

# **Theoretical-Methodological proposal to evaluate the quality of educational websites to support education**

## **ABSTRACT**

This study aims to review the literature on evaluating websites in order to identify, determine and suggest quality evaluation criteria directed to support teaching. The increasing use of the communication media in transmitting knowledge through the development of virtual learning consists of reading purpose aimed at authors, who wrote about criteria, evaluation quality, measure quality and evaluate educational websites, with the principal aims to choose the criteria of evaluation and draw a checklist for others futures studies. Firstly, the methodology used was analytical-descriptive and informative over the literature review and the study proposes criteria quality for evaluation educational websites. The result of this communication was to propose two general aspects, one functional and the other technical-aesthetic with ten criteria evaluation of quality, they are: authority, update, usability, accessibility and communication, all included in the functional aspects; and for technical and aesthetic we propose quality multimedia/graphic design, content, navigation, speed of access and interaction.

## **Keywords**

Evaluation of educational websites / Evaluation criteria / Teaching / Methodology

## **1. INTRODUCTION**

The Internet is a different set of computer networks that use protocols to provide different services. In general, the Internet enables all kind of communication between various types of computing devices spread around the world. The World Wide Web, known as Web or WWW, is an architectural framework that enables access to connect digital documents, spread over millions of computers on the Internet. It's very important to distinguish two concepts, which initially appear to have the same meaning, but they are different, which are the Internet and the World Wide Web. And currently the Internet has enabled a marked democratizing access to information, adapting new models of access, new query interfaces making it easier for inexperienced users' needs to retrieve information and handle websites properly.

The large consumption of content and the continuous accessibility to information is growing at a large scale. In this perspective, and knowing that young people needs to select the information, it's important create a proposal to assess the quality, produce evaluation mechanisms, taking into account the variety of information available on the Internet. This study aims to contribute to change this problem by proposing a methodology for measuring and evaluating educational websites.

The vast amount of information available on the Internet, the complexity, heterogeneity and the different characteristics of the users that access it requires the creation of a methodological approach to evaluation in terms of functionality and technical-aesthetic.

Using the definition of Area Moreira [4] educational website are spaces in the WWW pages of information that offer and feature the materials within the field of education. The same author considers that educational website or educational interest site, is a space where you can find and include mixed personal Web pages for teachers, educational websites institutions such as universities or the Ministry of Education, Culture and Sports, e-learning platforms, expanding courses distance, companies engaged in training, databases, and others. Area Moreira finds the application of terminology in this work, concluding in his view, that an educational website refers to a space or web pages that carry in addition to educational resources always related information of area education, always built by institutions or by teachers who have the same goal, training and dissemination of knowledge, and that the only vehicle used is the Internet.

## **2. OBJECTIVES**

This paper represents a set of criteria that can be used in evaluating any educational level and quality assessment tool. The objectives of this study are two: explore the criteria that have a significant relationship with the assessment of educational websites and identify them by proposing a methodology for measuring. This communication proposed a checklist in quality Evaluation of educational websites created from the review of authors' literature.

## **3. METHODOLOGICAL PROPOSAL**

The methodology presented here was drawn through the literature review developed through an analytical-descriptive and informative methodology selected by the author of this article. The different authors who formed the structure of the division of quality criteria required for this quality assessment proposal of educational websites have supported education at all educational levels. Having regard to the didactic point of view, educators must have the responsibility and the tools to differentiate the quality of educational websites of those who are not, thus being able to evaluate web pages.

The proposed methodology consists of general aspects divide in functional and technical aspects based on Marquès Graells [21] these two aspects are divided in five criteria which are, for the functional: authority, update, usability, accessibility and communication. The technical-aesthetic aspects were organized in graphic design and multimedia quality, content, navigation, speed of access and interaction.

The selection of authors for the creation of this methodological approach is of the author's responsibility.

### **3.1 VALIDATION OF CRITERIA ON QUALITY OF EDUCATIONAL WEBSITES**

In the retrospective reading of the scientific literature, we found the indication of very different criteria, parameters and indicators each author develops his checklist according to an individual variable analysis, the prospects evaluation and research goals [26] [21] [9] [28] [11].It's an assessment methodology using the evaluation of criteria and indicators, linking and adapting them to the gender websites of educational support. According to Olsina et al [26] quality feature can be decomposed into several levels or sub features and finally,

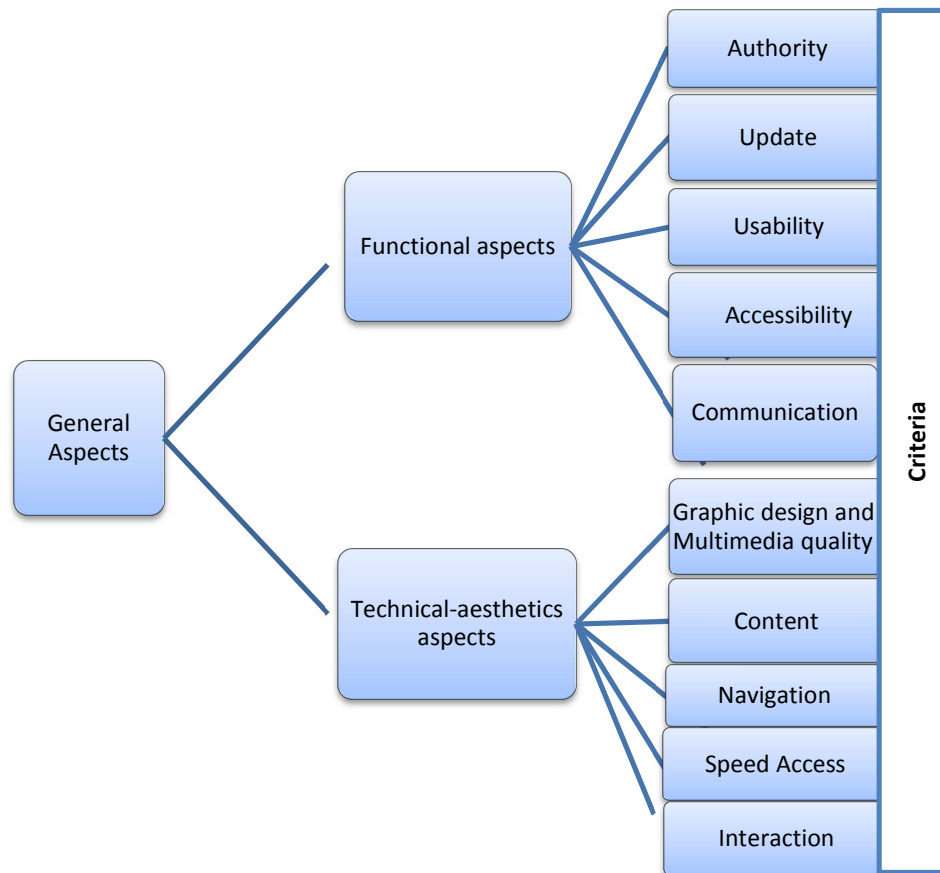
the sub features can be refined into measurable attributes. Referring also that it selects the features of a quality website, according to the different types of users, i.e., according to the age, the course of study they attend. The criteria have used to enumerate material respects, in order to assess the quality of a web page [20].

According to many authors who study the problem of quality information the concept is difficult to define [17]. As Codina indicates [11] there are no consensus on all the elements or parameters to be considered and many rating agencies use different criteria, coinciding in part with all of them, the content and the authorship. However the same author does not consider it essential to apply them in all circumstances [12] and we will need to develop specific indicators to evaluate what is being done and set to answer the question: can we evaluate? [12] And then, answer the question: how do we assess the criteria? After setting the list of criteria we must know how to measure them, to evidence the website's efficiency which will be evaluated. Also, the same author states that not all components of a quality website can be measured with the same efficiency; some are difficult to understand even by applying the method *a priori*. However, it's very important to identify and describe the elements that bring quality to a resource, although we cannot always measure them effectively, but we must identify them conceptually.

For this analysis we had to define the assessment objectives of the study, know what the audience intended; find out the intrinsic characteristics of these websites, what their goals and the audience to which they want to transmit the information. Subsequently determine the criteria that are proposed here.

The reading of literature related to the web pages of assessment models marks a set of factors to consider when evaluating the effectiveness of pages [8]. Based on Marquès Graells [21] the checklist is divided into two general aspects, the functional and the technical-aesthetic, each with five criteria, a total of ten criteria. The evaluation criteria which were chosen to be included in the evaluation checklist were adapted from Marquès Graells [21], Carvalho [9], Santos [29] and Pinto Molina [28] which led to the proposal evaluation checklist and is sustained in ten criteria for assessing the quality of an educational online resource. They are authority, update, usability, accessibility, communication, graphic design and multimedia quality, content, navigation, speed of access and interaction. All of them were chosen after an exhaustive literature review. The criteria used in the evaluation checklist will be outlined in Figure 1.

**Figure 1: Structure of Assessment Checklist criteria**



The first criterion in the functional aspects is the *Authority*. Beck [5] considers that the authority analyzes the following aspects: if there is an author, if the author has qualifications or Curriculum Vitae and it is associated with the propose and the site's theme, if there is an Institution with credibility responsible inside the site and, finally, whether there is any link between the author's information or the entity responsible for the website.

The author's view of the web page authority is very important for the confidence that the user may have regarding the reliability of the information and scientific nature of their content [19]. Boklaschuk [6] says that the author's name must be defined in the educational website, since without the author's name it is hard to give any credibility to information by those who use it.

Much of the websites (except for personal pages) in organizations or entities, have many responsible authorships, but they never show the names of the responsible, in general they do not offer detailed information of the people who contributed for the development of every detail of the pages [20].

The criterion authority is highly valued by the various authors who have addressed this issue, since it is traditionally used in printed material evaluation and due to excessive lag of electronic information online it takes on a special relevance [20].

Carvalho [9] and Burke [7] consider that the existence of e-mail address for future contact is important for the user to get clarifications and allows them to be encouraged to suggest improvements to their own educational resource.

The second criterion is the *Update* as the date of publication in a printed document, the date on a website is also important, since the information available is inconsistent, thus increasing its relevance. There are two dates that we should seek immediately: the date the website was created and in particular, the date of the last updates [9]. Carvalho [9] considers another way to present the latest updates can be by entering the "news", but doesn't mean that date is associated with a recent date. Treadwell [31] recognizes this important criterion saying that in addition to the update, date information, there should be linked to additional information, calling it "Good sites".

Simões and Carvalho [10] mention that periodically is important to check that the presentation of the website is still working as planned. The lack of use by the person who creates and generates a page in the future becomes a "broken" page. Carvalho [9] and Beck [5] propose three types of dates: the date, on which the material was written, was placed on the Internet and the latest update or revision. Educators are increasingly seeking updated information to pass on to their students [6].

The third criterion is the *Usability*. Aguilar Soto [1] considers efficacy was defined as the completeness and accuracy with which the user gets their specific objectives Nielsen and Loranger [25] define usability as:

“(...) a quality attributes relating to how easy something is to use. More specifically, it refers to how quickly people can learn to use something, how efficient they are while using it, how memorable it is, how error-prone it is, and how much users like using it. If people can't or won't use a feature, it might as well not exist”.

Pages which have poor interaction designs and with the identification users with erroneous needs, among others, are factors responsible for the waste of time when browsing the Internet which ends up discouraging them [14] [10].

The fourth criterion is the *Accessibility*. Martinez and Lara [22] report that accessibility is a necessary condition for people with different limitations to participate in social life. Currently most websites present accessibility barriers that make it difficult and impossible to use. However, if the websites and software are accessible, people with disabilities could use the services they offer effectively. It should be possible in the browser, on the View menu, to change the text size [9] allowing the user to adapt the information display to their needs.

This criterion is fundamental [9] [12] [16], because it proves that the authors or webmasters took care in eliminating access barriers, when they designed their pages [8]. It's important that all websites and educational resources online are in accordance with the standard WAI (Web Accessibility Initiative), or check whether the text can be changed by improving the monitor's display quality (visually impaired) [32], simplicity of interface, videos with language signs, adjustable volume and light signals (hearing impaired), as well as simple and operative informative reports (intellectual disabilities) [8]. All of these points are very important for this criterion. For Pinto Molina [28] this criterion is mandatory for all websites with official and public content, as websites of ministries, universities, libraries, and so on.

A site may have higher quality if it's easy to locate by users [23]. The visibility of the aid on the main page and the internal search engine, allow users greater accessibility and navigation, making it known to those who use the site as a structured content [27]. The bad structuring of the pages of a website are barriers to accessibility of

information [10]. The possibility to consult information can be in different languages and easy access to content for foreigners living in Portugal [28] [8].

Images, image maps do not have the alternative texts which hinders access to information [21]. When a site contains audiovisual and users need software requirement, such as Flash Player, this requirement must be clearly visible on the main page [6]. Elements like colors, a lot of content, graphics, moving images, audio, video and other elements that are included in the websites, also decreases access to information for people with disabilities [27]. It's necessary that those who build these sites pay attention to people with disabilities.

Pages should enable print and correctly display the printing of the content, whether text or graphics [7]. The ease of video or sound controlling i.e. mute or increase or decrease the volume as well as the ease of reading is determined by the font, the spacing between the lines as well as between paragraphs; by title highlighted and subtitles; the contrast between background and characters and the balance of colors used [9].

In the case of educational websites, which have usually photographs or graphics, access to this information can be frustrating for the user, because of the waiting time. Boklaschuk [6] warns us of this fact, saying that the authors of these educational sites should put on their website the information on how long the display of the information will take.

Currently there are tools that help webmasters of websites to perform Internet tasks with higher quality to prove the URL with the W3C consortium. In Portugal there is a UMIC program which includes the requirements of accessibility standards for people with disabilities.

The last criterion of functional aspects is *Communication*. Miranda [23], Carvalho [9] consider communication a key element to evaluate a website. According to the first author, to assess the communication capacity of each website, there are indicators which are responsible for this criterion, they are: the responsible contact (email, phone, address), synchronous communication (conducted through chat) or Communication by e-mail, forum [9].

An educational website should have the responsible contact for further clarification of questions that may arise students/users, provide discussion forums, so there is a space for reflection and thus motivate users to return again to the site and in this way intervene guardians, teachers and students to exchange opinions [9] [27].

The first criterion of technical-aesthetic aspects is *Graphic design and Multimedia quality* where multimedia resources, as stated in Codina [11] are increasingly used in the websites, including sound and video. Cooke [13] reports that the Internet is being developed through graphical and multimedia information sources.

For Pinto Molina [28] graphic design is evaluated according to their physical appearance or portal ergonomics, if the designs are functional and attractive; the combination of colors, shapes and images make the reading of the content easier; if printing is suitable for textual information, that is, on the size and typology of the letter; and the homogeneity of the color and with respect to all pages format.

For Area Moreira and García-Valcárcel [3] a media system can be defined as a device or set of devices (software and hardware) that let you integrate simultaneously several formats of information (textual, graphical, auditory and iconic. Hooper [18] indicates that people learn and remember more easily the knowledge presented visually and also those where the user actively participates in its acquisition, rather than simply having a receptive paper.

Miranda González and Bañegil Palacios [23] the quality of the website *content* is measured by access to relevant information for the users and a website should meet their needs and be updated at least every month. Other

authors [9] [23] [26] also consider that the Institution contact information or who built the website should be in the beginning of the page in order to establish feedback from the user.

For Pinto Molina [28] content must be accurate, clear, legible, properly formulated and checked in some way through references. The same author considers that information should be free of any ideological, political or commercial overtones. He concludes that a large percentage of information sent through the Internet has promotional and advertising purposes. Finally, the subjects must be appropriate to the recipients, the user's profile should be detailed when building a website [30] [31].

The third criterion is *Navigation* which, according to Pinto Molina [28] is the ease with which users move through all the pages which produces a website. The site map should appear on the first page [8] so that the users are familiar with the site they navigate by viewing the pages this can be an important tool of the cover site [2]. That is, the user should easily understand where on the website and know how to go to a certain location by always available menu of the website map, the index and the internal search engine (if you are in a site Web large) [9]. The same author believes that the route guidance, the sequence of pages accessed allows the users to know where they are and where they have been, so the site's name and the visible pages are basic requirements for the users to be guided.

Nielson [24] tells us that it's important not to forget the frequent update of the minimum discharge time, such as ease of use and ease to show the return to the home page [18]. The way you access and how you browse the website, the facility to return to the main page and the ease with which it processes the information are important factors for Miranda González and Bañegil Palaces [23].

The fourth criterion is *Access Speed* A site that has many large files causes reduced speed when downloading documents. This factor discourages the user to return to it: "Educational web sites containing many photographs or graphics as well as web sites containing frames may have a large size file" [6].

Miranda González and Bañegil Palacios [23] the speeds of access and response time are very important, because time is always a critical factor. According to the same authors, the access speed can be measured with a timer, but however, this record can be influenced by a number of factors, such as the hardware, time of access, web traffic, and so on. Many of the criticisms made by the Internet users are in relation to the waiting time to download the materials from web sites. It is also possible that the complexity of the programs, the popularity of the Internet, waiting time and delays prevail in relation to the efficiency of the hardware. These "fear" led some users to call and refer to the WWW, such as the World Wide Wait instead of the World Wide Web [15].

The last criterion of Technical and Aesthetic aspects is *Interaction*, where the collaborative tools (Web 2.0) are important for the users, by diversifying their information formats and downloading some content. The interaction with the user regards as writes Carvalho [9] and Marques Graells [21] the possibility of user interaction before the information is available to him, taking the user to enable an animation to be completed, sending, for example, forms, questions and getting feedback from the publisher's educational site. Similarly, the user can fill and check exercises, getting immediate response (e.g. interactive exercises with automatic correction, online games).

## Conclusion

In this paper we have presented a methodological-theoretical to assess some quality criteria for evaluating educational websites which are bad regarding the quality of information in the Internet.

There are a lot of checklist and authors that write about this subject, but in this area we tried to propose ten criteria to assess educational websites to support children studies and give them a role of quality criteria.

To help solve this problem and establish a standard which allows to know if the author's educational websites are making good use or not of the technology established and its impact on web technologies.

Among other purposes, this proposal aims to put in the hands of professionals of the educational information, a methodology that allows them to identify which methods and strategies are the best to ensure that their information reaches their users properly and to assess the quality of websites.

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