Digital Inclusion Initiatives in Brazil: Improving Education and Information Seeking Behavior through Government-Academic Partnerships

by Maria José Vicentini Jorente

Information Professionals in a Globalized World

My perspectives on information issues in Brazil are those of a designer. I graduated from the College of Arts at the Fundação Armando Alvares Penteado (FAAP), in São Paulo, Brazil. During my studies there I became interested in the epistemology of image information – conceptualizing the nature of images and their intersections with words. This interest led me to complete a B.A. in letters at the Faculty of Philosophy, Letters and Human Sciences of the São Paulo University (USP), continuing my exploration of the relations between images and words. Since then, my interest in aesthetic disciplines has always been linked to their applicability in the creation of new objects as information mediators and the belief that these aesthetic objects could bring real benefits to users' lives.

After some years working in the department of education and information dissemination of the Biennial of São Paulo Foundation at the São Paulo Municipal Bureau of Culture in a department responsible for the administration of municipal theaters and schools of arts, and as a university teacher, my interests turned mainly to the informational phenomena mediated by technological apparatus. I was especially interested in the World Wide Web and its influence on information storage, organization, socialization and dissemination through intersemiotical methodologies. I directed my studies to the trans-disciplinary area of information science and developed projects with students and designers seeking to understand technologically mediated information and to model strategies for seeking, recovery, use, reuse, reorganization and transformation of informational objects into knowledge. I am now a doctoral student in the new technologies in information research group within the Information Science program of the Faculty of Philosophy and Science of the Universidade Estadual Paulista (UNESP) in Marília, São Paulo state.

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These experiences put me in a unique position to participate in projects related to the Brazilian government's focus on improving access to and use of information and communication technologies throughout the population. Brazil is a very diverse country, including both a highly educated class and a large number of economically and educationally disadvantaged people. Brazil, however, has been working hard in recent years to bridge the gaps and provide more opportunities to all its citizens, focusing on information and communication technologies in particular. My work on projects related to these programs can provide insight into one aspect of Brazil's information-related environment.

Government Initiatives in Information Communication and Technology

The government of Brazil has elected information and knowledge as its sustainability basis – key strengths on which to build its future development. In 2000, the Information Society Program (also known as the "Green Book" [1]) was launched by the Ministry of Science and Technology of Brazil, aiming to "integrate and coordinate actions to foster the use of information

technologies and communication," viewing social inclusion and competition in the market overall, as well as "investing in the creation of broad empowering that allows citizens to have a role in the production of goods and services, operate with fluency in new methods and tools in their work, and creatively implement the new media." (p. 45)

A follow-up program, outlined in the so-called "White Book" [2], focused on creating "an effective Science, Technology and Innovation National System" and an environment of permanent learning in Brazilian society. These are among the specific goals cited:

- To spread the scientific and technological culture in society
- To broaden access to and use of information and communication technology (ICT) conditions for different segments of society
- To stimulate the use of ICTs in education and toward universalization of access to science and technology
- To encourage media coverage of science and technology information
- To contribute to modernizing and improving the teaching of science
- To promote and support the development of science and technology museums and exhibition (p. 67)

The need for these programs is highlighted by a recent report of the Brazilian Institute of Scientific and Technological Information (IBICT), in which the Brazil Digital Inclusion Map [3] shows that even in São Paulo, the state with the highest number (2,640) of digital inclusion points (DIPs – public spaces for technology access), the distribution of DIPs is very uneven. The city of Marília, for example, with approximately 220,000 inhabitants (of which I am one now, as a citizen and information professional), has only 22 DIPs.

Capacity for Effective Development of Information Technology Strategies

In a country where only about 10% of the population has access to the Internet, it is necessary to reflect especially on what models of information transfer and educational policies civil society can effectively adopt to bring a large part of the country into the information society. Although information science has historically looked for solutions related to the use, storage, flow, transfer and socialization of information, often through the strategies of the information and communication technologies (ICTs), these solutions must always be part of public policies and civil society priorities that support inclusion and minimize inequalities. In order to effectively reach the people, information needs to be organized and delivered according to the specific needs and context of the communities.

The World Wide Web is one of the easiest tools for improving access to and use of information by many people, but it has many of the same challenges as other earlier electronic technologies and networks when attempting to bring these tools to previously excluded populations. These are among the problems:

- Technical: related to the handling of computer, software and Internet-access (underserved populations may not have technical expertise)
- Cognitive: related to the autonomy and independence in the use of ICTs (populations may need assistance for some time before they feel comfortable operating a new technology on their own)
- Economic: related to the financial capacity to acquire and maintain computers and cost for basic software and networks access and maintenance (many people simply don't have the resources)

Schools can play a key role in the routing of educational public policies to support information technology initiatives. Schools are logical places to create the technical, economic and cognitive conditions for students to develop their potential for the study, exploration and production of knowledge, as these institutions have the advantage of being computerized environments already.

If the Brazilian society has truly chosen to make information and knowledge the basis of its future growth, it is important to establish conditions to monitor all aspects of the initiatives or there will be a question as to which inclusive practices will really be implemented. For example, it is not only necessary to expand and facilitate access to information and the production of knowledge and technology in schools, but also to provide the teachers with appropriate training in order to improve the use of these evolving information and communication technologies in their classes. It is also important to train teachers in the practices of providing guidance to students in how to conduct effective information searches in libraries and networks.

In this process of improving the use of information technologies, key concepts must be continuously reevaluated such as transfer of information, information expertise, information digital inclusion and learning, and knowledge management. Social and personal behavior among groups and individuals must be taken into consideration when evaluating these concepts, but also the different type of cognitive skills required.

The information broadcast in new interactive media such as the World Wide Web puts images, symbols, texts and many other information structures together in hypertext formats. Learning the new encoding of these information carriers requires a shift to image-based models of communication. Often it is not easy to develop this new cognitive process. I am involved in a government-academic partnership that is working directly on this problem.

Information Initiatives in the Marília Public Schools Integrate Cognitive Approaches

The need for a digital inclusion project in the Marília public schools that reflected this cognitive viewpoint was perceived by the coordinator of the new information technologies group of the Post-Graduate Information Science Program of UNESP (Dra. Plácida Santos). Dra. Plácida Santos was participating in an event sponsored by the Municipal Bureau of Education, which was starting to educate elementary school students in the world of computer-mediated information. The schools' computer instructors needed help in building their capacity to be effective in transferring and increasing knowledge among the students. This event led to the development of a workshop implemented in 2006, in which I took part as member of the group.

At this workshop, data were collected by observing the instructors in their computational units. This workshop developed into a larger project involving many researchers mentored by Dra. Plácida Santos. Within UNESP, this focus on studying and integrating cognitive approaches to teaching information technology in schools is converging with interest in public policies for information transfer and dissemination via new media.

This convergence has resulted in a formal partnership between the Municipal Bureau of Education and the UNESP new information technologies group. The general objectives include the following:

- Increasing the efficiency and effectiveness of social programs in addressing informational needs and teaching information technology
- Educating and training agents to implement digital inclusion programs to meet and monitor users in the search for information in digital environments in schools and community
- Disseminating the research results as a way to expand the reach of the generated knowledge, experiences and promoting partnership for new research in information science and interdisciplinary fields
- Contributing to the knowledge production of information and technology

Activities have included non-verbal techniques for collecting data, such as the analysis of the behavior in searching and accessing information, in conjunction with other data-gathering methodologies whose results are processed through digital systems to support sophisticated analysis of technical indicators and cognitive aspects.

Partnerships between Government and Higher Education Can Work

This partnership between government and higher education specially involves UNESP researchers along with staff from the technology department of the Municipal Bureau of Education and instructors who were winners of a competition designed to identify best practices in teaching information technology. The project also includes graduate students in librarianship, with the creation of Intersemioses, the first extension of the research of the new information technologies group. Involving the graduate students is considered very important in order to give them field experience with teaching support and problems that they will inevitably have to face as information professionals. It is important that they are prepared to work hard to expand the scope and intensity of digital inclusion initiatives, so that the country overcomes the acknowledged difficulties of a developing country.

The central problem of the project is measuring the effectiveness of digital inclusion programs developed in schools, whether they have been able to meet their goals in their teaching practices and in the indicators of

change and improvement in the lives of the beneficiaries. Already the project has involved computer instructors from 20 schools and students from 19 of those schools in a multimedia competition, where the students' improvement in computer technology use was evident, demonstrating the value of the training for instructors.

The Municipal Bureau of Education is participating in all activities related to the development of the research and bears the responsibility of implementing actions to solve identified problems. The implementation, execution, evaluation and the continuity of research depends on that connection and on the responsibility and commitment in the relationship. The partnership has already proven to be a good example of a successful digital inclusion project, and in the second semester of 2007 the group was contacted by another public school under state administration with a diverse spectrum of users and needs: adults excluded from the mainstream education process, returning for another try. There is a significant opportunity to expand the project further and for it be a model for the country in how to implement the information technology initiatives.

In 2005 Brazil was in 76th place in some measures of its information technology use [4, p. 30], while now in 10th place in the world economy [5] – a visible gap that shows an urgent need for inclusion work. In 2005 only 21% of the country's citizens had access to the Internet. However, according to The Brazilian Institute of Information on Science and Technology (IBICT) (May 2007) there was an expansion of 39% in Internet access in Brazil during 2006 as well as an increase in the number of digital inclusion points (DIPs) [6].

The increasing numbers, though, aren't enough to guarantee the quality of the processes for spreading these new technologies and their efficient use toward improving knowledge acquisition, requirements for improving quality of life. It is largely agreed that today the building of a genuine information society in Brazil relies on information professionals to facilitate the mediation of information, taking into account and respecting the regional characteristics of the population. The global changes must reach the social majority, addressing their real necessities without harming their uniqueness.

The partnership I have described is an encouraging step forward that can serve as a model for developing a true information society in Brazil – one that will include more of the population than ever before.

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