Digital Inclusion Challenge for People with Disabilities: analyzing Accessibility in Blogs

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Abstract: This article is based on the assumption that on-line socialization favors autonomy of People with Disabilities (PD) while stimulating their social-cognitive development. Taking into account the growing popularization of Web 2.0 tools, which favor the on-line socialization, this work aims at verifying the digital accessibility on blogs. As an analysis criterion, we used the digital accessibility principles established by the programs daSilva, Hera and Examinator on web portals and sites which display blogs and also on the blogs generated by these web sites. We believe that the diagnosis of digital accessibility on blogs is a first step to identify socialization patterns on them, the object of our research, and thus, propose measures to revert this scenario.

Keywords: Digital Accessibility; Blogs; People with Disabilities; On-line socialization.

1. Introduction

We believe there is socialization potential in the use of Information and Communication Technologies (ICT) for the enhancement of social-cognitive development of PD, and these tools can be adopted as digital inclusion practice. If the use of computers in education is capable of favoring this process, in the case of a PD this is a resource which favors life, according to Schlünzen (2005), since it is a communication, production, construction and diagnosis means, among others.

In a previous article (Montardo; Passerino, 2007), when trying to establish a relation between the concepts of social and digital inclusion, we criticized official Brazilian documents which deal with inclusion as a form of invitation and we also criticized authors who understand inclusion as merely overcoming exclusion (understood as the lack of material resources) from a dual point of view (inclusion as the opposite of exclusion).
In this way, Ladeira and Amaral (1999) offer a more coherent definition, conceiving it as a process which lasts for the entire life of an individual and aims at improving his/her lifestyle. For Sposati (2006), inclusion focuses on searching for the access to four basic utopias: income autonomy (capacity to supply the vital, cultural and social necessities of an individual), human development (a condition in which individuals inserted in society can develop their intellectual and biological capabilities in such a way that every individual can reach the maximum possible degree of human development), equity (guarantee of equal rights and opportunities, respecting human diversity) and life quality (the democratization of access to conditions for the preservation of men, the nature and the environment and the reduction of environmental degradation). In order to do so, according to Azevedo and Barros (2004), it is necessary to have a redistribution of social and technological wealth among citizens. Thus, digital inclusion is one of the facets of social inclusion and is defined by Sampaio as “the right to access to the digital world for intellectual development (education, knowledge extension, participation and creation) and for the development of technical and operational capacities” (Sampaio apud SPIGAROLI et al., 2005, pp. 213-214). In other words, more than simply having access to computer networks, the individual needs to be capable of autonomously operating them. And it is exactly at this point that digital accessibility becomes a necessary requirement, although not sufficient, to guarantee digital inclusion of People with Disabilities (PD), aiming at a more important benefit: social inclusion.

2. Socialization in virtual communities by means of blogs

Although there is a significant number of approaches to virtual communities, it is possible to say that all of them agree about the fact that a virtual community refers to a group of people with similar interests who communicate with a certain frequency by computer (Rheingold, 1993). Taking into account the fact that our study aims at verifying digital accessibility on blogs, it is important to select an approach which highlights the support in which communication mediated by computer takes place. We shall talk about blogs afterwards.

Jones (1997) distinguishes the virtual community from the medium (support) in which it is established using the concept of virtual settlement. According to the author, the virtual settlement is a defined place in the cyberspace in which people meet to develop relationships. Such places can be chat rooms, discussion lists, Orkut\(^1\), Flickr\(^2\), Twitter\(^3\), and the instantaneous messengers (MSN, Google Talk).

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1 Available at http://www.orkut.com.
3 Available at http://www.twitter.com.
However, the mere existence of such media does not imply the existence of a virtual community.

Among the characteristics of the virtual settlement, Jones (1997) proposes: 1) minimum level of interactivity (isolated blogs by authors who do not communicate are not a virtual settlement, as well as many people who are in Orkut but do not exchange scraps, for instance; thus, in both cases, there is no virtual community); 2) variety of communicators (people who interact on the virtual settlements); 3) a virtual and common public space (tool on which the relationship can be established, such as Orkut, blogs or Flickr, for instance) and 4) minimum level of permanent association (people who exchange messages only once by the MSN, for example, do not make this support a virtual settlement and thus, will not constitute a virtual community from this tool).

According to Thompson (2006), the first blog, Links.net, was created by the student Justin Hall, in 1997. According to Blood (2006), when they first came out, blogs were filters for the Internet content and consisted of links and hints about websites which were not well known and it was also a communication means for subjects related to various subjects. From the very beginning, blogs had parallel functions: expressing the feelings and opinions of their owners by the Internet and giving hints about the Internet itself.

Until 1999, the number of blogs was not significant. Their outburst happened from this year on, when Pitas⁴, the first tool for the creation of blogs, came out. In the same period, Pyra⁵ was launched, and later, Blogger⁶ and Groksoup⁷. In April 2007, the web site Technorati⁸ traced more than 70 million blogs. Its report also shown that the blogosphere increased from 35 to 75 million blogs in 320 days, and, on average, 120 thousand new blogs are created every day and 1.5 million postages are included per day, which means 17 postages per second.

On combining the concept of virtual settlement, by Jones (1997), and the concept of mutual interaction, according to Primo (2005), Recuero (2003) relates blogs and virtual communities based on an empiric study. Recuero (2003) proposes that webrings are established, which means a network of relationship among blog authors based on the tools for comments and on the postages on the blogs. In a later study, Recuero (2004) concludes that “blogs would, therefore, work as a virtual settlement for the webrings and, at the same time, as an interaction ground and as an individual space, as if every individual could have the chance to build his/her own virtual ‘living room’” (RECUERO, 2004).

In order to analyze the conversation on blogs, Primo e Smaniotto (2005) takes into account not only the linguistic resources, but also the technological ones. The

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⁴ Available at http://www.pitas.com
⁵ Available at http://www.pyra.com
⁷ Available at http://www.groksoup.com/
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(2005) lists the technological resources on blogs as: comments (tool which allows commenting the content of a postage included by the author of the blog), the trackback (activated when there is a postage to indicate, by means of a link to it, that this postage is being commented on another blog), the permalinks (every postage has its own link, which means that through this link it is possible to get to the postage without navigating on the initial page of the blog) and the blogroll (a list of links to other blogs).

It is understood that in the context of usage of such tools, observing the linking patterns among blogs is extremely important, since it helps visualizing a route of links among them and thus, it may be possible to infer the existence of a community around a certain subject. However, links are not important for this work as they were proposed by Marlow (2004), cited by Primo e Smaniotto (2005), who takes into account a quantitative criterion of links to inform the authority of blogs. As for it, the development stage of Semantics Web demonstrates that the authority criterion based on links is not sufficient to provide satisfactory analysis of content on the web, being more aligned to mass culture logics, which refers more to a determined audience than to specialized niches.

Bowker and Tuffin (2003) contradict the initial effort to establish similarities between the socialization on-line and off-line, trying to legitimate the first and to assure the importance of focusing on what happens in a different way, regarding this issue, in these environments. The authors (2003) state that the participation in on-line forums allows deficient people (physical and sensorial ones) to take part in the social world without necessarily exposing their physical appearance or their stigmatized identity. Bowker and Tuffin (2003) noticed the potential and the consequences for PD who take advantage of the anonymity provided by the IRC to experiment some kind of subjectivity which does not include any type of stereotypical reaction to their physical or sensorial condition. The continuation of this study will concentrate on the study of blogs of relatives of PD and of the ones who reveal themselves as PD in these types of support.

We would like to highlight that the verification of the digital accessibility on blogs is a sine qua non condition for the study of the socialization of PD on these supports.

3. Digital Accessibility

When the concept of accessibility was first introduced, it was connected to physical issues related to access facilities (architectural barriers) and to physical and professional rehabilitation. Afterwards, it was applied to informatics, specifically concerning the access to the web. Then, throughout the 40’s and the

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9 One of the projects of W3C for the web which will enable the representation and search of knowledge through computers.
60’s, the term started to be specifically applied to functional and physical issues. But it was from the 60’s on that the issue of accessibility and the elimination of architectural barriers became internationally prominent and also became a goal for all the developed countries and also for the developing ones. In this period, the concept of Universal Design also came out and was applied to attempts to conceive design which could be adaptable to all the various needs of the population. In the 90’s, when Internet and virtual communities became popular in the USA, it is possible to notice the need to provide the same universal access to the web, based on the construction of accessible virtual environments. In this way, two worldwide pools, W3C (Web Pool) and WAI (Initiative to Accessibility on the Web) are the two main organizations which are responsible for the popularization of the term from the end of the 1990’s on, when Internet, specifically the web, became more expressive and these organizations established standards and protocols which should be followed by computer systems in order to be considered accessible.

Accessibility “represents to our user, not only the right to access the information network, but also the right to eliminate barriers, such as: architectural, communication availability, physical access, suitable equipment and programs, content and presentation of information in alternative formats” (Acessibilidade Brasil, 2006). For Granollers (2004), (digital) accessibility means providing flexibility to adapt to the needs of each user and to his/her preferences and/or limitations. Conforto and Santarosa (2002) consider accessibility (to the web) [...] as a synonymous of approximation, a way to make it available, for every individual, interfaces which respect their needs and preferences [...]. Many times the discussions about accessibility are reduced to physical or sensorial limitations of the individuals with special needs, but these aspects may bring benefits to a higher number of users, allowing that all knowledge available on the Web can be accessed by a bigger audience without causing any harm to its graphic or functional characteristics. (CONFORTO; SANTAROSA, 2002: 92-94).

It is important to highlight that digital accessibility can only be provided by means of a combination between hardware and software which offers mechanisms to overcome barriers of perception and of access to functions and information, because “accessibility aims at the usage conditions, at how the user faces interactive interfaces, at how such an exchange may happen and mainly at how the user will access the available information” (PASQUALOTTI, PASSERINO, 2006).

Considering accessibility to the web, W3C established a series of criteria which must be followed by the site developers in order to guarantee accessibility to people with any kind of special need, considering these needs divided into four groups: visual, auditory, motor and cognitive. The function of these criteria is to guarantee accessibility, considering that the users may not be able to see, hear or move, may have difficulty in reading (regarding reading comprehension), may need specific equipment to navigate, such as an adapted mouse or keyboard, may
have poor quality internet access (inferior to what is required to access graphic representations and animations or videos from the page), may not speak or understand fluently the language in which the documents are written, may have different versions of navigators or operational systems, among other possible problems of access (W3C-WAI, 1999).

According to W3C-WAI, the most frequent causes for the lack of accessibility to Web pages are associated to the lack of structure on the pages, which make the user disoriented and the navigation difficult, and to the abusive use of graphic and dynamic information (images, maps of images, macro tables, Java scripts, Flash animations, among other multimedia elements) without offering alternative medias to users with some kind of special need.

People with special needs present functional debilities which may be organized in four categories: 1) visual deficiencies which can make reading difficult if the text is written in short font or in a specific color or if it may require special technologies; 2) auditory deficiency which can make it difficult to listen to or recognize audible signs, such as some kinds of alerts; 3) motor deficiency which may affect the capacity of using peripheral devices, such as the keyboard and the mouse; 4) several forms of cognitive deficiency, including perception differences and language deficiency (Conforto, D. & Santarosa, 2002).

To fulfill such needs, the accessibility principles were developed in order to guide every person who wants to create some kind of content to the web. These criteria meet two aspects: ensure harmonious transformations when other programs, such as screen readers, are activated to help the user and make the content easy to understand and to be navigated.

The accessibility criteria are available on the W3C-WAI website (1999) and should be applied only to information which is considered relevant for the understanding and/or navigation. By means of a set of rules, the software evaluate the website accessibility level, generating detailed reports divided into three levels of priorities: 1) Priority 1 are points which must be completely fulfilled by designers of web content; in case these points are not met, one or more groups of users will be prevented from accessing information from the document; 2) Priority 2 regards points which should be fulfilled by web designers; if they do not do so, one or more groups of people may have difficulty in accessing information from the document; 3) Priority 3 refers to points which web designers may fulfill; if they do not do so, one or more groups of people may face some difficulty in accessing information from the document.

The complete description of these criteria and points of verification may be found in many web sites, but the ones from W3C-WAI are indicated as regulation (http://www.w3.org/TR/1999/WAIWEBCONTENT).

In order to validate all these criteria, it is possible to perform a manual evaluation of the website or page or perform it by means of automatic tools\(^\text{10}\). The automatic methods are generally fast but it is not possible to guarantee all the

\(^{10}\) Bobby, Da Silva, Hera..etc.
accessibility aspects. Because of this, even when using automatic evaluators, it is advisable to complement the evaluation with personal checking which will try to analyze specially semantic aspects related to content, language and how easy it is to navigate.

4. People with Special Needs and the implications for the social inclusion via digital accessibility

Fonseca (1995) defines People with Special Needs (PSN) as being people with physical and mental limitations which affect behavioral aspects but do not prevent them from developing capacities which may help them to complement such limitations.

According to data from the last census (IBGE, 2000), there are approximately 24,600,256 people, out of approximately 170 million people in Brazil, who suffer from some kind of deficiency (motor, mental –permanent-, tetraplegy, visual, auditory and emotional). Among these people, only 2,850,604 are children and youths (up to 17 years old).

The deficiencies may be classified into: sensorial, motor and of locomotion, cognitive, of communication and behavioral and emotional. Among the sensorial ones, there is the visual deficiency which may be total (blindness) and the so-called low vision, which allows distinguishing shapes, colors and lights. The other sensorial deficiency is the auditory one. The auditory deficient is considered to be the person who has totally lost the hearing capacity (deaf) or suffered only a partial loss of it.

No matter which is the deficiency, when considering digital inclusion, it is necessary to search for solutions that promote autonomy and the development of People with Special Needs (PSN), without focusing on the deficiency, but on the consequences that such a deficiency causes in terms of sociability and development. In this way, ICT must be instruments for the inclusion in projects for social inclusion which focus on the individual in action within society. Warschauer (2006) states that only digital inclusion projects which are connected to the social systems to which they are targeted tend to be successful and, as a result, these projects can be improved and there may be generation of technology.

Thus, promoting social inclusion via the use of ICT means “focusing on the transformation and not on technology” by questioning the dual idea of digital inclusion and exclusion, since there are different levels of digital inclusion. Facing this issue, the author (2006) systematizes these resources into: physical resources (computers and connectivity), digital resources (digital material which is available on-line in terms of content and language), human resources (literacy and education for the use of informatics and on-line communication) and social resources (community, institutional and social structures which support the access to ICT).
These resources are employed as contributors to access ICT and thus, access, adapt and generate knowledge favoring a virtuous circle to enlarge and motivate new resources in this area.

IT may help people with physical deficiencies to overcome mobility problems, physical limitations and social discrimination and every type of technology influences the structuring of human relationships, “the real objective of IT is restructuring human communication and relationship” (WARSCHAUER, 2006: 279).

5. Analysis of digital accessibility on Portals/Sites which display Blogs and on Blogs

According to Soares (2007), programs for the analysis of accessibility are a kind of software which, through the HTML code of the Web page analyzes its content. This software is normally based on the Accessibility Initiative on the Web by the W3C as stated before.

We used three types of programs in Portuguese to perform the accessibility evaluation on portals/site which display blogs and on the blogs themselves: daSilva, Examinator e Hera. In order to guarantee equity in the evaluation, all the sites were evaluated for the same period in each different program to avoid alterations on the results due to changes in versions. The on-line versions of the programs used were available in May, 2007.

The selection of portals/sites, as well as blogs, was made according to the popularity of the first ones and the subject of the second ones. Regarding the subject, the blogs chosen were the ones which approached difference, diversity, deficiency, etc.

On the following table we have summarized the main results of the analysis (which originally had more than 180 pages) (Bez; Montardo; Passerino, 2007).

Table 1. Summary of the analysis of the digital accessibility in portals/sites which display blogs and on blogs. Subtitles: A (Approved); X (Failed); NA (Not possible to analyze)

<table>
<thead>
<tr>
<th>Portal/Sites which display Blogs</th>
<th>Da Silva</th>
<th>Examinator</th>
<th>Hera</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P 1</td>
<td>P 2</td>
<td>P 3</td>
</tr>
<tr>
<td><a href="http://blog.uol.com.br">http://blog.uol.com.br</a></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><a href="http://blog.terra.com.br">http://blog.terra.com.br</a></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><a href="http://www.ig.com.br/novo_blogs_i_g_temp.html">http://www.ig.com.br/novo_blogs_i_g_temp.html</a></td>
<td>X</td>
<td>X</td>
<td>N</td>
</tr>
<tr>
<td><a href="http://wordpress.com/">http://wordpress.com/</a></td>
<td>X</td>
<td>A</td>
<td>X</td>
</tr>
<tr>
<td><a href="https://www.blogger.com/start">https://www.blogger.com/start</a></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><a href="http://www.blogdrive.com">http://www.blogdrive.com</a></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Blogs</th>
<th>Tempus</th>
<th>Fugit</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
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The main problems identified were: codes with validation errors (syntax errors), language not specified on the page, CSS code with errors, obsolete attributes in HTML, tables being used to organize various elements on the page, pictures without subtitles, links with the attribute “target” (pop-up), among others.

The program Hera could not analyze the Blogger portal since it used the protocol https instead of http as the others did. In the same way, the program could not analyze IG and “Diferentes Diferenças” blog portals. From the portals/sites analyzed, according to daSilva program, the one which presented a smaller quantity of errors regarding Priority 1 was Blogger, with 10 errors. Regarding Priority 2, the website on this condition was Wordpress, with 5 errors and regarding Priority 3, two portals did not show any error: UOL and Wordpress. According to the analysis by the Examinator program, Wordpress was the one which presented less errors regarding barriers\textsuperscript{11} to accessibility. Regarding

\textsuperscript{11} It analyzes alternative text on the images and alternative contents for iframe and scripts, inlaid elements, manipulation of events and alternative texts on the images. They are factors whose absence limit and prevent access. These factors include aspects such as an inaccessible physical environment, lack of proper support technology. Available at: \url{http://www.cm-evora.pt/gica/conceito.asp#Barreiras}.  

-http://diferentesdiferenças.zip.net
- http://outrosolhares.blog.terra.com.br/
- http://blogsespeciais.blogspot.com/
- http://horaciosoares.blogspot.com/
obstacles\textsuperscript{12} and noise\textsuperscript{13} to accessibility, UOL portal presented the smallest quantity of errors.

On the analysis by Hera, the site Wordpress presented the smallest quantity of errors, which were seven out of 232 elements. Portal Terra comes after, with eight errors out of 198 elements which were analyzed. Both Wordpress and Portal Terra received a suggestion to verify 37 points manually.

Among the blogs analyzes by daSilva, the smallest quantity of errors was found on the blog: “Acessibilidade: ou seu site tem ou não tem. Padrões Web com Mandioca e Strogonoff” and on the blog “Blogs Especiais”, with four errors in Priority 1. In priority 2, the blog “Blogs Especiais” had two errors. However, in Priority 3 all the blogs had one error.

According to Examinator, the blog “Outros Olhares” was the one which had the best performance. However, regarding the barriers to accessibility, the blog “Acessibilidade na Web: Custo ou Benefício?” was the best one and regarding the obstacles to accessibility, the blog “Acessibilidade: ou seu site tem ou não tem” was the one with highest quality. The blogs “Horácio Soares” e “Acessibilidade: ou seu site tem ou não tem. Padrões Web com Mandioca e Strogonoff” were the best ones regarding the quality of noise to accessibility.

From the blogs analyzed by Hera, the one which presented the smallest quantity of errors was “Blogs Especiais”, with six errors, followed by the blog “Acessibilidade: ou seu site tem ou não tem. Padrões Web com Mandioca e Strogonoff”, with eight errors.

In a general analysis, the site Wordpress was ranked best regarding accessibility and among the blogs, the ones with the smallest quantity of errors were “Acessibilidade: ou seu site tem ou não tem. Padrões Web com Mandioca e Strogonoff” and “Blogs Especiais”.

5. Final Considerations

Digital accessibility is a crucial point in any project envolving the web. Publishing the criteria for digital accessibility, as well as the analysis here proposed, aim at raising consciousness among the scientific community and the citizens, in order to develop works for the digital inclusion in wider and more democratic ways. The lack of accessibility in blogs limits socialization of PSN on these tools and thus,

\textsuperscript{12} It analyzes the declaration of the type of document/syntax, the validation of the sheet codes style CSS, (X)HTML version, usage of headings, declaration of the type of document/syntax, page title, obsolete elements and attributes, usage of tables to model the page (table-layout), destination of links Summary/Summaries on the tables of data.

\textsuperscript{13} It identifies the main language on the page, group links, information about related documents, abbreviations on the headings cells, Summaries on tables of data, ways to skip groups of links, use of accesskey, heading in tables of data.
their inclusive potential, since socialization cooperates with the autonomy of these people.

It is necessary to highlight that the results obtained in this study were not surprising because, in general, we expected to find some kind of negligence regarding the treatment of PSN on the web. It was already known that discourse substitutes actions in terms of digital accessibility in this market. Thus, it is important to point out that if the big Brazilian portals do not guarantee digital accessibility, we can have little hope on individual blogs which are, many times, hosted by these non-accessible portals. In this way, the blogs themselves depend on a more complex structure which does not aim at digital accessibility.

However, when searching for PSN blogs with search engines, the number of occurrences is expressive, either having PSN as authors or their families. Such occurrence does not invalidate the results obtained in this study, which have to be taken into account when we select the sample of blogs to be analyzed according to the type of special need, but it serves as an alert when we consider the people who could be part of it but are prevented from it due to the lack of digital accessibility of these tools.

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