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Brazilian Project on Open Educational Resources: Challenges and Perspectives

Green-Paper:

The State and Challenges of OER in Brazil: from readers to writers

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I – Introduction

Enormous investments are being made worldwide to integrate the Internet into educational processes: broadband to connect schools, laptops distributed to teachers in very competitive prices, computer laboratories built in schools. However, the focus is nearly always on infrastructure. Statistics and metrics of the number of wired classrooms, the number of computers in schools - these are often the key elements of policy making and judgments of success.

When there is contemplation of what information moves across this infrastructure, the problem is usually characterized as a set of isolated challenges – thus, the One Laptop Per Child project is tied to the Sugar operating system and Creative Commons licenses, scholarly literature is tied to the Open Access movement, Free Software listed in guidebooks for consumption. This does not create the ideal foundation for educational innovation. These diverse elements of hardware, software, content, and applications all play a role in innovation on the network, and in the success or failure of creation of cultures of collaboration and reuse.

Treating the elements as separate items rather than a connected ecosystem misses a key dimension of the discussion, which is how the infrastructure and content are used in education and how the culture of collaborative work can transform both teachers and learners. For this it is essential to talk about the content issues. Content means everything from theses to software to modules to textbooks to research articles, and content issues cover a wide variety of ground from teacher training to intellectual property rights, content price, access privileges, technical standards, and more.

Education policy and projects that combine infrastructure investment with a coherent "network" approach to content are the most likely to have significant positive impact and realize the goals of the policy. The ability of the Internet to create radical increases in innovation is not an accident – but it is also not guaranteed to happen simply through putting computers and courses onto the network. This "generative" effect comes from the combination of open technologies, software platforms that allow creative programming, the right to make creative re-use of content, and the widespread democratization of the skills and tools required to exercise all of those rights.

As nations worldwide move to implement digital education projects, and developing nations in particular look to use the Internet to replace outdated and insufficient educational systems, an examination of existing work is in order. It is important to provide a map of lessons learned, and to understand how existing projects can be connected to one another to create the largest possible impact for both educators and learners. Our goal is examine these broad issues within the lens of a detailed examination of the Brazilian experience applying ICTs to education in policy, technology, pedagogy, and the impact of the emerging concept of "open educational resources" in both theory and practice.

II - Purpose

Brazil is poised at a decisive moment to improve education. With a record budget of more than 4,000,000,000 of Reais in the hands of the Ministry of Education, a major effort to connect the public network of schools to the Internet and to foster the adoption of digital educational tools, in addition to an increased investment in research in higher education, is taking place.

With this Green Paper, the Brazilian Open Educational Resources Project aims to join the ongoing debate on the long-term future of open educational resources - both projects and policy - in developing countries, with a primary focus on Brazil. In particular, the Green Paper is an attempt to structure the open educational resources debate as it relates to access to publicly funded educational resources. There are four axes of structure to the OER context in Brazil, echoing internal structures of traditional education as well as the new opportunities afforded by the move to digital networks for dissemination and use of educational materials:

> • public access to educational materials in general, as an open education strategy to include the individual, the family, the community and the whole society in the process of learning and of collaborative knowledge production;
>
> • the economic cycle of educational materials production and its impact on the "right of citizens to learn";
>
> • the possible benefits OER may bring to learning strategies, the production of educational resources more sensitive to issues driven regional diversity and regional standards of quality;
>
> • the impact of digital, online, open resources on teachers' continuous professional development.

To draw the projects along these axes of structure, this Green Paper creates a map of Open Educational Resources efforts in Brazil, understanding the role OERs play in the educational context and if they are developed under a consistent educational policy. Questions of how educational policy is favorable (or not) to OER, and how public funding flows into educational materials such as textbooks are discussed.

This consultation is targeted at everyone – education experts, policy makers, teachers, and self-learners – who wants to advance access to knowledge, open education and educational levels by using the collaborative, innovative and more inclusive approach presented by open education resources. Wide dissemination of education contributes to more inclusive and cohesive societies, fosters equal opportunities and innovation in line with the priorities of a renewed social agenda focused on the knowledge society. In this sense, this study brings a series of recommendations to foster this dialogue.

The paper begins with a brief introduction of how the concept of Open Educational Resources interacts with the concept of development. The second section explores the state of education in Brazil - its policy governance, structures and institutions. The third section delivers an analysis of Brazilian "open" educational projects against the international definitions of the concept of Open Educational Resources as understood by UNESCO and the Cape Town Declaration on Open Education. The fourth section examines the state of textbooks in Brazil, analyzing public policies and government purchase programs, which have key leverage in making choices about educational resources. The fourth section also examines the challenges for textbooks in K-12 education and college, with particular attention to the flow of public investments into the production and distribution of textbooks. A conclusion is followed by a set of recommendations that aim to foster further discussion within the educational and policy community.

III - Open Educational Resources Concepts

A significant attribute of most educational resources is that they are restricted to a set of traditional players with access through institutional employment or enrollment. As such, many educational materials can cost a lot to access and if free to access, copyright restrictions block creative re-use, restricting the actions of remix essential to modern pedagogical activity. This follows the economic market for educational resources, which is a typical content sales market. Educational materials are packaged up as copyrighted goods that have to be bought from a store or accessed through course fees, repositories with restricted access, or directly from the manufacturer-publisher.

In the basic to the high-school levels of public schooling, free and temporary provision[1] of educational material provided through governmental programs guarantees access for those attending public schools in many countries. However, problems regarding diversity, appropriateness, timeliness, and quality of these materials are common. Also, the provision of copyrighted educational material via public libraries has proven insufficient, since the number library of buildings (and their structural conditions), the number of copies available, photocopying restrictions, and the opportunity costs involved in traveling to the library often represent great barriers to learners.

This situation is even more severe in developing countries such as Brazil, where, among other problems, teachers frequently need more and better training, resources are often scarce or non-existent, public library buildings are falling apart, and cost of textbooks are prohibitive for many college students and their families.

The philosophy of open educational resources (OERs) places educational materials as common and public goods[2] from which all should benefit, but most especially those who receive the least benefit and support from current systems of education, whether publicly or privately funded.[3] This view is supported by the notion that sees knowledge itself as a collective social product that naturally forms a commons.

This philosophy finds fertile ground to bloom on the Internet, where the expansion of digital technologies ruptures pre-network barriers of space, time and money, allowing socially beneficial consequences such as new forms of knowledge production and distribution to emerge. Scholars see evidence of this commons formation in free software, access to scholarly literature, "free culture" and other areas in which the network has both disrupted traditional "read only" culture and enabled the emergence of an empowered individual creator existing within a community of creators.

A key element of these communities is the drop of the cost of copying and distributing

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[1] in general the student can use the book just for the scholarly year, having to give back the book to the school at the end of each term

[2] In this sense, when the consumption of the educational resource by one individual does not reduce availability of that resource for consumption by others; and that no one can be effectively excluded from using the resource.

[3] [http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11309 Opening Up Education], pg 149

new content drops to nearly zero after its production. In the education context, this change allows for the debate to shift on educational resources, which are often publicly funded. The question then becomes: once the resources have been paid for by the public, how should they be managed and made available?

In this sense, OER is a reaction to the move of proprietary analog educational materials management onto the network. OER encourages and enables the open production, sharing of, and access to educational content and resources. This alone is a valuable societal good, increasing the value of investments made in education. But OER creates the opportunity for a more fundamental and transformative change: the move from passive consumption of educational resources to the formal engagement of educators and learners in the creative process of education content development itself.

The Cape Town Declaration on Open Education, a community definition of OER, is clear on fostering both advantages of the philosophy. Cape Town notes that "Educators worldwide are developing a vast pool of educational resources on the Internet, open and free for all to use. These educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge. They are also planting the seeds of a new pedagogy where educators and learners create, shape and evolve knowledge together, deepening their skills and understanding as they go."

Many variations of the OER concept have been proposed over the years within the broader open education community. For instance, the OECD 2007 report Giving Knowledge for Free (OECD Report) suggests that the term "open educational resources" refers to accumulated digital assets which can be adjusted and provide benefits without restricting the possibilities for others to enjoy them. Another OER leader, David Wiley, described in 2000 open educational content and resources as digital learning objects, such as "small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts . . . [that are] deliverable over the Internet . . . [and that] any number of people can access and use them simultaneously (as opposed to traditional instructional media, such as an overhead or videotape, which can only exist in one place at a time)".

Digital library world members view open content for education as being anything used for educational purposes, usually with access free as in "free of cost" that someone has posted to a managed collection of learning materials and resources. Finally, some also add open pedagogical content as part of OERs, affirming that the OER movement can only reach its potential when teachers participate in the development of open educational content by contributing their pedagogical expertise in development and use of these materials, by documenting the learning routine and process developed within specific groups of students. In this sense, Flora MacMartin considers that "OER are resources with context, with purpose, with pedagogical frameworks. They are not stand-alone pieces of information."[4]

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[4] (Opening Up Education - 2008 - http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11309) (pg 143)

In 2002, during the Forum on the Impact of Open Courseware for Higher Education in Developing Countries[5], UNESCO defined as OERs as "The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes." However, UNESCO and the early leaders of the movement dropped the "for non-commercial purposes" part of the definition, acknowledging its restrictive nature. Non-commercial licenses bring, by their nature, significant risk to the "interoperability" of content collections. Legal interoperability is an essential factor in the ability to scale a broad network of educational content, and the non-commercial clauses in licensing can hinder the emergence of the desired community of users and uses, frequently chilling even uses desired by the content owners by default. This still is a contentious discussion within the OER movement, mirroring discussions in the Free-Libre Open-Source Software movement (non-commercial licenses fail both the Free Software Definition and the Open Source Definition) as well as the Open Access movement of access to scholarly literature on the Internet[6].

The definition we adopt for the purposes of this Green Paper is widely used and is the most broad in scope, as our goal here is to cast a wide lens on a variety of projects in Brazil. Crafted by The William and Flora Hewlett Foundation, it states that OER are teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. In this sense, OER includes learning content, software tools to develop, use and distribute any kind of content, and implementation resources such as open licenses. From the Open Education Declaration: "These resources include openly licensed course materials, lesson plans, textbooks, games, software and other materials that support teaching and learning. They contribute to making education more accessible, especially where money for learning materials is scarce. They also nourish the kind of participatory culture of learning, creating, sharing and cooperation that rapidly changing knowledge societies need."

This holistic understanding of the OER concept is essential to help us understand if projects developed under the "open" flag, such as the Brazilian projects analyzed in this Green Paper, successfully achieve true openness – and if not, what pieces of the puzzle are missing.

The OECD Report goes a step further in the discussion of OER and invites a rethink of the action of "going to school" and "formal education", pointing three arguments for governments to support OER projects:

> • They expand access to learning for everyone but most of all for nontraditional groups of students and thus widen participation in higher education.

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[5] http://portal.unesco.org/ci/en/ev.php-URL_ID=5304&URL_DO=DO_PRINTPAGE&URL_SECTION=201.html

[6] http://www.soros.org/openaccess/initiatives.shtml, http://oa.mpg.de/openaccess-berlin/berlindeclaration.htm and http://www.earlham.edu/~peters/fos/bethesda.htm

• They can be an efficient way of promoting lifelong learning for both the individual and the government.

• They can bridge the gap between non-formal, informal and formal learning.

In this sense, OER is a fundamental instrument to instantiate an Open Education framework, and draws upon "open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues. It may also grow to include new approaches to assessment, accreditation and collaborative learning."[7]

There are many reasons and motivations for the materialization of the OER phenomenon. Siemens (2003) lists a number of reasons for educators to share learning resources for free, including: sharing digital resources has essentially a zero cost for dissemination; giving educators alternatives and increasing competition in the market; and democratizing and preserving public education.

The OECD Report asserts that the reasons for individuals and institutions to use, produce and share OER can be divided into basic technological, economic, social and legal drivers. The technological and economic drivers include improved, less costly and more user-friendly information technology infrastructure (such as broadband), hardware and software. Content is cheaper and easier to produce and costs can be further reduced by sharing and re-use. The OER also spurs innovation in new economic models around the distribution of free content. Legal drivers are new licensing schemes that facilitate free sharing and reuse of content, and social drivers include an increased willingness to share.

However the Report also recognizes that a key technical barrier is the lack of widespread broadband availability, part of what we generally call the "digital divide." Lack of resources to invest in hardware and software for developing and sharing OER is an economic barrier. Barriers such as these are often mentioned as significant obstacles in developing countries. In addition, social barriers include a lack of skills to use the technical innovations (such as novel modern programming languages or APIs to platforms such as Facebook) and cultural obstacles against sharing or using resources developed by other teachers or institutions.

To these, the language barrier should be added as a socio-cultural barrier, since the vast majority of OER is in English and based on Western culture, limiting relevance outside Western culture. This further carries the risk of consigning developing countries to be placed in the role of consumers. This reality has lead to efforts of open translation. However, these efforts still do not deal with the fact that: "Much of the educational materials available on the Web replicate the epistemological hegemony of higher

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[7] Cape Town Declaration

education and the relationship between 'developed' and 'developing' nations, where knowledge (content) from the 'developed' is privileged over the 'developing'."[8]

A literature review points to at least six types of reasons for an institution, such as a University or a School, to be involved in OER projects:

- The altruistic argument that sharing knowledge is in line with academic traditions and a good thing to do;

- Educational institutions (particularly those publicly financed) should leverage taxpayers' money by allowing free sharing and reuse of resources.

- Quality can be improved and the cost of content development reduced by sharing and reusing.

- It is good for the institution's public relations to have an OER project as a showcase for attracting new students.

- There is a need to look for new cost recovery models as institutions experience growing competition.

- Open sharing will speed up the development of new learning resources, stimulate internal improvement, innovation and reuse and help the institution to keep good records of materials and their internal and external use.

- The risk associated with "doing nothing" in a rapidly changing environment.

For individuals, some recognized incentives, familiar to the free-software and free-culture phenomenon, are:

- The altruistic motivation of sharing (as for institutions), which is supported by traditional academic values.

- Personal non-monetary gain, such as publicity, reputation within the open community or "egoboo" as it is sometimes called.

- Free sharing can be good for economic or commercial reasons, as a way of getting publicity, reaching the market more quickly, gaining the first-mover advantage, etc.

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[8] (pg 142) (Opening Up Education - 2008 -http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11309)

· Sometimes it is not worth the effort to keep the resource closed. If it can be of value to other people one might just as well share it for free.

Some of the recognized obstacles to the expansion of OER and its adoption, in addition to some of the barriers pointed above, refer to matters of trust in and quality of the content. Different from web culture, where the end-user is viewed as the arbiter of quality and value work in and review by "user-peers" is the rule - the peak of which perhaps being the manner in which Google aggregates the "choice" of the end users in where to link and click as the ultimate ranking systems of the web - in the education arena this is rarely the case. Recognized (or recognizable) expertise, academic skills and institutional support are crucial for the success of an OER. Many formulas are emerging to deal with these questions based on community driven content review. For instance, Connexions works with mechanisms such as branding, the possibility of specific look-and-feel for institutions and also the lenses mechanism[9].

Even with no clear statistical analysis due to the multitude of efforts under the OER flag, the Giving Knowledge for Free report points to, in January of 2007, more than 3000 open courseware courses available from over 300 universities worldwide. For instance, in repositories such as MERLOT[10], Connexions[11], OpenLearn[12] and others[13], there are hundreds of thousands of pieces of content or materials representing thousands of freely available learning hours accessed from all over the word[14].

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[9] http://cnx.org/lenses/
[10] www.merlot.org/
[11] http://cnx.org/
[12] http://openlearn.open.ac.uk/
[13] see a list here: http://labspace.open.ac.uk/mod/oublog/allposts.php?&tag=online+learning
[14] http://cnx.org/stats

IV - Open Educational Resources and Open Access

As noted elsewhere in this Green Paper, OER does not exist as a movement in isolation. Free Software and Free Culture are in many ways siblings. But the closest relative is perhaps the Open Access movement, calling for access to the fruits of scholarly publishing to be available on the internet. The tie to education is obvious and the movements share many actors and stakeholders. However, even acknowledging their proximity, these two social movements present different meanings and, in some extent, a different set of justifications and incentives.

As argue before[15], the Internet has a great impact on scientific communication and research; specifically, information and communication technologies (ICTs) have affected the publishing sector and given rise to new models of knowledge distribution in science. Open Access is proving to be best method for the flow, interchange and production of scientific knowledge – reminding us that access to knowledge is crucial for innovation and innovation is crucial for development.

Open Access (OA) is part of this greater revolution in knowledge generation and distribution allowed by the ICT expansion and has the potential to empower individuals, communities and institutions, contributing to development and wealth in the patterns proposed by the Information Society. In this sense, Open Access is an appropriate model for knowledge transfer, since:

> Basic scientific research fuels most of our nation — and the world's — progress in science. Society uses the fruits of such research to expand the world's base of knowledge and applies that knowledge in myriad ways to create new wealth and to enhance the public welfare. Yet few people understand how scientific advances have made possible the ongoing improvements that are basic to the daily lives of everyone. Fewer still are aware of what it takes to achieve advances in science, or know that the scientific enterprise is becoming increasingly international in character. Freedom of inquiry, the full and open availability of scientific data on an international basis, and the open publication of results are cornerstones of basic research (…) By sharing and exchanging data with the international community and by openly publishing the results of research, all countries (…) have benefited.

Open Access is a knowledge distribution model by which scholarly, peer-reviewed journal articles are made freely available to anyone, anywhere over the Internet. In the era of print, open access was economically and physically impossible. Indeed, the lack of physical access and the lack of knowledge access were the same – without physical access to a well-stocked library, knowledge access was impossible. ICTs change that. Physical access to the ICTs is much easier than access to a library with all journals

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[15] Carolina Rossini, Open Access Paper

subscribed, but legal knowledge access is still very restricted. OA changes that in turn, as ICTs changed physical access.

The first definition of Open Access comes from the Budapest Open Access Initiative:

> "By 'open access' to [the] literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited."

In Open Access the old tradition – to publish for the sake of inquiry, knowledge and peer acclaim – and a new technology – the Internet – have converged to make possible an unprecedented public good: "the world-wide electronic distribution of the peer-reviewed journal literature" (THIS NEEDS A CITE TO BOAI AS WELL)

Brazil is a leader within the Open Access movement. Efforts lead by the Ministry of Science and Technology and by the Scientific Electronic Library Online (Scielo), an institution related to BIREME and the World Health Organization, working with Federal and State public Universities are worldwide examples.

Specifically, in 2005, Brazil opened its doors to an important international symposium – the International Seminar on Open Access, a parallel event to the 9º Mundial Congress on Information in Health and Libraries and the 7º Regional Congress on Information in Health Science – where the Salvador Declaration was born.

Also, despite the lack of specific legislation mandating OA and the presence of a new innovation law based on the U.S.A. Bayh-Dole Act (which creates economic incentives that prioritize confidentiality in order to prosecute patents by public universities) and increasingly restrictive copyright legislation, government bodies and foundations are driving major projects forward in Open Access.[16]

Ibict, under the Open Access and Scholarly Information Brazilian System (OASIS) hosts the Digital Library of Thesis and Dissertations (BDTD), a national digital library for electronic theses and dissertations from the Brazilian federal and state universities. The BDTD is already integrated in the international Networked Digital Library of Thesis and Dissertation (NDLTD). The project has been a collaborative effort among Ibict, universities and other research centers in Brazil, with an architecture based on the Open

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[16] Brazilian Institute for Information and Science (Ibict) and the State of São Paulo Science Foundation (FAPESP) joined with BIREME, are leading initiatives that are already consider global success models, such as the more than 10 years-old Scientific Electronic Library Online - Scielo (Gold Road) and OASIS (Green Road).

Archives Initiative (OAI), where universities and research centers act as content providers and Ibict as a service provider. Brazil was one of the first countries to have a clear mandate for publication on the Internet of theses and dissertations. In service of this effort, a Brazilian metadata standard for electronic theses and dissertations was developed for the BDTD and a toolkit including open source package is being also distributed. We can see here the key elements of a knowledge commons for theses here: combination of digital library resource, policy mandate, and metadata interoperability standards.

The effort towards openness and a more inclusive educational system does not stop here. Open Access addresses materials that are more suited for graduate and post-graduate levels of education, and these are highly important, but not the only materials nor the only educational levels to which we should pay attention. In a country like Brazil, with high levels of illiteracy, and low numbers of the population in graduate and post-graduate levels there is a great need to focus on a broader group of materials that support a more democratic and inclusive learning since the earliest ages.

V - The Education Reality in Brazilian lands…

V.1. - Recognizing education as a necessary step for innovation

> With the transition from the industrial economy of the 20th century to the knowledge economy of the 21st century, the global marketplace increasingly has rewarded flexible, efficient economies that are able to rapidly adapt to new circumstances—in a word, those that can "innovate." Countries that have been successful most recently are those that have mechanisms in place for expanding trade, producing knowledge, and putting technology to efficient use. Increasingly, these countries participate in the global chain through economic conversion toward higher value-added activities.[17]

Recognizing this environment, and with UNESCO's support, the Brazilian Minister of Science and Technology (MCT) elaborated, in 2001, the "Project of Strategic Directives for Science, Technology and Innovation in a 10-year horizon" (DECTI). The main objective of this project was the creation of the institutional basis the MCT would need to establish policies, guidelines and strategies for the development of science, technology and innovation in Brazil.

The activities of the Project seek to internalize and foster the production of knowledge in Brazil, and, simultaneously, put this knowledge at the service of social inclusion and of improvement of quality of life throughout the Brazilian territory. This clearly asks for programs that foster formal and informal access to knowledge and diversified education strategies.

The DECTI had its implementation started in 2001 and has five main points[18]:

- "In the path of the Future": focused in education to science and technology and the advancement of knowledge;
- "Quality of Life": focused the impact of scientific and technological development on the citizens and on the environment, with views to promotion of sustainable development;
- "Economic development": focused on Science and Technology from the economic angle - producing goods and services in a society marked by serious regional and social inequalities;

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[17] Knowledge and Innovation for Competitiveness in Brazil. Available at:
http://web.worldbank.org/WBSITE/EXTERNAL/WBI/WBIPROGRAMS/KFDLP/0,,contentMDK:217533 05~menuPK:1727232~pagePK:64156158~piPK:64152884~theSitePK:461198,00.html
[18] UNESCO Brazil. Project of Strategic Directives for Science, Technology and Innovation in a 10 years-horizon. (2001) Available from:
http://www.unesco.org.br/areas/ciencias/institucional/projetos/diretrizes/mostra_padrao

- "Strategic Challenges" - focused on major programs of impact for the next decade, such as the information society and biotechnology, in projects mobilizing national and strategies of economic exploitation of the Brazilian borders, and
- "Institutional Challenges" - focused on the legal, institutional and organizational challenges to be overcome.

It is also worth noting the 2007-2010 Action Plan (PAC). One of the PAC's objectives is amplify the innovation capacity in companies, but, for the purposes of the paper, what most matter is its objectives concerning[19] the expansion, integration, consolidation and modernization of the National System of Science and Technology and Innovation (SNCTI), acting in conjunction with state governments to enlarge the national scientific and technological base, focusing on (i) Training of Human Resources for C,T&I and (b) Infrastructure and Promotion of Scientific and Technological Research; among other objectives.

The current Brazilian national innovation system is complex and intricate, and like all innovation systems is constantly in flux from new policies, new entrepreneurial developments, and international trade. But the Brazilian system has always prioritized a focus on knowledge creation and an investment in high-knowledge areas such as biotechnology and software.

However, it is highly questionable if the Brazilian education system is prepared to support this challenge. Studies and numbers in fact show the opposite – that the Brazilian private and public systems are not graduating the necessary working force to handle this responsibility regarding the future of the country. It does not recognize or facilitate long-life learning initiatives, leaving in the hands of the companies the training of a workforce that often arrives in the job with low levels of qualification and skill-deficits that should have been addressed by the education system.

V.2. - The state of education in Brazil

Education in Brazil has changed significantly for the better in the last several years. However, there are serious problems related to quality, equity, inappropriate use of resources and under-trained teachers as found by a 2009 national exam performed by the Ministry of Education. One of the outcomes of this reality is that – even with nearly universal access to basic education, expansion of the secondary and higher education – 11.5% of children between eight and nine years old and 10% of adults (this index increases up to 23% in the Northeast) are illiterate[20].

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[19] See in general MCT. Plano de Ação 2007-2010: Ciência e Tecnologia para o Desenvolvimento Nacional. (2007). Available from: http://www.mct.gov.br/upd_blob/0021/21432.pdf . Data presented in this paragraph see at p 42.

[20] IBGE (Analfabetismo infantil, Folha de Sao Paulo, July, 14, 2009 - http://si.knowtec.com/scripts-si/MostraNoticia? &idnoticia=445646&idcontato=16634&origem=fiqueatento&nomeCliente=PROBRASIL&data=2009-07-14)

One of the main achievements in recent years is related to school access and equity. However, many developing countries have made similar efforts, and in comparison to such countries, Brazil is not succeeding. Also, many criticize the fact that the Brazilian education system, which on paper seems to be exemplary[21], is, in reality neither able to teach rote knowledge[22] nor critical thinking. As summarized by Simon Schwartzman, a visiting fellow at the Centre for Brazilian Studies at Oxford University, the main problems are those related to quality and retention of students in the public system.[23] Schwartzman points out the historical cause of these problems:

> "that, by and large, Brazilian society did not have the elements that would lead its population to organize and develop its own educational institutions; and the Brazilian state, both at the national and regional levels, did not have the human and financial resources, nor the motivation to bring the population into a centralized and vertical educational system. More specifically, two crucial links between these two spheres were missing, a well-structured and organized teaching profession for basic education, and an academic profession for higher education, which could spread, implement, and foster de values of education."

V.3. – Brazilian basic educational system

Currently, Brazil's basic educational system is divided into preschool, which covers the social development of children through age six; the fundamental learning (ensino fundamental), which is an eight-year cycle (from 7 to 14 year olds). These years are divided into two stages (grades 1–4 and 5–8), with national testing conducted at the end of each stage and an increasingly diversified curriculum and instructional organization during the second half of the cycle. The third division is a three-year "intermediate" cycle (ensino médio), which consists of grades 9–11 and is intended for students aged 15–17. The National Education Law—LDB (Lei de Diretrizes Basicas)—describes ensino médio as the "final phase of basic education" to which all citizens are guaranteed access.

The Brazilian Federal Constitution (BFC) states "Education, which is the right of all and duty of the State and of the family, shall be promoted and fostered with the cooperation of society, with a view to the full development of the person, his preparation for the exercise of citizenship and his qualification for work." Education is therefore a duty of the state that has to ensure mandatory and free elementary education, including the assurance of free offer to all who did not have access to education at the proper age, and progressive universalization of the free high-school education.[24]

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[21] We will discuss the Brazilian national education programs in section XX.

[22] By "rote" knowledge we understand a memorized form in the absence of meaning.

[23] Simon Schwartzman (version 3, 2003), The challenges of education in Brazil. Centre for Brazilian Studies at Oxford University.

[24] BFC, Articles 205 to 208. http://www.v-brazil.com/government/laws/titleVIII.html

Important to the OER debate are also some indices from article 5 of the BFC[25], which guarantee certain rights of the citizens: (a) to be part of the cultural life; (b) to be benefited by the technological and scientific advances; (c) the right to information and expression and (d) the social function of property.

Prior to the 1988 Constitution, all three levels of government (municipal, state, and federal) were involved in the financing and provision of all levels of education. The resulting uncoordinated coexistence of education systems has been criticized as one of the primary sources of inequity and inefficiency within Brazilian basic education. With the 1988 Constitution guidelines and the 1996 National Education Law (LDB), the country delineated administrative responsibilities determining that the municipal and state governments should share responsibility for financing and provision of grades 1–8 (7 to 14 years old), while state governments are primarily responsible for the provision of grades 9–11 (equivalent to US high school, with teens from 15 to 17).

The BFC also establishes minimum levels of investment of its resources on education from the federal government (18%) and from the state and local governments (25%). In the early 2000s, the National Fund for Basic Education (FUNDEF[26]) was created, in parallel to the National Institute for Educational Research (INEP)[27], as a fund for financing sub-national spending on primary and lower-secondary education, reducing regional differences and setting a floor for state and municipal expenditures on fundamental education.

In this period, public schools also saw the development of new curricular guidelines for basic and secondary education, and other programs to provide schools with managerial, pedagogic and material resources (including educational materials, food, and cash).

V.4. - ICTs and education in Brazil

With the context of the "traditional" education system, we may turn to the modernization efforts attempted since the rise of the consumer Internet in the 1990s, when enormous amounts of money were invested in bringing ICTs into education. There is general consensus that ICTs are a powerful tool to improve the educational process for both the teacher and the student, and to create opportunities for both traditional students and the life-long learner. There is however not a statistically significant amount of data to support these assumptions, and indeed studies have shown that even in the most advanced schools in industrialized countries, ICTs are generally not yet considered

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[25] BFC, Article 5: http://www.v-brazil.com/government/laws/titleII.html

[26] More on FUNDEF: (1) Education attainment in Brazil: the experience of FUNDEF http://www.olis.oecd.org/olis/2005doc.nsf/linkto/eco-wkp(2005)11 and (2) Evaluating the Effects of FUNDEF on Wages and Test Scores in Brazil available at http://cep.lse.ac.uk/seminarpapers/03-02-04-FIL.pdf

[27] INEP (http://www.inep.gov.br/) is as an office for education statistics and evaluation, which became responsible for the reorganization of Brazil's education statistics and the implementation of three large systems of education assessment: SAEB, the assessment system for basic education; ENEM, a national exam for students completing secondary education; and the national examinations for undergraduate programs, known as "Provão".

central to the teaching and learning process. However, there is also a general consensus that both teachers and students feel ICT use greatly contributes to student motivation for learning[28].

One reason that it is hard to delineate the real impact of ICTs in education is that most measures are related to more easily measured infrastructure elements such as the number of computers bought, learning centers constructed, and so forth[29]. However, it is vital to note that when we speak of ICTs in education, the point is not learning to use the computer but instead "using the computer to learn[30]."

For ICTs to truly play a positive disruptive role, they must be utilized across the entire range of education, from textbooks to teachers to methodology to administrators to parents to learners. This requires changes in the ways teachers are trained, they way they teach, the way they are rewarded, and more. OER represents one potentially significant "killer application" of ICTs in education that can create the open pool of reusable content for the teacher to bring to the new value chain of education.

The story of ICT and education in Brazil follows the international trends. Brazilian policy exhibits of a general belief in the power of technology to benefit education, followed by a systematic investment in infrastructure – but not a systematic investment in training, pedagogy, and content native to an ICT view of education.

For a country with large social disparities, Brazil has made significant gains in expanding internet access and mobile-phone usage in recent years. It is home to the largest population of internet users in Latin America and the seventh largest in the world. The country first connected to the internet in 1990 through a network based on Universities, and connectivity is now available in most areas through a variety of technologies, though some infrastructural limitations remain.

According to the International Telecommunication Union (ITU), Brazil had 68 million internet users as of December 2008, representing 35.2% of the population. A lack of infrastructure affects large segments of users, mainly in rural areas, and is the primary barrier to internet connectivity. Nevertheless, great improvements have been made in recent years as the government has initiated dozens of programs to connect the population to the internet, including investment in WiMax Networks and Digital Cities projects. Many of these projects employ broadband technology, which is accessible to a large number of users. The internet is used by people at various socio-economic levels, and the country's e-commerce, e-government, and online-banking services are among the most developed in the world. However, due to persistent poverty, internet access remains out of reach for large portions of the population.[31]

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[28] http://www.infodev.org/en/Publication.154.html

[29] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTEDUCATION/0,,contentMDK:20533883~menuPK:617610~pagePK:148956~piPK:216618~theSitePK:282386~isCURL:Y,00.html

[30] http://www.mydigitallife.info/2008/03/04/ict-in-education/

[31] http://www.freedomhouse.org/template.cfm?page=384&key=205&parent=19&report=79

% OF INDIVIDUALS WHO USED INTERNET FOR EDUCATIONAL PURPOSES			% OF ACTIVITIES PERFORMED RELATED TO EDUCATION				
% over the total of internet users (X,207 individuals interviewed in Urban Areas)			Research for school homework	Serach of Information on courses	library research and material download	on-line courses	others
Percentual (%)	YES	NO					
TOTAL	77	75	65	22	21	11	-
COUNTRY REGIONS							
SOUTHEAST	70	53	63	22	20	11	1
NORTHEAST	77	23	72	22	23	5	1
SOUTH	62	34	57	16	28	7	-
NORTH	85	15	63	26	23	13	2
CENTER-WEST	77	23	71	25	20	11	-
SEX							
MALE	80	21	64	25	21	11	-
FEMALE	71	25	69	25	22	10	-
INSTRUCTION							
LITERATE/BASIC	63	37	83	2	10	1	
FUNDAMENTAL	70	33	68	6	13	5	-
HIGHER EDUCATION	67	33	63	16	17	3	-
HIGHER EDUCATION	82	18	71	19	29	16	2
AGE							
10-15 years old	87	13	86	4	14	5	-
16-24 yo	75	25	68	25	23	11	-
25-34 yo	66	34	59	32	27	14	-
35-44 yo	63	37	55	25	21	11	2
45-59 yo	40	52	57	22	18	10	1
more than 60	21	79	32	5	11	5	-
FAMILIAR EARNINGS							
< R$415	69	31	61	4	12	1	-
R$415-R$830	72	28	64	14	17	2	-
R$830-R$1200	69	31	63	17	19	7	-
R$1200 R$2075	70	33	63	25	21	10	-
R$2075 R$4150	74	23	65	35	27	17	2
> R$4151	78	22	65	38	30	22	
EMPLOYMEN							
Working	63	32	61	26	24	13	-
Unemployed	68	32	57	26	30	5	2
House-wife/unemployed	79	21	76	10	16	5	-

Specifically regarding the use of ICTs and access to internet in schools, 40,000 schools have computer labs and almost 20,000 have broandband connections. The governmental plan is to connect, by 2010, all urban schools in Brazil (~55,000), while the remaining public schools in rural area (~87,000) are to be connected by 2018. The fulfillment of such a policy is conditioned on the accomplishment of universal access obligations assigned to telecommunications companies in Brazil and provison of computers through programs lead by MeC[32].

Ritla's 2007 study *Pencil, Eraser and Keyboard* (Lapis, Borracha e Teclado) also notes that the availability of Internet access in public spaces, such as school or hot spots of digital inclusion, reinforces the divide that is observed in the rates of access to Internet from private spaces, such as homes. The study calls for plans that prioritize the access for sectors excluded from Internet - democratization of access – rather than the reinforcement of the economic divide via Internet access points[33]. The fear is that the wealthy will be able to use the networ ubiquitously but the poor only at school or other

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[32] http://www.mc.gov.br/ministerio-on-line/142-mil-escolas-publicas-do-brasil-terao/ and
http://www.agenciabrasil.gov.br/noticias/2008/04/07/materia.2008-04-07.3055799025/view
[33] www.ritla.net/index.php?option=com_docman&task=doc_download&gid=83

public spaces. However, it is important to recognize here that this pattern is probably partially explained by the broadband network reach provided by the telecom companies and also the high costs of other kinds of access, such as satellite for rural areas.

Ritla's 2007 study, based on the PNAD data[34], found that in 2005 Brazil had 3,200,000 teachers. More than half (54%) had used the Internet in the 3 months before the census was done. However, the internal divide is enormous when comparing internet use of professors of higher education (93%) with the rest of the sample (29.4%). Also, regional variances are high: while 65% of educators from the south and southeast used the Internet, just 35% used in the north and northeast. 48% of Brazilian educators have computers in their homes, while 37% have Internet connectivity. The three main reasons that educators use Internet are: activities related to education, communication and reading of news.

V.5. - Policy Background: The state of educational policy in Brazil

The Brazilian National Education System was developed before the widespread availability of consumer internet. It is based on a mandate from the Constitution of 1988 and implemented through a set of laws, plans and regulations. It can be understood as a complex inter-federative regime based on cooperation among the federal government, the states and municipalities. Under this system, the education in Brazil is regulated by the Federal Government, through the Ministry of Education, which defines the guiding principles for the organization of educational programs. Local governments are responsible for establishing state and educational programs following the guidelines and using the funding supplied by the Federal Government.

This system of cooperation is governed, at the federal level, by the Basis and Directives Law, the National Plan of Education, a system of graduate and post-graduate education (federal universities and institutes), a fund that regulates educational investments, and a system of national evaluation; and at the state and municipal levels a system of a myriad of pedagogical possibilities.

Under this system, the goal is to reduce social exclusion to avoid social inequality. To achieve this and with a budget equivalent to 4.7% of the Brazilian GDP (41,000,000,000 Reais - the biggest in the history of the Ministry[35]), the Brazilian Ministry of Education proposes a set of development programs in different but integrated directions. For instance we see the *Education Development Plan* (Plano de Desenvolvimento da Educação)[36] – which created the Basic Education Development Index (Ideb), a measure of the flow of students to higher levels of education and of their performances through the *Brazil Exam* (Prova Brasil), focused on Portuguese language and Mathematics – and the *All for Education Plan* (Plano de Metas Compromisso Todos pela Educação), which is established through a Decree[37]. The Decree created a social contract in which federal,

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[34] http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2005/default.shtm
[35] http://portal.mec.gov.br/centraldemidia/play.php?vid=381
[36] http://portal.mec.gov.br/pde/
[37] http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Decreto/D6094.htm

state and municipal governments to work in an alliance with families and communities to implement a series of guidelines to coordinate pedagogical, administrative and financial actions. It also created the Articulated Action Plan (Plano de Ações Articuladas - PAR), a set of multi-year actions planned with each municipality and focused on basic educational improvement.

Under these Plans the Ministry of Education also restructured and consolidated a group of national evaluation systems, into the National System of Basic Education Evaluation (Sistema Nacional de Avaliação da Educação Básica - Saeb) e do National Exam of the Intermediate Cycle (Exame Nacional do Ensino Médio - Enem). The Prova Brasil exam is deployed under the Saeb system.

The programs under the PDE also include: equipping schools with the necessary structure to use computers and internet connections; enhancing teacher education and training stressing the development of information technology skills; providing open and distance learning opportunities; and offering free and quality digital learning resources.

The National Program for Informatics in Education (Proinfo) plan for the next three years consists of supplying 138,405 public schools in Brazil with computer labs and broadband internet connection, and offering training on educational technology for K-12 teachers of all parts of the country. Proinfo is a result of a partnership among the federal government, states and cities to equip schools with computers. A variety of digital content is brought to schools with the new computers, such as educational videos, multimedia-learning objects, hypertexts, and open source software.

V.5.a. – PDE and the focus on the teacher

One of the priorities that emerged within the Articulated Action Plan was the necessity of a better training strategy for teachers of the public k-12 schools network. During the development of the Articulated Action Plans by the cities, it became clear that the Brazilian educational public system is served by a large numbers of primary and secondary teachers who have low levels of qualification. As a result, many initiatives – by the government, non-governmental organizations (NGOs) and private sector organizations – have been undertaken by a variety of state and private providers for in-service teacher development.

The Ministry of Education believes that teachers will change their practices as they build up confidence using technology and as they have easy and access to digital content. In addition to this expectation of improvement through experience, the Ministry of Education action plan includes a restructuring of the teachers' career plan, higher salaries and additional training of 240,000 teachers by 2010. The hope is that equity of access to information instruction and technology in schools will help to overcome economic barriers to achievement. It will also help educators to reduce the barriers that prevent some students from developing their full potential.

In order to accomplish these outcomes, the National Plan of Teachers Training was

organized by MeC in partnerships with states, municipalities and public universities (76 institutions in total, offering 331,607 spaces) to offer training to teachers that had not finished a certificate in education, and to teachers that give classes in areas outside their core educational training. In order to register in the program, the teachers need to update their curriculum vitae and register their data at the Freire Platform[38].

V.6. - Legal Background: The right to learn and Copyright

Intellectual Property law and policy can dramatically affect the government's ability to provide public goods ranging from health care to education. Brazil was an early adopter of the Bern Convention[39] and of the TRIPS agreement, with its current copyright law in force since 1998. The Brazilian law n. 9610/98 regulates copyright and adopts the system of exceptions and limitations to grant rights to those who access knowledge. Recently Brazil partnered with other developing countries to lead discussions on a Development Agenda[40] to bring balance to the international Intellectual Property system.

V.6.a. - Copyright

After continuous expansions of copyright term (from 14, passing to 28, then 50 years) and adaptation to international standards, Brazil now protects copyright for 70 years starting in January 1st, of the subsequent year of the author's death. Taking into consideration the average life of a Brazilian (68 years old), copyright protection lasts for up to of 150 years.

V.6.a.1. - *Exceptions and Limitation regarding education*

The main copyright statute (Lei 9.610/98), the 1940 Penal Code (recently altered in its copyright-related matter by Lei 10.695/03) and Software Law (Lei 9.609/98) form the system that regulates copyright in Brazil.

The law #9.610/98 incorporates the current provisions of Brazilian copyright exceptions and limitations. These may be divided into three groups: 1) derivative works, 2) partial or full reproduction, and 3) performing rights. However, no clear and general limitation concerning the use of works specifically for education (as developed, for instance, in countries such as the USA under the fair use doctrine) is available.

In the USA, the fair use doctrine is based on the First Amendment of the American

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[38] http://freire.mec.gov.br/ssd/index/

[39] Brazil adopted the Bern Convention from 1886 in 1922.

[40] The WIPO Development Agenda is a strategic device that brings a development perspective to IP issues. However, the practical impact of the WIPO DA will not be felt in the short-term and it will take time to see whether the principles of the Agenda will be incorporated into the WIPO's day-to-day actions. The first WIPO report on the Development Agenda chose recommendations for immediate adoption can be found here: http://www.wipo.int/ip-development/en/agenda/recommendations.html. Many months have passed since the adoption of the Development Agenda, in October 2007. It is time to start a critical appraisal of what is working, what is failing and what else should be done.

Constitution authorizes the use of works for "Educational purposes", meaning[41]:

· non-commercial instruction or curriculum based teaching by educators to students at nonprofit educational institutions
· planned non-commercial study or investigation directed toward making a contribution to a field of knowledge, or
· presentation of research findings at non-commercial peer conferences, workshops or seminars.

It is vital to realize that fair use in the USA is considered a defense, and not a "right" – one can argue fair use in response to an infringement lawsuit, but one is not guaranteed that the judge will agree that the doctrine applies. Indeed, some eminent legal scholars believe that fair use has become simply the "right to call a lawyer."[42]

The long-term US debate over course-packs and digital media also resulted in "educational use guidelines" established by publishers and parts of the academic community, and endorsed by the US Copyright Office[43]. These guidelines are considered to be minimum standards for fair use in education, generating a zone of non-infringement. But is also true that they represent a very conservative interpretation of the law. Many of the initial proposals allowing a broader understating of fair use were never adopted[44], creating an ongoing debate about educational fair use[45].

In Brazil, there are two articles that can be related to the educational use. The first one, our major focus in this Green Paper, is the article that allows partial copies of works, while the second is the article that allows the reproduction of works for the visually impaired[46]. Another limitation under the Brazilian copyright law is the right of students to take lecture notes, though there is no corresponding right to publish them without the lecturer's prior authorization.

Also, unlike the USA situation, the industry reached no agreement with academic institutions, nor did institutions publish any specific guidance until recently, in the controversial case of copy of textbooks – which resulted from the US threat to insert Brazil back in its Special 301 black list[47]. We will discuss that later in this section.

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[41] http://fairuse.stanford.edu/Copyright_and_Fair_Use_Overview/chapter7/7-b.html
[42] http://copyfight.corante.com/archives/004834.html
[43] www.copyright.gov/circs/circ21.pdf
[44] http://fairuse.stanford.edu/Copyright_and_Fair_Use_Overview/chapter7/7-c.html
[45] Some argue that a guideline such as the Fair Use in Online Video would be more appropriate for education: http://www.centerforsocialmedia.org/resources/publications/fair_use_in_online_video/
[46] Brazilian copyright law permits Braille and other accessible formats for visually impaired people to be made so long as the activity is non-commercial. Specifically, LDA, article 46, I, d states that "reproduction … in Braille or by means of another process using a medium designed for [the visually handicapped]" is an exception to the exclusive rights of the copyright holder. For a complete study on this exception and a international comparison see the study: Study on Copyright Limitations and Exceptions for the Visually Impaired, by prepared by Judith Sullivan, available at http://www.wipo.int/meetings/en/doc_details.jsp?doc_id=75696 (retrieved in June, 2008).
[47] Specifically, the 2008 report stated: "Conduct effective enforcement against copyshops, located both inside and outside university campuses that make illegal copies of books and related teachers' notes that go

The limitations to copyright in Brazil are establishes in articles 46[48], 47 and 48. For our discussion, we will focus on 46 II, which reads:

> "46. The following shall not constitute violation of copyright:
> (…)
> II. the reproduction in one copy of short extracts from a work for the private use of the copier, provided that it is done by him and without gainful intent;" (emphasis by author)

In 2003, the Penal Code was amended to include a provision establishing that there is no crime when the act under considerations is covered by a limitation or exception under the

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beyond the bounds of the law. Also, engage university administrations in efforts to encourage the use of legitimate materials on campuses." and "Work with the State of São Paulo University to reverse its administrative rule, which allows widespread reprographic copying of portions of books by commercial, for-profit copy centers." http://www.iipa.com/rbc/2008/2008SPEC301BRAZIL.pdf

[48] "Chapter IV - Limitations on Copyright
46. The following shall not constitute violation of copyright:
I. the reproduction
(a) in the daily or periodical press of news or informative articles, from newspapers or magazines, with a mention of the name of the author, if they are signed, and of the publication from which they have been taken;
(b) in newspapers or magazines of speeches given at public meetings of any kind;
(c) of portraits or other forms of representation of a likeness, produced on commission, where the reproduction is done by the owner of the commissioned subject matter and the person represented or his heirs have no objection to it;
(d) of literary, artistic or scientific works for the exclusive use of the visually handicapped, provided that the reproduction is done without gainful intent, either in Braille or by means of another process using a medium designed for such users;
II. the reproduction in one copy of short extracts from a work for the private use of the copier, provided that it is done by him and without gainful intent;
III. the quotation in books, newspapers, magazines or any other medium of communication of passages from a work for the purposes of study, criticism or debate, to the extent justified by the purpose, provided that the author is named and the source of the quotation is given;
IV. notes taken in the course of lessons given in teaching establishments by the persons for whom they are intended, provided that their complete or partial publication is prohibited without the express prior authorization of the person who gave the lessons;
V. the use of literary, artistic or scientific works, phonograms and radio and television broadcasts in commercial establishments for the sole purpose of demonstration to customers, provided that the said establishments market the materials or equipment that make such use possible;
VI. stage and musical performance, where carried out in the family circle or for exclusively teaching purposes in educational establishments, and where devoid of any profit-making purpose;
VII. the use of literary, artistic or scientific works as proof in judicial or administrative proceedings;
VIII. the reproduction in any work of short extracts from existing works, regardless of their nature, or of the whole work in the case of a work of three-dimensional art, on condition that the reproduction is not in itself the main subject matter of the new work and does not jeopardize the normal exploitation of the work reproduced or unjustifiably prejudice the author's legitimate interests.
47. Paraphrases and parodies shall be free where they are not actual reproductions of the original work and are not in any way derogatory to it.
48. Works permanently located in public places may be freely represented by painting, drawing, photography and audiovisual processes." http://www.wipo.int/clea/en/text_html.jsp?lang=EN&id=514#P197_22819

Copyright law or if it consists in a "copy of an intellectual work or phonogram, in a single copy, for the private use of the copyist, without intent of direct or indirect profit."[49] Thus, under the amended penal code it is not a crime to make a single copy of a work for private use of the copyist. However, this still is an infringement at the civil sphere, opening compensation and search and seizure rights to the copyright owner who sees a whole copy of her work taken.

However, the reach of this article has been fiercely debated over the past years, resulting in a slew of bills of law[50] in all directions and extremes. The center of the debate concerns the meaning of "short extracts", and the efficiency of having the student being the actual "copier" and not just a person gaining a copy from a third party. Also, much has been debated in terms of what qualifies as "gainful intent" as many of the copy-shops are part of university departments and price the copies based at cost.

Additionally, it is constantly noted in these discussion that the Brazilian government and society provides high direct and indirect incentives for the production of textbooks and books in Brazil. This creates an ongoing debate over the role of the government to exercise market power on behalf of society. Details on this come later.

V.6.b. - The discussion around the copying of books

Since the law was developed without an eye for the reality, necessities and routines of college academic life and markets in a developing country, mass infringement is the rule. Copies of book chapters, scientific articles, and even entire books can be found in copy-shops around universities, ready for on-demand reproduction for the academic community. Spiral-bound photocopies of class materials and textbooks are carried around in all directions. And in general, no prior authorization from rights holders is obtained. Some professors state that they are the authors of the material, but forgot that, in all likelihood, they licensed all their patrimonial rights to their editors.

The Brazilian book market features high prices. Most library collections are deficient and incomplete, and a great part of adopted books are out-of-print or were never published in the national territory.

A study carried by IDEC[51] - a consumer's group - in 2008 calculated the costs of acquiring the class material for disciplines such as law, economics and business, for the first college year at some public and some private teaching institutions. The results were dramatic. The average cost in public institutions were R$ 2578.46 and in private ones R$ 3907.89. Another striking results was that almost 1/3 of the books were out of print and thus not computed in the average costs. IDEC also investigated the situation of

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[49] http://jus2.uol.com.br/doutrina/imprimir.asp?id=4432

[50] For instance we find a pro-publishers bill # 1197/07 (prohibiting Universities to carry photocopy machines at all) and a pro-students bill # 5046/05 (Authorizing single copies of full books by college students for non-commercial purposes and recently amended to authorize copies just of out-of-print books http://www.camara.gov.br/sileg/MostrarIntegra.asp?CodTeor=295013)

[51] IDEC. 2008. Copiar é preciso. Revista do IDEC, n. 121, p. 20-23. And http://rodiziocultural.blogspot.com/2008_05_02_archive.html

institutional libraries and discovered that the average collection numbered no more than 6 books per 100 students at public institutions and no more than 8 in private (for numerical context, USP law first year course has 450 students).

The study carried on by the Grupo de Pesquisa em Politicas Publicas para o Acesso a Informação (GPOPAI) at the University of São Paulo (USP) shows similar results. They evaluated the cost of all professional books required in 10 courses at USP compared with the average monthly income. The conclusion was that ¾ of the students had a cost related to acquiring books superior to their family monthly income. For context, the current Brazilian monthly minimum wage is R$ 465.00.

COURSE	ANNUAL COSTS OF BOOKS	% OS STUDENTS WITH MONTHLY INCOME INFERIOR TO R$ 5000.00
Information Systems	R$ 3.915,58	90,6%
Natual Sciences	R$ 3.640,90	91,3%
Turism	R$ 4.572,90	81,3%
Marketing	R$ 4.242,51	76,1%
Technolgy of textils	R$ 4.164,79	79,5%
Enviromental Management	R$ 5.212,69	84,1%
Medicine-Obtretrics	R$ 5.810,46	86,7%
Medicine – Gerontology	R$ 4.417,19	91,2%
Phisics	R$ 3.344,75	88,3%
Public Policy Management	R$ 5.243,02	78,1%

Another result from the GPOPAI study brings similar observations in relation to out-of-print books: 1/3 are out-of-print and were not counted in the costs computed in the study. Additionally, a study conducted by Sá Earp and Kornis, published in 2005, concludes that the relative price of a book in Brazil is 270% higher than in Japan and 150% higher than in the United States[52].

In response to this set of interlocking problems – high costs, an unclear limitation to the right of copyright holders and a increasing pressure from the students under the flag "The Copy of Books is a Right" – some Universities have fueled the fire and issued internal resolutions adopting 10% as the meaning of "short extracts." This stance resulted, as mentioned above, in a threat from the International Intellectual Property Alliance through its Special 301 blacklist.

But the threats also came from within Brazil in addition to the international IP community. The Brazilian Association of Reprographic Rights (ABDR) refused to accept the universities' resolutions, increased the 2004 activity of revoking licenses and suing copy-shops, and began an extreme media campaign called "Copying Books is a Crime". ABRD actions did not differentiate among cases where books were out-of-print, or rare, openly licensed through Creative Commons, or even in the public domain. At the

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[52] Sá Earp, Fábio and George Kornis. 2005. A Economia da Cadeia Produtiva do Livro. Rio de Janeiro: BNDES. http://www.scribd.com/doc/7177640/eBook-a-Economia-Da-Cadeia-Produtiva-Do-Livro

policy and legal level, ABDR pushed for restrictive bills to entrench their point of view into law, though without success so far.

V.7. - The Textbooks Case

Although our study is not limited to textbooks, particularly when one considers how digital expressions of educational content have begun to blur the definition of a "textbook", the prominence of this form of EM acts as an important gateway to understand the rest of the EM field. The price of and access to quality textbooks, particularly at the higher education level, has been a highly controversial issue in many countries[53].

The following sections focus on professional and scientific textbooks and books – those in general used in higher education, and textbooks for the equivalent to the k-12 level in Brazil.

V.7.a. - Professional and Scientific Books in the context of high education

Both the IDEC and GPOPAI studies reach similar results when investigating who pays for greater part of the production of Professional and Scientific textbooks adopted by Brazilian Universities. For instance, the results from the sample collected by GPOPAI show that the market for professional and scientific textbooks responds for 25% of titles and 7% of sale-unities. This amount responds for 20% of sales of the publishing market – the equivalent to R$ 418,550,460,26 in 2006.

Additionally, since 1960, the publishing industry (books in all its forms, newspapers and magazines) is tax-exempt. This was reaffirmed by article 150 of the Brazilian constitution that establishes:

> "Article 150. Without prejudice to any other guarantees ensured to the taxpayers, the Union, the states, the Federal District and the municipalities are forbidden to:
> VI - institute taxes on:
> (…)
> d) books, newspapers, periodicals and the paper intended for the printing thereof"

In 2004, the publishing industry was granted additional benefits and freed from an obligation to make contributions such as PIS/PASEP (Social Integration Program) and COFINS (Contribution for the Financing of Social Security).

These tax (IPI and ICMS) and contributions (PIS and COFINS) exemptions, which affect both final product and the production process (including, for instance, the paper

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[53] In the USA, for example, you have "Make Textbooks Affordable" student movement (http://www.maketextbooksaffordable.org). A similar effort in Brazil – "Copy of Books is a right" – did not last for so long, having faced industry pressure and threatens of legal actions.

used) supported the objective of reducing the final price of the product. However, what we see are instead increasing prices, sales and a lack of transparency regarding publishers profits, costs, and losses.

Relying on the data that was available, GPOPAI estimated that from 2001 to 2006 the subsidies represented a windfall of around 30% of the equivalent to sales from the tax and contribution exemptions. For the sake of comparison this subsidy represents two times the full budget of the Brazilian Ministry of Culture over the same time period[54].

The government also plays a major role in the markets, with taxpayer monies the largest single investor in scientific and professional books for higher education in Brazil. This role plays out in multiple areas including books: unlike most countries, the federal and state public Universities in Brazil are free – there is no annual or monthly tuition, the students are responsible for the cost of books and living costs[55]. Payment of salaries for employees and professors come from the University budget and a great number of scholarships, including for master and doctoral level, are provided.

Additionally, the majority of public institutions maintain their own academic publishing units, also supported by the University budget (in the sample collected around 10% of the adopted books were published by University Presses). This results in a concentration of textbooks written by professors - one of the results showed, for instance, that 86% of the books in the collected sample (1910 books adopted by 25 different courses in more than 14 institutions) were authored by full time employed professors from public institutions.

Finally, the GPOPAI report calculated the total invested by universities, through scholarships and publication grants from public financial agencies, such as FAPESP, per student, resulting in a total of R$ 78,409.53 in 3 years for the production of a master thesis and R$ 155,344.04 for the production of a doctoral thesis.

By comparing these values, with the value invested by publishers of books coming from the thesis, GPOPAI arrived in incredible: 17.9% of the total cost of a book based on a master thesis comes from private investment, while 82.1% from public investments; while for doctoral thesis, 9.9% comes from private, while the remaining 90.1% comes from public investment.

An important role is also is also played by University Presses. Researching a sample of 29% of University Presses in Brazil, the majority from public institutions and among the

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[54] The lack of data create great barrier to draw similar comparison for the years of 2007 and 2008, when both budgets of the Ministry of Culture and Education had great increase. It is also interesting to note the increase of partnerships of both Ministries in programs of culture and education, such as the Open Book project, which intend to revitalize with materials, infra-structure and activities public libraries around the country.

[55] Students in order to attend the most prestigious public colleges and universities have to take a national exam and if approved they start school a couple of month later. Under Lula administration, the government also adopted a program of cotes for students that declare their race as black (what has driven great discussion and a current judicial law suit, since for many the reason of inequality in Brazilian Universities is based on poverty and not race).

group with most market expression, GPOPAI analyzed 10 items that could be subsidized by the University: taxes, rent, water, light, salaries, transportation, telecommunications, workshops and training, mail and marketing. More than 90% of the sample sees 91% of these items paid by public universities or related institutions; while 55% had all 10 items paid. The average of the support was 66% (direct or indirect) of the total costs of the university press.

Asked about the out-of-print books, which are part of the presses' catalogs, 85% of the interviewees answered in favor of making them available online in a print-on-demand model and 77% in favor of making the books openly licensed.

V.7.b. - Textbooks in the context of "K-12" education[56]

V.7.b.1. - Conceptual Aspects

i. The textbook as a teaching tool

To understand the EM situation around textbooks in Brazil, a quick grounding of the current status in the history of Brazilian textbooks, and their relation to government, is essential. Brazil has undergone a relatively rapid set of political transitions in the last 60 years that have marked the educational materials system in a lasting way. Brazilian policy and actions in this space are marked by a significant emphasis on philosophy around learning and the status of the textbook itself as an object impacting education in multiple dimensions. This history creates the ground in which OERs are attempting to grow, and is deeply relevant to the recommendations and studies presented elsewhere in this Green Paper. The textbook is a central part of a historical effort to change the educational system in Brazil, stretching from before World War II to the present day.

In his article "The History of Textbooks and Editions: Regarding the State of the Art," Allain Choppin presents an interesting discussion about the main problematic areas identified and the themes of historic research on textbooks and editions. Textbooks assume four key functions in his analysis, which parallels much of the experience in and around textbooks in Brazilian education:

- The first role refers to its reference as support for the necessary educational content.

- The second role refers to the instrument, in other words, the implicit methodology that takes the students through the learning process by way of activities and exercises.

- The third role, which is older, situates itself in the condition of textbooks as instruments of ideological circulation, culture and the values of the leading social classes.

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[56] This section V.7.b. and sub-items were written in collaboration with Prof. Carlos Castanha.

- The fourth role, connected to the formation of the teacher, is documental. Through text or iconic documents it aims at the critical development of the student.

Every proposal that is geared toward the creation of a system that favors the utilization of open educational resources will have to pay attention to this fact: in Brazil, a textbook is contemplated as an organized "corpus" with specific goals, and is rooted in a coherent methodology. Failure to take this historical reality into account endangers the potential success of OER attempts in the textbooks space.

The methodology of teaching with textbooks follows a defined path: the ruling systems make a choice of books that have a direct relationship with the political and teaching supported by the ruling system. In the case of Brazil this connection became very evident in 1996 when the first systematic and continuous evaluation system of textbooks used in the public school system was created. The experience of creating the National Curriculum Parameters (PCN) and the impact that a policy change can have on textbooks, and in turn of textbooks policy on education, is examined in the next section and informs the recommendations of this Green Paper related to textbooks.

ii. Quality and PCN's

The beginning of the 1990s marked the first steps taken by MEC in regards to effective participation in the evaluation of the textbooks. The new Law of Guidelines and National Education (Federal Law n. 9.394), approved on December 20, 1996, largely defines the methodological direction of education in the country; inserted within this context are the PCNs (National Curriculum Parameters). The PCN became the reference document prepared and adopted by Brazil to redirect the entire educational system. In this reference there is a specific methodology that serves as the founding structure of this entire new system.

The methodology developed by the PCN can be summarized in the terms found in its document, terms such as "learning to learn", in other words:

> Today, more than ever, schools must present the need to assume themselves as a social space for the construction of significant and necessary ethics for every action regarding citizenship.

> Basic education plays the role of guaranteeing conditions so that the student can build instruments that give them the skills for the process of permanent education.

> It is necessary that the following be explored in the process of teaching and learning: the learning of methodologies capable of

prioritizing the building of verification strategies and evidence of hypotheses.[57]

The goal is to educate learners that are capable of participating in the building of knowledge, argumentation, and the development of the critical spirit in favor of creativity. This is in many ways counter to the traditional "read only" systems of education, which are the dominant forms of education actively supported by the government (though of course alternative systems are not prohibited).

The orientation proposed in the National Curriculum Parameters recognizes the importance of the constructive participation of the student and, at the same time, the intervention of the teacher. Contrary to the concept that teaching and learning is a process that is developed in steps, in which each step ends with the knowledge learned, PCN proposes a vision of complex and provisional knowledge

"Traditional teaching" is a proposed way of education that centers on the teacher, whose role is to look out for the students while counseling and correcting them as well as teaching the material. In the majority of schools this teaching practice is characterized by a load of information that is given to the students, with the textbook as primary container. The logical organization of the course materials is the key thing that guides the teaching of content. The teacher is an authority, an organizer of the content and teaching strategies and, therefore, the primary guide of the entire educational process. The learner sits in Lessig's "read only" world.

It is clear that there is an enormous advantage for those that know how to operate within this system and transform information into knowledge – a financial advantage in some cases for content producers. The methodology chosen by Brazil with the adoption of PCN's is completely coherent with the demand for growth and development, especially if one takes into account developing countries with the world's largest populations, such as agreed upon in 1990 at the Worldwide Conference of Education for Everyone in Jomtien, Thailand, convened by Unesco, Unicef, PNUD and the World Bank. However, it is definitely a pre-network approach.

iii. Evaluation

In 1996 criteria were defined to evaluate textbooks. It was established that books with any of the following criteria were to be eliminated:

> • books that express prejudice against origin, race, gender, color, age or any other type of discrimination;
> • books that induce one to err or contain serious mistakes in relation to their content, for example, conceptual mistakes.[58]

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[57] National curriculum parameters: introduction to national curriculum parameters / Secretary of Elementary Education. – Brasília: MEC/SEF, 1997. p. 27. Available at: http://portal.mec.gov.br/seb/arquivos/pdf/livro01.pdf

[58] Didactic book of the Portuguese language, writing and written culture / Roxane Rojo, Antônio Augusto Gomes Batista – Campinas, SP: Mercado de Letras, 2003. p. 30.

The analysis of the books offered up until then generated a classification into four large categories:

• Excluded – category made up of books that presented conceptual mistakes, induced one to err, outdated, prejudice or discrimination of any kind;
• Not recommended – category that constitutes manuals in which the conceptual dimension is insufficiently presented, and things were found that significantly compromised the didactic-teaching efficiency;
• Recommended with exceptions – category made up of those books that have minimal qualities that justify their recommendation, even though they also present problems that might not compromise efficiency if taken into account by the teacher; and finally,
• Recommended – category made up of books that correctly fulfill their role, satisfactorily meeting all the normal and specific requirements as well as the criteria most relevant to the area.

In the field of publishing there has been a growing improvement in the standards of quality as a result of PNLD and the preparation of PCN's. The percentage of books that are recommended has been increasing as the publishers increase the number of works that are positively evaluated and reduce the number of rejections. Receiving the positive evaluation mark from PNLD became a market need for publishing companies, who renew their books and adapt them to more progressive methodology demands – from there we can see the investment in quality. This quality is referred to in the PCN's:

In relation to PNLD/1997, 118 of the titles registered in PNLD/1998 were new; in PNLD/2000-2001, 315 new titles were registered in relation to PNLD/1998.

Taking these data into account as an element of reflection for the topic of open educational resources in Brazil, we can conclude that there is a crucial need to create an evaluation system of all educational materials that are specifically used in the public school system, and that said evaluation must be based on the National Curriculum Parameters. Whether or not the PCNs are network-contemplating, they represent an essential element of government leverage. If the changes for OER occur against the PCNs, there would be a large step backwards in terms of the quality of the material made available for the students and the teachers. The consequences would be damaging to education in the entire country.

iv. Formation of teachers

Taking into account PNLD/1997, around 72% of the teaching choices fell within the non-recommended books, and only around 28% within those recommended. In PNLD/1998, even though the total number of books recommended (with distinction, 21.88%; with

exceptions, 22.15%; or simply recommended, 14.64%) made up the group most chosen by teaching staff, the category, which, on its own, demonstrated itself to be the most widely represented was the non-recommended group (41.33%). Finally, in PNLD/1999, the choices by teaching staff, with the elimination of the non-recommended category, fell predominantly within those recommended with exceptions (46.74%), and those recommended with distinction only represented 8.40% of the choices.[59]

The data show that teachers have a tendency to choose the books with the worst quality, or those that obtained very poor evaluations by PNLD. According to Batista, this is grounded in the low quality of education of these teachers.

The process of the popularization of education carried out in the last few decades has the ironic side effect of weakening the average strength of a teacher. Non-competitive wages and a lack of benefits for the career teacher do not create a large, skilled pool of educators. This situation is worsened by the absence of motivational instruments and alternative incentives, turning the profession into one that is not very attractive to the middle and upper classes of society.

There are also a large number of problems in the institutions that offer teaching degrees. Those courses attract students from the lower social classes, who see a teaching career as a way to get ahead because there are many positions available in the public system. These future teachers usually study for their undergraduate degrees at night in private institutions, attempting to reconcile work and studies.

It is important to pay attention to this reality when searching for possibilities to apply open resources for education in Brazil. Brazil needs investment and implementation of feasible programs for the continuous formation of professionals in the area of education, and these programs should prepare teachers to deal with open resources. Moreover, the development of incentive policies (like prizes) along with the formal recognition for contributions made in the development of material is a key element for career growth. Eventually these resources and new technologies could serve as tools for continuous education, even more so when we observe the great difficulties of implementing formation programs due to the enormous distances within the country and the costs involved, mainly in relation to the production of centers of excellence (teaching knowledge) in the Southern and South Eastern regions of the country.

V.7.b.2. - Operational Aspects

i. General description of the working policies of the textbook in Brazil

Through the Ministry of Education, the Brazilian federal government operates three programs geared toward the textbook: the PNLD (National Textbook Program)[60] that meets the demands of students registered in elementary education; the PNLEM (National

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[59] Supra p.50
[60] http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=218965

Textbook Program for Secondary Education)[61] that meets the needs of secondary school students, and the PNLA (National Textbook Program for Youth and Adult Literacy)[62] that meets the needs of youth and adults that have already finished the regular school phases, but wish to continue their education to receive their formal diplomas.

The textbooks of the courses corresponding to the school year are distributed free of charge to all students registered in elementary school, high school and for young people and adults that participate in the Brazil Literacy program[63]. It is an action by the Ministry of Education that aims to eliminate illiteracy in the country.

FNDE (National Fund for the Development of Education)[64], a federal subordinate agency of the Ministry of Education executes all actions to acquire and distribute textbooks in a centralized way; therefore there is no transfer of resources to the states or municipalities for this end.

The tally of the number of books and their destination is based on an annual census carried out by INEP (National Institute on Educational Research and Studies)[65], a subordinate agency to the Ministry of Education. That census provides the data on the number of students registered in state and municipal schools, as well as other relevant information to monitor educational levels in the country.

Specifically between 1994 and 2005, PNLD acquired 1.077 billion books for use in the school years between 1995 and 2006. They were distributed each year to an average of 30.8 million registered students in about 163.7K schools. In 2007, PNLD bought 110,241,724 books to be used in the 2008 school year. This acquisition cost R$ 559,752,767.00. Books were acquired for every course and discipline for the 13.4 million students from 5th to 8th grade (or grade nine for the schools that have adopted this teaching level over a period of nine years) and for all of the students in kindergarten, as well as those who must repeat grade one, two or three[66].

All of the resources used for the textbook programs in the country are financed by the general budget of the federal government, obtained through a tax called "salary-education."

The salary-education tax was instituted in 1964 and is a social contribution (tax) destined toward the financing of projects, actions and programs that are geared toward basic public education. That contribution is laid out in section 212, § 5º, of the Federal Constitution and regulated by laws 9.424/96, 9.766/98, Decree nº 6003/2006 and Law nº 11.457/2007. This tax is calculated on a 2.5% percentage base on all remunerations paid

[61] http://portal.mec.gov.br/index.php?option=com_content&view=article&id=13608:programa-nacional-do-livro-didatico-para-o-ensino-medio-pnlem&catid=195:seb-educacao-basica
[62] http://portal.mec.gov.br/index.php?option=com_content&view=article&id=12381:pnla-funcionamento&catid=314:pnla&Itemid=639
[63] http://portal.mec.gov.br/index.php?option=com_content&view=article&id=12280&Itemid=86
[64] http://www.fnde.gov.br/
[65] www.inep.gov.br
[66] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

by companies. It is collected and inspected by the Federal Revenue Agency, an agency connected to the Treasury. The taxpayers of the salary-education tax are companies in general as well as public and private entities connected to the pension system. It is up to FNDE to redistribute the resources obtained from these taxes. In 2008, the total gross amount collected was R$ 8,863,800,740.28[67].

The functioning of the textbook programs falls under the following phases:

- The first phase is the registration of publishers. These companies (publishing companies that hold copyrights) must follow the rules established in the proclamation published in the Official Gazette of the Union and on the program sites. This way they present their works for evaluation by SEB (Secretary of Basic Education), an agency connected to the Ministry of Education. The same proclamation determines the deadline for the presentation of works by the publishing companies.

- The second phase is the selection & evaluation of publishers' works. In this phase the works are analyzed by IPT (The São Paulo Institute of Technological Research) for a physical and technical evaluation of the books (quality of the material used, durability, resistance, etc). The approved books are sent to the Secretary of Basic Education (SEB), who is responsible for their evaluation. SEB recruits specialists that prepare the book's summaries in order to create a manual of the textbook.

- The third phase is where the textbook manual is made available and then sent on printed material to the schools registered in the school census carried out by INEP.

- The fourth phase is the choosing of the books directly by the teachers and principals of state and municipal schools.

- The fifth phase is the order. The teacher orders desired works by filling out an electronic form available on the internet or manually through a form sent through the mail.

- The sixth phase is the acquisition. FNDE compiles the information from the data received via internet and through the mail, and then carries out a centralized negotiation with the publishers. The centralization is desirable mainly due to the large quantities of orders and subsequent lower prices when compared to a single book order process.

In PNLD/2009, for example, the average printed notebook cost: 0.3493 reais and the average of books (total amount) cost 5.00 reais. The single unit value in bookstores where private school students acquire their material varies a great deal, depending on the title, publisher and the bookstore, but is generally much higher as an average. Following are some examples:

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[67] Source: System STL/DIFIN/CGFSE/DIASE

- Novíssima Gramática da Língua Portuguesa - Novo Acordo Ortográfico (New Grammar of the Portuguese Language – New Agreement on Spelling) - 48ª Ed. 2009 (editora Nacional) (Publisher) = 79.90 reais
- Geografia do Século XXI - Brasil : O Despertar de uma Grande Potência (XXI Century Geography – The Awakening of a Great Potential) - 6° Serie (5th Grade) - 2° Edição (2nd Edition) 2005 (ed. Positivo) (Publisher) = 71.00 reais.
- Geoatlas - Brochura (ed. Ática) (Publsiher) = 51.90 reais
- Atlas Geográfico Século 21(21st Century Geography Atlas) (ed. Ática) (Publisher) = 24.90 reais.
- Tudo É Matemática (Everything is Mathematics) - 6º Ano - Conforme a Nova Ortografia (According to the New Spelling Rules) (ed. Ática) (Publisher) = 68.90 reais.[68]

- The seventh phase is the production phase when FNDE closes the contract and divulges the number and locales for delivery of the textbooks. The publishers proceed to produce the works with the supervision of technicians from FNDE.

FNDE is in partnership with the Institute of Technological Research (IPT)[69]. This institute is responsible for collecting samples and for the analysis of the physical characteristics of the books in accordance with specifications from the Brazilian Association of Technical Norms (ABNT), ISO norms and procedural manuals that have already been prepared.

- The eighth phase is the distribution of the works. This is carried out directly by the publishers to each and every school. This distribution is carried out through a contract between FNDE and the Brazilian Post Office (ECT).[70]

- The ninth phase is the receipt of the books. The city schools receive their books between October and the start of the school year. The rural areas receive their books through the Secretary of Education from their respective municipalities.

São Paulo is one of the states that opted for decentralization[71]. This means that FNDE transfers the financial resources for the acquisition and distribution of textbooks and the Secretary of Education has total autonomy in regards to the choice of titles.

National Textbook Program (PNLD) Elementary Education[72]

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[68] Amounts researched on June 15, 2009.

[69] http://www.ipt.br/

[70] Available at: http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

[71] Available at: http://www.fnde.gov.br/home/index.jsp?arquivo=perguntas_frequentes.html#livrodid

[72] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

Year of Acquisition	Year of PNLD (school year)	Students who benefited	Schools that benefited	Books	Dictionaries	Finances (R$)
1995	1996	29,423,376	179,953	80,267,799		196,408,626
1996	1997	30,565,229	179,133	84,732,227		223,251,105
1997	1998	22,920,522	169,953	84,254,768		288,730,591
1998	1999	32,927,703	169,949	109,159,542		373,008,768
1999	2000	33,459,900	165,495	72,616,050		273,625,130
2000	2001	32,523,494	163,368	110,052,003	20,231,351	486,479,318
2001	2002	31,942,076	162,394	110,555,046	10,140,546	542,848,625
2002	2003	31,966,753	159,228	52,496,832	4,528,041	277,416,507
2003	2004	31,911,098	149,968	116,030,521	3,349,920	600,074,313
2004	2005	30,837,947	149,968	111,189,126		619,247,203
2005	2006	29,864,445	147,407	44,245,296	6,403,759	352,797,577
2006	2007	28,591,571	144,943	102,521,965		563,725,709
2007	2008	31,140,144	139,839	110,241,724		679,948,005

National Textbook Program (PNLD) Secondary Education[73]

Year of Acquisition	Year of PNLD (school year)	Students who benefited	Schools that benefited	Books	Finances (R$)
2004	2005	1,304,477	5,392	2,705,048	47,273,737
2005	2006	7,012,619	13,253	12,581,620	143,834,244
2006	2007	6,896,659	15,570	9,175,439	124,275,397
2007	2008	7,141,943	15,273	18,248,846	234,375,685

[73] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

ii. The Brazilian Model of the Publishing Market for Textbooks: One Perspective

Presently in Brazil, the publishing market that is geared toward textbooks is crystallized in large corporate groups, most of which also control extensive media networks. Up until the 1990's there were nine publishers that practically dominated the textbook market in Brazil, including: Saraiva, FTD, Cia. Editora Nacional, Editora do Brasil, Ática, Scipione, Moderna, Atual and IBEP. At present however there are only five conglomerates that dominate the very lucrative market of Brazilian textbook publishers. Most of them characterize themselves as "national" family-owned companies, and the only company with foreign origins was FTD, which belonged to the religious order of Irmãos Maristas Francesa.

All of the companies benefited from an increase in the number of students during the 1970's, and consolidated their corporate structures atop the new investments in education by the state, with the objective of increasing access to public schools. This development of the publishing companies was always parallel to government incentives. Generally it was increasing taxation in order to expand public education that funded the expansion and solidification of the publishing houses.

Each publisher built their own "story" of corporate origins, which are often tied into the personalities of the founders. The first ones in the early 1900's (the case of FTD), went through the 1920's as Cia. Editora Nacional with the founders Monteiro Lobato[74] and Octalles Marcondes. The company Editora do Brasil arose in the 1940's from teachers who were ex-employees of Cia. Ed. Nacional. Saraiva was founded by Joaquim Ignácio da Fonseca Saraiva. It started out as a small vender of legal books next to the Largo São Francisco School of Law. The publisher Ática was founded in the 1960's by Medical Students from the University of São Paulo School of Medicine that opened up courses for youth and adults that had already passed the normal age for school studies. The demand for the need of course materials justified the creation of the publishing company. This publisher innovated and created a system that took into account teacher's books (with answers and guidelines for the teaching staff), student books (to follow the content), and the exercise notebook (a notebook to do the exercises that were proposed). The teacher's book as a rule is a market trend for evaluation on the part of the present PNLD.

Special attention should be given to Editora Moderna, created at the end of the 1960's by teachers from a pre-university preparatory course[75]. In the mid 1970's, Professor Ricardo Feltre assumed control of the entire company. In the following decades the publisher earned considerable space in the market by utilizing competitive differentials: a large variety of titles available and a high quality of catalogs. The 1990's was marked by unprecedented growth for Editora Moderna and the transfer of its command to Feltre's children. The new administration invested in an even greater variety of titles trying to

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[74] Intellectual and famous writer of children's stories and creator of characters that, even today, make up a part of the Brazilian imagination. Those stories became celebrities in the 1940's and started a trend that has become predominate in basic education to adopt books that stimulate reading.

[75] Vestibular (university entrance exam) is the way adopted by Brazil for students to get into university. As a rule it consists of one or more exams, written and multiple choice. They take into account the various disciplines studied throughout high school.

reach the public beyond the school system, expanding its catalog horizontally. In 2001, the powerful Spanish media group Santillana bought Editora Moderna, implementing new transformations in the way the company worked in the market place.

The 1990's was a period in which the country opened up to foreign investment, and in the publishing market of textbooks there was a clear movement towards a concentration of capital and market power into the hands of fewer and fewer parties. That concentration has crystallized through large publishing groups that absorb the smaller national and family-owned businesses. They are:

- Grupo Saraiva (The Saraiva Group): formed by Editoras Saraiva, Atual and Formato, acquired between 1998 and 2003

- Grupo Abril (The Abril Group): in 2004 it took over shareholder control of the publishing companies Ática and Scipione.

- Grupo Editorial Santillana: belongs to the Spanish Group Prisa bought Editora Moderna in 2001.

- Grupo IBEP/Cia. Editora Nacional: in 1980, IBEP bought Cia. Editora Nacional.

- FTD: bought Editora Quinteto in 1997.

- Grupo Positivo: Brazilian origins by way of Editora Nova Didática, inserted itself into the market by selling teaching systems The Grupo Positivo has a growing participation in the country's computer market.

With the arrival of these publishing groups and the accompanying concentration of high barriers to entry resulting from concentration of capital, the entrance of independent publishers in the textbook market in Brazil is becoming increasingly more difficult. This is due to the high investments necessary to introduce a didactic collection in the public school system, which benefits the conglomerates and acts as a control point on market entry by startups and entrepreneurial publishing ventures.

The corporate groups concentrate their efforts on marketing and spread their material to those who have the power to help sales: the teacher. In the 1990's, it was common for companies to hire people to market directly and strictly with teachers and school principals from public schools, since these were the people who would decide on the books that would be used. Laws were created to restrict access by these marketers in the public school system[76]. The goal was to try and make the choice free and unbiased, and the present PNLD (National Textbook Program) acts as a filter for the teacher who chooses the books, since a selection and classification of the works have already been carried out by renowned technical specialists. The result of this evaluation is the

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[76] ADMINISTRATIVE RULE Nº 7, FROM APRIL 5, 2007; available at:
ftp://ftp.fnde.gov.br/web/resolucoes_2007/por007_05042007_norma_de_conduta_programas_livros.pdf

production of a Textbook Manual that is distributed to public schools as a fundamental source for the teacher to base their choices on.

Another strategy of publishers is the creation and distribution of promotional folders and catalogs to spread the collections beyond sending samples for the teachers to choose. Advertising this way is very expensive - there are around 178,000 public schools spread throughout the entire country. Speeches or large gatherings with specialists and authors are also common practices used today. This is another way in which market forces mitigate against disruptive new entrants.

In the case of private schools the strategy is to make the largest schools their number one priority, since they represent the largest number of sales, although in total approximately 10% of all of the educational institutions in the country are private. The earnings from private schools are greater than the share of institutions overall, however. Private schools lack the market force of centralized purchase, and buying books one at a time costs five times as much as those sold to the state.

More recently the publishers began to use ads on TV and the radio, mainly those used by companies that promote teaching systems. They are sold as a successful system because they originate from private schools. Private schools have an image that equates to a better education than the public system for the simple reason, even if minimal in nature, that they are able to escape the misfortunes of the public school system, such as: low teacher salaries, very poor physical structures and conditions, violence within the schools, unstructured teaching methodologies due to low quality of the teaching staff, among others.

The strategy, considered aggressive by many educators, brings about results in a population that is used to seeing the process of waste in the public school system. This fact can be observed in the evaluations at the end of school terms: Elementary and Secondary Education, promoted by the Ministry of Education.

Amounts Negotiated – PNLD 2008 – Elementary Education[77]						
Publisher	Total Circulation	Titles Acquired	Average Circulation	Printed Notebook	R$ Notebook	R$ Sample Copy	Total Amount
Moderna	36,107,212	189	194,125	577,968,517	0.2799	4.47	161,470,113
FTD	21,575,189	396	54,483	340,051,896	0.3177	5	107,936,653
Ática	17,353,460	322	53,893	296,909,980	0.3288	5.62	97,527,974
Saraiva	12,602,527	272	46,333	203,891,822	0.3311	5.35	67,427,204

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[77] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

Scipione	6,091,137	252	24,171	94,582,574	0.3511	5.45	33,175,765
Positivo	5,186,321	132	39,290	73,001,721	0.3788	5.33	27,624,343
Do Brasil	3,538,648	120	29,489	50,968,468	0.4055	5.84	20,650,604
Escala	3,579,987	98	36,530	47,136,953	0.3788	4.98	17,837,645
IBEP	2,294,468	148	15,503	29,842,799	0.4277	5.56	12,752,749
Base	609,831	64	9,529	7,227,439	0.5677	6.72	4,100,193
Dimensão	425,381	44	9,668	5,919,900	0.5766	8.02	3,411,842
Sarandi	536,312	10	53,631	6,034,109	0.5588	6.28	3,368,289
Nova Geração	250,552	10	25,055	3,569,799	0.3611	5.66	1,417,978
Casa Publicadora	88,798	8	11,100	1,748,749	0.5811	11.44	1,015,654
Educarte	1,901	8	238	15,347	1,8822	18.81	35,759
Total	110,241,724	2,070	53,257	1,738,870,071	0.3219	5.08	559,752,767

Amounts Negotiated – PNLD 2008 – Secondary Education[78]

Publisher	Total Circulation	Titles Acquired	Average Circulation	Printed Notebook	R$ Notebook	R$ Sample Copy	Total Amount
Moderna	7,618,580	44	173,150	180,280,898	0.2799	6.62	50,402,465
Saraiva	2,555,915	28	91,283	93,909,623	0.3311	12.16	31,083,572
Ática	2,610,470	30	87,016	86,653,043	0.3288	10.91	28,483,585
Nova Geração	1,318,362	6	219,727	64,692,481	0.3611	19.51	25,723,246
FTD	1,421,335	12	118,445	52,453,416	0.3177	11.72	16,653,149
Escala	777,960	2	388,980	32,726,892	0.3788	15.93	12,389,541
Scipione	634,943	18	35,275	19,035,539	0.3511	10.52	6,678,671

[78] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

CIA da Escola	389,394	2	144,697	10,787,442	0.5099	19	5,499,433
IBEP	311,227	12	25,936	8,483,978	0.4277	11.65	3,627,063
Positivo	435,001	18	24,167	6,561,388	0.3788	5.71	2,483,545
Do Brasil	135,660	10	13,566	4,773,721	0.4055	14.26	1,934,949
Base	139,999	14	10,000	3,126,849	0.5677	12.67	1,774,268
Total	18,248,846	196	93,106	563,485,269	0.3314	10.23	186,733,493

Largest vendors of books by number of samples – 2002[79]

Country	Sample Copies (millions)	%
China	7103	49
USA	2551	18
Japan	1403	10
Russia	494	3
Germany	479	3
France	413	3
Brazil	345	2
United Kingdom	324	2
Italy	265	2
Spain	235	2

Source: Earp and Kornis (2005)

Population and estimate of the textbook market in Latin America and the Caribbean (2001)

Countries	Population (2000 - 2001) millions of inhabitants	Estimate of the didactic book market (in millions of dollars)	%
Argentina	36,260,130	110	10.3
Bolivia	8,274,325	8	0.7
Brazil	169,799,170	493	46
Chile	15,116,435	27.1	2.5
Colombia	42,105,000	45.9	4.3
Costa Rica	3,810,179	10	0.9
Ecuador	12,156,608	15	1.4

[79] Data available at http://www.fnde.gov.br/home/index.jsp?arquivo=livro_didatico.html

El Salvador	6,756,789	6	0.6
Guatemala	11,237,195	6	0.6
Honduras	6,076,685	1	0.1
Mexico	97,483,412	197.4	18.4
Nicaragua	5,071,671	1	0.1
Panama	2,839,329	4	0.4
Paraguay	5,163,198	3	0.3
Peru	25,932,929	15	1.4
Puerto Rico	3,808,610	80	7.5
Dominican R.	8,562,541	6	0.6
Uruguay	3,241,003	3	0.3
Venezuela	24,920,902	40	3.7
Total	488,616,107	1071	100

Source: Data organized by Célia Cristina de Figueiredo Cassiano from Uribe (2006); Moreno y Otero (2006) and IBGE (2000).

VI. - Brazilian Experiences: The Tropical OER

Brazil, under the current government and the leadership of Ministry Fernando Haddad, invests in distance education and digital inclusion projects in parallel to traditional programs to train professors. As Anna Christina Nascimento, one of the project coordinator the SEED – the Secretary of Distant Education at the MEC noted: "Distance learning programs seem to be the best alternative to provide opportunity for students who, because of background or economic conditions, do not have access to education in their community."

In relation to this option, this section of the Green Paper will map some of the projects developed under SEED and perform an analysis of their design, with special attention to how each one relates to the concept of OER. The initial analysis here demonstrates that the lack of a clear policy around the terms of provision of educational resources has resulted in projects misclassified as "open" under generally accepted international conditions for OER. A side effect of this lack of clarity and adherence to international standards for OER is a certain insecurity from the part of teachers that are accessing the resources, who do not understand the boundaries of what is and is not possible in terms of academic creative reuse and redistribution.

The research laid out in this section represents a significant source of the recommendations advanced elsewhere in the Green Paper.

VI.1. - Open University of Brazil

Related to Content / Technology policy, Content / Pedagogy policy, Content / IPR

The Open University of Brazil – UAB is an initiative started in 2005, resulting from partnership among public universities, states and cities governments, and coordinated by MEC. It is not a new institution or university, but instead a network of institutions and universities that aim to bring higher education to the municipalities where no superior program is offered or where, when courses are available, they are insufficient for the existing demand.

One of the UAB's primary concerns is the initial and continuing education of public school teachers, mainly for the fundamental learning cycle through the offer of distance learning courses.

The courses are offered through learning centers built by the cities, each including a library and labs for computer, physics, chemistry, and biology. The learning center also offers the students a face-to-face tutoring. The public higher institutions involved in the UAB network are responsible for the courses development as well the instructional materials. Currently, there are 74 institutions composing the UAB network, 728 learning centers where 550 courses are being offered.

However, the use of the word "open" within this project should not be understood as open as in the Hewlett Definition of OER. The courses offered by the learning centers are free of charge for those selected. The selection process follows the public entry exams rationale common to the public higher educational system in Brazil. The materials are not available for those not formally enrolled and no part of the content is available online. Also, the lack of open licenses or a clear federal policy regarding the ownership of the content produced by the Institutions involved within the UAB, probably means that each institution owns copyright over elements of the content developed for the courses offered through UAB, but paid by the federal government.

VI.2. - Digital Educational Repositories

Related to: Content / Technology policy, Content / IPR

Since 2003, the MEC has invested in the development and provision, through different process and methodologies, of learning objects. Learning objects are digital educational resources, which are developed within certain standards so it is possible their reuse at different educational contexts. They are stored in educational repositories, and they must be catalogued, so users can easily find them. Some examples are: texts, e-books, quizzes, course syllabi, courses, simulations, presentations, audio and video files, etc. The two main projects in this area are the Interactive Virtual Network of Education (RIVED) and the Public Domain Portal.

VI.3. - RIVED[80]:

Related to: Content / Pedagogy policy, Content / IPR

RIVED's (in the past know as International Network of Virtual Education, and currently named Interactive Virtual Network of Education) goal is to improve the role of the teacher as a facilitator and leader of the teaching/learning process, and to enhance the role of the student as a learner, thinker, investigator and problem-solver.

In 1997, Brazil and United States signed an agreement to develop technology for educational use. Brazil's effective participation began in 1999 through a partnership between the Department of Secondary Education and Technology (now Basic Education Secretary - SEB) and the Distance Education Secretary (SEED). In Latin America, Peru and Venezuela joined the effort with Brazil. The pilot enterprise aimed to produce technology-rich learning activities and objects to support teaching within the participant countries, to support and be incorporated within the scientific curricular goals of each partner.

By 2003, SEED was responsible for the production of 120 learning objects of Biology, Chemistry, Physics and Mathematics for Secondary Education. In 2004, SEED transferred the production process of learning objects to universities, through a Project named "Virtual Factory". The participation of Universities (18 by 2009) within the

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[80] http://rived.mec.gov.br/site_objeto_lis.php

Virtual Factory made possible the expansion of learning objects production into other levels, such as the production of content for other areas of knowledge, for basic and vocational education, and for other special needs. It also enabled and incentivized the participating institutions to share their best practices, learning activities, strategies and experiences

The international and partnership shape that characterized the project in its birth has shown the benefits of a flexible enough policy that would allow the re-use and adaptations of objects for local needs.

The learning objects, the majority in Portuguese, are divided into knowledge areas and retrieved by a search mechanism. They are accompanied by a teacher guide that provides suggestions on how to use the material, how to build activities and classes around it, how the teacher should prepare herself and the students, the minimum knowledge required, and the knowledge objectives aimed by the activities.

The learning objects retrieved from the RIVED database do not have any open license attached to them. The website also does not have any specific terms of use or copyright notice. The section "How to use" features a tutorial on how to use the repository, including a short online course. However, when reading the RIVED website Q&A, one of the items speaks to copying and rights:

> "Can I copy the objects published by the RIVED site?
> All objects that have the 'download' button can be copied and reproduced, you just need to click on it and save in your machine. For instance, the contents can also be saved in CD-Rom and sent to schools and other learning institutions without Internet connections. They can also be reformed and re-edited, however the original authorship needs to be kept."

Currently, the RIVED home page carries a notice that:

> "Use License: the contents produced by RIVED are public and will be, gradually, licensed thought a Creative Commons license. These contents can be accessed through our search tool in our online repository, which allows you to see, copy and comment the published contents. With the Creative Commons license, the author rights are guaranteed and it will be possible for others to copy and distribute the material, with the proper attribution to the authors."

However, there is no specification within the RIVED system as to which CC license will be adopted. It seems, from the mission that accompanied the project since its birth, and the possible uses allowed through the Q&A and this notice in the home page of RIVED that CC-by is the most appropriate license.

VI.4. - International Bank for Educational Objectives[81]

Related to: Content / Technology policy, Content / Pedagogy policy, Content / IPR

The International Bank for Educational Objectives is a repository created in 2008 by MEC, in partnership with the Ministry of Science and Technology, the Latin American Network of Educational Portals (RELPE), and the Organization of Ibero-American Countries (OEI), among others. It was developed using DSpace – an open-source platform for accessing, managing, and preserving scholarly works, developed by MIT Libraries and HP Labs.

The International Bank aims to maintain and share digital educational resources (in a variety of more elaborate formats than simple documents) for free access by a community with different realities and languages, in general Portuguese and Spanish. Examples vary from audio, video, animation, simulation, educational software - in addition to image, map, hypertext considered relevant and appropriate to the reality of the education community place, respecting the differences of language and regional cultures. This repository is integrated with the Teachers Portal.

The official description of the International Bank within the Ibero-American Countries portal (http://www.oei.es/noticias/spip.php?article2886) states, regarding the acceptation of educational resources to be part of the International Bank, that:

> " The Ministry of Education will accept educational resources that have been licensed in the following ways:
>
> * License given by the author or his representative directly to the Ministry of Education, enabling reproduction, translation, distribution and transfer.
> Other licenses such as:
> * Resources licensed through a Creative Commons license that allows the reproduction, translation, distribution and transfer.
> * Resources licensed through a the terms of use of a institution's site that allows the reproduction, translation, distribution and transfer."

However, an analysis of a sample resource downloaded from the bank shows that the licensing situation of the bank is complex and not uniform, causing great difficulties to the users in understanding how they can actually use the contents retrieved from the bank and the level of resource interoperability.

The sample showed that the user of the bank can find resources without any notice on copyright license (which may mean that the object is fully copyrighted, having "all rights reserved", since the Bank does not have a unified policy to deal with this type of

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[81] http://objetoseducacionais2.mec.gov.br/ and http://www.oei.es/noticias/spip.php?article2886

case), resources licensed with different Creative Commons licenses and resources that bring their own use conditions.

VI.5. - Public Domain portal

Related to: Content / Technology policy, Content / Pedagogy policy, Content / IPR

The Public Domain Portal is a digital library developed on a free software platform, launched in November 2004. Its mission is the collection, integration, preservation and sharing of knowledge, and promotion of the broad access to the literary, artistic and scientific works (in the form of text, sounds, images and videos), which are part of the Brazilian and Universal cultural heritage. Additionally, we read in its mission, signed by Ministry Fernando Haddad:

"the "Public Domain Portal" [aims] to provide information and knowledge in a open and free manner, seeking to encourage learning, innovation and cooperation between the generators and users of content, while leading a broad discussion on copyright - so that 'some rights reserved encourages further uses' - and an adaptation to the new paradigms of technological change, production and use of knowledge."

Under its archive policy, the portal assures that the works digitized, published and accessible – a total of 123.510 in June 2009 – through the site are in the public domain or licensed through a Creative Commons license. In the area for authors, the site provides instructions regarding how copyright holders can contribute with the library. They ask the author to first license the work through a Creative Commons license and then send the work, with some specific archiving information and the license, to an email dominio@mec.gov.br. The Ministry of Education holds the right to refuse works and also the right to take down works and content in violation to copyright.

The project also fosters collaboration from other stakeholders, such as institutions, translators and volunteers. In the case of the institutions, these are instructed to send an email to dominio@mec.gov.br in order to assign the copyrights. However, the download of a sample of contents showed that not all contents have Creative Commons licenses associated with them and many are not in the public domain based on a simple count of years. It is true that many do not have a copyright notice or symbol in the material, however the Brazilian law – implementing the international copyright system – does not require notice for copyright to hold true. Thus, while recognizing that our sample is not statistically significant, it is fair to say that the examples we found break down the copyright statement from the Dominio Public project.

Additionally, the site provides links to other project and digital collations, such as Machado de Assis, recent performances of Brazilian classical music and other collections that are not in the public domain, with the great potential of generating confusion among the users and violation of copyrights.

Through the search engine at the Public Domain Portal, the user has access to a database of theses and dissertations. The download of a sample showed that the theses frequently do not carry any notice regarding their copyright license. Thus, a conservative user might interpret that the texts are fully copyright protected – which again can cause confusion, since the publication of copyrighted materials lacking open licenses on this site contradicts its mission.

VI.6 - Teacher's Portal[82]

Related to: Content / Pedagogy policy

The Teacher's Portal is an initiative from the Ministry of Education to integrate the whole public system of the equivalent to the K-12 education. It is target to create an environment where decision makers, academics, teachers and students are connected.

The Portal is organized into 7 sections:

(a) "Classroom Space" – a place to create, view and share lessons and classroom methodologies for all levels of education. Classes can contain multimedia resources such as videos, animations, audio, etc., imported from the Portal or external sources. Any teacher can: create and collaborate, develop lessons individually or in teams, search and explore the content of lessons. There are, for instance, 1138 lessons suggested within this space, the majority of which are focused on how to conduct a class focused on a certain kind of content. In the toolkit on how to build a classroom, there is a brief passage on page 5 stating that:

> "After finishing your Classroom, do a good spell check, verify if all links are correct, working and published in the correct sequence. Check also the quality and size of images inserted and now you can post your Classroom suggestion for public access through the Portal. For this, you just need to open the Classroom and click on 'Save and publish' after agreeing with the assignment of copyright."

The checkbox the platform creates, as seen above, says:

> "I agree with the publication of this Classroom for public access. This assignment of copyright allows copy, distribution, edition, and execution, if proper attribution is granted"

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[82] http://portaldoprofessor.mec.gov.br/

However, when you access a Classroom, this section or the Portal, no open licenses associated with the content created and published are visible or findable. Indeed, the home page of the Portal carries a copyright notice attributing all rights to the Ministry of Education.

(b) "Teacher's Newspaper" – 15-day publication with news from MeC and others related to education and the day-by-day life of teachers.

(c) "Educational Resources" – 3527 educational resources imported from the International Bank of Educational Objects. The user guide states that

> "All resources published in the Teacher Portal can be downloaded - to your computer, pen-drive, CD, DVD or otherwise -, copied and distributed, being forbidden any for-profit use."

However, a sample of materials has shown that each material has its own license, some licensed through CC, some not. Thus the standard statement is again not correct for all cases.

(d) "Courses and Materials" – Courses and materials focused on teachers' continuous training. This section acts as an aggregator of external links to programs of continuous training coordinated by MEC and its partners. The majority of courses are registration-based only and are face-to-face, being developed through a network of learning institutions.

(e) "Integration and collaboration" – This section fosters the adoption of web 2.0 tools by teachers in order to interact and collaborate with teachers, by supporting internal and external tools for the creation of groups, sharing of content, information, research and debates. Within the forums the hot topics are technologies for education.

(f) "Links" - This section acts as an aggregator of external links to national and international resources, institutions, courses, museums, software, etc. The criteria for having a link in this section are not clear. The main page of this section says: "National and International Sites and Portals to support the research by and continuous training of teachers". Within the International links projects like Connexions and MIT OpenCourseAware are placed within the same list where BBC sites are listed, with no marks to indicate that some are compliant with international standards for OER while others are not.

(g) "Freire Platform" – national project dedicated to train teachers that do not comply with the national norms of minimum curriculum.

VI.7. - Projeto Folhas[83]

Related to: Content / Pedagogy policy, Content / IPR

The Folhas Project is part of the State Secretariat for Education of Paraná (SEED)'s program focused on training the teachers of that state. It was established in 2004 and is an effort to involve teachers in the development of educational materials. The objective is to establish a daily practice of research in schools, encouraging teachers to search the digital knowledge, and theoretical and methodological foundations of the disciplines they teach, producing texts to be used in the classroom. The framework of this work is the curriculum of the Parana State. Once finalized, the text, called "Folhas", is, after being verified and validated by the Educational Regional Nucleo (NRE) and by the SEED, published in the Dia-a-Dia Educational Portal (www.diaadiaeducacao.pr.gov.br). This portal provides information and materials for teachers, students, schools and its communities.

With the publication, the authors receive points that are counted in order to advance the career of that teacher. The texts, which can be developed via co-authorship, are published in the internal network of schools form Parana, and can be accessed and printed by the schools.

The "Folhas" are then organized in books – called "Public Textbooks"[84] - that follow the content of the Parana state curriculum, and that are subject to the federal Law of Directives and Bases of Education. The State Secretariat for Education of Paraná do not purchase the books listed by the National Program of Textbooks (PNLD) or the National Program of Textbooks for High School (PNLEM). These Public Textbooks are free and available in digital format, and can be printed and distributed, if attribution is maintained. There are a total of twelve books attending the secondary school curriculum subjects: Art, Biology, Physical Education, Physics, Philosophy, Geography, History, Portuguese Language and Literature, Modern Foreign Language, Mathematics, Chemistry and Sociology. In order to distribute the books, the state publishes a call for bid.

VI.8. - SciELO Books

Related to: Content / Price, Content / IPR

The Open Access movement for scholarly literature is closely related to OER as it creates a growing corpus of peer-reviewed research for use in open courseware and elsewhere. One of the pioneers of Open Access journal publishing in developing countries, and a model of the effectiveness of regional collaboration in Open Access research dissemination, is the Scientific Electronic Library Online (SciELO) project

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[83] http://www.diaadia.pr.gov.br/projetofolhas/modules/conteudo/conteudo.php?conteudo=3;
http://www.scribd.com/doc/3969779/Livro-Didatico-Publico-Sociologia;
http://www.diaadia.pr.gov.br/projetofolhas/modules/conteudo/conteudo.php?conteudo=2.

[84] http://www.diaadia.pr.gov.br/projetofolhas/modules/conteudo/conteudo.php?conteudo=12

from Brazil. SciELO is a leading open access journal aggregator focused on Latin America, and is now expanding its efforts via SciELO Books.

The SciELO Books program[85] aims to create a consortium of academic publishers, including, in the pilot phase: UNESP (State University of Sao Paulo), UFBA (Federal University of Bahia) and FIOCRUZ (Oswaldo Cruz Foundation). The objective is the online publication of scientific works, focusing on out of print books, as well as new books. It will provide tools for publication, marketing, access, search, and interaction with users. A virtual store with mechanisms for the sale of books in both printed and electronic form (e-books) is being developed. The pilot will launch with 500 books. However, SciELO has not yet secured all the funds needed to implement the project.

VI.9. – Thesis, Dissertations and Institutional Repositories

Related to: Content / Technology policy, Content / IPR

The thesis and dissertation are traditionally focal points of Open Access rather than OER. However, they represent essential material outputs of education and research in higher education institutions, and form in this sense part of a broader definition on Educational Resources in higher education. Brazil has made a series of policy and funding steps to ensure access to these resources.

In December 2002, IBICT, linked to the Ministry of Science and Technology, launched the Brazilian Digital Library of Theses and Dissertations (BDTD) through the establishment of working groups and a network of Federal and State Universities. The mission of the BDTD is to make the national academic production available nationally and internationally. BDTD adopted Open Archives Initiative (OAI) technology and international interoperability standards, such as the NDLTD[86], to ensure interoperability

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[85] The case of SciELO: "SciELO hosts 125 journals dealing with health and other sciences published in Brazil and other Latin American countries. SciELO is a collaboration between the Foundation for the Support of Science of São Paulo and the Latin America and Caribbean Center on Health Sciences Information, BIREME, and has significant government funding and support. SciELO operates as a network of national and thematic collections of open access journals, which are managed so as to be inter-operable, using Open Archives Initiative protocols. Around 55 000 articles with Latin American and Caribbean affiliation were online by 2006 (Packer 2006). The combination of regional collaboration and Open Access has dramatically improved the global visibility, accessibility, and impact of science from Brazil and other regions of Latin America. Article downloads have increased from 1000 in 1998 to 6 million in 2006. SciELO articles appear in Google Scholar statistics as having the third highest hits globally, and citation levels are increasing (Packer 2006). The economics of SciELO are interesting. Figures from 2005 show that, with $1 million of government support, there were 150 journals online, at about $650 per journal. With close on 10 000 new articles online, the cost per article was around $100. The total of 60 000 articles available indicates a longer-term investment of around $16 per article per year. There have been 27 million downloads, representing 3.7 cents per download. (Packer 2006). The lesson would appear to be that regional cooperation in the delivery of online Open Access research publishing, supported by government subsidy, is a worthwhile investment." Eve Gray, Achieving research impact for development: A Critique of Research Dissemination Policy in South Africa, with Recommendations for Policy Reform pp. 44 and 45 (Open Society Institute) at http://www.policy.hu/gray/IPF_Policy_paper_final.pdf.
[86] http://www.ndltd.org/

of Brazilian information with international catalogs and search engines such as Oaister[87], Scirus[88], and Base[89], among others.

In February 2006, CAPES, the federal Brazilian agency for supporting postgraduate programs linked to the Ministry of Education[90], published *Ordinance 13*[91] mandating all institutions (public or private) which offer masters and doctorate degrees to make student theses accessible through publication on the Internet. The ordinance decrees that publication will be made through an institutional repository or through a national repository and all theses and dissertations published after March 2006 should be online within one year.

The language used in the mandate, stated in article 5th of the resolution, is worth noting and might serve as a model for other policy positions around Open Access and OER:

> "The funding of academic work with public money, in the form of scholarships or any kind of assistance granted to a master or doctoral program, implies the obligation of the master or doctor student to present it to the society that funded its research, applying to it the provisions this Ordinance."

After this Ordinance, there were efforts to have BDTD be the centralized access point for research on the databases of thesis and dissertations, based on its legitimacy within the network of Universities and its technology and adoption of international standards, but these were unsuccessful.

Nowadays, there are two main e-thesis aggregators: IBICT, through the Brazilian Digital Library (an effort started in 2002, even before CAPES Ordinance 13, through the establishment of working groups with Federal and State Universities) –- and the Public Domain Portal. As of July/2009 IBICT reported 91,975[92] published works accessible through its databases covering the period of 2000-2009.

Thus, the theses and dissertations are now accessible through multiple access points, causing some confusion regarding how extensive any one database might be, and if any aggregators are really covering all available online thesis and dissertations. It is important to note that many Universities also maintain their own repositories while sending information and digital archives to both IBICT and the Public Domain portal.

To deal with this problem, legislation was proposed in 2007 and recently approved in of the Brazilian House of Representatives (bill of law # 1.120) that requires public

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[87] http://www.oaister.org/
[88] http://www.scirus.com/
[89] http://base.ub.uni-bielefeld.de/en/index.php
[90] Its mission has 4 main goals: to evaluate the graduate and post-graduate courses (master and doctorate); to foster the access and public communication of Brazilian science production; to invest in high-value resources through national and international training and to promote international academic cooperation.
[91] http://www.capes.gov.br/sobre-a-capes/legislacao/2340-portarias
[92] http://bdtdj.ibict.br/indicadores/graficoSHID.jsp?cod1=&cod2=&cod3=

institutions of higher education to deposit the entire content of the technical-scientific production of students and professors into repositories. The bill establishes that IBICT shall lead a committee that will be responsible to develop a national policy of access to information, specifically access to the academic/scientific research produced in public institutions in Brazil. The project also unifies, under IBICT, the publication of the information regarding access to the institutional repositories.

The bill allows two exceptions. For the case of publications that had its rights previously assigned or licensed, the publication metadata needs to be archived and accessible through the institutional repository. The same rationale is applied to publications that are part of research aiming towards a patent application.

It important to notice that while the main goal of this bill is to provide "open" access to the national scientific production, the bill does not utilize the definition of open and based on the repositories already in practice. The "open" may be understood as "free / no cost" and not as having the publications under some kind of open license.

VI.10. - Fundação Getulio Vargas Distant Learning – FGVOnline

Related to: Content / Pedagogy policy, Content / IPR

In July 2008, UC Irvine Extension – the continuing education arm of the University of California, Irvine – with the Fundação Getulio Vargas (FGV) announced a joint educational venture to provide online distance learning courses through UC Irvine Extension's OpenCourseWare (OCW) initiative[93]. Through the partnership, FGV – a nonprofit higher education institution and the largest provider of online education in Brazil – has created free online courses, such as "Ethics" and "Training and Human Resources Development", presented in Portuguese.

Said Gary W. Matkin, Ph.D., and dean of Continuing Education at University of California, Irvine: "The sharing of free, high-quality courses between two higher education institutions with international reach will benefit students all over the world. Exemplifying the power of the OCW initiative, this partnership enables learners, no matter whom or where they are, to gain access to University-level courses."

For the project, FGV did not simply translate the courses, incorporating new distance-learning methodology and content. Regarding this improvement, Gary W. Matkin commented: "(…) since most educational material is shared from the Northern hemisphere to the Southern, this partnership provides us the opportunity to showcase high quality educational content produced in the vibrant countries of South America. The collaboration between UC Irvine Extension and FGV represents one of the first times that an international institution has created content for utilization by the United States – making it an early example of both cultural significance and educational pioneering."[94]

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[93] http://ocw.uci.edu/courses/,
[94] http://unex.uci.edu/pressroom/releases/pr.asp?ID=156

The UC Irvine courses have been localized by adding concepts and cases that reflect the business and cultural environment of Brazil.

VI.11 - The MeC Guide on Educational Technologies[95]

Related to: Content / Pedagogy policy, Content / IPR

The Technology Guide put together by the Ministry of Education provides a structured and revised set of technologies and materials that serve as a guide for the adoption of technologies within the public network of schools. MeC published calls for applicants who can present technologies in 5 main categories: Education Management, Learning tools, Training Tools for teachers, Tools for Inclusion and Portals. This Guide is one of the actions under the Education Development Plan.

However, there are no clear criteria regarding the adoption of these technologies, as each school has the autonomy to choose which technology they will adopt and present a plan and a budget to the Ministry that then supports the acquisition of the technology. The objective of the Ministry is to foster education technology production and adoption. Despite the fact that many of the technologies presented in the guide are free-software, there is no clear policy regarding the adoption of open licensed materials and software.

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[95] http://www.congressotecnoeducacional.com.br/index.php?link=imprensa/noticias/035.php and http://di.uern.br/sementedigital/?p=111

VII. - Conclusions

Brazil has clearly made a significant commitment to bringing the network into the classroom, as evidenced by the wide variety of projects surveyed in this Green Paper. Within five years, tens of thousands of schools will be wired into the global Internet, and the various attempts to bring content and pedagogy online will be mature and ready for evaluation. These and other projects all appear to be beneficial to educator and to learner and hold the potential to transform education more generally.

The question is, will the projects create the same radical increase in individual capacity for the teachers and students that the Web has brought to us as consumers, programmers, and cultural creators? Or will it simply take the forms of education that are familiar to us, including the content consumption model, and make it more efficient? Neither ending is pre-ordained, and the choices we make as a society play the central role in which eventual "digital education" future we realize. An easily imagined ending is one in which multiple "open" projects fail to achieve interoperability on some level (legal, technical, or semantic) results in the creation of a batch of projects that change individual domains but do not result in true disruption of the system for the better.

The recommendations laid out in the next section represent lessons drawn from the areas in which the individual has been transformed by access to the network. In these areas, we see a mixture of open licensing, access to the network, access to tools, increased personal capacity, technical standardization, and policies that create default settings in favor of this mixture. Each recommendation aims to support the tendency of networks to result in distributed, user-driven innovation in content creation and distribution.

A systematic approach to law, policy, training, and market forces holds the best chance for the dream of an educational culture in which teachers and students join forces in a lifelong educational process, drawing on the best ideas and courses worldwide to build locally relevant pedagogy. This continuing educational process would give developing nations like Brazil, at last, something like an equal opportunity in the global innovation system, and represents one of the best hopes of development in the network society.

VIII - Recommendations

General principles of educational-ICT policy: the highest return on public investment in education ensues when the following principles related to the interaction of contents and networks are reality.

1. Publicly funded educational materials, both the teaching materials and the research output, should be considered to be public goods and made available under the international definitions of OER. Adherence to this principle requires attention to IPR, price, access, and training.

2. Data, statistics, and metrics regarding the success of the OER policy should be easily available to all.

3. Public funds for ICT investment in infrastructure should be conditioned on the recipient having an acceptable pedagogy plan to educate teachers and other key stakeholders. A pedagogy plan defines the inputs of open resources, the outputs of the educational process, and explains how teachers and the community will be engaged to take full advantage of the combination of technology and open content.

Under these general principles, we make a set of more detailed recommendations for next steps to realize the full potential of the network to positively transform the Brazilian educational system. These recommendations should be the starting point – not the end – for conversation, refinement, and implementation. Wherever possible, the recommendations are tied to the adoption of existing or emerging international standards related to content and network-based innovation.

The unifying concept behind these recommendations is that policymakers should carefully consider the culture of the collaborative project on the network. Before the network, the impact of choices related to the interaction of technology, pedagogy, price, access, and intellectual property might have been small compared to the importance of classical infrastructure like the construction of buildings for libraries. But now, all of these factors must be considered as core elements of the social infrastructure of the community of educational stakeholders, and key to the long-term success or failure of educational technology investments.

I. Content / Technology policy
1)   Unify IR policies and create via OAI a single meta-index of all Brazilian e-theses

II. Content / Pedagogy policy
1)   Create online courses to train teachers in the use of online educational resources
2)   Create specific pedagogical resources in the use of OER
3)   Create metrics to reward teachers who not only use OER but re-contribute new OER

III. Content / Price
1)   Require publishers to disclose info on textbooks' wholesale prices and revision histories;
2)   Recommend that institutions explore alternative textbook sources or otherwise innovate to reduce costs of educational materials (e.g. textbook rental programs);
3)   Regulate textbook prices in public institutions
4)   Commission studies and reports to investigate high cost of textbooks;
5)   Require schools/bookstores to actively promote textbook buyback programs.

IV. Content / IPR
1)   Amend copyright law to expand and formalize exceptions and limitations related to education, libraries, etc.
2)   Establish a federal law/policy giving "open" and cost-free access to books, theses and articles necessary for higher-education produced by professors working full-time in public universities or students receiving full time scholarships from the government;
3)   Establish a federal law/policy establishing "open" licensing (allowing all uses including commercial use, such as the Creative Commons Attribution license), and cost-free access to books and other educational resources, such as digital or analog learning objects, developed by and/or paid by the federal government and its sub-contractors;
4)   Unify copyright policy, specifically the establishment of an unified "open" license approach (allowing all uses including commercial use, such as the Creative Commons Attribution license) regarding projects developed by the federal government which aim to provide educational resources to all levels of education;