

Towards New Computational Architectures for Mass-Collaborative Open Educational Resources

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ABSTRACT

Open Educational Resources offer several benefits mostly in education and training. Being potentially reusable, their use can reduce time and cost of developing educational programs, so that these savings could be transferred directly to students through the production of a large range of open, freely available content, which vary from hypermedia to digital textbooks. This paper discuss this issue and presents a project and a research network that, in spite of being directed to Latin America's reality and need, search for answers that would help to solve some educational questions that go beyond countries' boundaries.

KEYWORDS

e-learning, open educational resources, digital textbooks, learning objects, hypermedia educational content.

1 INTRODUCTION

Open Educational Resources (OER) [1] offer benefits in education and training, since they allow to reduce time and costs of establishing educational programs, through their adaptation, reuse and remixing. An initial definition for the term was “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” [2].

Nowadays, the definition of OER now most often used is: “open educational resources are digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research” [3].

Conceptualize them involves a brief review of its origins, and thus the predecessor theory, regarding to Learning Objects (LO) [4]. David Wiley, using the term “learning object” coined in 1994 by Wayne Hodgins, helped to popularize the whole idea of design and reuse digital elements to use them in different teaching and learning situations and contexts. According to [3], also David Wiley used the term “open content”, inspired in open source philosophy, to refer to learning objects that could be freely available and openly adapted, edited and remixed [5].

Thus, an OER should include, according to [3] [6]:

- Learning content: full courses, courseware, content modules, collections and publications.

- **Tools:** software to develop, use, reuse, and deliver learning content including searching and organization of content, content management systems and training, content development tools and online educational communities.

- **Implementation Resources:** Intellectual property licenses to promote open publishing of materials, design principles of good practice and translation of content.

Figure 1, extracted from [3], shows the main elements of OERs.

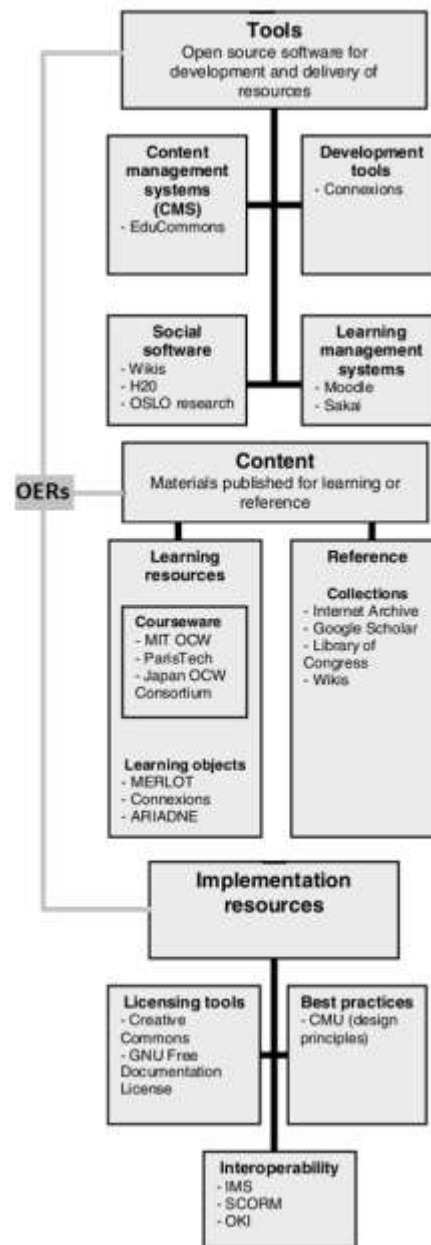


Figure 1. Different elements of OERS (Adapted from [3])

Ferran et al. [7] conceptualized the term OER about features that should meet the resource, in terms of cost and availability, including:

- Access to open content (including metadata) should be available free of charge for educational institutions, content services and end users such as teachers and students;

- The content is meant to have a free license for reuse in education, with no restrictions which could be preventing users to modify, combine and direct content to other purposes, and consequently, the content should be designed for easy reuse of content standards and open formats;
- Open Source software and free Application Programming Interfaces (APIs) must be used, as well as authorizations to reuse services and Web-based resources.
- There are a very demanding set of principles, which in many cases, the repositories of educational resources more relevant nowadays in fact do not fully comply with.

However, Downes [27] highlights that this type of initiative also requires consideration in relation to sustainability. This involves the question of maintaining the availability and even distribution of OER production. The answer, according to the author, involves some elements.

Among them it is possible to stand out two aspects. The first refers to the possibilities of cooperation. These are related to the share, which may even result in growth opportunities for innovation arising from the opening concept. Likewise, the opening access allows a more dispersed, which means not only the greater visibility of the actors involved (institutions, teachers, etc.), as well as a greater democratization of information [28].

However, the second aspect highlighted by Downes [27] when he discuss the OER sustainability does not imply the absence of cost. This means that strategies are needed for large-scale investment or partnerships to enable the

provision of OER. In this sense, the author highlights some funding models:

- Endowment Model – characterized by obtaining and managing resources for a project;
- Membership Model – where institutions that have common interests can make contributions in a kind of managed system;
- Donations Model – based on support by the community and this is made possible by a non-profit foundation;
- Conversion Model – is guided in providing no-cost elements, which can be complemented by additional paid services or resources;
- Contributor-Pay Model – establishes a system where the people or institution bears the cost contributes to the maintenance of that contribution so that it is freely available;
- Sponsorship Model – maintenance is linked to the use of commercial messages;
- Institutional Model – similar to above, is determined by whether an institution to assume the role of maintainer of the proposal or project;
- Governmental Model – in this case the maintainer is a government agency;
- Partnerships and Exchanges – establishes the philosophy of partnership for maintenance.

A complementary aspect that should also be considered in the context of OER, including in relation to sustainability, is the issue of mass collaboration.

2 MASS COLLABORATION

The spread of Internet and the evolution of its technologies have made possible the construction of huge knowledge

bases by means of mass collaboration, with thousands of volunteers contributing simultaneously. As stated by [8], "mass collaboration systems enlist a multitude of humans to help solve a wide variety of problems".

People already has been using Web 2.0 as *prosumers* - a term formed by contracting either the word producer with the word consumer, first proposed by Toffler [9], regarding the previous work of McLuhan & Nevit [10], which forecasted relevant changes in society due to all advances electric technology provided at that time. This term was already better explored by Tapscott and Williams [11], together with the term "Wikiconomics", about mass collaboration and based over four principles: Openness, Peering, Sharing, and Acting Globally.

Still regarding to mass collaboration, Howe [12] coined another term, *crowdsourcing*, which stands for a production model that uses collective intelligence and knowledge carried by volunteers across the Internet to solve problems, and give solutions for content creation or development of new technologies. These concepts, together with the "long tail" concept (which points out that the aggregate value of a quasi-unlimited set of low-demand undervalued elements usually is higher than the sum of values of a limited set of high-demand most valued elements) are leveraging a brand new manner to deal with things apparently distinct (like goods being sold by an e-commerce website and content being delivered through the Internet), but that, in fact, share the same essence.

In this way, any kind of media could be created as *palimpsests*. A palimpsest means any manuscript, typically of papyrus, parchment or tablet, that has

been written on more than once, after earlier writing has been incompletely erased, usually with diverse layers apparent beneath the surface. In this sense, Davidson [13] had coined the term *palimpsest* in order to describe a text that could be written in a non-finished manner, thus allowing collaborative work to be performed over it. Extending this main idea to hypermedia content – and thus coining the portmanteau *palimpsestic media*, there are numerous possibilities provided by today's Web-based tools for editing, publishing and sharing content in a *palimpsestic* way: instead of planning a hypermedia product as an amalgam of statically-planned content, new pieces of information are meant to be constantly added, as well as any content inside such an aggregation is likely to be modified, updated, deprecated, substituted or even removed.

Despite all of these neologisms and new ways of thinking about media delivery, global markets and content production process, there are some crystallized, well-established processes that, still today, remain indistinguishable from years ago, when the world was immerse in a Web 1.0 era. Educational resources, for instance, are not usually created under such perspective; instead, instructional design-based techniques are the standard mantra for the process of creating educational resources. A multidisciplinary team of experts, including linguists, programmers, educators, media and content experts are involved in a huge effort of creating resources that are designed for use in formal and non-formal educational situations. This is still the current way to design and implement learning resources.

Such approach, in spite of being currently and regularly applied in distinct teaching and learning scenarios, suffers from the fact of inherently constituting a static, almost immutable way to conduce educational media creation. Even the so-called OERs are not really open if they use proprietary formats or if they are planned in a way that do not easily “*mashup*” with other resources. Besides, it lays over the multidisciplinary team the whole responsibility about the content being created – and no guarantees about being it the most suitable content that could be offered to each specific learning / teaching situation.

In mass collaboration-based systems, four questions immediately arise, as pointed out by [8]:

- How to recruit and retain users?
- What contributions can users make?
- How to combine user contributions to solve the target problem?
- How to evaluate users and their contributions?

Some of these questions could meet the answers by regarding how professors, teachers and students' skills are usually underestimated in the educational content creation process. By taking into account all media these actors are able to create or harvest, sharing them with their colleagues, the long tail of educational elements is already formed. Thus, it consists on diverse, rich materials mined by students and that could be used by course designers. At that point, the thin layer that separates teachers and learners collapse to bring a new educational agent – the *tearner*, using a term suggested by Hodgins [14] which mix teachers and learners together in an

unique, interchangeable role as *prosumers* of the educational process.

This approach leads to a brand new set of issues that must be addressed: which strategies of harvesting must be applied in a long tail full of low-demand content to grab the most significant ones; how to combine all user-led dynamic content with static objects; how to organize all this *mashup* in a learning environment – if any; which kinds of evaluation could be performed over new content aggregated to a *palimpsest* – which would determine the quality of collaboration some media gives to a courseware; and many others questions to be addressed in the next items.

3 THE CASE FOR TEXTBOOKS

Among the most important barriers for accessing and succeeding in Higher Education Institutions (HEI) in developing countries are the costs of being a university student. Even if there is not tuition to be paid, as in the case of many public HEIs, or through scholarship from the government in private HEIs, other often overlooked costs, most notably the cost of textbooks, are real impediments for low-income prospective and actual students.

In developing countries, the cost of books in undergraduate education is often prohibitive for most of these students, making these books inaccessible to them, and even sometimes motivating them to make illegal copies. A study [15] made at Brazil's largest University (São Paulo University- USP) shows that the purchase of books used in University – as opposed to the reprographic, often illegal, copies of them, is not available for students – even considering that Brazil is the seventh world's economy, in

spite of still being an emergent country, being part of BRICS (Brazil, Russia, China, India and South Africa).

Table 1. Costs (in €) of purchasing textbooks for ten undergraduate courses in USP/Brazil [15].

Course	Cost of books/year (€)	% of minimum wage (BR)
Information Technology	1.688,89	59.89%
Nature Sciences	1.570,42	55.69%
Tourism and Leisure	1.972,41	69.94%
Marketing	1.829,91	64.89%
Textile Techniques	1.796,38	63.70%
Environment Management	2.248,37	79.73%
Obstetrics	2.506,38	88.88%
Gerontology	1.905,25	67.56%
Physical Education	1.442,68	51.16%
Public Policies	2.261,45	80.19%

According to Table 1, the average yearly cost for textbooks to study a program in USP is 1,900€. That corresponds to the 67% of the Brazilian minimum wage (2.820€ per year). This make almost impossible for low-income families to support the university study of even one of its members. Even for Argentina, whose minimum wage, the biggest of the region, is 4.092€ per year, the cost of books would represent, in average, 46% of the total family income. The situation is only worse in other developing countries, being still miles away from the situation on underdeveloped countries.

This problem has been traditionally addressed through the existence of

university libraries that lend copies of the textbooks for free to the students. However, university libraries do not have the budget to meet the demand from low-income student as the costs for acquiring the material is too high for the purchasing power of most families. It is not uncommon to find a ratio of 50 students per book in high-demand courses. This usually results, in the best-case scenario, with the students making illegal copies of the books or, in most common case, with the student relaying only in limited class notes. This problem creates a significant difference between students that could afford to have a copy of the textbook and those who could not. One of the roots of the high cost of the textbooks is that, in underdeveloped and developing countries, most of them are produced outside the country where they are meant to be used – some exceptions must be cited: for instance, the former Soviet Union used to have one of world's largest editorial (state-owned) market – inherited by Russia, also from BRICS group. Focusing back on Brazil, it has the largest editorial production of Latin America, and accounts for over half of the overall books edited on the continent, followed by Mexico, Argentina, Colombia, Chile and Venezuela [16][17]. However, the total production of books in the region is actually lower than 10% of the entire world [3]. Besides, according to several studies, only a small part (approximately 10-20%) of the books used in Latin American HEIs were created by Latin American authors. Thus, the root problem is not related with the lack of production capacity, but with the difficulty that local professors/authors have to publish and distribute their books.

In addition, [15] also measured the amount of recommended books whose reading is required in the disciplines, but they are not more available to purchase since they are out of print. It should be noted that just because they are out of print, the costs of these books (which come to 1/3 of the bibliographic database, in average) were not computed. In addition, the research also has shown that foreigners authors (translated or adopted directly imported) have a strong presence in courses' bibliography, being responsible from 33.8% to 64.5% of recommended books. When directly imported, even without taxes (in some countries), these books are often more expensive for shipment costs; when (often badly) translated, these books discourage local authors to produce their own.

The problem with the foreign origin of the textbooks have several additional consequences beside their cost: most textbooks are not tailored to the context of underdeveloped or even developing countries' Higher Education systems, the most current versions are not available in a language in which most professors and students are fluent and it creates the harmful perception among students that knowledge always comes from outside the region – except, of course, those countries were “mainstream” languages are currently spoken, as English-speaking countries like India.

The economical factor is not only an issue for developing countries, as reported by [18] and [19]. To illustrate this, Figure 2, extracted from [19], shows that in an 30 years interval, (data was measured between 1978 and 2008), the cost of tuition at universities in US increased much more than inflation rate. The same graphic compares this increasing to the cost of healthcare in the

US, which is well-known for being an expensive market whose prices publicly have increased.

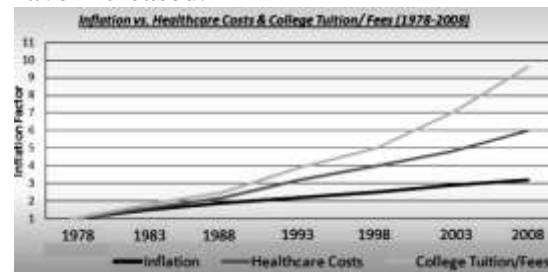


Figure 2. Costs for college tuition and fees versus US inflation rate and healthcare costs [19].

According to Figure 2, in some developed countries, books prices are not the most weighted item in students' budgets. This occurs probably because of the conjunction of two facts: books tend to be less expensive in these countries (like US, Canada, UK – which has lower prices than US [20] – and some – but not all – EU countries), since they historically produce them locally; and in some cases, like in US, tuition costs are extremely high. Comparing to the total budget amount students are meant to expend (Figure 3), it seems that books prices is not the main preoccupation of US students. However, it must be noted that in state universities, this cost is an average 25% the cost of tuition, increasing to 75% in community colleges.

However, besides economical factors, there are some other issues to be addressed: for instance, how a book totally fits to some course's goals? Undergraduate syllabi often present a set of no less than three reference books, which are meant to have some parts read in order to fulfill course's requirement. In the best situations, reference books have no more than 50% of their content covered by a course - which increases costs, since two or three are to be

bought, instead of only one. Even in US, an average 40% of faculty asserts that “new” textbooks editions – that cost to students 45% more than used “old” editions, are “never” or “rarely” needed. This leads to an average of 65% of the students that do not buy all of the required course textbooks.

This conjunction of facts leads to the need of more adaptable, customized books, which are possible only with the participation of teachers in the whole process of book selection - or, more than this, its construction.



Figure 3. Total costs for high education in US, including textbook costs [19]

One approach to this issue are the open textbooks. There are several Open Textbook initiatives already running: Wikibooks, Connexions, the California Open Source Textbooks Project, etc. These initiatives have been found to reduce significantly (~80%) the cost of textbooks for the students. Some of these initiatives also include small sections of materials in other languages than English, but participation of authors from “peripheral countries” has been rather limited, for the reasons above mentioned.

4 THE CASE FOR MULTIMEDIA

Multimedia content has inherently its own pits and pitfalls, considering different multimedia supporting formats nowadays present in the market, over the internet and in Academia. Whilst text (de)composition, edition and mixing is an easier task to be performed, strictly from the technical point of view, the sharing, editing, mixing and reuse of multimedia content brings some challenges besides those proposed by open texts.

Figure 4 below depicts a graphic with the main multimedia file formats, classifying them according to the variety of multimedia support (x-axis) versus the feasibility of its editing/mixing (y-axis).



Figure 4. Some multimedia formats, arranged according the easiness for edit and remix versus the “hypermediatic” feature – a measure of how many different hypermedia content are directly supported by a resource under this format.

In spite of being a difficult task to define the frequency each one of these multimedia formats appears on Web-based educational resources, a Google search was made for five topics in different fields of knowledge, as shown in Table 2 – for the sake of preciseness, it must be noted that such experiment was performed just for exemplification purposes, with no means of having any

statistical validity, since the topics were chosen in a random way.

Table 2. Results on Google for searches using the following keywords: “LU Decomposition”, “Meiosis”, “Nihilism”, “Oscar Niemeyer” and “String theory”.

Subject / Area		pdf	ppt	doc	xls	swf	raster images
LU Decomposition	Math	40,100	606	1040	29	3	7470
Meiosis	Biology	286,000	14900	30200	8490	1190	189000
Nihilism	Philosophy	188000	1300	15800	1510	463	256000
Oscar Niemeyer	Architecture	549000	253	5000	873	1260	266000
String theory	Physics	281000	6200	7630	4360	667	298000

Subject / Area		Google - Total	Other formats
LU Decomposition	Math	261000	219,222
Meiosis	Biology	2960000	2,619,320
Nihilism	Philosophy	2500000	2,292,927
Oscar Niemeyer	Architecture	1640000	1,577,694
String theory	Physics	2580000	2,279,943

In all searches, the two most frequent formats found were PDF files and raster images, both with low levels of easiness to edit/remix and with low support to multi/hypermedia contents. This situation is best depicted by Figure 5 below, that isolates the results for “Nihilism”.

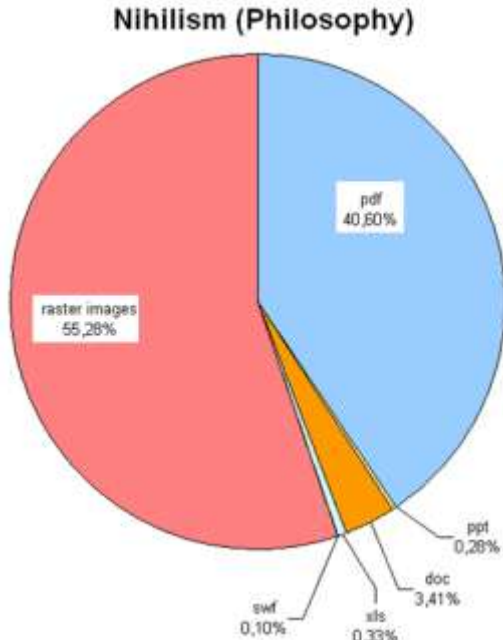


Figure 5. Results for searching “Nihilism” on Google. Comparing to other formats, PDF files and raster images are the absolute majority.

It must be also noted that, in spite of being frequent enough, these formats

still are in a lower number than “other formats” (mainly HTML pages), as can be seen in Figure 6 below.

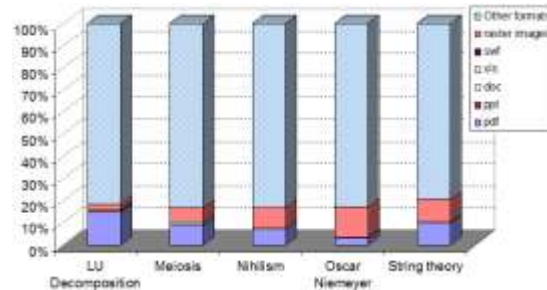


Figure 6. Comparing all formats, including HTML pages.

Having both scenarios in mind – the social need for textbooks and the challenge of mixing multimedia resources, next section will discuss some considerations and propose an architectural framework to support the task of sharing, editing and mixing multimedia and/or text-based educational content.

5 THE LATIn PROJECT

Several authors have proposed solutions for live and/or collaborative edition and mixing of multimedia content. As examples, there is the work of Shaw and Schmitz [21], which provides a framework to collaborative video edition and mixing; in a similar way, Engström et al. [22] proposes an application for live video production and mixing, but directed to VJs. In fact, the subject has been focus of study since digital video became a popular reality – as is proven by the seminal work in [23].

Many architectures for sharing media on Web follows a common framework, which is not meant to deal with the sources of personal media while it is not made publicly available by the author. Once this step is over, a repository-based

strategy is used to store, search and disseminate the media. Figure 7 depicts one of these reference architectures.

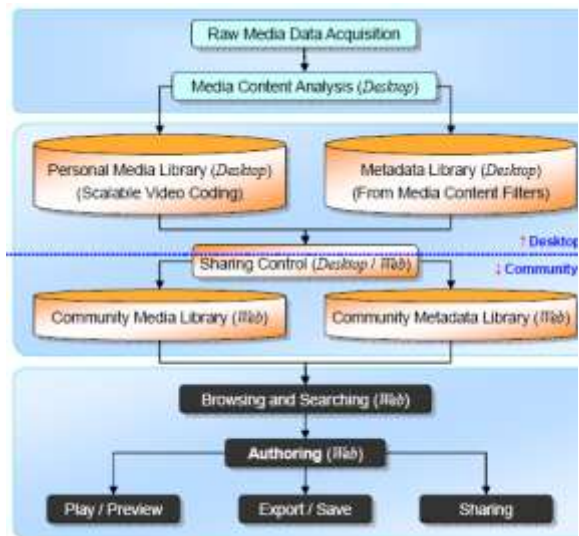


Figure 7. Architecture proposed by [24] for personal media sharing and authoring.

It must be noted that the third part of this architecture (below) would allow collaboration, but common, YouTube-like solutions usually just implement it until the “Browsing and Searching” feature.

One of the possible architectures for user-led collaborative content creation is presented in [25], which can be seen in Figure 8 below.

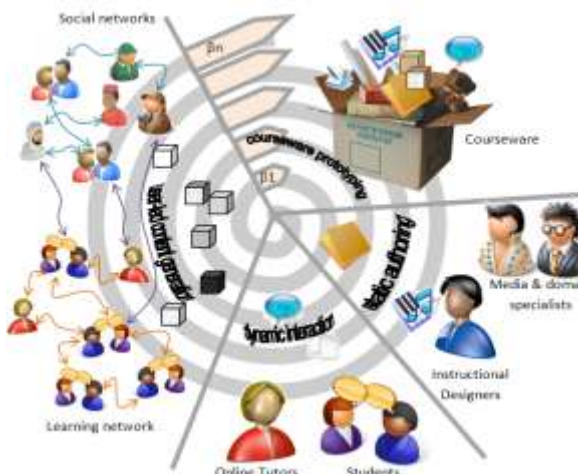


Figure 8. Architecture proposed by [25] for collaborative authoring of learning content.

This architecture will be one of the starting points for the implementation of LATIn Project (Latin American open Textbook Initiative). In the original architecture proposed in [25], all educational agents were meant to collaborate in the creation of educational resources.

As a first approach, the problem of open collaborative textbooks will be addressed, in order that professors and academic authors will be the main users of the proposed solution. Nonetheless, students (mainly those with lower incomes) will be the main beneficiaries of the freely available textbooks produced by the initiative. In a second phases, the issue of mixable multimedia will be also addressed.

The overall objective of the project is to improve the accessibility, initially to the Latin American Universities, for low-income students, as well as to reduce the dropout rate due to financial reasons. This objective will be reached via the reduction or elimination of the cost of required textbooks that sometimes could represent a significant share of the income of a minimum-salary family. The initiative proposed in this project will result in the regional collaborative creation of textbooks that could be freely and legally copied, printed, modified and distributed to students. These books will have the additional advantages of being easy to update and being in a language that the student could easily understand. The specific objective of the project will be the creation and dissemination of a Collaborative Open Textbook Initiative for Higher Education tailored specifically for Latin America. This initiative will encourage professors and academic authors from different HEIs in

Latin America to collaborate with colleagues from other HEIs in the region to create chapters and textbooks tailored for their specific course needs that will be freely available for students to read, print and share, and to other colleagues to adapt, translate, distribute and remix. The project will address the pedagogical, technological and political issues needed for such an initiative to work successfully in Latin American countries. Once consistent results are obtained, the project can be expanded to other parts of the globe.

During pilot implementation of the initiative that is one of the proposed actions of this project, it is expected that the solution will help 144 courses in 9 different Universities, with a total benefited population of more than 4.500 students in 6 months. At the end of it, the created textbooks will remain freely available to reuse, translate, adapt and remix. In this pilot phase, a total of eight Latin American countries will be reached, as shown in Figure 9.



Fig. 7. Latin American countries to be involved in the first phase of LATIn Project

It must be pointed out that the present proposal is especially relevant for developing and underdeveloped countries because it attacks the main problems with traditional textbooks and electronic learning materials in these regions:

- It reduces the cost of the textbooks, making them accessible, affordable and even free for low-income students;
- It allows local professors and authors to easily produce, share and distribute the knowledge with a local view and contextualized to the Latin American cultures and languages.

While traditional interactive digital content is only accessible to those that have access to computers, Open Textbooks could always be printed and used without the need of any technological device.

The objective of this project complies with the improve the quality, relevance and accessibility to Latin American HEIs, because lowering the costs of textbooks will have a direct impact in increasing the accessibility and reducing the dropout rate of low-income students in Latin American HEIs. This project also helps indirectly the regional integration process, by creating communities of professors from different HEIs to discuss and reach agreements on the learning materials to be used in their courses. This conversation will be a first step to harmonize the curricula of different courses and programs. This project will modernize the process of content creation among Latin American HEIs through the use of OERs. Second, this project will be developed through the collaboration of two continental Learning Technologies networks: the Latin American Community on Learning Objects (LACLO), and the ARIADNE Foundation, a mainly European network of Learning Object repositories. LACLO Universities will be responsible for the implementation, while ARIADNE partners will support it through their experience. This collaboration will strengthen the links inside and between these networks.

The activities of this project will be divided in 6 phases:

1.Project setup: In this phase, the communication infrastructure (intranet, mailing lists, website and virtual meeting platform) and guidelines (reporting, financial procedures and quality plan) for the project operation will be set. The partner agreements will be signed. The main objective of this phase is to allow partners to collaborate in the project activities.

2.State-of-the-Art Analysis: In this phase, a wide analysis of state-of-the-art and its possible application to the regional context will be performed by groups responsible for each one of the results. The objective of this phase is to identify other initiatives in the area of Open Textbooks and learn from their experience in order to guide the development of the Latin American Open Textbook Initiative.

3.Design and Implementation of the Results: In this phase, the pedagogical methodology, the technological platform and the adoption strategies will be designed and developed by each responsible group. There will be periodical interaction among the groups given that there is interdependence between the results.

4.Piloting, Evaluation and Validation of the Collaborative Creation of Open Textbooks: In this phase, professors and authors from all the Latin American partner Universities (144 professors in total in 16 common subjects) will create the content (chapters/sections) for the Open Textbooks using the proposed collaborative methodology and make them available to be joint, translated and remixed using the technological platform. Once the basic material is created, the professors will mix the chapter or sections to create their own customized version of the textbooks for their courses.

5.Piloting, Evaluation and Validation of the use of Open Textbooks: In this phase, the efficacy of Open Textbooks will be tested on real courses (144 in total) in each one of the Latin American partners. The textbooks will be used in regular courses during the semester. The courses that use the Open Textbooks will be compared with control courses. This phase will take 9 months because the

start of the semesters varies between each partner.

6.Final Polishing, Dissemination and Technology Transfer: In this phase, the feedback obtained from the pilot studies will be used to improve the results before being disseminated to other HEIs. The Latin American Open Textbook initiative will be launch publicly and made freely available for other Latina American HEIs beside the original partners. The dissemination will be facilitated by the existence of the LACLO community. For example, the results of the project will be presented in its annual conference, virtual training sessions could be organized through the community, and organize inside the communities the creation of new Open Textbooks in which their members are interested in collaborate. Also LACLO and ARIADNE are well known in the region, and their support will provide credibility to the initiative.

Finally, the results that are expected from this project are:

1. A methodology for collaborative creation of open textbooks. Such methodology will guide the process of collaborative creation of materials, in which professors and authors will be involved. The main objectives of this methodology are: to guarantee the quality of the materials; to facilitate the collaboration process and to ensure further re-usability of individual components. This methodology will take into account the idiosyncrasies and cultural background of different Latin American countries.

2. A technological platform to support the collaborative creation, adaptation, mixing and re-use of open textbooks. This Web-based platform will provide the functionalities needed to support the

methodology for the collaborative creation of book sections and chapters. It will also provide tools to mix these sections and chapters into customized textbooks to be used in an specific course. The system will then provide tools for the users to read the books online, to download them as PDF to be printed or for off-line reading. The system will facilitate the creation of new versions of the materials (adaptations) or translations to other languages or cultures All modules and books are also meant to be reused, sliced, joined and remixed in new modules and books, to become parts of brand new books, according to the needs. The system will also provide recommendation tools for the creation of new communities and for relevant new textbooks or chapters.

3. Strategies for implementation and adoption of this solution. This result, arguably the most important for the success of the project, will establishing the political and legal guidelines for the operation of this initiative, such as financing alternatives for the creation of the textbooks, the kind of open licenses that better adjust to the laws of the different countries, sharing policies and ownership/authorship of the textbooks. Also, this result will include a set of strategies for the gradual adoption of the Open Textbooks Initiative in Latin American HEIs, being just for a course, a program or for the whole University. To validate the efficacy of the proposed pedagogical methodology, the technology platform and the implementation strategies, 144 courses (16 courses in each Latin American partner in 16 different subjects common between all the partners) will use Open Textbooks collaborative created between professors from each partner during, at least, one semester. The feedback

received after this pilot will be use to improve the results (methodology, platform and strategies) before their public release.

6 CONCLUSIONS

The LATIn Project will address the problem of high cost of textbooks for Higher Education, initially in Latin America, but following guidelines that turns its main concept as country, language, culture and region-independent. The main actions will be the creation and dissemination of a Collaborative Open Textbook Initiative for Higher Education tailored specifically for the region. This initiative will encourage and support local professors and authors to contribute with individual sections or chapters that could be assembled into customized books by the whole community. The created books will be freely available to the students in an electronic format or could be legally printed at low cost because there is no license or fees to be paid for their distribution. This solution will also contribute to the creation of customized textbooks where each professor could select the sections appropriate for their courses or could freely adapt existing sections to their needs. Also, the local professors will be the sink and source of the knowledge, contextualized to the Latin American Higher Education system

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