Digital libraries in the context of human development: the case of Brazil

Timothy Aaron Thompson (University of Miami) - t.thompson5@miami.edu

Resumo:

To date, relatively few studies in English have focused on the growth of digital libraries in the developing world. Brazil provides an apt case study for examining the evolution of digital initiatives in the context of a developing country. Assumptions about the goals and content of digital projects in developed countries may not be applicable to the socioeconomic context of developing countries. In North America and Europe, for example, the early days of digital library development were dominated by cultural heritage projects. In Brazil, however, the need to implement sustainable, scalable systems for scholarly communication led to a different set of priorities. As a result, a culture of open access to information has come to define the outlook of Brazilian digital library administrators. In-depth interviews with 21 project managers from 13 digital libraries in Brazil provide a basis for exploring the social relevance of digital libraries in the context of human development.

Palavras-chave: *Brazil. Digital libraries. Human development. Interviews. Qualitative research.*

Área temática: *Temática III: Bibliotecas, serviços de informação & sustentabilidade*

Digital libraries in the context of human development: the case of Brazil

Abstract:
To date, relatively few studies in English have focused on the growth of digital libraries in the developing world. Brazil provides an apt case study for examining the evolution of digital initiatives in the context of a developing country. Assumptions about the goals and content of digital projects in developed countries may not be applicable to the socioeconomic context of developing countries. In North America and Europe, for example, the early days of digital library development were dominated by cultural heritage projects. In Brazil, however, the need to implement sustainable, scalable systems for scholarly communication led to a different set of priorities. As a result, a culture of open access to information has come to define the outlook of Brazilian digital library administrators. In-depth interviews with 21 project managers from 13 digital libraries in Brazil provide a basis for exploring the social relevance of digital libraries in the context of human development.

Keywords: Brazil. Digital libraries. Human development. Interviews. Qualitative research.

Thematic area: Temática III: Bibliotecas, serviços de informação & sustentabilidade

1 Introduction

The development of digital libraries in Brazil can be divided into roughly three phases. The first phase of digital library development (1995–2002) saw the creation of major initiatives in the area of scholarly communication; funded by state and federal agencies, they helped establish a strong commitment to open access academic publishing in the country (CUNHA and MCCARTHY, 2006). During this period, digitization projects involving special collections or archival material tended to be smaller, less frequent, and less integrated, a trend that differed from the dominant pattern in North America and Europe, where cultural heritage collections were a predominant presence in digitization projects from the early days of the Internet (DALBELLO, 2008). The second phase (2003–2006) represented a transitional period marked by the growth of open access institutional repositories as well as in-house and commercial solutions for digitization and project management. Finally, the third phase (2007–present) has signaled a new turn toward special collections, archives, and integrated access to digital resources in the arts and humanities (THOMPSON and MCCARTHY, 2012).

The primary objective of this study is to provide an overview of the current state of digital libraries in Brazil, focusing on a core group of 13 initiatives. What are the characteristics of these initiatives? Who is responsible for managing them? How did they develop, what do they have in common, what sets them apart, and what challenges do they face? Why were they created and what communities were they intended to serve? These questions will be explored in the context of human development. In the field of development studies, the human development approach is one that stresses overall quality of life as an indicator of development. Whereas traditional views of development tend to measure "progress" according to economic indicators, such as a country's gross domestic product (GDP), the human development approach emphasizes the importance of enlarging people's "substantive freedoms" and their power to choose (SEN, 1999, p. 3). One of the basic components of this approach involves full, open access to information and knowledge.

Dalbello, in detailed studies focused on North America (2004) and Europe (2008, 2009), examined the role of digital libraries as new vehicles for preserving a country's cultural memory. Dalbello's analysis placed a premium on the role of culture as the *sine qua non* of national digital initiatives. The same level of attention, however, has not been given to the digital libraries of developing countries. Does Brazil's socioeconomic context play a decisive role in determining the mission and content of its digital libraries? What are the opinions of Brazilian digital library administrators and project managers regarding questions of social relevance? Are the goals of human development seen as important to digital library administrators in Brazil? A study of Brazilian digital libraries serves to test and potentially qualify Dalbello's emphasis on the centrality of culture in digital library development.

2 Methods

This paper reports the results of a primarily qualitative study of Brazilian digital libraries carried out from October to December of 2011. Semistructured interviews (ranging from one hour to 90 minutes) were conducted with 21 administrators and project managers from 13 digital libraries in Brazil. The projects included in the study

varied widely in size, complexity, and rates of usage. Some respondents questioned the term “digital library” itself, since it was taken to imply a direct comparison to a physical library, a comparison that did not reflect their understanding of the institutional context of their work. For the purposes of this paper, however, the terms digital library, digital project, and digital initiative will be used interchangeably. The study’s working definition of “digital library” is borrowed from Toutain (2006):

> A library whose informational content consists of full-text digital objects—books, periodicals, dissertations, images, videos, and so on—that are stored and made available, through standardized processes, on dedicated or distributed servers and accessed via computer networks. (p. 16)[1]

The projects included in the study were drawn from a preliminary list of 26 digital initiatives. Although far from exhaustive, this list included a range of large and small projects from a variety of Brazilian institutions. All interviews were conducted in Portuguese and took place in person on the premises of the institution or organization responsible for the digital library. The interviews were digitally recorded and transcribed for analysis, totaling a combined 15 hours of recorded content. Participants were asked to respond to a series of 12 questions, providing project-related information and offering their opinions about the general social relevance of digital libraries in Brazil.

To complement the interviews, the study also included a quantitative aspect. Participants were asked to complete two questionnaires: one soliciting basic demographic information and another requesting detailed technical information about their digital project, covering topics such as software, digitization workflow, usability, and copyright. Most demographic questionnaires were returned at the time of the interview. Technical questionnaires, which were open to input from the entire project staff, were returned by electronic mail at the convenience of the respondents. Respondents’ ability to complete the technical questionnaire varied greatly depending on their access to specific technical information about the project. This variance points to a gap in technical support that also emerged as a theme during the

[1] All translations from Portuguese, including interview quotations, are by the author.

interviews. A sufficient number of questions were answered by all projects, however, to allow for comparison on certain points.

Previous discussions of Brazilian digital libraries have focused on listing and describing current projects or providing a general overview of the digital library landscape (Cunha & McCarthy, 2006; Rosetto, 2008). The current paper represents what may be the first attempt to present original, first-hand research on the development and management of digital libraries in Brazil. Although the study's small sample size potentially limits its ability to generalize about Brazilian information professionals or digital libraries, it can still be seen as representative of the range of digital libraries currently active in the country. The study's overall objective is to provide a baseline that future studies of Brazilian digital libraries can build upon. Subsequent research is needed to improve on the study's methodology and expand its sample base to include additional digital initiatives. Because the study focused solely on project managers, further research is needed to examine the perspective of Brazilian digital library users as well.

3 Findings

3.1 Participant profile

Of the study's 21 participants, 47.6% were male, 52.4% were female, and 61.9% were age 40 or older (see Table 1). Six interviews were conducted with a single participant, six with two participants, and one with three participants. The job titles of 14 participants (66.7%) included terms such as coordinator, director, or chief, indicating primary administrative responsibility for the digital library in question. The six single-participant interviews were conducted exclusively with administrators; one interview was conducted with two participants who indicated shared administrative responsibility; and the remaining six interviews were conducted with administrators and additional participants whose job titles reflected other management roles in the project.

Table 1 – Participants by Age and Sex (*N* = 21)

Age	**Men (n = 10)**		**Women (n = 11)**		**Total**	
Under 40 (n = 8)	19.05	%	19.05	%	38.10	%
40 and Older (n = 13)	28.60		33.30		61.90	
Total	47.65	%	52.35	%	100.00	%

All participants reported having an undergraduate degree, with an average graduation year of 1992 (*SD* = 13.20). Library science (including degrees in documentation) was the most common undergraduate field, accounting for just under half of all participants (48%). An academic degree beyond the undergraduate level was reported by 17 participants (81%): seven had completed a specialization, which is a course of study that includes management and professional degrees such as the Master of Business Administration (MBA); 10 held a master's degree; and seven held a doctoral degree. Across all degrees, a total of 17 different academic fields was reported. History and library science accounted for 47% of all degrees, although the number of individuals holding library science degrees (n = 11) was nearly triple the number of those holding history degrees (n = 4). The average of 2.33 degrees per participant (*SD* = 0.91) reflects the overall level of educational attainment of the study population.

Two participants with library science degrees indicated prior professional experience with digital initiatives; for the remaining nine librarians, the current project represented their first experience with digital library development (although two also described having previous technical experience with databases or electronic resources). Participants with library science degrees were chiefly responsible for seven of the 13 projects in the study (53.8%), whereas the remaining six projects (46.2%) were not overseen by librarians. Of these six, participants reported that librarians were involved to varying degrees in four projects (30.8%), whereas two initiatives (15.4%) had no librarian involvement.

The 10 participants who did not also hold a degree in library science represented a variety of academic and professional backgrounds: computer networks, engineering, history, law, linguistics, literature, marketing, psychology, public administration, sociology, and urban planning, with all 10 holding at least one

degree (including specializations) beyond the undergraduate level. Six of these 10 participants held doctoral degrees, three of which were in the field of history. One participant reported prior experience with a digital initiative, whereas the remaining nine indicated that their experience with digital libraries had begun with the current project (of these participants, one also indicated prior technical experience as a systems analyst). The projects represented by these participants were somewhat more likely to involve cultural heritage collections, as the presence of historians might suggest: four cultural heritage collections were managed by this group, compared to three in the group of projects directly overseen by librarians.

For both groups, the average time participants had spent working on the digital project in question was over four years (M = 4.43, SD = 3.49). The librarian group displayed greater variance (M = 4.71, SD = 4.86), with two participants reporting over a decade of experience and two reporting a year or less. Participants in the nonlibrarian group were closer to the average (M = 4.15, SD = .81).

The heterogeneity of academic backgrounds among the study's participants may be a reflection of the disciplinary diversity of the digital libraries field in general: those responsible for digital projects or special collections are often expected to have a background in project management or expertise in a relevant subject area (CHOI and RASMUSSEN, 2009). It may also suggest that there is a shortage of qualified librarians prepared to take leadership roles in Brazilian digital projects. In the U.S. context, a similar shortage of digital librarians has been described by Tennant (2002), Choi and Rasmussen (2006), and Thomas and Patel (2008). For Brazilian students pursuing an undergraduate degree in library science, opportunities for specialization in digital libraries have been limited (MÁRDERO ARELLANO and CUNHA, 2004). Academic courses related to digital libraries are offered primarily at the graduate level as part of master's programs in information science, and the majority of Brazilian universities have yet to develop digital library programs, although many have implemented open access institutional repositories in recent years (CUNHA and MCCARTHY, 2006).

In a profession that is being transformed by rapid technological change, curricular standards must be constantly updated in order to keep pace with new developments. As Márdero Arellano and Cunha (2004) stated, "The success of digital

libraries in Brazil will depend to a large extent on the existence of human resources, both in quantity and quality." This statement is also relevant to the current curricular structure of archival studies and museum studies in Brazil, which, like library science, are primarily undergraduate fields. As separate undergraduate careers tracks, the disciplinary divisions separating these three fields are particularly pronounced—which tends to make interdisciplinary collaboration among them less common. In the present study, five of the seven projects led by individuals with library science degrees were also managed within libraries (the remaining two were hosted by a university and an NGO, respectively). This would seem to suggest that institutional and disciplinary boundaries tend to limit the activity of Brazilian librarians, making them less likely to be actively involved in the implementation of digital initiatives outside the context of traditional library services.

3.2 Project profile

The 13 digital projects in the study represented a range of institutional identities: archives, government agencies, libraries, museums, nongovernmental organizations (NGOs), and universities. Regarding the content of their digital collections, there were three primary areas of activity: cultural heritage, government information, and scholarly communication (see Table 2). The study's government information projects posed somewhat of a special case because they incorporated aspects of both cultural heritage initiatives and institutional repositories: although each of the three included legal and academic publications produced by members of its parent institution—and so could be placed in the scholarly communication category—each had also invested in rare book digitization or online exhibitions. The study sample also reflected the current geographic distribution of Brazilian digital libraries, which are largely concentrated in the Brasília–Rio de Janeiro–São Paulo triangle: four projects from each of these urban areas responded to the invitation to participate in the study. One project from a city in Northeast Brazil, a region that has historically seen less investment in technology and infrastructure, also participated in the study. Table 2 (below) provides a detailed profile of the study's 13 digital projects.

A distinction should be drawn here between a project's primary institutional identity—the identity of its parent organization—and its secondary identity, if managed by a subsidiary unit or third party. In Table 2 the institutional category of library, for example, is used to refer only to standalone libraries that served the general public directly, in contrast to academic or special libraries that served the needs of a parent organization. This distinction is most relevant regarding three of the four digital projects hosted by government agencies: although technically managed within libraries, much of their content was either produced by or designed to meet the information needs of internal users. The distinction also applies to projects that relied on vendors to manage and implement their digital libraries. One of the two "library" projects, for example, worked with a single vendor that was responsible for all aspects of digital library development. Likewise, one of the university projects was institutionally affiliated with a university, but its digital library was developed by an ensemble of three different vendors (the participants from this project represented the vendor responsible for textual editing and overall project coordination).

Funding (and instability of income from year to year) was a major concern for many of the digital libraries in the study. Only two projects (numbers 2 and 9) reported having their own budget. Other projects were either funded internally by their parent institution (as in the case of government agencies) or depended on a variety of sources of funding, primarily from the public sector.

Table 2 – Profile of digital libraries (*N* = 13)

Digital library	**Launch year**	**Primary institutional identity**	**Primary area of activity**	**Primary sources of funding (past and present)**	**Location (state)**	**Number of items**	**Staff***
1	1998	Library	Cultural heritage	MinC	Rio de Janeiro	24,100	5
2	1998	NGO	Scholarly communication	Fapesp, CNPq	São Paulo	190,599	35
3	2002	University	Cultural heritage	CNPq, Grupo Santander, Internal (public)	Paraíba	459	4
4	2002	Government agency	Scholarly communication	Finep, Internal (public)	Distrito Federal	173,707	5
5	2003	Library	Cultural heritage	Fapesp, Petrobrás, BNDES, MinC, Harvard University	São Paulo	4,711	NA

6	2004	Government agency	Government information	Internal (public)	Distrito Federal	36,611	18
7	2006	Government agency	Government information	Internal (public)	Distrito Federal	211,941	5
8	2007	Archive	Cultural heritage	Fapesp, BNDES, Casa Civil, FDD	São Paulo	40,000**	NA
9	2008	NGO	Scholarly communication	Internal (private)	Rio de Janeiro	41,498	5
10	2009	University	Cultural heritage	Fapesp, FDTE, Internal (public)	São Paulo	3,020	33
11	2009	Government agency	Government information	Internal (public)	Distrito Federal	1,519	3
12	2010	University	Cultural heritage	MEC, Faperj	Rio de Janeiro	120	NA
13	2010	Museum	Cultural heritage	IBM, MinC, FDD, Sociedade de Amigos	Rio de Janeiro	1,745	7

* Staff total includes full-time, part-time, and interns.
** The total of 40,000 items is a rough estimate based on a reported total of 400,000 individual image files (rather than digital objects).

4 Opinions about social relevance

Participants were asked to reflect, generally, on the impact of digital libraries on human development and, specifically, on the social relevance of the projects they were responsible for managing. They described the content of their digital libraries as being primarily relevant to the academic community. Several participants were also interested in appealing to high school students or members of the general public, but the majority viewed their projects as providing resources that would be relevant to researchers. Brazil's context as a developing country did not seem to influence the kind of information provided by the digital libraries in the study, but it did seem to affect the ways in which the issue of social relevance was framed. The principle of providing open access to knowledge was closely linked to participants' views of social relevance and human development. One participant pointed to the social role of digital libraries in reducing inequality and overcoming geographic barriers on a local level:

> There are people on the outskirts of the city of São Paulo who take two or three hours to get downtown. When we digitize these collections, we'll be

> seeing to it that these people no longer have to make a trip downtown to obtain information.

This view was affirmed by a second participant, who framed it as a national issue:

> [This project] is tremendously useful. You're breaking down barriers. We have to remember that this is a country of continental proportions. We're eliminating geographic barriers. One way or another, we're making it possible, especially for regions where access is more difficult, [...] we're helping make Brazil more interconnected.

Some highlighted the role of digital libraries as efficient delivery mechanisms for local content—content that, otherwise, might have no way of reaching potential users:

> I think it's a way to facilitate and disseminate this knowledge, to share something with people that they wouldn't otherwise have access to, or would have great difficulty in accessing, or wouldn't even know about, right? They wouldn't even know about what we have here. [...] We receive a lot of positive feedback, e-mails with positive feedback. People from all over Brazil, from places you wouldn't even imagine, have contacted us to say, "Hey, I'm connected. I'm preparing for a civil service exam. I used it in an assignment".

Others echoed this sentiment, placing it within the context of Brazil's overall information landscape: the absence of quality public, school, and university libraries was seen as making digital library services all the more relevant. The director of a scholarly communication project emphasized the historical and cultural factors that had served to accelerate the obsolescence of physical libraries in Brazil:

> I believe that virtual libraries are extremely important in a country where there are basically few public libraries in general, except in big cities. Or at least outside of big cities, there are few quality public libraries. This is a country that has really grown in the last 20 years in terms of new universities, the majority of which have low-quality libraries. And what's more, with a reading culture that's miniscule and limited. If you go to a university, you won't see many people at the library. [...] If you go to a U.S. campus, the library is still a place of study. On Brazilian campuses, the library is not a place of study. So there are few libraries, of poor quality, and this amplifies, reproduces a culture of not using the library. So, I think the future lies with virtual libraries. There's no

> doubt about it. Even more so in a country like Brazil that lacks real, physical libraries of quality. There are very few.

The manager of one cultural heritage project, however, saw digital libraries as a necessary complement to traditional library services, not a substitute. In this view, digital libraries have a potential role to play in bolstering the social profile and relevance of libraries in general:

> Brazil is a country without libraries. [...] Even in a city like São Paulo, which is a country unto itself, with nearly 11 million inhabitants, there are public libraries, but very few! And they don't see much use. And we tend to lose sight of this horizon. There are projects focused on creating [physical] libraries, and they need to be improved and expanded. We don't believe that our [digital] library competes or should compete with the creation of physical libraries in Brazil. It should serve to encourage reading; it should help draw attention to books, so that people want to visit [physical] libraries as well. [...] Digital libraries are a simplified tool for immediate, broad access to information, and therefore they contribute to human development. And we're committed to aiding in human development. We make books available that are sometimes very rare, very difficult to access. Or sometimes not, sometimes they're difficult to access not because the book itself is rare . . . but because there are people who don't have access to a title because their city doesn't have a library, because the title isn't in their school library, because they're not able to go to the bookstore and buy it because they don't have the money. Whereas here everything is available for free, so long as you have an Internet connection.

This participant's caveat regarding the need for Internet access raises the issue of basic infrastructure: discussions of open access must inevitably address literal, physical access as well. In 2010, 27% of Brazilian households had an Internet connection (INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA, 2010). The government's recently created National Broadband Program aims to increase the figure to 40% by 2014 (MINISTÉRIO DAS COMUNICAÇÕES, 2012). However, the digital divide was not an issue that most participants chose to emphasize directly, although one did make the following observation:

> Today, in Brazil, we're talking a lot about digitization, but the infrastructure for digital inclusion is not advancing. At some point, I think we may run into a bottleneck here. We may start having money to digitize our collections, but then some places will have only low-speed access to them.

The lack of discussion of the digital divide may have stemmed in part from the nature of the projects themselves; their missions, defined by the immediate context of their parent institutions, often lacked clear plans for public outreach or social inclusion.

In this regard, participants were also asked about their use of social networks as a means of interacting with users and publicizing their digital collections. Two digital libraries maintained their own social network accounts: one project was active on both Facebook and Twitter, whereas the other was active primarily on Twitter. Participants from six projects stated that social network accounts were maintained by the communications department of their parent institution, with content from the digital library featured on a regular basis. One project had attempted to maintain its own accounts, but was unable to update them regularly. The lack of human resources was cited as a primary reason for relying on institutional rather than project-specific social network accounts.

Perhaps the central paradox of digital library development in Brazil is that the primary goal of most projects was to expand or facilitate open access to information, but most participants acknowledged having relatively little knowledge about or interaction with actual users. Of course, this is somewhat less true of scholarly communication projects or institutional repositories, whose user populations are more clearly defined—although participants from the latter observed that much of their traffic came from outside their parent institutions. Only one participant (a government librarian) discussed having carried out a formal user study, which focused on users who had registered to receive updates when new items were added to the institutional repository.

5 Conclusion

In Brazil's context as a developing country, the preservation of cultural heritage has not been the main factor driving digital library development, as demonstrated by the chronological precedence of large-scale scholarly communication projects. The need to implement sustainable, scalable systems for publishing academic journals and theses and dissertations, for example, has led to a

different set of priorities in the development of information systems in Brazil. As a result, a culture of open access to information has come to define the outlook of digital library administrators in the country. This strong commitment to open access stands in contrast to the for-profit model of academic journal publication that continues to predominate in North America and Europe.

At the same time, however, Brazil presents a complex case because its digital libraries have been shaped by the country's social context only in part: they are not explicitly oriented toward addressing socioeconomic inequality or serving users who suffer from information scarcity on a basic level. A potential model for future digital library development may be found in the philosophy of the Brazilian educator Paulo Freire. Extrapolating from Freire (1989), a digital library geared toward human development would be created in close collaboration with local communities, and it would contain resources that responded to the immediate needs of community members in the context of their "dramatically lived reality" (p. 20). The first items to be added to a new digital collection might even be texts produced by members of the community themselves. In the end, the 13 digital libraries examined here did respond directly to the information needs of specific communities, but those communities were institutional communities, defined first and foremost by existing social structures rather than the goals of human development.

To a certain extent, the social relevance of Brazil's current digital libraries is limited by the specialized nature of their content. None of the projects in the study had been designed to meet basic information needs, support community development, or address the country's digital divide directly. This is not to say that they do not perform an essential function: their support of academic research, institutional memory, and cultural heritage is directly relevant to human development, and its importance should not be underestimated. Moreover, the symbolic significance of equitable access to information—particularly when it involves cultural artifacts, traditionally the domain of the privileged few—has particular resonance in the context of Brazilian history. As Suaiden (2000) observed, books were historically viewed as status symbols in Brazil, especially because of their high price: "People would place books in their sitting room to demonstrate that they were knowledgeable and were to be viewed as intellectuals. Owning books was synonymous with having

power and knowledge. Books were to be preserved, not consumed" (p. 55). The question of social relevance is ultimately context dependent. In Brazil, digital libraries do play a leveling role, democratizing knowledge and diminishing the negative effects of cultural privilege.

REFERENCES

CHOI, Youngok; RASMUSSEN, Edie. What is needed to educate future digital librarians? **D-Lib Magazine**, v. 12, n. 9, 2006.

_____. What qualifications and skills are important for digital librarian positions in academic libraries? A job advertisement analysis. **Journal of Academic Librarianship**, v. 35, n. 5, 2009, p. 457-467.

CUNHA, Murilo Bastos da; MCCARTHY, Cavan. Estado atual das bibliotecas digitais no Brasil. *In*: MARCONDES, Carlos H. *et al*. (Org.). **Bibliotecas digitais: saberes e práticas**. 2. ed. Salvador/Brasília: UFBA/IBICT, 2006, p.25-54.

DALBELLO, Marija. Cultural dimensions of digital library development, part I: theory and methodological framework for a comparative study of the cultures of innovation in five European national libraries. **Library Quarterly**, v. 78, n. 4, 2008, p. 355-395.

_____. Cultural dimensions of digital library development, part II: the cultures of innovation in five European national libraries (narratives of development). **Library Quarterly**, v. 79, n. 1, 2009, p. 1-72.

_____. Institutional shaping of cultural memory: digital library as environment for textual transmission. **Library Quarterly**, v. 74, n. 3, 2004, p. 265-298.

FREIRE, Paulo. **A importância do ato de ler: em três artigos que se completam**. 23. ed. São Paulo: Cortez, 1994.

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA. Domicílios particulares permanentes, total e com bens duráveis, segundo as Grandes Regiões e as Unidades da Federação – 2010. Tabela 8.6. **Censo Demográfico 2010 – Resultados Preliminares da Amostra**, 2010. Disponível em: <http://www.ibge.gov.br/home/estatistica/populacao/censo2010/resultados_preliminares_amostra/default_resultados_preliminares_amostra.shtm>. Acesso em: 13 abr. 2013.

MÁRDERO ARELLANO, Miguel Ángel; CUNHA, Murilo Bastos da. Metodologias para o ensino de bibliotecas digitais. *In*: **Seminário Internacional de Bibliotecas Digitais**, 2004, Unicamp, Campinas, São Paulo. Disponível em: <http://repositorio.bce.unb.br/handle/10482/1033>. Acesso em: 13 abr. 2013.

MINISTÉRIO DAS COMUNICAÇÕES. Programa Nacional de Banda Larga (PNBL). **Ministério das Comunicações**, 2013. Disponível em: <http://www.mc.gov.br/acoes-e-programas/programa-nacional-de-banda-larga-pnbl>. Acesso em: 13 abr. 2013.

ROSETTO, Marcia. Bibliotecas digitais – cenário e perspectivas. **Revista Brasileira de Biblioteconomia e Documentação**, São Paulo, v. 4, n. 1, 2008, p. 101-130.

SEN, Amartya. **Development as freedom**. New York: Knopf, 1999.

SUAIDEN, Emir José. A biblioteca pública no contexo da sociedade da informação. **Ciência da Informação**, Brasília, v. 29, n. 2, 2000, p. 52-60.

TENNANT, Roy. The digital library divide. **Library Journal**, v. 126, n. 13, 2001, p. 37-38.

THOMAS, Chuck; PATEL, Salwa Ismail. Competency-based training for digital librarians: a viable strategy for an evolving workforce? **Journal of Education for Library and Information Science**, v. 49, n. 4, 2008, p. 298-309.

THOMPSON, Timothy A.; MCCARTHY, Cavan. Library development in Brazil. In: SHARMA, Ravindra N. (Org.). **Libraries in the early 21st century: an international perspective**. Berlin: De Gruyter Saur, 2006, p.145-182.

TOUTAIN, Lídia Maria Batista Brandão. Biblioteca digital: definição de termos. *In*: MARCONDES, Carlos H. *et al*. (Org.). **Bibliotecas digitais: saberes e práticas**. 2. ed. Salvador/Brasília: UFBA/IBICT, 2006, p.15-24.