients, seen as target groups. Differentiating their offer may give institutions an opportunity for appealing to candidates who might consider distinctive aspects from the traditional objective and rational perspectives. The institutional website can project those differences via multimedia contents which may appeal to emotional and affective features, relevant to the target-groups. However, such content must be complementary to the objective and rational content, which must itself be easily obtainable through a site with good usability and coherent corporate image. The best way to assess the site usability is through the practice of usability analysis in support of iterative design. The usability of their websites may benefit the competitive strength of the higher education institutions.

If given the opportunity, users are willing to collaborate in usability tests and share their thoughts whenever they feel their work will be used to improve a tool they see as relevant. In utilization scenarios, proper motivation is important and, in our opinion, tests should be carefully designed prior to testing with representative users.

The "guerrilla usability" approach proved itself useful to gather relevant information with a small sample of representative users in a short notice but, in the future, more thorough testing may include a statistical approach, with a larger sample of users from different target groups The usability tests carried out on the current website of the IPB permitted us to detect important design flaws. These were taken into account in a high fidelity prototype and tested with design modifications that proved effective. The usability testing of the prototype also showed the appeal of the multimedia contents, whose approval by users was assessed both by the "think aloud" technique and by the post-test questionnaire. Future development will also include the improvement of minor glitches in the design and the insertion of more multimedia items.

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