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(Ed.)

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Introduction

Research paths, between austerity and uncertainty

António Teodoro

Every book has a story. This collective work has its own, as is only to be expected. It was born out of the criticism levelled by Carlos Alberto Torres, who, as member of the External Monitoring and Advisory Committee of the Centre for Interdisciplinary Studies on Education and Development (CeiED), called our attention to the limited knowledge each of us has on the work, scientific concerns, theoretical frameworks used by everyone else in the unit. Accepting this critical observation, it was then decided, along with other options, to edit two collections of a selection of papers, both in Portuguese and English, published by the CeiED researchers in the period between 2013 and 2017. The present volume represents the collection of papers originally published in English.

CeiED is a research and development unit (R&D U) constituted at the Universidade Lusófona de Humanidades e Tecnologias (ULHT), and its axes are Human Development and Social Justice, considered from the fields of Education, Memory, Heritage and Territory. These two main pillars are connected to the concept of Public Science applied to teaching and learning, as well as to the social work derived from R&D. CeiED sees itself as a learning community and an inclusive R&D Centre, integrating researchers from the Lusófona Group (besides ULHT, also ULP and ESEAG), and from polytechnic institutes, both public (Castelo Branco and Santarém) and private (ESE Paula Frassinetti and ISCE). Since it is constituted by lecturers-researchers, many of whom from small institutions predominantly geared to teaching activities, their participation in CeiED takes on particular significance in the establishment of links between teaching and research.

CeiED seeks to do top-quality, highly relevant research, ensuring the scientific support to the PhD, Master's and Bachelor's degrees, as well as promote services to the educational community which include the continuous and specialized training of teachers, instructors, museologists, urban planners and other professionals in the fields of the researchers-lecturers involved.

CeiED integrates important national and international networks and partnerships. Assuming its position in a university which takes Lusophony as its founding matrix, CeiED pays extensive attention to the networks constituted in

Europe, in Latin America and in Africa. The coordination of the RIAIPE Network (Europe- Latin America cooperation) since 2006, and the attribution, in 2018, of the UNESCO Chair in Education, Citizenship and Cultural Diversity to the Lusófona University only served to emphasize CeiED's commitment to a set of issues that lie at the core of the construction of a better world and fair education for all.

CeiED pays special attention to the links between scientific production and its dissemination. Thus, the investment in the *Revista Lusófona de Educação* (RLE), leader of the international journals published in Portugal in the field of Education, and in *Cadernos de Sociomuseologia*, pioneering initiative in its respective field. The creation of the Observatory of Education and Training Policies (Op.Edu), with the Centre of Social Studies (CES) of the University of Coimbra, broadens this orientation of doing public science, monitoring and analysing education and training policies.

At the time when these texts were originally published (2013-2017), the action of the R&D units was conducted in Portugal between *austerity* and *uncertainty*. *Austerity*, which marked the action of the right-wing PSD-CDS Government until 2015 (backed by the external intervention and monitoring of *troika*, constituted by the IMF, the EC and the ECB), was coupled with the policy pursued by Nuno Crato (and Miguel Seabra at FCT) which, in the name of "excellence", destroyed important parts of the national scientific fabric, especially damaging in the social and human sciences. When this dark period of the national life was left behind, the Government of the Socialist Party, backed by the parliamentary Left (including, besides PS, BE, PCP and Os Verdes), has carried out a policy marked by massive factors of *uncertainty*, between the rhetorical discourse of the "return to Mariano Gago", the maintenance of blatant limitations in public funding, and a completely unpredictable policy (in rules or deadlines). Science requires a predictability of rules and a periodicity of funding which have been absent from the Portuguese situation, giving rise to an atmosphere of dissatisfaction and discontent which spans the scientific community, as the massive subscription of the Manifest *Ciência Portugal 2018* clearly expressed.

* * *

The present book consists of 13 chapter, all originally published in English, as per the references found at the end of each text, and they cover the different fields of CeiED, from studies on an urban space, to sociomuseology and education.

In Chapter 1, entitled *Building a theory on co-creating a Cyberpark: lessons learnt from the COST Action CyberParks and the Flussbad Project, Berlin*, Carlos Smaniotto Costa and his research team (Jan Bovelet, Kai Dolata and Marluci Menezes) discuss the production of mediated public open spaces by investigating the impact of ICTs in a participation process, and from this discussion they develop arguments to base a theory on co-creating a cyberpark. This approach focuses on how digital interconnectivity, through its potential for engaging potential users, gives rise to new forms of agency in the design of public spaces. The conceptual

framework is backed by the COST-Action Cyberparks, and the Project Flussbad, both tackling the reflection of the proliferation of ICT-related media in public open spaces.

Chapter 2 reproduces a keynote address by Mário Moutinho and Judite Primo, on *Sociomuseology's theoretical frames of reference*. The aim of this chapter is to present some of the events that may help clarify the path taken by museums as agents of social development, and consequently how they seek to deal in a participatory way with the challenges of contemporary society: inclusion, gender, hybridism and human rights. From the Museum as *mausoleum,* to new museology's Museums and complex museums, the aim is to understand the scope of Sociomuseology, and naturally the challenges posed to universities in the light of this process.

In Chapter 3, entitled *Social Representations Theory and Museum Visitors*, Aida Rechena asks: how can the social representation concept serve museology? More specifically, how can it be used in the analysis of the communication process in museums and the roles of visitors and museologists in that process? Bringing social representation theory proposals to the museological field allows us to make each visitor a special person, whether working with museums as service providers or working with participatory museums. Either way, working in visitor-oriented museums requires professionals committed to the social needs of visitors and aware of the communication processes and the role of social representations in them. Finally, it is noted that some social representations are prejudiced and promote social inequalities, like those associated with interpretations of the categories "race" or "gender", for instance. The mission of museums should also be to contribute to change unfavourable social representations and those with a negative impact on society.

Chapter 4 presents a text by José V. Brás, Maria Neves Gonçalves and André Robert on *The Jesuits in Portugal: the communion of science and religion*. For several centuries, the dichotomy between science and religion widened, so much so that these were considered two opposing fields of knowledge. On one side, stood the defenders of rationality, and on the other, obscurantism. Following the anti-Jew myth, with the Enlightenment, the anti-Jesuit myth emerged. This myth started to gain momentum in Portugal with the Marquis of Pombal. Starting from this framework, the authors raise the following core questions: were the Jesuits enemies or ardent supporters of science? Can it be that their concern was limited to the religious catechism, and opposed the teaching and dissemination of science? In face of what was stated above, the following goals are highlighted in this chapter: (i) to analyse the role played by the Jesuits in disseminating science in Portugal; and (ii) to reflect on the importance given by Jesuits to the social and hygienist pedagogy. As regards methodology, two dimensions of analysis were followed: (1) science, religion, teaching-innovation and dissemination; and (2) social and civic pedagogy. This study enabled its authors to conclude that the strategy and practice followed by the Jesuits served to launch them in the scientific field, playing a part of great relevance in scientific education, contrary to the myth that was created around them.

In Chapter 5, called *The experience at a New School Education with 'abnormal' children: Faria de Vasconcelos (1880-1939) in the context of special education*, Ernesto Candeias Martins considers the role played by Faria de Vasconcelos in the construction of modern pedagogy, materialized in the School of Biérges (Belgium) experience, and the special education with school 'abnormal' children. Using hermeneutic and historical-descriptive analysis on his pedagogical thought and action, the goals of this chapter are to deepen the experience with Biérges, integrated into the ideals of the new school, which involved students for inclusion, the power of initiative, observation, experimentation and integral culture, associating thought-action; to analyze the contributions to the education of pedagogical 'abnormal' children and to schools, from mental and pedagogical reeducation. Teaching always included practical application, learning by inquiry, problem solving and working by doing, developing the basic dimensions of the child: physical, intellectual, moral and civic cooperation. This special attention given to the 'abnormals', who at the time had no special school, was a huge contribution to special education, conducting psych pedagogical examinations, diagnostics and interventions, which provided a useful guidance to schools and teachers. The proposals of Faria de Vasconcelos fit some guidelines of special education and psychological support.

Chapter 6, entitled *European and Latin American Higher Education Between Mirrors. Designing possible futures*, was written by António Teodoro. This chapter discusses some of the analyses and proposals presented by a large network of European and Latin American researchers which developed a broad programme on institutional equity and social cohesion in higher education institutions between 2011 and 2013. The impact of higher education expansion and diversification has been felt and questioned differently in the various countries, due to their history and place in the world system, to their education systems, their organization, or their ability to react, to mobilize resources and to implement relevant policies. The article has Europe and Latin America as privileged locus of analysis, but acknowledges that many of the characteristics and issues described are part of a global agenda. It is assumed that neoliberalism has failed as a model of economic development, but it is recognized that, as policy for culture, it is (still) in force, derived from having become a common sense that shapes the actions of governments and education policy-makers. The University, as well as higher education policies, may have another sense and give an important contribution to the construction of fair societies, fighting for equality among human beings, fully respecting their differences. This is the sense of the nine proposals for a radically democratic and Citizen University the paper ends with.

Chapter 7, entitled *The Evolution of Teacher Training in Mozambique and the Contexts of its Emergence*, was written by Ana Carita, Moisés Cau, Óscar Mofate e Rosa Serradas Duarte. This chapter aims to report on the teacher training strategies in the 1975-2014 period, highlighting the main landmarks of their evolution as well as their benefits and constraints, illuminating the geographic, economic, political and cultural contexts where they emerged, as well as the education system they are supposed to serve. The chapter is organized in three sections:

Geographical, Demographical, Social, Economic, Political and Cultural Context; Educational System; and Teacher Training. In the first section, the general context of training is analysed in its evolution along the dimensions stated in the heading. The second section is dedicated to describing and analysing the evolution of the formal education system, its goals and organization, population and challenges. The third section is dedicated to teacher training strategies, their evolution, objectives, access conditions, duration, institutions responsible for the programmes and challenges. The chapter ends with a concluding section, where the essential traits of the previous analyses are highlighted, and the increase in the number of teachers, the rise in their qualifications and the actual development of the teaching competencies are highlighted as the main challenges of teacher training.

In Chapter 8, *The Role of Vocational Training Centres in the Local Development Process. The Case of the Urban District of Samba, Luanda, Angola*, authors Eduardo Figueira and Teresa de Jesus present the results of a study which aimed to understand how VET Centres contribute to the development of the local economy in the district of Samba, Luanda, Angola. More specifically, the study aimed to understand how vocational training offerings and the respective strategies of the Samba's VET Centres contribute to satisfy occupational skill needs of the local community and to what extent the VET occupational output profiles of the Samba's VET Centres contribute to the development of the local economy. In addition, the study aimed to rehearse a research approach for extending the study to the different local territories of Angola. The most effective way to ensure local communities' adequate skills to meet the daily challenges is by continuing vocational education and training which can meet the people's professional and social skill needs. The study was conducted as a case study approach complemented by a survey of a sample of former trainees and key-people interviews. Data collected by questionnaire was statistically analysed and the information collected through the interviews was submitted to content analysis.

The study behind Chapter 9, *All-day schooling: improving social and educational Portuguese policies*, by Jorge Martins, Ana Vale and Ana Mouraz, aimed to evaluate the scope of the political measures associated with all-day schooling as it was implemented in Portugal by the AEC programme and put into practice in 2009/2010. The two fundamental dimensions of its means of operating were identified: the political and the curricular. The study focuses on two cases of different local decision. The results revealed a unanimous valorisation of the philosophy and the objectives underlying the AEC programme, which gives shape to a 'good measure' of social and educational public policies, consistent with the nuclear project of all-day schooling. They also showed, however, that the dimension of the curricular enrichment still needs to be improved.

In Chapter 10, *How Teachers Experience Practical Reflectivity in Schools: A Case Study*, Alcina Oliveira Martins, Maria Nazaré Coimbra, Isabel P. Pinto and Rosa Serradas aim to analyse the essential capacities and attitudes of teachers concerning the concretization of teacher's reflective practices, by considering potentialities and constraints through the perceptions of teachers and supervisors, in a

public school in Porto, Portugal. In the case study, a mixed research strategy was used, with the application of a questionnaire to basic school teachers, as well as interviews with their supervisors. The results show the importance of practical reflectivity and teachers' collaborative work, based on continuous learning. As constraints, supervisors draw attention to discontinuous reflection, limited to the initial moment of activity planning. On the other hand, teachers point out the problem of being overloaded by school daily tasks and a superficial evaluation of practices, which hinder the deepening of practical reflectivity.

Chapter 11 is entitled «*On the Origin of Species*»: *Didactic transposition to the curriculum and Portuguese science textbooks (1859-1959)*. Its author, Bento Cavadas, aims to contribute to the history of teaching Darwinism in the Portuguese curriculum from 1859 to 1959. To this end, the didactic transposition of the book *On the Origin of Species* for Natural Sciences standards and textbooks of secondary education was analysed. This study showed some standards did not address Darwinism (Standards of 1856, 1872, 1880, 1886, 1926 and 1929), while others only prescribed the study of some subjects of Darwinism (Standards of 1889 and 1905). Standards of 1895 were the ones that addressed more Darwinists ideas in the 19th century. In the 20th century, the overall approach to Darwinism was related to the study of transformist ideas (Standards of 1919) or evolution (Standards of 1936 and 1954). However, even when the respective standards did not make that prescription, the major part of textbooks addressed the mechanisms of Darwinian evolution: adaptation, variability, growth correlations, heredity, natural selection, vital competition, geographic isolation and sexual selection.

Chapter 12, *Attitudes and self-beliefs of ability towards Mathematics and Science and their effects on career choices: A case study with Macao-Chinese girls*, by Ana Maria Correia, Clara Fernandes and João Sampaio da Maia, explores girls' attitudes and self-assessment of abilities towards mathematics and science, and their effects on career preferences. The results from Pisa 2012 stated that Macao girls do as well as boys in mathematics and science. However, less than 0.5% of Macao girls contemplate pursuing a career in mathematics related fields and less than 2% contemplate pursuing a career in science related areas. In this study, which follows a quantitative design and was developed in the academic year of 2013/2014, the female students of Macao secondary schools who also attended a Foreign Language course at the Macao Portuguese School were surveyed. The instrument "Modified Fennema-Sherman Mathematics and Science Attitude Scales" was adapted to measure students' self-beliefs and attitudes towards mathematics and science along four domains, namely (a) confidence, (b) usefulness, (c) mathematics and science as a male domain, and (d) students' perceptions of their teachers' expectations regarding the abilities of male and female students in both subjects. The results suggested that (1) the female students' self-beliefs on abilities in mathematics and science are below average; (2) the female students' attitudes towards mathematics and science are positive; (3) the students' attitudes and self-assessment of abilities towards mathematics and science are not significantly related to their intended choice of university degree; (4) the female students do not assume mathematics and science as a male domain; and

(5) the female students do not perceive their teachers' expectations regarding girls' mathematics and science skills as lower than boys' mathematics and science skills.

In Chapter 13, *First language teacher´s development: learning from small-scale classroom research*, its authors Nazaré Coimbra and Carla Dimitri Dias Alves put forward an understanding that teachers' training, and particularly that of first language teachers, requires a new logic of action in order to renew teachers' knowledge and skills. In this way, they intend to analyse how small-scale classroom research can improve the professional development of first language teachers and promote students' reading and writing skills. The research was carried out in the context of two continuous training courses, encouraging Portuguese teachers to become lifelong learners in a research-based profession.

CeiED adopts an inclusive orientation. Its key objective is to increase the scientific production of all members (including collaborators and PhD students) and foster the linkage between teaching and learning activities, research and innovation. This is the context of the contributions collected here.

Aroeira, August 2018

1

Building a theory on co-creating a Cyberpark Lessons learnt from the COST Action CyberParks and the Flussbad Project, Berlin

Carlos Smaniotto Costa | Jan Bovelet | Kai Dolata | Marluci Menezes

Introduction

This chapter proposes to reflect on the interactions between people, places and technology in creating a cyberpark, a kind of public open space mashed-up with technology. No doubt, communication and information technologies (ICTs) have greatly changed society and the way people communicate and interact, and this trend will continue to proliferate as the digital realm is more and more pervasive in people's lives. At the same time, ICTs enable people to capture and share personal experiences in new ways that create new forms of learning, gathering and communicating across multiple contexts (Buchem & Sanagustín, 2013). This raises the question if among these contexts ICTs are changing the way people use urban spaces, and beyond that, if and how ICTs inspire the emergence of new forms of use of public spaces and even the emergence of new types of spaces.

Creswell (2009) identifies home, work, public and virtual spaces as digital places of consumption. Hence, public and virtual spaces are taken as two different places – but we argue that this division is blurring, and with the penetration of digital technology in people's life a new kind of space is emerging: a cyberpark – where ICTs enhance the physical spaces. In the context of digitally mediated public spaces, cyberpark encompasses two different perspectives: From a spatial planning perspective, it is seen as a new type of urban landscape where nature, society, and (cyber) technologies blend together to generate hybrid experiences and enhance people's quality of life. From a technology perspective – cyberpark is the virtual meeting places in form of social media concerned with public open spaces, their uses and users. The concept of a cyberpark offers a

promising line of thought as technology opens different ways to access the physical space and enhance its socio-spatial dynamics (Smaniotto et al., 2017).

There are several ways to tackle the penetration of ICTs into a cyberpark. This work focuses on the increasing the understanding on approaches for the co-creation of public open spaces through support of digital devices. In recent years, it has become increasingly clear that interventions designed to encourage citizens/community participation in policymaking and local development produces many important and more long lasting benefits. This work is aimed at providing a broad review of the main approaches for co-creating a cyberpark, considering cooperation, participation, partnerships, co-production, and others similar approaches, and at reflecting the experiences gained in the Project CyberParks and by the Project Flussbad in Berlin (Germany) to contribute to the formation of a theory on co-creating cyberparks. For this purpose, it is necessary to have a look at two current trends: the "digital mesh" and the enhanced governance, i.e. the citizens' participation in the production of urban environment. It is important to note that *production* include all steps in the public spaces development, from its conception, to design, implementation and management. We argue that there is a call to increase the knowledge on the opportunities ICTs open up for making urban spaces more inclusive, and to do so to better understand the socio-cultural, spatial, and technological factors as well as their interactions, in order to provide arguments for decision-making processes and with this, initiate the necessary changes towards improving urban liveability and democratic processes. The focus on the relationship between the digital and physical space or the ways, in which virtual or digital technologies interact and entangle with physical spaces, opens up different perspectives to understand the arising of mediated urban spaces. For this an integrated framework could be useful, especially for aiding the development of people-friendly smart cities or the building of the communities' capacity to engage with their environment. As we noted above, new technological innovations are entering both the market and the city at a rapid pace, but they enter so fast that they have detrimental effects. For example, new 'smart' screen can be installed in public open spaces to enable people to look up local information, but if that screen is located at a height that cannot be accessed by people in a wheelchair or children, or if the screen is not user-friendly to those with limited technological literacy, then technology bearers an exclusionary dimension.

Therefore, an integrated framework must be adopted, one that enables a full overview on users and their needs and preferences, and allows through ICT tools that users are actively encouraged to participate in the production of public spaces, bringing together people in people-friendly urban spaces.

Cyberpark – a concept for a technologically mediated public space

This work takes up the definition of a cyberpark coined by the Project CyberParks, as the mediated physical space and the virtual meeting places in form of social media. In this context, technology can be used to give or gather informa-

tion, to aid co-creation of space, to allow crowd sourcing of information and opinions, and to facilitate effective sharing or self-monitoring of activities (CyberParks, 2016).

According to the purposes the intertwining of ICTs in public spaces, as proposed by the CyberParks Project, the use of ICTs can be primarily structured in three major dimensions: (1) for *research*, i.e. as a way to produce, collect, manage, mediate and interpret data, (2) for *design,* i.e. as a range of possibilities for conceiving and/or creating public spaces, and (3) for *implementation*, i.e. by looking onto the transformations of the material production of space and and/or social interaction triggered by the continuous introduction of new hardware and software.

Research through ICTs comprises acquiring, archiving, analysing, organizing, of information, which can be qualitatively and quantitatively sourced manually (collected by researchers), interactively (automatic processes triggered by the user) and automatically (autonomous sensory data collection). An interface usually translates input into data. To get relevant outputs is necessary to well plan how to approach the information, collecting and storing data. Data processing, analysing and interpretation enable the production and dissemination of knowledge. *Design* through ICTs can foster conceiving processes by means of conceptualisation and visualisation, and has a strong impact on creation processes in the planning phase (co-creation, auto-creation and self-creation). *Implementation* of ICTs in public spaces can be driven by software and applications, such to improve awareness or deliver services like location guides, and/or by the building of hardware or infrastructure, i.e. wi-fi antennas, GLS satellites, internet of things (IOT) tokens, or the next smartphone generation.

These examples evidence that there is no distinctive boundary that could be drawn between software and hardware with respect to cyberpark, as well as in the matter of digitalization in general: we are at a point where the presence of digital hardware is so ubiquitous that new public spaces might be created without much spatial-material alterations by creating new relations between existing hardware through new software. The cyberpark' approach, aiming at the production of public spaces that meet the communities' needs in "networked societies" (Castells et al., 2005), makes the call to rethink the interactions between people and spaces, and in our case with public spaces and their enhancement by ICTs means. To do so, the production of public spaces has to encourage and enable the concerned community to participate actively in the process, be it the development of a concept, the implementation of a plan or the maintenance of a public space. The co-creation process requires the willingness of stakeholders to shift roles, as they all should be drivers and not merely participants or the targeted end-users. Co-creation explicitly refers to an active and comprehensive involvement of stakeholders, making use of their local knowledge as a resource for maintaining and improving public spaces quality (Molin, Fors, & Faehnle, 2012). Co-creation makes the call for clarifying how different contributions will be considered, even if the initial idea grew individual or spontaneously; following steps have to be prepared in order to make better use of local knowledge and the collective intelligence available. The challenge surely is to harness the collaborative power of networks, be it of ICTs, of people or of knowledge.

The ontology of co-creating a Cyberpark

There are different terms being used to define the citizens' participation in decision-making processes, such as participatory design, public participation, co-operative design, co-design, etc. This work adopts the broad understanding of *co-creation* as a shared process of making better and more inclusive places. It is backed by the understanding that participation and sharing knowledge are key mechanisms in sustainable development, as demonstrated by several policies and white papers of EU, UN, UNEP, etc. Co-creation of public spaces is understood as an actively driven (planning, design and management) process, which enables the participation of not only professionals or officials but also people with interest in and/or users of the space. Co-creation is based on networks and flows of information, data and resources, and is largely motivated and mediated by ICTs as for example by social media used to appropriate spaces for political expression. ICTs can radically improve processes simply by the speed and vastness of data collection, and their processing, distribution and visualization accessible to all participants (Mayer-Schönberger & Cukier, 2013).

Co-creation is driven by the idea that all participants should be capable of providing theoretical and practical input as best as possible, making local knowledge the driving force of the process. It reinforces the call for citizens'/ /user's empowerment, as the citizenry is increasingly seeking a more active role beyond just accepting council decisions (Molin et al., 2012). As a basis for co-creating, the participants should agree on an open process with unknown outcomes although following a common strategy. Co-creation can be 'constructed' in different ways and with different ICT support, concatenating different stakeholders – community, experts, and politicians – but the outcome should be a shared result. Co-creation is not only innovative and inventive but also always political. Its implementation requires a paradigm shift as it asks for understanding citizens as active, creative, decision-making equals rather than passive recipients of top-down design, towards developing ideas from the bottom up. Co-creation is therefore a dynamic, adaptive and self-aware process. Producing spaces with and for news audiences – through mixed use and maximising activities potential – can make these spaces more welcoming, inclusive, safe and accessible for all. Such space, where users feel invited, encourage them to spend more time outside and foster interaction among communities (Gehl, 2008).

Flussbad Berlin project – turning a part of the spree river into an accessible public water space

Flussbad Berlin aims at transforming a neglected 'fluvial' area around the Museums-insel in the centre of Berlin, into a space to be regularly used by inhabitants and visitors. To mention only the World Heritage status of the area, the project is plastered with technical, administrative and also ideological challenges. Fluss-

bad Berlin is a contemporary urban development approach initiated - not by the municipal administration, but rather by a non-governmental, also called 'Flussbad Berlin, e. V.' (registered association). Based on a fictional idea from 1997 it has become a broad movement steered by already 300 association members and another couple of thousand supporters, including people of all political parties and the local administration. To include these different groups of interests within the project, a process had to be set up to accommodate needs and arguments in a most transparent manner without neglecting the original idea of a small group of visionaries.

Although the association has been funded to develop the original idea into a proper project plan, it has still no official status within the urban development department. Regardless of the wide support it lives a parallel life next to the ongoing urban development projects in Berlin. This is rather disappointing, but how can such a citizen's movement be included in administrational policies and developed parallel until its implementation. This is the challenge.

The project consists of several key issues, mainly derived from the abovementioned challenges that have to be addressed. The very complex intertwining between responsibilities has to be simplified in order to be understandable for anybody who wants to be involved in the project. The knowledge transfer needs to run between its original inventors (individuals), the citizen (anybody involved) and the public administration (bodies elected by the citizens to be formally responsible for the urban development process). This requires a change in attitude towards urban planning.

To tackle these issues, the project uses ICT to collect, structure, analyse and distribute data in order to address its broad range of collaborators with their individual qualifications in order to reach the best result possible for everyone involved in the process. The individual topics that are processed vary between very small and very large scale, like in environmental issues (i.e. creating stepping-stones for migrating hydro fauna), in policy (i.e. strengthen political agenda for the project), informing and discussing (i.e. public panels or dedicated planning authority presentations), technical issues (i.e. technical solutions for channel flooding situations, integrating planning into on-going neighbourhood projects), negotiating (discussions with conservationists, property owners etc.) water hygiene (i.e. water and sewage company, bathing water regulations), social and economic (i.e. how such interventions will affect gentrification in the neighbourhood), etc. The association is working on all those issues simultaneously but of course with very different and changing priorities.

One concrete example is the issue of creating a way of monitoring water quality in real-time. Due to the structure of the city's sewage system, the Spree River water quality has specific tipping points tied to weather, use, and maintenance patterns, resulting in sewage spillovers. Human access to the water after those spillovers is a hazardous and unhealthy risk. Flussbad Berlin currently plans a natural filter system to treat the water around those tipping points, in order to reach a permanent swimming water quality. If these tipping points could be 'filtered' out of the use pattern in the projected Flussbad area through a

software, Berliners might be able to swim in the Spree without the installation and maintenance of expensive hydrological hardware such as a material filter systems. ICTs solution can also send back information to the municipal water treatment company to optimise the waste water flow within the sewage system – an effort already in progress. The benefit thus does not only lay in the direct effect for the Flussbad area but can be adopted and integrated with other existing systems as well. The success of such programme is of course not limited to its geographical location within the Flussbad area, but can be "exported" to other locations and use cases.

Realising such a ICTs solution will only be feasible if various stakeholders such as the water treatment company, the council, the public administration, federal departments, scientists, ethnologists, developers, etc. co-create in joint effort. The challenge is to bring them together with their individual knowledge, institutional and individual (ICTs) standards, and their various political, technological, legal, administrative and economic aims.

Perspectives on co-creation for a cyberpark

The analysis of *co-creation* as an alternative and experimental way in engaging stakeholders or actors in the production of cyberparks sets out an enhanced understanding of co-creation as learning space improved by opportunities opened by the proliferation of ICT devices. Both Projects (CyberParks and Flussbad Berlin) are explored as case studies with focus on ICT-based community building processes The central challenge remains how to use ICT and technological innovation to keep the human scale and create public urban spaces that meet a peculiar community's needs instead of the mechanical multiplication of high-tech smart cities, once the concept of smart cities and its ideology are being mostly discussed around the technology to solve urban problems. We however argue that smart cities have to be people-centred. Or for whom should cities be optimized for?

Another aspect of digital technology and its ubiquity refers to the amalgamation of physical and virtual spaces. The blurring of boundaries between them does not necessarily mean we lose the sense of place; rather we might better consider technology as multiplier of spaces, than it adds to physical spaces a digital layer. The interconnection can provoke different and maybe new social practices. Needless to say, that the overlay of physical and virtual situation, does not mean the virtual spaces can be a substitute of the physical spaces. Still in the digital era people need the contact with nature and each other (Thomas, 2014)

Theoretically, a co-creation approach for public spaces is an experimental environment, where users together with researchers, local stakeholders, planners and public institutions come together to search for new solutions or development models. All parts involved become active participants in a process towards developing innovation and fostering commitment. The social networks play in the process a relevant role. According to Castells (2001), social networks based on local communities have general characteristics, although different

motivation contribute to their building and development. First, social networks generate and disseminate information (from/by local authorities, residents' associations, groups of interest) and assume the role of transport of day-to-day information in the city/community; and second, they facilitate the virtual interaction and exchange of information among community members.

Further, ICTs systems enable the integration of councils and people – who, in other contexts, could hardly join such systems. Engaging with public spaces generates material and non-material practices that have influence in peoples' and communities' life. These practices encompass the routines and movement of individuals and/or groups go on their everyday life within a society and in our case, in urban spaces. These practices evidence the role of public spaces as the connective matrix in the urban fabric, as they afford an essential human need of interaction, gathering and exchange. Public spaces support the capabilities of people to improve their prosperity, health and wellbeing, and to enrich the social relations and cultural understanding. Therefore, they need to be connected, safe, and accessible, on the one hand, and inclusive and meet the community needs, on the other. Furthermore and above all, it is in public spaces that some of the best and the worst characteristics of urban life and society are created, observed and reproduced (Šuklje-Erjavec, 2010).

In the following two aspects are selected - as they revealed as essential towards effective co-creation processes:

Rationale of Co-creation

- As a cities-driven approach, the process has to set current and potential users in the centre of the action – because it is ultimately for them that cities are built.
- The extent of citizen's participation and involvement has to be clarified in advance, in order to not spark overly expectations and requests that cannot be addressed or fulfilled.
- Social reporting is a useful way to get people involved. This means on the other hand that actions have to follow the reports, otherwise it is just another information lost that get lost in the cyberspace.
- Social and spatial changes are integral to each other – both call a rise in the adaptability in planning – as the process changes with the development in a circle under mutual influence.
- Making use of local knowledge and capacity of actions is central – i.e. conceiving co-creation in a particular way to value the comprehensive local knowledge that the citizens bear, which can support advancing situated knowledge.

The technology interface

- ICTs and their devices generate information and data – continuously in real time, which are searchable and/or editable. Information can be easily personally filtered an in this way meet interest groups.

- ICTs provide data on obtained results – the right indicators should enable transparency on the progress made. They can provide insights and values that can be shared by all.
- The importance of the technology & social media is evident since it determines the way that the message is being transmitted and perceived. They make possible to jump into the discussion of the relation between media and the environment.

Concluding remarks

Co-creation is the new magic word in planning. It is indicating a turn in the modelling and application of collaborative environments and strategies. Co-creation transcends the mere gathering of facts and involvement of diverse stakeholders, by providing, maintaining, and nourishing a space for producing together beyond intellectual discussion, and talking together has alone a positive effect on the implementation of alternatives uses/concepts of public spaces. Through co-creation, the design and use of these spaces can be more locally rooted and therefore pave the way for fostering willingness and capacities for future collaboration. The analysis of CyberParks and the Flussbad Berlin enable the drawing of the following lessons learnt:

- Technology fixes do not solve urban problems and smart cities should be cities for people. The role of technology has to be merely that of a facilitating medium.
- Co-creation of public spaces builds community ties, increases the sense of place, and fosters a shared investment in the future of a community (not only in financial terms, but in capacity building and local resources).
- Quality of public spaces remains a central issue, even in the digital era. No one will leave their home and use a public space, if it isn't safe or doesn't offer the requirements. Quality public spaces make up the richness of urban life.

It is important to recognize that the production of public spaces, with or without ICTs, is a never-ending process and that to a large extend we live in "yesterday's cities" (Resilience Alliance, 2007), as current features, public spaces, buildings, roads, networks and other urban elements, are built on the past and reflect former decisions and processes. This raises the question what kind of city is our legacy for the forthcoming generation. And getting back to the ICTs issues, their increasing penetration in our lives raise a series of questions that need to be addressed in the future: Does co-creation processes with ICT support also mean more people can be involved in decision-making? How powerful is the "wisdom of the crowds"? Will minorities or less powerful people still or better be heard and raise their issues? Is co-creation through ICTs more democratic? At

this point these questions remain unanswered but co-creation as a collective learning framework, can in the future provide better insights.

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2

Sociomuseology's theoretical frames of reference

Mário C. Moutinho | Judite Primo

The text aims to call attention to a series of documents that may constitute a theoretical frame of reference for Sociomuseology. As part of the whole summarizing process, this text is reductive, since it will always be the possible to call on other documents, other authors and other readings.

The paper reviews some of the events and perspectives that may be said to characterize Museology in the post-Second World War era, and which in some way may help clarify the bases of Sociomuseology. There is, however, an awareness that, as with all summaries, there is always the danger of exclusion or exaggeration.

The quotes are little more than simple indicative interpretations covering only some aspects of the issues under consideration. More importantly, it should be recognized that this text is the result of the meaning we attribute to the work we do in our Department of Museology, our deep links with MINOM-ICOM and our in-depth interaction with universities and museologists in Brazil.

For a long time, the concept of museology and the material nature of Museums was relatively consensual. Museology was a technique to work in museums which included various skills applied to the selection, conservation and restoration of museum objects that made up their collections. The Museum was a rather lavish building where collections of objects were kept, whose purpose was to be displayed in different rooms, corridors, stairwells and gardens. Objects were possessed of some form of symbolic or actual value, almost always signifying rarity, beauty or authenticity.

These Museums and this Museology are already sufficiently described, and we can't exclude of course their relevance as an essential element in the construction of memory/memories, by preserving snapshots of different social realities, in the construction of local, national and transnational identities. All the Louvres, British Museums and Hermitages, large and small, from every city and country, are undoubtedly there to demonstrate their place in everyday life and in the imagination of generations.

Philosophers, historians, anthropologists and sociologists have poured over these Museums and this Museology, and Paul Valéry's insight into museums , as much as Proust's, reinterpreted through the lens of Theodor Adorno's essential text, will always take us back to a dimension of a world outside the real world, where each object loses its life in favour of its new status as a museum object.

> The German word, 'museal', has unpleasant overtones. It describes objects to which the observer no longer has a vital relationship, and which are in the process of dying. They owe their preservation more to historical respect than to the needs of the present. Museum and mausoleum are connected by more than phonetic association. Museums are like the family sepulchres of works of art. They testify to the neutralization of culture. (Theodor, 1983, p.173).

In some ways, it is an institutional category, which on the one hand would have supported itself, oblivious to the social and historical contexts in which it found itself, but on the other hand would have comforted or even served the dominant ideology of each era.

These Museums are an inevitable reality and were certainly the basis for the first definition of Museum drawn up by ICOM in 1946. Thus, the very naming of museums refers to collections of knowledge isolated from one another: Science Museums, Museums of Art and Applied Arts, Museums of Natural History, Museums of History of Science and Technology, Museums of Archaeology and History and Historical Sites, Museums of Ethnography (including folk art and culture), Zoological Gardens, Botanical Gardens, National Parks and Forests and Nature Reserves and Trailside Museums. More explicitly, ICOM's Constitution stated that:

> The word 'museums' includes all collections open to the public, of artistic, technical, scientific, historical or archaeological material, including zoos and botanical gardens, but excluding libraries, except in so far as they maintain permanent exhibition rooms. *(ICOM Constitution,* 1946*).*

Yet, at the same time, in parallel with institutional museology, we must acknowledge many authors who pursued another role for museums and another rationality, more in line with the environment of which they were a part. Alma Wittlin, for example, argued that:

> Museums are man-made institutions in the service of men; they are not ends in themselves. (…) What can museums do with regard to the unmet needs of people? Museums are not islands in space; they have to be considered in the context of life outside their walls. This truism has become a verity under present conditions of accelerated change and at a time when every institution has to take measure of itself as a means to legitimate survival. Exposure is not enough. One of our blind spots, in all manners of educational environments, is the assumption that the exposure of people to experiences necessarily results in learning and stimulation. (…) A museum, every single museum hall, every individual exhibit is a man-made environ-

> ment; it is not a natural phenomenon resisting change; it can be changed (Wittlin, 1970, pp. 201-204).

In fact, it was said that museums should take into account the milieu of which they were a part, and that they should seek out solutions for the 'unmet needs of people'. They should not, therefore, simply be institutions turned in on themselves.

And it is precisely these simple directions which at that time were to be found in the growing self-criticism apparent in different academic fields. How could we fail to associate this questioning and reflection with John Dewey (1859--1952) or Paulo Freire (1921-1997) when they sought new ways to understand and make education itself.

By being directly or indirectly related to the different dimensions of Museology, many other authors should be taken into consideration, several of whom are referred to, in a 2-volumes fundamental work [1] organised by MNES, *Vagues: une anthologie de la nouvelle muséologie*. Everything happens as if a new awareness of the challenges of Western society was being built on the rubble of the Second World War. A new awareness of social responsibility that would cover different areas of knowledge. And, naturally, Museology would not remain impervious to this process.

Stage One: Ecomuseology and the Santiago de Chile Declaration 1972

It is within this process that we can understand the sense of the Santiago de Chile Round Table, convened on the initiative of UNESCO by ICOM. The Declaration drawn up, which became a key document for understanding the new directions in museology, stated:

> That the museum is an institution in the service of society of which it forms an inseparable part and, of its very nature, contains the elements which enable it to help in moulding the consciousness of the communities it serves, through which it can stimulate those communities to action by projecting forward its historical activities so that they culminate in the presentation of contemporary problems; that is to say, by linking together past and present, identifying itself with indispensable structural changes and calling forth others appropriate to its particular national context. (…)
>
> That this approach does not deny the value of existing museums, nor does it imply abandoning the principles of specialized museums; it is put forward as the most rational and logical course of development for museums, so that they may best serve society's needs; that in some cases, the proposed change may be introduced

[1] de Bary, M.O, Desvallées, A., Wasserman, R., (1992-1994) Vagues: une anthologie de la nouvelle muséologie, 2 vols, Éd. W, Savigny-le-Temple : M.N.E.S. (Muséologie Nouvelle et Expérimentation Sociale).

> gradually or on an experimental basis; in others, it may provide the basic orientation. (…)
>
> That the transformation in museological activities calls for a gradual change in the outlook of curators and administrators and in the institutional structures for which they are responsible; that, in addition, the integrated museum requires the permanent or temporary assistance of experts from various disciplines, including the social sciences. [2]

This understanding, linked to the process begun in the period that followed "May 1968 movement" and resulted in the creation of numerous local museums recognised as **ecomuseums**. Somehow these initiatives were recognised in what George Henri Rivière characterised in his *Evolutive Definition of Eco-Museum*.

> An ecomuseum is an instrument conceived, fashioned and operated jointly by a public authority and a local population. The public authority's involvement is through the experts, facilities and resources it provides; the local population's involvement depends on its aspirations, knowledge and individual approach. It is a mirror in which the local population views itself to discover its own image, in which it seeks an explanation of the territory to which it is attached and of the populations that have preceded it, seen either as circumscribed in time or in terms of the continuity of generations. It is a mirror that the local population holds up to its visitors so that it may be better understood and so that its industry, customs and identity may command respect [3]

Since then, ecomuseums have become a massive phenomenon spread across the five continents, revealing an extraordinary ability to adapt to the different social and political environments in which they find themselves. This process is analysed in detail by Peter Davis (Davis, 2011).

Unsurprisingly, these institutions have their own dynamics, determined by numerous factors, which means that over the years they have been transformed, renewed, reoriented or even institutionalised. The nature of these processes, in fact, bears witness to their relationship with the environment which is also subject to broader contexts.

At the ICOM General Conference in 2016, Ecomuseology occupied a significant place, not because it affirmed models, but because it underlined the importance of understanding the various paths that ecomuseums had taken in different parts of the world over the years [4].

For example, it is worth noting that in a 2015 document from Heritage Saskatchewan and the Museums Association of Saskatchewan, in which Eco-

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[2] Resolutions adopted by the round table of Santiago (Chile) (1973). The Role of museums in today's Latin America, *Museum, 3 (* XXV), 193. http://unesdoc.unesco.org/images/0012/001273/127362eo.pdf

[3] Rivière, G. H., (1985) The ecomuseum—an evolutive definition, Museum International, ICOM, Volume 37, Issue 4, pp 182–183

[4] Forum Ecomuseums 24th General Conference Milan-Icom 2016.

museology is defined from contemporary practices, there is continuity in the understanding of the role of Ecomuseums.

> First, as community museums, ecomuseums are products of their communities, so they need to be initiated, characterized, and managed by local residents. Their geographic scope, governance structure and other features are not determined or overseen by an outside agency, and whatever ends they decide to pursue, their activities and outcomes hinge on active community engagement. Second, ecomuseums put equal emphasis on natural and cultural assets, including local industries. This separates them from recreational or wilderness parks, which focus mostly on nature, and from heritage districts, which focus mainly on the built environment. Third, in keeping with their role as a museum, ecomuseums aim to preserve and interpret heritage assets, but they also work to apply this knowledge to address local development issues, with a focus on sustainability. To that end, ecomuseums provide a valuable conduit between the heritage community, the private sector, and elected officials. Fourth, the focus of an ecomuseum goes beyond objects, buildings, wildlife, and other tangible assets to include music, ceremonies, traditions, and other aspects of intangible heritage. This means that ecomuseums can be defined and mapped based on their tangible features, but they can also encourage more holistic approaches to learning and cultural adaptation. Finally, the fact that all of the assets associated with an ecomuseum continue to 'live' where they exist means that the organization itself is light-weight and flexible, with little need for capital investment. In effect, an ecomuseum emerges from, and adds to, the fabric of a community through what it does and who gets involved, using the unique features and qualities of a place as context. [5]

Stage Two: New Museology and the Declaration of Quebec

The New Museology certainly accounts for the transformations that we have mentioned in museology in general, within whose framework Ecomuseology took shape. The term was consolidated at the 1st International Workshop - Ecomuseums/New Museology Workshop in Quebec (Canada) in 1984. This meeting marked a point of great significance in museology for different reasons.

On the one hand, the recognition that the New Museology was not only the movement of ecomuseums, but instead manifested itself in different ways, such as Neighbourhood Museums in the USA, Identity Museums in some African countries, local museums in Portugal and in Spain, Casas del Museo in Mexico, or popular exhibitions in Sweden (Riksutstälningar). In every instance, these were institutions or initiatives that based their activity on local communities, in search of what Alma Wittlin termed 'unmet needs': affirmation of identity, local development, democratisation of museum practices.

This process of enlarging the meaning of New Museology was not done in a

[5] A report prepared jointly by Heritage Saskatchewan and Museums Association of Saskatchewan, February 2015.

simple way; quite the contrary, it was the cause of deep discussions that resulted in the Declaration of Quebec, which stressed that

> At the same time that it preserves the material fruit of past civilizations, and that it protects those that bear witness to present day aspirations and technologies, the new museology – ecomuseology, community museology as well as all other forms of active museology – is first and foremost concerned with the development of populations, reflecting the modern principles that have driven its evolution while simultaneously associating them to projects for the future. This new movement has unquestionably put itself at the service of creative imagination, constructive realism and the humanitarian principles upheld by the international community. It has to some extent become one of the possible forms of bringing peoples closer together, for their own and their mutual knowledge, for their cyclic development and their desire for the fraternal creation of a world that respects its intrinsic wealth. In this sense, this movement, which aims at manifesting itself globally, has concerns of scientific, cultural, social and economic order. Among other means, this movement uses all the resources of museology (collection, conservation, scientific research, restitution, diffusion, creation), which it transforms into tools suitable to each specific social context and projects. [6]

On the other hand, this meeting was the origin of the International Movement for a New Museology [7], an organization which would be recognized by ICOM two years later. This was perhaps how the most innovative idea took shape, the recognition of the right to diversity, removed from Adorno's idea of the 'mausoleum museum'.

Stage three: Sociomuseology

Sociomuseology is not a new term for the new museology. It should instead be understood as a multidisciplinary approach to doing and thinking about museology, as a resource for the sustainable development of mankind, based on the equality of opportunities and social and economic inclusion, grounded on the interdisciplinary inclusion of other areas of knowledge.

This museology was recognized in the final document of the XV MINOM International Conference, which took place in Rio de Janeiro in 2013, in defence of a museology aiming at the:

> Breaking down of power hierarchies, to enable the emergence of new protagonists with their own memories;
>
> Understanding community museums as political, poetic and pedagogical processes in permanent construction and linked to very specific world-views;

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[6] Declaration of Quebec – Basic Principles of a New Museology 1984 Special edition 22nd ICOM General Conference 2010, *Sociomuseology* IV, *Cadernos de Sociomuseologia*, 38, http://revistas.ulusofona.pt/index.php/cadernosociomuseologia/issue/view/153

[7] http://www.minom-icom.net

> All these organizations give and take, make and unmake their memories, feelings, ideas, dreams, anxieties, tensions, fears and live their own reality, without asking permission from the established authorities;
>
> Recognizing that all these museums and museological processes have their own ways of 'musealizing', appropriating and making use of diverse knowledge in the way that suits them. [8]

In this sense, Sociomuseology can be situated within the social sciences, establishing paths to understanding the various contemporary museological practices, at the same time as being an agent of museological activity. In Brazil, the terms Sociomuseology and Social Museology are used interchangeably. However, we believe it is more accurate to recognize social museology as the practice of community-inspired museology, in its different ways. As for Sociomuseology, it is about recognizing a new school of thought, which aims to clarify and, to a certain extent, enhance the new museological practices at the service of development. As a basis for reflection, at the XII International Conference of MINOM held at the Universidade Lusófona in Lisbon, we put forward a document in which we assessed the current status of a possible, but above all necessary, "evolving" definition of Sociomuseology.

> Sociomuseology expresses a considerable amount of the effort made to suit museological facilities to the conditions of contemporary society.
>
> The process of opening the museum, as well as its organic relation with the social context that infuses it with life, has resulted in the need to structure and clarify the relations, notions and concepts that may define this process.
>
> Sociomuseology is thus a scientific field of teaching, research and performance which emphasizes the articulation of museology with the areas of knowledge covered by Human Sciences, Development Studies, Services Science, and Urban and Rural Planning.
>
> The multidisciplinary approach of Sociomuseology aims to strengthen the acknowledgement of museology as a resource for the sustainable development of Humanity, based on equal opportunities as well as social and economic inclusion.
>
> Sociomuseology bases its social intervention on mankind's cultural and natural heritage, both tangible and intangible. [9]

Like any disciplinary area (we were far removed from the old discussion about ascertaining whether museology is a science), Sociomuseology has a growing body of theory, with a multifaceted field of action, emerging from social practices which recognize a set of shared values. These values are very clear within the conceptual framework of the "National Museums Policy" instituted in Brazil by Minister Gilberto Gil (2004-2017). This lay at the root of the trans-

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[8] *Final Declaration, XV International Conference of MINOM, Rio de Janeiro 2013*

[9] Moutinho, ... (2009). Evolving definition of sociomuseology: proposal for reflection. *Cadernos de sociomuseologia, 28*(28). <http://revistas.ulusofona.pt/index.php/cadernosociomuseologia/article/view/510>. accessed: 20/01/2017. 2018.

formation of the Brazilian museological outlook, once open to recognizing the relationship between museology and social responsibility. Once understood as a disciplinary area, it is important to recognize the need to systematize its assumptions, clarify methodologies, and act towards the establishment of a consistent theoretical body.

In this context, we must situate the international and contemporary acknowledgment of this process, which has led to the recently approved 'Recommendation concerning the protection and promotion of museums and collections, their diversity and their role in society' adopted by the UNESCO General Conference at its 38th Session Paris, 17 November 2015. In particular, the following points should be noted:

> 16. Member States are encouraged to support the social role of museums that was highlighted by the 1972 Declaration of Santiago de Chile. Museums are increasingly viewed in all countries as playing a key role in society and as a factor in social integration and cohesion. In this sense, they can help communities to face profound changes in society, including those leading to a rise in inequality and the breakdown of social ties.
>
> 17. Museums are vital public spaces that should address all of society and can therefore play an important role in the development of social ties and cohesion, building citizenship, and reflecting on collective identities. Museums should be places that are open to all and committed to physical and cultural access to all, including disadvantaged groups. They can constitute spaces for reflection and debate on historical, social, cultural and scientific issues. Museums should also foster respect for human rights and gender equality. Member States should encourage museums to fulfil all of these roles.
>
> 18. In instances where the cultural heritage of indigenous peoples is represented in museum collections, Member States should take appropriate measures to encourage and facilitate dialogue and the building of constructive relationships between those museums and indigenous peoples concerning the management of those collections, and, where appropriate, return or restitution in accordance with applicable laws and policies [10].

This important document, conceived in 2010 in the Department of Museological Processes at the Brazilian Museums Institute (IBRAM) by its specific coordination devoted to Education and Social Museology, had in fact identified the lack of a document at international level that recognized the principles of renewed contemporary museology.

Once the process was initiated, after a long procedure, with the participation of over 160 experts from at least 70 Member States, the recommendation was approved.

Mário Chagas, coordinator of the Department of Museological Processes and one of the main inspirations of the National Museums Policy, referred to the

[10] http://portal.unesco.org/en/ev.php-URL_ID=49357&URL_DO=DO_TOPIC&URL_SECTION=201.html

Recommendation, and stressed its importance for the whole international museum community:

> The recommendation discusses themes that are central to the activity of an increasing number of museums on every continent. These are recognized as drivers of development, social inclusion, gender equality and respect for diversity, taking on board the principles and values already signed up to in the Declaration of Santiago de Chile in 1972, that the recommendation itself invokes in its own right. This is a document that mobilizes, guides, recommends and encourages action. Therefore, although in some places it is possible to identify an undisguised desire to producing standards and rules in the final draft of the Recommendation, this UNESCO recommendation represents essential guidelines to guarantee, expand and subsidize new reflections and practices in Social Museology and Sociomuseology that express the challenges of the contemporary world. [11]

We couldn't fail to mention a possible new phase that could be called Altermuseology, as announced by Pierre Mayrand in his *Manifesto* presented in Setubal, 27 October 2007.

> Today, globalization obliges museologists to combine their energy, in peoples and organizations that fight for a transformation in museums on the Forum – Agora – Citizenship. It also leads to a didactic and dialectic attitude, capable of promoting dialogue among peoples in a gesture of cooperation, resistance, liberation and solidarity with the World Social Forum (Mayrand, 2007, n/p).

Maybe this is the dimension that museology should assume in a world where challenges are increasingly global, and their solution lacks a comprehensive understanding, but can express local realities and contexts.

Sociomuseology in the context of the social sciences

As Sociomuseology is increasingly consolidating its practice, and constructing its theoretical boundaries and its place in the field of social sciences, it is also important to look at other identical processes in areas of knowledge (or science) that in recent years have opened up to society's challenges, not only to understand their meaning, but also to claim an active place in their possible direction.

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[11] Brief considerations about the genealogy and the meaning of the *Recommendation on the protection and promotion of museums and collections, of their diversity and role in society Paris, 20 November 2015,* Alessandra Gama, Alexandre Gomes, Ana Valdés, Claudia Storino, Inês Gouveia, João Paulo Vieira, Judite Primo, Juliana Siqueira, Luisa Calixto, Luzia Gomes, Marcelle Pereira, Marcelo Murta, Mario Chagas, Mario Moutinho, Mirela Araujo, Nathália Lardosa, Pedro Leite, Sarah Braga, Simone Flores, Vania Brayner, *Cadernos de Sociomuseologia*, 10, pp. 163-180
http://portal.unesco.org/en/ev.php-URL_ID=49357&URL_DO=DO_TOPIC&URL_SECTION=201.html

This is the case, among others, of Public Sociology (Burawoy, 2005), or Public Archaeology (Funari & Robrahn-González, 2008).

Public Sociology seeks to bring sociology into a dialogue with the audience beyond academia, an open dialogue, in which both sides deepen their understanding of public issues. It is the opposite of Professional Sociology – a scientific sociology created by and for sociologists - inspired by public sociology, but, also, without which public sociology would not exist. The relationship between professional and public sociology is thus the fruit of an "antagonistic interdependency" (Burawoy, 2005).

For its part, Sociomuseology is recognized as a significant part of the effort to adapt museological structures to contemporary society, and, moreover, to build a dialogue beyond the museological profession, also made by and for museologists.

The significant difference arises from the fact that over time museological theory has been an area of knowledge essentially focused on the museum institution, paying little attention to the social environment that characterized its context and consequently its practice. This has almost always been reduced to the practice of the museum institution, with its increasingly complex audience, the central role of the material heritage of its communication capabilities and the modernization of institutions. [12]

Their openness to the social environment which gives them life is their current direction.

This explains to some degree what Burawoy thinks of the sources of Public Sociology, and may legitimately invoke the work of Marx, Weber, Durkheim and Gramsci, as well as of contemporaries Bourdieu, Touraine, Habermas, Beauvoir, Freire, Hooks and Fanon.

The starting point for Sociomuseology seems to be rather distant in time. But if we consider its epistemological roots, it is also difficult to sustain Sociomuseology without reclaiming the same sources and the same schools too. This is most evident when it comes to Freire, Fanon, Gramsci and Habermas or even the 'misguided' vision of Foucault on museology. In other cases, it is also hard to think of Sociomuseology without Marx, Weber or Durkheim, whose contributions continue to support a more consistent understanding of contemporary society. In other cases, it is hard not to consider the thinking of a host of researchers who have contributed, in particular since the 1970s, to knowledge in the field of museology, in particular Sharon Macdonald, Martin Schärer, Georges Henri Rivière, Hughues de Varine, Hooper-Greenhill, Zbynek Stránsky, Anna Gregorova, Peter van Mensch, Marta Arjona, François Mairesse, Geoffrey Lewis, Mario Chagas, Cristina Bruno, Adriana Mortara, Maria Celia Moura Santos, Bernard Deloche, Jean Davallon, Peter Davis, Ulpiano Bezerra de Menezes or Pierre Mayrand, to name just a few.

[12] cf. Agren, P.U. (1992). "Museology – a new branch of humanities in Sweden?", Papers in museology 1/Acta Universitatis Umensis 108 Stockholm, 104-113.

It is not a matter of situating Sociomuseology within the broader public Sociology. This is taking Sociomuseology in its 'antagonistic interdependence' with Museology, taking its essence as part of Social Sciences and assuming that its place in contemporary society is much more relevant, the deeper its dialogue with Public Sociology; and also, of course, with all disciplines or sciences that open themselves up organically to the society which is their context.

Both Public Sociology and Sociomuseology have the same objective in common which is in some way to deconstruct the two areas of reflection that sustain and inevitably nourish them: Sociology and Museology.

Understood in this way, Sociomuseology becomes a new school of thought arising from the connections between other areas of knowledge that contribute to the contemporary museological process.

The splitting of the Museum in two and its organic relationship with the social context that gives life to it, have led to the need to elaborate and clarify relationships, notions and concepts that can account for this process.

This proposal for a definition of Sociomuseology is more than purely an exercise in semantics. It aims to actually draw attention to a whole area of concerns, methods and objectives that make increasing sense of a museology whose boundaries never cease to grow. The restrictive vision of museology as a working technique oriented towards collections has given way to a new understanding and to museological practices geared to the development of mankind.

It is precisely towards this reality, the result of connecting areas of knowledge that grew out of museology, but gradually became indispensable resources for the development of Museology itself, that Sociomuseology can contribute to understanding processes and defining new directions.

The University and Sociomuseology

This understanding naturally entails looking for the new space that the University can and should occupy regarding the issues raised.

In recent decades, Museology in many countries has become an object of study and research, with academic recognition in parallel to the already consolidated programs of museology understood as a set of techniques.

Based on the work of the most important precursors and with reference to new practices and resources, universities moved essentially in two directions:

1 – Training and research geared to the needs of museums, focused on their collections, with all the corresponding responsibilities vis-à-vis the management, maintenance and conservation of collections. Research and qualification in these areas, which are connected with the challenges of enhancing the institution's relationship with different audiences, and in both situations with the growing importance of new information and communication technologies. In fact, programs oriented towards these museums require a more global vision of the role of Museologists, in the paradoxical situation of the break-up of the profession,

resulting from increased specialization of the different tasks that these museums perform.

2 – On the other hand, programs oriented towards the museums with their willingness to respond to *unmet needs*. This is about guaranteeing training and research for a museology that is recognized as a communications resource, focused on 'new collections', constituted by the challenges of contemporary society. And working with objects is fundamentally different from working with people facing the challenges of the societies of which they are a part.

This is the recognized dilemma of Museology which works **for**, or Museology that works **with**. But nowadays we must also recognize that museology, as a whole, is not divided into watertight areas.

The daily practice of a growing number of museums and museological experiences has reduced this separation. Traditional museums increasingly integrate into their activities programs and actions that seek to deepen the relationship with their stakeholders in order to respond to the real challenges of the environment, social integration, gender, and more broadly social inclusion. At the same time, we must recognize that many institutions situated at the apex of social museology build collections which they use in different forms and are forced to consider all the problems that the conservation and management of collections necessarily require.

In this sense, it appears necessary to rethink existing educational models, to meet the needs of these new museums characterized by the highest levels of conceptual complexity. Such need would certainly apply to many of the Museums of objects, Museums of Social Museology, Museums of global challenges, Museums of technological luxury, Imperial Museums and other contemporary Museums.

We are therefore faced with Complex Museums, not so much by the technical complexity required to run them, but by the fact that they work simultaneously with different structural concepts in their very essence. Sorting out ideas and consequently building the skills of those working in these complex museums is, in our opinion, the main challenge that the University must face to reorganize its educational programs and adapt them to the multifaceted reality in which the Museum now operates.

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3

Social Representations Theory and Museum Visitors

Ainda Rechena

1. Social Representations and each one of us

> *... each individual hosts inside him his own museum; each person is formed, filled and constantly influenced by crosscurrents of impulses throughout their life and consequently represents a place, an age, a generation*. (Per Uno Agren, 2001, p. 22)

Per Uno Agren's words draw our attention to two separate but complementary facts: each individual is characteristically different from all others; each individual is also integrated in a group, a place and a specific time, with which he shares his "crosscurrents of impulses" throughout his life. By following this line of thought, in order to consider visitors as "special", museums have to take into consideration these two realities: the visitor's individual dimension and the visitor's social context or social dimension. Bringing these concerns to the fields of knowledge appropriation, world categorization and construction of individual and collective conscience, in this paper we took social representation theory (SRT) developed by social psychology and used it as conceptual framework to understand the communication process that takes place in museums, specifically in exhibitions.

How can the social representation concept serve museology? More specifically, how can it be used in the analysis of the communication process in museums and the roles of visitors and museologists in that process? The etymological meaning of the word indicates that "to represent" or "representation" is to show or make clear something not present, by spoken or written words, by actions, by images, mentally or symbolically. Representations were originally studied within sociology with the works of Émile Durkheim who developed the concept of "collective representations" (Durkheim, 1898). To Durkheim collective representations are external to individual consciences and arise not from the isolated individual but from relations between individuals. Collective representations

designated a wide range of mental forms such as sciences, religions, myths, time and space, but also opinions and knowledge. Durkheim considered that collective representations perpetuate in society, have their own existence and act directly on each other, combining and creating other representations. This way, Durkheim did not acknowledge that individuals played an active role in forming collective representations since, as social phenomena, they did not depend on personal nature but on realities of collective nature.

Based on Durkheim's work, Serge Moscovici uses the collective representations concept, although he moves away from the original idea, by giving individuals an active role in forming and communicating the representations that he classifies as "social". Moscovici published his first work on social representations in 1961 (Moscovici, 1961) studying the way of apprehending and understanding psychoanalysis in France and defined it as:

> A system of values, ideas and practices with a twofold function: first, to establish an order which will allow people to orient themselves in their material and social world and control it, and, secondly, to enable the communication between members of a community by providing them with a code for naming and classifying unambiguously the various aspects of their world and their individual and social history. (Moscovici, 2004, p.24)

To Moscovici social representations are created collectively, they are social thoughts elaborated by members of a group, which allows them to understand the world and communicate between themselves.

Denise Jodelet, who deepened Moscovici's research and theory, held that a social representation makes present an absent object, being the mental representative of the object it symbolically restores. Jodelet defined social representations as:

> …a form of knowledge socially elaborated and shared, with a practical aim and contributing to the construction of a common reality for a social group ... The social representation is always a representation of something (the object) and someone (the subject). Characteristics of the subject and the object will affect it. (Jodelet, 1994, 36--37 and 43)

Jodelet establishes the defining limits of the concept: a *subject* carrier of representation, an *object* that is represented and a *context* of a social group in which the representation acquires meaning. But to Jodelet, the characteristics of each of these elements – subject – object – context – influence the created social representations and extend the participative role not only to the subject, but also to the object and the context.

This triad (subject – object – context) was designated by Bauer and Gaskell (1999) the social representations "toblerone" assigning a ternary matrix structure to which they added a third dimension: representations of subjects, representations of objects and representations of contexts which multiply and deploy

whenever the focus and relationships between subject, object and context change.

To broaden our understanding of the social representation theory we introduce the definition of Angela Arruda, a Brazilian psychologist, who relates the social representation with the collective symbolic world:

> … being a symbolic production to understand and guide the world, [the social representation] comes from an active and creative subject, has a cognitive and autonomous character and shapes the social construction of reality. Action and communication are his crib and ground: social representation comes from them and to them it returns. (Arruda, 2008, p.142)

To the author social representations are not reality, but a symbolic social construction produced by people and reproduced through communication, allowing us to compare social representations and the ability of representing cultural heritage in museum exhibitions.

Let us go back to Jodelet's ideas to understand how social representations are formed. Several reactions arise in an individual facing a new event in social context. [1] They may be expectation, fear, euphoria or applause. The new event involves a cognitive activity to understand it, master it and defend oneself from it. This is the moment of representations as "cognitive phenomena". The lack of information in this first phase, favors the emergence of representations passed down by word and through the media. Made with available information and resources, these representations fall into pre-existing thought frameworks that allow its interpretation (moral, religious, medical, etc.) – as Moscovici claims. Sometimes, new words appear that make possible the describing of the representation. At this point the representations form systems and give rise to spontaneous theories, versions of reality that embody images or condense words, in both cases loaded with meaning. When a new representation arises, through the transformation of a previous structure, it becomes shared knowledge and a stable structure. It is the moment of the representation as "interpretational system."

In this social process of knowledge production, the representation formation presents a sequence of two mechanisms theoretically developed by Moscovici. The first mechanism is "anchorage" through which we try to locate strange or foreign ideas within a familiar context, and reduce them to common categories and images, i.e., changing objects from unknown into familiar. The

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[1] The author gives the example of AIDS emergence. When the disease appeared, the media and the conversations referred to it as a tragedy and a fatality. Before the scientific clarifications, people developed theories (common sense knowledge) supported on the available data related to patients (drug addicts, hemophiliacs, homosexuals) and the "vectors of evil" (blood and semen). In this first interpretation AIDS was considered a punishment-disease. This was a spontaneous moral interpretation, which led to social stigma and ostracism that caused the rejection. These early social representations of AIDS, (…) enrolled in the pre-existing thought frameworks related to social morals and arose words with obvious pejorative meaning to refer to patients. (Jodelet, 1994, pp.32-35)

second mechanism is "objectification" through which we transform the unknown into something almost concrete, representing the ideas as concrete phenomena existing in the physical world. In objectification people link new conceptual schemes to real, concrete and comprehensible images, taken from everyday life. That's why Moscovici states that "all representation = image / meaning" or "in other words, the representation equals every image to an idea and every idea to an image" (Moscovici, 2004, p. 46)

From the mentioned authors we can deduce that social representations are a complex system that developed in the cognitive, affective and social dimensions of human life: cognitive because it concerns the construction of social knowledge; affective for bringing the implicit symbolic and imaginative character of this social knowledge; and social because both cognition and affections are based on social reality and all forms of interaction and communication between people.

Summarizing, on the one hand, social representations are a cognitive phenomenon, a builder of social knowledge and a form of knowledge shared by a particular social group. On the other hand, social representations are a system of interpretation, which governs our relationship with the world and others, directs and organizes, conducts and makes communication possible. Social representations are a way of apprehending and decoding the world, and after being built they are integrated into the system of values, attitudes, ideas, norms, prejudices and stereotypes with which we categorize and interpret the world, a process based on a pre-existent mental structure, which enables communication with members of our community.

It is Moscovici, when speaking of social representations, who draws attention to the essential aspect of communication between individuals because, according to him, "all human interactions, be they between two people or two groups, presuppose representations" (Moscovici, 2004, 40). The author, supported by Guareschi and Jovchelovitc (2008, p.20) identifies the social representations in various phenomena, such as in conversations, in the streets, in the mass media, in informal channels of communication, social movements, acts of resistance and in all social places, among which we can include museums. [2] The role played by communication in the emerging and making of social representations and in their consequences [3] is a fundamental element in Moscovici's theory. Considering that museums and their exhibitions are a means of communication and a place of representation, we must admit that, as a social phenomenon, museums are also places where social representations interact, change and probably emerge.

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[2] We consider museums as a social space by defining them as a place where the relationship between people and cultural heritage takes place.

[3] The consequences of representations are stereotypes, attitudes and opinions (Bauer e Gaskell, 1999, p.165).

2. Museums and each one of us

By transposing the social representations concept (as cognitive phenomenon and interpretation and communication system) to the museological sphere, and more specifically to the museum exhibitions, we presume that the human being uses social representations in the moments of interaction with cultural heritage. Our own social representations (shared with the group but related to the specific individual sphere in which they originated) are what allow us to interpret a museum exhibition and appropriate the cultural heritage placed in museums, by integrating it in our thought framework or pre-existent mental structure.

It is the subject's active role in producing and transmitting social representations that allows us to apply the social representation theory to museology and the study of museum visitor's role. Moscovici states:

> What we are suggesting (...) is that people and groups, far from being passive recipients, think for themselves, produce and communicate constantly their own specific representations and solutions to questions posed by themselves. On the streets, bars, offices, hospitals, laboratories, etc. people analyze, comment, formulate spontaneous and unofficial "philosophies", that have a decisive impact on their social relationships, their choices, in the way they raise their children, how they plan their future, etc. Events, sciences and ideologies, just provide them the "food" for thought. (Moscovici, 2004, p.45)

Both in museology and the museum/exhibition communication process, the individual plays an essential role. If the subject is represented in museums through the preserved heritage she also takes an active role as a visitor, in the appropriation of this recontextualized and interpreted heritage in the museum space. If in a social representation "a subject, an object and a context" are always present (as Jodelet stated) the same is true in the museum context, the place where the subject relates to the cultural heritage, which is interpreted using social representations. The visitor is thus crucial in the interpretation of a museum exhibition, constructing meanings, integrating it in his symbolic and affective system and in his mental framework. When considering the visitor as an "actor", the museum becomes a place of negotiation, a place of confrontation between the observer (= museum visitor), the observed (= the exhibition) and the producer (= curators and other museum professionals). The museum becomes a place of contact between social representations: of the museologist, of the visitor, and the ones contained in the displayed museological objects. Thus the museum appears as a conducive terrain to change or form new social representations.

People entering a museum bring with them "the rest of their lives, their own reasons for visiting and their specific prior experience" (Hooper-Greenhill, 1999, p. 5). This means that each person or group interprets a museum exhibition differently from other people and groups. In other words, different categories of people interpret the exhibition according to their aspirations and self-knowl-

edge, making subjective interpretations. Each person uses the communicated messages in a personal way, interpreting them using a set of factors of cultural, social and personal reasons [4], making communication bidirectional.

Apparently the presence of different levels of social representations in a museum exhibition, understood as a process of communication, would hinder communication. And, in fact, visitors do not often understand the message that museums want to communicate, or they interpret the exhibition in a way unexpected to its curator. However, when considering the existence, in each person, of a common social framework of pre-existing thought, as proposed by Moscovici, social representations are a beacon to the individualized interpretation of a museum exhibition, preventing this process from being an endless shower of subjective readings.

This idea is consistent with the limitations indicated by Martine Joly (2002, pp. 87-105) to the subjective interpretation of works of art, limitations created by our expectations, prejudices and social stereotypes, i.e., by our social representations. In her study, Joly believes that part of our interpretation, in adulthood, is already partially built before we had access to the images because we superimpose to the signs produced by the image, the stereotypes of its own reception. To Joly, when looking at an image we associate it with something that already has a previous representation in our minds (social representations, stereotypes, prejudices) through a process the author calls "transference" (2003, pp. 104-105). It is the limitation imposed by social representations that explains why a particular subject or social group values and interprets cultural heritage [5] differently from another person or social groups.

Let us return to Jodelet's theorization when she says that social representations, as socially elaborated and shared knowledge, have "a subject, an object and a context" as intervening parties in its construction and represent a consensual view of reality within a particular social group. To the author, the goal in social representation is that the person assigns meaning to the world and creates order and perception in it. But as dynamic structures, social representations always carry the mark of the individual and the social group that produces them, operating on a set of relationships and behaviours that come and go, along with the social representations. This dynamic of social representations is a part of the wider process of communication, also defined by the intervention of a subject, an object and a context, a situation that transports us to the museum and to the museological communication processes.

We contended that social representations are formed in the streets, in conversations, in the media and also when someone stands before the historical and cultural heritage. As public institutions, museums emerge as possible location for driving thought and senses in order to make possible the establishment or

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[4] That Santiago Palomero Plaza (2011, 18-23) calls "our islands of knowledge and perception".

[5] We consider cultural heritage in a broad sense, from objects, to rituals, traditions, symbolic systems, i.e., everything that can be represented in a museum.

modification of the dominant social representations. This possibility leads us to question the role of the museum staff in the communication process. If the visitor interprets an exhibition according to the prior knowledge and sensitivity that he or she already has, will it not produce an inconsequential exhibition meaning, unable to influence visitors? And in that case, what is the role of museum staff in the communication process? In other words, how do we ensure communication between the museum and its visitors? To seek an answer that allows us to reconcile the subjective dimension with the social dimension of museum visitors we follow two distinct but complementary lines of thought: the proposal of museums as service provider institutions, presented by the Portuguese museologist Mário Moutinho (Moutinho, 2008) and the participatory museums proposed by the North American Nina Simon (Simon, 2010).

3. Museums as institutions providing service

The classification of museums as service provider institutions has been advocated by social museology. We consider social museology as a field of museology, with a focus on people, communities and their needs. Defining museology as "the relationship between the subject and his cultural heritage," social museology focuses its attention on the subject. One of the theorists of social museology, Mário Moutinho, says that what distinguishes social museological approach is the "recognition of museology as a resource for the sustainable development of mankind, based on equal opportunities and social and economic inclusion" (Moutinho, 2007, p.1). Social museology assumes an intervention in the cultural (tangible and intangible) and natural heritages, recognizing cultural hybridization, the overlap and coexistence of multiple cultural identities, articulated or not in the same territorial space. Moutinho states:

> What characterizes Social Museology is not exactly the nature of its assumptions and objectives, as in other areas of knowledge, but the interdisciplinary way of calling for areas of perfectly consolidated knowledge and relates them with Museology. (Moutinho, 2007, p.1)

To Moutinho, the main concerns of social museology are the recognition of a global responsibility for cultural heritage; the centrality of development issues, broadening its scope to the national and international level; museums performance linked to the permanent social change; the need for professional training that goes beyond the range of techniques focused on collections, creating professionals committed to the local communities. As a final concern, Moutinho says that social museology assumes museums to be institutions which provide services, which involves giving deeper consideration to the relationship between museums and their visitors.

Developing this latest proposal – museums as service providers – Moutinho highlights the role of the visitor in the interpretation of museum exhibitions and

recognizes the exhibition design as an autonomous writing that uses cultural heritage, aiming to produce knowledge and critical thinking. Also he considers that applying the characteristics of services (inseparability, variability, perishability and intangibility) to museums would have relevant consequences in their performance and relationship with visitors (Moutinho, 2008, pp.36-43).

The first consequence of this approach relates to the inseparability, i.e. the simultaneity between the production and consumption of the service. In a museum, simultaneity is materialized when the visitor gets in contact with the exhibition. The moment of simultaneity between production and consumption of a museum exhibition is also the moment when the museum public evaluates its service. As a service provider, the museum would have to concern itself more with this moment, sometimes fugacious, in which its work is "consumed" by those to whom the service is aimed: the visitor, the community, the researchers. When the positive impact of that moment is lost, the result reflects negatively on the museum's public image.

Another impact of museums being perceived as service providers relates, according to Mário Moutinho, to *variability*. Institutions providing services try to adapt to each client, looking for customization, personalization and differentiated service to their customers. If museums are assumed to be service providing institutions they must seek to adapt to each user, group of visitors, students, researchers, and avoid displaying exhibitions built to please the greatest number of visitors. This would lead to acknowledging a greater autonomy for museum visitors to interpret museum exhibitions.

A third consequence is linked to the intangibility of the services, which Moutinho identifies within the museum by equating it with leisure spaces. The consumption of exhibitions is intangible, in that the consumer cannot take with him the exhibition itself, but only the intangible affect related to learning, feelings, leisure and enjoyment. For this reason, museum exhibitions should work more with feelings and sensations and less with the rarity, antiquity or aesthetics of objects. An observer can only decode an object in its fullness if she already possesses information about that object or a similar one. The use of sensations and feelings is a way to extend the visitor's relationship with that specific object or theme.

Finally, the fourth characteristic of museums as service providers is *perishability*. Moutinho considers that service provision in a museum exhibition ceases at the moment of consumption. But this feature does not apply to permanent or long-term exhibitions, where the same product is available for years on end. Moutinho suggests that exhibitions should have a limited life span to keep their impact, significance and power of communication.

If we consider museums as service providers, we place the responsibility of communication in the hands of the museum professionals who should cease to have a homogenizing posture and present irrefutable technical speeches and try to get closer to the visitors needs. Applying the theory of social representation to Mário Moutinho's proposal requires that museums focus their activity on visitors and requires museum professionals to be "social workers" with the ability

to produce content, able to provoke sensations and ideas, to activate memories and promote thought by asking questions.

4. Participatory museums

Nina Simon's participatory museums proposal is close to Mário Moutinho's proposal, in the sense that in both, the museological approach focuses on people who go to museums and on the community and not on the collections of objects. But if in museums acting as service provider institutions the responsibility for managing the communication and content production is that of museum professionals, in participatory museums this responsibility is shared between museum staff and museum visitors, contributing both to the construction of the communication process and to the final outcome of museum exhibitions. Based on three fundamental ideas, namely: the museum is an institution focused on visitors, visitors build the meaning of their cultural experiences, the opinions of museum users can inform and invigorate the project and programs of the museums themselves, Nina Simon defines a participatory cultural institution as:

> … a place where visitors can create, share, and connect with each other around content. *Create* means that visitors contribute their own ideas, objects, and creative expression to the institution and to each other. *Share* means that people discuss, take home, remix, and redistribute both what they see and what they make during their visit. *Connect* means that visitors socialize with other people—staff and visitors—who share their particular interests. *Around content* means that visitors' conversations and creations focus on the evidence, objects, and ideas most important to the institution in question. (Simon, 2010, online version)

The main alteration in the relationship between the museum and its visitors is that the museum assigns visitors the responsibility of co-authorship of the contents in a museum exhibition. Instead of producing content for the visitor's consumption, as in the traditional museums communication process, the museum now acts as a platform between visitors, who are simultaneously content creators, distributors, consumers, critics, reviewers and collaborators.

By asking the visitor to "create, share and connect with each other and around content," (Simon, 2010, online version) the museum is asking visitors to bring to the exhibition their social representations and build with them a museological discourse and establish a dialogue with the cultural heritage and with other visitors. This way, the museum effectively becomes a social place, where social representations manifest, evolve and emerge, in the act of communication. This way of working in museums demands that institutions have "a genuine respect and interest in the visitor's background and capabilities," by giving up the control of the communication and creative process. Simon states:

> People use the institution as meeting grounds for dialogue around the content presented. Instead of being "about" something or "for" someone, participatory institutions are created and managed "with" visitors. (Simon, 2010, version online)

This transformation of a communication "about" something or "for" someone into a communication "with" people creates museums as dialogue places, of multivariate production, places of confrontation between social representations and consequently conducive to the emergence of new social representations.

5. The special visitor: "All of Us"

By bringing the social representation theory to the museum's sphere we consider that the visitor is not a passive receiver but each person carries his/her own social representations — worldviews, beliefs, myths, religions, norms, values and stereotypes — that will be put into action when visiting a museum exhibition, interpreting it in their own way. People have an active role in the communication process and each one plays a part in elaborating, communicating and transforming social representations that arise from their own cognitive categories, their cultural environment and their personal experiences. According to the social representation theory, each of us has a social knowledge shared with others that allows communication within the museum. In the communication process that occurs in museums (specifically in museum exhibitions), communication does not have a unidirectional path: it is always made between those who communicate and those who receive the communication.

It is important to bring to this discussion the fact that heritage in museums results from the common social representations in a particular community. This community ascribes value to a specific group of cultural objects. So, the cultural heritage selection process is subjected to the same kind of categorization of all reality, and that explains why different patrimonial objects are valued by a particular social group and others are not. Based on this line of thought, it is possible to identify some contact points between museum theory and social representation theory:

1. Museums establish categorization systems for real objects (the cultural heritage), contributing to the apprehension of the world (as constructors of knowledge), allowing people to be aware, to guide themselves and relate to the preserved cultural heritage
2. Museums as places of representation do not work with reality but with modes of symbolic fixation of reality
3. Museums give the person a decisive role in the communication process
4. In the same way that social representations are located in time and space, the relationship between people and their cultural heritage is characteristic of a specific time and space.

Bringing social representation theory proposals to the museological field allows us to make each visitor a special person, whether working with museums as service provider institutions or working with participatory museums. Either way, working in visitor-oriented museums requires professionals committed to the social needs of visitors and aware of the communication processes and the role of social representations in them. Finally, we note that some social representations are prejudiced and promote social inequalities, like those associated with interpretations of the categories "race" or "gender", for instance. Museums' mission should also be to contribute to change unfavorable social representations and the ones with a negative impact on society.

Presently museums are defined and experienced as active social institutions that reflect and convey what is happening in their environment, integrated in social and historical dynamics and fundamental in shaping collective identities. Museums are considered active participants, not passive observers, they are responsible for mediating strategies to identify and appropriate heritage and not mere storage for collections or memories. Today, museums reflect on multiculturalism, the relation between memory and power and the globalization impact on cultural heritage. Museums' objectives are no longer just researching or gathering collections; it is no longer about the *object* but rather the *relation between person and object*. Making every museum visitor special, means to involve people in all museum actions, with their singularities, ambitions, disappointments, expectations, feelings, emotions, dreams, social representations, contributing to a society equally shared and experienced by all of us.

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4

The Jesuits in Portugal: the communion of science and religion

José Viegas Brás | Maria Neves Gonçalves | André Robert

Introduction

The Jesuitism created in Portuguese society after the Pombaline Consulate a great controversy. According to Franco (2000), following the myth of the Jews, there emerged, with the Enlightenment, another, even more negative, myth, the myth of the Jesuits. In Portugal, the great architect of the anti-Jesuit myth was the Marquis of Pombal. It corresponded to a centralization process of the absolutist state, keeping the control of education, which belonged to the Society of Jesus. "The Jesuit myth fantasmatic figure of absolute power, formidable and fascinating, and, above all, of a political nature: they belong, in this sense, to the modern world; he dwells inseparable from the emerging forms of politics, of freedom (...), he constitutes the obstacle, the negative of a lay power" (Leroy, 1992, pp 6-7). This myth had such a lasting negative impact in the Portuguese society that even today they are seen by many as responsible for obscurantism and as enemies of science. As Botelho illustrates (1881, p.5):

> they accuse the Jesuits of committing all kinds of crimes, from larceny to murder, of plotting in the darkness against freedom, of turning credulous spirits into fanatics, terrorizing them with the ridiculous paintings of Hell and of the dreadful punishments of eternity; of teaching the beliefs, thus preparing the youthful spirits for their future work of destruction; of abusing the trust that in the naive their hypocritical humbleness inspires, to, one day, raise the strength, light up the fire and douse in blood the martyrs of this land of liberals.

This results in an extremely negative and demonizing image, so much so that all that is negative is pointed out as the result of the Jesuits' wicked action. Diderot in the *Encyclopédie* dedicates an entry to them: "What is a Jesuit? Is it a lay priest? Is it a regular priest? Is it a layman? Is it a clergyman? Is it a community man? Is it a monk? It is something of all this, but it is not this at all (…) They preach the subjects an obedience without reservation for their sovereigns; to the

kings, the independence of the laws and a blind obedience to the pope; they grant the pope infallibility and universal domination, so that, masters of a soul they are masters of everything (…) it is an unruly and dangerous troop"(*Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers*). This figuration comprehends all that is malevolent, and the attack on and annihilation of the Jesuits in the eighteenth century constitutes the expurgation of all the evils that befell Portugal: the education lag, the science lag. In this sense, therefore, myths were constructed which served to project a backward image, the main cause of the country's decadence, when compared with other countries in Europe and in the rest of the world. The relation, also attributed to them, with the Inquisition – which in the end was created almost at the same time (the Society of Jesus was constituted in 1534, and the Inquisition in 1536) – fuelled even further their negative representation as blockage of transforming forces. This relation was established in the so-called conspiracy project which the Marquis of Pombal was adept at capitalizing. Besides, the anti-Jesuit myth is considered to be the major driving force behind the perversions of the Holy Office.

Thus, the Society of Jesus, which was established in Portugal in 1540 (having been founded in 1534 by Ignatius of Loyola) had an important intervention in Science and in Culture, in the Portuguese territory, as well as in the Portuguese empire, for a long time. This action was carried out up to the extinction ordered by the Marquis of Pombal, in 1759. Even today, we are influenced by the image of discredit the Pombaline reforms earned the Society of Jesus, which is often said to be mainly responsible for scientific backwardness and obscurantism. That was the main motive for the three expulsions from the Portuguese territory.

Starting from this framework, we raise the following core questions to our study:

– Were the Jesuits enemies or ardent supporters of science?
– Can it be that their concern was limited to the religious catechism and opposed the teaching and dissemination of science?

Starting from what was discussed above, the goals of this paper are: (i) to analyse the role played by the Jesuits in the teaching and dissemination of science in Portugal (ii) to interpret the echo that Jesuitism generated in the Portuguese *intelligentsia* of the nineteenth century, and (iii) to reflect on the importance given by the Jesuits to social and hygienic pedagogy.

As sources of our work, we have selected: (i) Booklets e essays by the nineteenth century Portuguese *intelligentsia*; (ii) The Constitutions of the Society of Jesus; (iii) The Ratio Studiorum; (iv) The *Sphaera Mundi.* Science in the Class on the Sphere, scientific manuscripts of the College of Santo Antão; (v) The moral and religious education in the Colleges of the Jesuits (1913); (vi) the College of Campolide: 1873-1898.

Regarding methodology, we followed two major dimensions of analysis and interpretation: 1st – science, religion, teaching-innovation and dissemination; 2nd

– social and civic pedagogy, organization of teaching, expansion and the new salvation.

1. The Jesuits as one of the causes of the decadence of Portugal

It is in this sense, Franco and Tavares (2012, p.107) argue, that the Pombaline reforms were undertaken with the flag and the idea of exorcizing decadence, aiming to make the cleansing of the Jesuitical bad influence. It was the image of this heroic act that the Marquis of Pombal wanted to project: to reclaim Portugal from the inventor of the malignity devised and continued by the Jesuits. Actually, this topic continued to be extensively discussed in the Democratic Conferences of the Lisbon Casino by the 70s Generation. Antero de Quental, in his Conference on *The Cause of the Decadence of the Peninsular Peoples*, states as factors of that decline, absolutism, the conquests, and what he calls "baleful Jesuitical moral (Reis, 1990, p.62). Along the same line as Antero, also Oliveira Martins, in his work *History of the Iberian Civilization*, considers Jesuitism one of the elements in a triad responsible for the backwardness of the Peninsular peoples: "Should we wish to summarize in few words the causes of the disorganization of the peninsular society, we will find three which will provide us with the key to the problem: individualism, Jesuitism and the conquests". (1918, p.26). Ramalho Ortigão and Eça de Queirós, too, share a similar view. In *Echoes from Paris*, Eça wrote: "Jesuits, all about them is unpleasant to me (...). Their sinister and scheming organization (...) assimilates the Society to a theocratic Carbonarism (*Ecos de Paris*, 1905, pp. 27-28). Even before that, at the start of the 1920s liberalism, Carvalho, in his *Ensaio Histórico-Político*, dated 1830, goes as far as to make them responsible for the disaster of Alcácer-Quibir when he mentions the priest Luís da Câmara, King Sebastian's tutor, who, with "his pernicious lessons prepared him for the Catastrophe" (Freire, 1830,p. 58). Also in the field of scientific knowledge, the Jesuits were named as primarily responsible for the backwardness of science in Portugal. Miguel Bombarda (1900), in his fierce attack of Jesuitism, arising from his positivist view, declared that science and religion were incompatible. In a Portugal dominated by the positivist vision of Auguste Comte (1798-1857), the argument used by the Portuguese Republican Party (PRP) for banning the religious orders on 8th October 1910 was also that Jesuits [1] were the greatest hurdle to scientific progress in Portugal (Rameiras & Leitão, 2012).

Nevertheless, in the history of science in Portugal, so Fiolhais (2013) tells us, we find periods of light and shadow. The period of shadow which goes from the end of the sixteenth and early seventeenth century, corresponding to the Iberian Union, was attenuated by the intervention of the Jesuits. In this dynamics

[1] The Jesuits were expelled from the Portuguese territory in three moments: in 1759, by the Marquis of Pombal; in 1834, by Joaquim António de Aguiar within the scope of the restauration of liberalism; and in 1910, at the onset of the Republic, by the then Minister of Justice Afonso Costa.

between the periods of creation/production and the periods of glare/inhibition, one must allocate an important role to the Jesuits due to the brilliance that they were able to give the production-dissemination of science in Portugal. The Jesuits' action was decisive for the reception of what the vanguard of scientists was producing (Fiolhais, 2013). As we know, it was indeed in Portugal that the first Jesuit colleges in the world were established – the College of Jesus and that of the Arts in Coimbra, the College of Santo Antão in Lisbon, and the College of the Holy Spirit, in Évora (seat of the Jesuit university for two centuries)[2]. The Jesuits played an ambivalent role. They were important for the action they took in the reception of scientific knowledge, and, on the other hand, they also played a prominent role in the globalization of scientific knowledge. In fact, the high cultural level of the Jesuits earned them a significant place in the whole European expansion of the time, to the extent of being considered a State within the State (Carita, 1987, p.45).

If knowledge generates power, as Foucault argues, their domination of the world is related to their knowledge of the world. Not only did they exchange ideas but also other knowledge. Still according to Fiolhais (2013, p.60), the Jesuits brought the scientific revolution to Portugal and to the world.

2. The jesuits and scientific dissemination

Christianity burst forth as an absolute novelty in the context of the ancient world (Marias, 2000: X). Christianity began in the fulness of time. As Marias argues, it is necessary to see what was missing for Christianity to emerge. According to Bobineau and Tank-Storper (2007), a society is not formed merely by a group of individuals, a territory, by the things they serve and the movements they make. First and foremost, a society is formed by the idea it makes of itself. In this sense, we can name religion as a collective hypostatic force (moral forces), constituted by the ideas and feelings that society awakens in us. These authors tell us that "Religion proposes a higher principle of social cohesion, bringing together living beings around a moral community so that they can live in harmony" (Bobineau & Tank-Storper, 2007, pp. 22-23). Maybe for this reason one can assert that there is no society without religion. Between one and the other, this reciprocal relation is established: society depends on religion and religion depends on society.

To Veyne (2007), one of the decisive events of western history, and even of the world history, took place in the Roman Empire in 312. It was in this year that one of the most unforeseeable events happened: Constantine, one of the four co-emperors who shared the rule of the empire, converted to Christianity, which was considered one of the boldest acts carried out by an autocrat. So much, so

[2] In the mid-nineteenth century, the College of Campolide (Lisbon) was founded (see Brás, Gonçalves & Robert, 2016) as well as that of Saint Fiel (Louriçal do Campo – Castelo Branco) (see Martins, 2006).

that in the sixth century, the empire was to be almost entirely peopled only by Christians. With his conversion, Constantine thought he could participate in a supernatural epic saga, he himself taking on the lead for the salvation of humanity. By becoming Christian, the Roman throne enabled the Church to become a power. Without Constantine's conversion, history would have been different. However, Constantine (and his successors) do not impose by the force of the new faith. Constantine was intelligent, since he used persuasion rather than persecution, punishment and exclusion. The fact that each person is free to make their own conversion allowed pagans not to rebel against the Emperor and against Christianity. This religion of love created a magnetic field, giving life a sublime sense. The vast empire, which was the centre of the world, would become the Christian empire. It was in that created magnetic field that life was being processed. It was that magnetic field that enabled, in a specific context, the emergence of the Jesuits, a little all over the world and, particularly, in Portugal. The members of the Society of Jesus who participated in the Portuguese expansion converted the native populations to the Catholic religion but, at the same time, studied the language, the fauna and the flora as well as the customs of those populations. As Romeiras (2015, p.13) elaborates: "The Society of Jesus was, probably, the most controversial religious order of modern history, but studying it proves to be crucial to understanding the history of science in the sixteenth, seventeenth and eighteenth centuries".

We should note that at a time when science had no expression, not only in Portugal but also all over Europe, the Jesuits already devoted themselves to experimental science, making a record of sunspots, calibrating pendula, making notes of the time bodies took to fall. Besides, they featured prominently in the fields of mechanics, geometry, optics, magnetism and cartography. Seismology was known for some time as the "Jesuitical Science". In this regard, Ferreira (2012), Leitão (2003, 2008a) and Romeiras (2014) present a group of Jesuits who played a crucial role in the development and dissemination of science. Among others, we should highlight the following (Vide Table nº 1)

3. The class on the sphere: a pioneer in scientific dissemination in Portugal

The Society of Jesus was founded in 1534 in a cultural setting where modern science began to flourish and develop. It is important to understand how certain contexts are constituted in their relations and mutual interactions. In 1543, Copernicus's work is published, establishing for the first time the heliocentric astronomic system. In 1609, Kepler publishes his *Astronomia Nova*. In 1610 and 1630 *Discourse* and *The Dialogues* by Galileo emerged. In 1637, Descartes publishes his *Discourse on the Method*. In 1687, Newton published *Principia Mathematica* and in 1704 his work *Opticks*. In these works, these scholars definitely abandoned the principles of medieval science anchored in the theocentric system and in Aris-

Table 1
Jesuits who played a crucial role in the development and dissemination of science.

Name	Role in the development and dissemination of science
José de Anchieta 1533–1597)	He devoted himself to the study of the Tupi language, its fauna and flora – especially the medicinal plants of Brazil;
Christopher Clavius (1538–1612)	He was an important mathematician who introduced decimal notation, parentheses in algebraic expressions, and was one of the forerunners of logarithms, introducing the Vernier scale. We also owe him the replacement of the old Julian calendar for the Gregorian, as he discovered that there was a 664-second difference between what should be a year – determined by the Earth's movement around the Sun – and what was established by the Julian calendar
José de Acosta (1540–1600)	He is a pioneer in geophysics, recorded weather phenomena (earthquakes, tides, volcanoes,...) and studied the diseases caused by the Andes' altitude, one of which would come to be known as "Acosta's disease
Christopher Scheiner (1575–1650)	He was an important mathematician, physicist and astronomer who even engaged in controversy with Kepler and also with Galileo, eminent scientific references at the time
Grégoire de Saint-Vincent (1584–1667)	He is renowned mathematician, considered one of the founders of Analytic Geometry. He founded the famous School of Mathematics in Antwerp;
Athanasius Kircher (1602-1680)	He worked in several areas of the sciences (mathematics, astronomy, acoustics, chemistry, microscopy and medicine), participating in the scientific development of his time. Founder of Egyptology, he was one of the first to use the microscope to observe microbes
Bartholomew de Gusmão (1685-1724)	He is celebrated professor of physics and mathematics became known as the "Flying Priest" for the experiments he conducted at the Court in Lisbon with a small airship called "passarola"
Pierre Teilhard de Chardin (1881–1955)	He is one of the most renowned of Jesuit scientists. He devoted himself to palaeontology, geology and anthropology and also to the study of the evolution of the universe from its origin to the advent of man; Oliveira Pinto (1868-1933) was one of the founders of the Portuguese Society of Natural Sciences (1907), member of several scientific societies, ran the *Sciences Section of the Scientific and Literary Academy of Most Holy Immaculate Mary* between 1904 and 1910, and wrote a number of articles for the scientific journal *Brotéria.* He published original results on radiology and ionization.

totelean Physics. These are the works and these are the authors which inaugurate the foundations of modern science by defending the scientific method based on experimentation, observation and on the mathematical principles.

The Jesuit scientists maintained relations and contacts with the most important figures of modern science, such as Galileo, Kepler, Descartes and Newton. Descartes himself, who studied at the Jesuit college of La Flèche for eight years, always praised Jesuitical pedagogy, namely the teaching of mathematics, to the extent that in 1638 he wrote to a friend – who was looking for a school for his own son – telling him: ""nowhere else does one study better than in the Jesuits' Colleges. I must pay this tribute to my masters, saying that there is no place in the world where mathematics is better taught than at the college of La Flèche" (Oñate Guillen, 1999, p.695).

This interest in the sciences is embodied in the *Ratio Studiorum* (1599), the document that standardized the Jesuitical pedagogy. Christopher Clavius (1537-1612), who contributed to the drafting of the *Ratio Studiorum*, insisted that in the curriculum the same importance be given to sciences as to the other disciplines (Udías Vallina, 2000, pp.207-208). And Clavius tried to foster the teaching of Mathematics within the Society, embarking on an epistemological defence of this discipline in his pedagogy works, and fighting for the establishment of an academy devoted to its teaching in the renowned Roman College of Italy (Mota,

2008). Thus, side by side with the teaching of Humanities, among which Philosophy and Theology featured prominently, the natural sciences and mathematics were taught (Romeiras & Leitão, 2012).

In view of this scenario, suitable for the development of the sciences, as acknowledged by Thuiller (1988), although they did not invent modern science, the scientific Jesuits contributed to its development by the importance they gave the teaching of mathematics, observation and experimentation. In this same sense, emphasises Udías Vallina (2000, p.208) "the Jesuits of that time understood that their presence and work in the field of the new sciences were greatly necessary as part of their apostolic work, and even now they still consider it to be one of the Society's most important ministries".

The scientific development of the Jesuits – already covered by Rodrigues (1938-1950), Albuquerque (1994, 1972), Carvalho (1989) and more recently by such researchers as Leitão (2008), Mota (2008), Gessner (2008) Romeiras (2015), among others – became apparent when, in 1553, they founded the College of Santo Antão, where they excelled in the teaching of the Sciences, in the famous and celebrated Class on the Sphere.

In the College of Santo Antão, which started in an old convent in Lisbon in the Mouraria district, classes were taught especially of Latin, Greek, Rethoric, moral and religious topics. From 1555, Francisco Rodrigues began to teach classes on the Sphere and it is these classes that lay at the root of the future Class on the Sphere (Leitão, 2008, p.20). The origin of the name Class on the Sphere is certainly related with the countless Treatises on the Sphere composed in the Middle Ages, especially the Treatise on the Sphere by João Sacrobosco, which dated back to the thirteenth century. In these treatises notions of Cosmography and Astronomy were set forth, topics which were known at the time as Sphere.

Teaching in the Class on the Sphere was aimed simultaneously at future specialized missionaries and at a lay audience; there were also classes focused on practical matters (navigation, land-surveying, fortification, war machines) and these topics were taught in Portuguese. The Class on the Sphere was graced by eminent teachers of the European science of the seventeenth century: Christoph Grienberger (1564-1636), Cristoforo Borri (1583-1632), Paolo Lembo (1570-1618). And was also graced with the most renowned national men of science: João Delgado (1553-1612), Francisco da Costa (1567-1604), Luis Gonzaga (1667-1714), Manuel de Campos (1681-1758), Inácio Vieira (1678-1739), among others. Some of the students of the Class on the Sphere would later become figures of great repute in various scientific fields: the cosmographer and chief-engineer of the realm Luís Serrão Pimentel (1613-1679), the chief-cosmographer Manuel Pimentel (1650-1719) and the reader of Engineering, Francisco Pimentel (1652-1706) among others (Leitão, 2008, p.19).

The scientific topics covered in this Class were much broader. In it, geometry, algebra, flat and spherical trigonometry, logarithms, seamanship, optics, perspective, scenography, the nomenclature of the celestial bodies, various techniques of Architecture and military Engineering, construction of simple machines and scientific instruments.

The appreciation of Astronomy in the Class on the Sphere was mostly due to the experiments carried out in the astronomical Observatory of Santo Antão, where Jesuits, such as Luis Gonzaga, Bocarro, Carbone, Borri, Teles, Soares and others, worked and made known abroad the observations made in Portugal. Important matters like the telescope and the observations its use allowed and the discussions on the cosmological ordering of the world has relevant room in the mentioned Class. And Astrology was also addressed, a field which nowadays is not considered a scientific discipline. It is worthwhile to make a brief digression here to say that some of the famous astronomers like Kepler devoted themselves to astrology to increase their meagre earnings. Kepler was appointed teacher of Mathematics and Astronomy at the University of Graz. That place was, as far as pay goes, mediocre. Besides teaching, every year Kepler had to prepare an almanac and in it he included predictions which sometimes turned out to be accurate. This gave him the possibility of earning money, writing horoscopes for magnates who believed in him as an astrologer. The little faith Kepler himself had in these horoscopes is reflected in some of his sayings that are uttered even today "Mother Astronomy would die of hunger if sister Astrology did not earn the bread" (Caspar, 1948, p.212).

The Class on the Sphere had the support of the Cardinal Henry, who ensured it an annual income from King Sebastian, his nephew. This income, however, came with a condition: that the class of mathematics would be taught in the College. The imposition of this discipline was due to the Court's knowledge of the deficiency in the teaching of mathematics, be it at the University of Coimbra, after the jubilation of Pedro Nunes in 1564, or in the Class of the chief-cosmographer in Lisbon. During the circa 170 years it operated, the Class on the Sphere was the most important education institution of scientific practice in Portugal. It was a training centre for scientific specialists and technicians, which the country lacked. And it was the starting point and the organization centre for some of the most important scientific ventures of the time (Leitão, 2008, pp.19-21).

The role given by the Jesuit masters to the method of the new science (observation, experimentation,...) was relevant. Take the Preface to the Reader that the Jesuit priest Inácio Monteiro (1724-1812) – teacher in several Portuguese Jesuit colleges and, later, after their expulsion from Portugal by the Marquis of Pombal, at the University of Ferrara in Italy – writes in his work *Philosophia Libera seu Eclectica Rationalis et Mechanica Sensuum:*

> Already from the beginning, but especially from Descartes to the present time, [Natural] Philosophy has undergone many and varied vicissitudes (…) Within this variety of preferences, there are some who defend Aristotle, other who prefer, to Aristotle, Epicure, prince of atomists. (…) others turn Descartes into the sole object of their delight, electing him as philosophical guide. On the other hand, Newton, (…) snatched a large number of fans from him and, even, a whole nation; and there were some, like Leibniz, who waged war on Newton, founding a new school. (…). The only Philosophy that I nurture with love and pleasure is the one you will find, dear reader, in these lessons. We shall employ solely observation, experience, reason,

> calculus, to the extent that such difficult and obscure matters will allow it; it is with such elements that we shall construct our Physics. All that which in Aristotle, Epicure, Gassendi, Descartes, Newton, Leibniz seem to me to be in accordance with this, I admit it as true, but everything which in these, as in other philosophers, goes against such criterion, I reject entirely, whatever the name that subscribes it. (*Revista Portuguesa de Filosofia*, vol. XXIX, fasc. 3, 1973, pp.57-59).

The transcription seems to us to be paradigmatic of what the methods of modern science meant for the scientists Jesuit masters, and also translates the knowledge of the more renowned philosophers and scientists of their time.

The Class on the Sphere opened up a forum for the scientific debates of the time. "It is not possible to accept the historiographic interpretation that for so long considered the Jesuits in Portugal as hindrances to knowing scientific novelties since the documental evidence – namely the manuscripts on the Class on the Sphere in Portugal's National Library – undeniably shows that they were the first (and apparently the only ones) to be interested in the dissemination and study of these matters in our country (Leitão, 2008, p.44). It is in this sense that one understands, in the Class on the Sphere, the cosmological debate derived from the telescopic discoveries made by Galileo (1564-1642) which questioned the traditional Aristotelian-Ptolemaic view of the cosmos. The Class on the Sphere had a close relation with the Academy of Mathematics of the Roman College, in Italy, and, in this way, Galileo's astronomic observations were known and discussed in Portugal. The Jesuit Paolo Lombo taught in the College of Santo Antão in 1615-1617, a course whose handwritten class notes show astronomic and mathematical diagrams, representations of machines, references to the telescope and a very striking epithet to Copernicus dubbed "highly learned male "(Leitão, 2008, p.37). Paolo Lombo explicitly refers to an observation he had made in Lisbon with a telescope, which was witnessed by students of the Class on the Sphere and other interested people. Other Jesuit mathematicians taught in the Class on the Sphere (Ignace Satfford, Simon Fallon,…); still, not all the Jesuits in Portugal shared and accepted these astronomic novelties and these new areas of knowledge (Leitão, 2008, pp.38-46). Thus, in the College of Santo Antão exhibitions on the cosmological debate and telescopic observations were made, and in them Ptolemy's traditional geocentric system was discussed, as well as Copernicus's heliocentric system, and Tycho Brahe's system, also geocentric. The vitality of this discussion around astronomy is due to two factors: on the one hand, it is the result of the tradition of mathematical and scientific studies of the Society of Jesus, especially in the Class on the Sphere; on the other hand, it is the consequence of the international structure of the Society of Jesus and the vast network of schools it possessed around several countries.

The Class on the Sphere also started a debate on the scientific nature of the discipline of Mathematics. Within the Society there were Jesuits, especially the teachers of Philosophy who denied any scientific value to Mathematics, and there were Jesuit mathematicians defending the opposite thesis. "The mathematicians of the Class on the Sphere were the only ones truly committed to the

epistemological defence of this subject in Portugal throughout the sixteenth and seventeenth centuries (…) producing an important counterweight vis-à-vis the dominant anti-mathematical epistemology" (Mota, 2008, pp.45-46). Before the Class on the Sphere, mathematics was a subject taught by Philosophers without autonomy, elementary, ancillary to understanding some Aristotelian texts, lacking the epistemological strength of Physics or Metaphysics" (Mota, 2008, p.50). Thus, and in the face of the lack of unanimity regarding the scientific status of Mathematics, this subject began to be taught in two curricular spaces of its own; one, within the scope of the Philosophy degree, taught in Latin and attended by Jesuit students with a view to better understanding Aristotelian texts; another, within the scope of the Class of the Sphere, taught in Portuguese and attended, especially by students from outside the Society, serving a practical purpose. The Jesuit João Delgado, teacher of Mathematics in the Class of the Sphere, claimed that the discipline complied with the Aristotelian requirements so as to be considered a perfect science, and it is a superior discipline the results of which influence the production of theories in other scientific disciplines such as Physics (Mota, 2008). The sixteenth- and seventeenth-century debate on the scientific status of mathematics is disseminated in Portugal due to the actions of the Jesuits, with the Class on the Sphere taking on cardinal importance in the defence of the scientific nature of mathematics opposing the anti-mathematical arguments of the Jesuit philosophers.

4. The social and hygienic pedagogy

The Society of Jesus, founded, as we stated above, in 1534, exerted a shaping influence not only in the Church but in the social, cultural and educational fabric. Although the «office of education» did not constitute an initial objective of the Ignatian order, as can be deduced from the statement in the Constitutions "neither studies nor lectures", education was always one of the activities the Society devoted itself to from very early on, as attested by the number of Jesuit colleges that were founded (Couto, 2008, p.10). Between 1540 and 1759, the Jesuits established a network of colleges in Portugal, and ended up being responsible for the education of about 20,000 students in a population of 3,000,000 inhabitants. When it started, in 1553, the College of Santo Antão (Lisbon) had over 500 students; in 1575 it had 1,300 students, in 1588 and 1593 these were 2,000. In 1558, the College of the Arts (Coimbra) had 1,000 students and in 1594, 2,000. In 1575 in Évora they had 1,000 students and in 1592 1,600 students. In 1600, there were between 236 and 245 Jesuit colleges scattered in different countries, and this number rose to 800 towards the end of the eighteenth century (Rodrigues, 1917, pp. 168-169). This expansion was impressive for its time, which indicates the social demand for the schools of the Society, be it for their new educational methods or the innovative solutions which they put forward, or even the creation of a new degree in the then academic universe – secondary education – an intermediate degree between the schools of reading and writing

and university. This success was certainly due to the Jesuits' devotion to education, to research and to the sciences, which in under half a century elevated the Society of Jesus to the position of dominant religious congregation in the field of education. In a few decades, the Jesuits became educators of European and Trans European elites, explorers of unknown regions, and missionaries who attempted to evangelize and catechize the gentiles. In the full golden period of the Discoveries, Portugal was one of the first countries to welcome the Ignatian order. King John III – to whom Diogo de Gouveia had indicated the existence of a group of clergymen capable of converting India – received with great pomp the Navarrese Francis Xavier and the Portuguese Simon Rodrigues, sent to Portugal by Ignatius of Loyola. The Portuguese monarch provided them with worldwide evangelisation and made them workers of the first process of globalization when he brought them into contact with faraway peoples and diverse cultures (Franco & Fiolhais, 2015). As, since the century of the Discoveries, there is a social demand for education, the Jesuits responded to this educational social demand and, as time went by, opened more a more schools for seminarists and laymen. According to Father Francis Rodrigues "The Society of Jesus in Portugal filled the whole seventeenth century" (Carvalho, 1987, p.363).

Already in the sixteenth century, the Jesuits tried to respond to the need felt by ""pilots, second pilots, masters, boatswains, guardians who had the charge of the direction of said voyages" and also by "cartographers, makers of nautical instruments and seamen". (Albuquerque, 1972, pp.25-27). In the Class on the Sphere – taking into account, moreover, the very name (Sphere) – particular interest is given to the instruments, namely the globes [the terrestrial globe, the celestial globe (representing the constellations) and the celestial globe (armillary sphere)]. They also refer to sundials of various types, an instrument to measure the magnetic variation, several maps, the nautical astrolabe, the ordinary astrolabe, the inclined astrolabe, compasses, the manufacture and use of the Jacob's staff, the lodestone, Pedro Nunes's instrument for the eastern or western deviation of the magnetic deviation (*nordestear* and *noroestear*) (Albuquerque, 1972).

The importance of so many nautical instruments – which are the material manifestation of the public service of scientific knowledge – is due, on the one hand, to the intention of perpetuating the European university tradition which from the Middle Ages was taught based on the *Sphaera Mundi* by João Sacrobosco except for the *quadrivium* which belonged to Astronomy. And, on the other hand, to the characteristics of an age when specialized professional activities are carried out which resort to instruments (navigation, land-surveying, war machines, fortification) (Gessner, 2008, p.79). In this way, the members of the Society, with their theoretical-practical knowledge, responded to the aspirations of a society eager for new knowledge to reach the territories of the East and to educate both the élites and the ordinary people in an unmistakable social pedagogy. The Jesuits in Portugal actually managed about thirty schools which constituted the only organic and stable school network in the country. Teaching was free and open to all classes. The Jesuits were not only involved in education. They also taught the catechism and engaged in the priestly ministries and in charity works.

They took care of prisoners, visited hospitals, assisted those sentenced to death, and helped those in need at times of pestilences and calamities. This civic and social pedagogy was reinforced by the written meticulous recording they made of the peoples, cultures, habits, languages, religions, fauna and flora, a recording disseminated by the network of colleges they founded and where the most renowned Jesuit scientists regularly taught. The circulation of knowledge and teachers was crucial for the Ignatian order. Unquestionably, the Jesuits, who contributed to the great revolution that the Discoveries inaugurated, deservedly earned the epithet of *builders of globalization* (Franco & Fiolhas, 2015).

As is well known, with the Marquis of Pombal the anti-Jesuitical myth which lingered for a long time. After their expulsion in 1834, by Joaquim António de Aguiar, within the context of the restauration of liberalism, the Jesuits managed to return to Portugal. In 1858, Carlos Rademaker started the College of Campolide, having had the collaboration of two other Jesuits, one Portuguese and one Spaniard. In the following years, more Jesuits joined them, coming mainly from Italy, and a novitiate was set up. In 1863, the Portuguese Mission was officially constituted, whose first superior was the Italian Priest Francis Xavier Fulconis. Also in 1863, the Jesuits took charge of the Orphanage of São Fiel (Martins, 2006) which they turned into a College.

The pedagogical practice of the College of Campolide again demonstrates that the Jesuits were pioneers in teaching and scientific dissemination in Portugal. And they revealed pedagogic and hygienic concerns in the building of colleges, in the organization of school space and time and in the structuring of the curriculum, managing to introduce a sense of salvation different from the therapy of religious asceticism, abuse and mortification of the body. They found a way to reconcile the salvation of the soul with the care of the body advocated by science (Brás, 2008; Brás, Gonçalves & Robert, 2016). The Jesuitical pedagogic practice integrated in Portugal physical education and Swedish gymnastic, earlier than the state grammar school, where they would only be introduced in 1905 (Brás & Gonçalves, 2009). The Jesuits were also innovative when they attached educational value to games, and they played an important role in scientific education in Portugal. In 1902, in São Fiel, the journal *Brotéria* was created, which, ran by the College teachers, published research articles namely in the fields of botany and zoology.

Conclusions

The Society of Jesus, founded in 1534, exerted a shaping influence not only in the Church but in society in general, namely in politics, diplomacy, culture and in education. In a few decades, the Jesuits became educators of European élites and missionaries who took the Christian doctrine to faraway lands. The network of schools founded by the Jesuits in Lisbon, Coimbra and Évora was decisive in the teaching and dissemination of science as well as the construction of scientific instruments in Portugal, of which the construction of the first telescopes and the

beginning of the cosmological debate around Galileo are emblematic examples. In the College of Santo Antão in Lisbon, the Class on the Sphere operated between 1590 and 1759, a forum for learning and scientific debate of such important topics as logarithms and the telescope or the Mercator projection. Its longevity (about 170 years) and diversity of subjects taught (geometry, optics, perspective, architecture, navigation and military engineering, among others) were considered unique in the teaching of sciences in the Portuguese context. These facts are well known today among experts, and they have been progressively disseminated to a broader audience (Romeiras & Leitão, 2012). It is undeniable today that the Society of Jesus was essential for the development of scientific teaching in Europe between the sixteenth and eighteenth centuries. Although teaching was not one of the activities to which initially Saint Ignatius of Loyola and his fellow priests aimed to devote themselves to when they founded the Society of Jesus in 1540, it became a priority early on. Both the Jesuitical *Constitutions* and the *Ratio Studiorum*, besides the fundamental space dedicated to Philosophy and Theology, did not fail to highlight the importance of the study of natural sciences and mathematics.

The Class on the Sphere of the Jesuit College of Santo Antão was, in its day, the most significant learning institution of the scientific practice in Portugal, training scientific technicians which the country, at the height of the golden age of the Discoveries, needed.

The social pedagogy demonstrated by the Jesuits through their teaching and the missionary efforts carried out in the farthest corners of the world was remarkable and a factor in enhancing their actions in all the settings where they developed their activities almost always with visibility and social impact. In the building of their nineteenth century colleges they also demonstrated a hygienic concern in keeping with the trends of the time (Brás, 2008).

This was an Order which exerted significant dominance in the training of specialists for the European elite, besides having considerable influence with kings, elites, in Europe, Asia, Africa and America. It was due to this vast network that it was possible for foreign Jesuits to lecture in the Class on the Sphere, also because many Jesuits, before becoming missionaries in the East came to Lisbon and visited the College of Santo Antão to explain the scientific novelties.

In short: it is undeniable today that the Society of Jesus was essential to the development of the teaching of science in Europe between the sixteenth and the eighteenth centuries in Europe (Romeira & Leitão, 2012, p. 9). The strategy and the practice followed by the Jesuits served to project them in the scientific field, playing a prominent role in scientific education. As Rómulo de Carvalho had already mentioned, the Pombaline reforms hoisted the flag of modernity and freedom but what they actually did was cause a regression in the education system and scientific progress in Portugal (Carvalho, 1986). The Jesuits were not only pioneers and important in the scientific training of a great number of technicians, but they also gave us the opportunity of contacting with the more renowned foreign scientists of the time. In light of the data we worked on, we can state that the Jesuits assumed a place of prominence in the History of Science

in Portugal. Not without reason, "the affection towards the Society of Jesus was an unchanging feeling in the Camilian canon" (Cabral, 1988, p.487). The novelty of the article is: the Jesuits developed the scientific knowledge and innovated teaching practices and curriculum (hygienism and physical education). Unlike the dominant idea, they were pioneers in the scientific and pedagogical domain

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5

The experience at a New School Education with abnormal children: Faria de Vasconcelos (1880-1939) in the context of special education

Ernesto Candeias Martins

Introduction

António de Sena Faria de Vasconcelos e Azevedo (1880-1939) is a central pedagogue of the new school movement, one of the greatest Portuguese pedagogues in the History of Education and/or Pedagogy of the 20th century, with a great European and Latin American prestige, disseminator of the foundations of 'child science' (paidologia) and psych pedagogy in the growth of the child (Alves, 1967), a pioneer of the education of the future, who continues indisputably, still today, updated in many aspects of his thought (Figueira, 2001).

He studied at the School of Espírito Santo (Braga), graduated in law, following the family tradition, but felt a deep vocation in the area of social sciences, namely of pedagogy. In his book 'School Problems' (School Problems) (1929) explains what he understands by (contemporary) pedagogy, considering it with a character and a spirit clearly scientific and experimental. Pedagogy should be the efficient means to elevate learners to individualized and simultaneously socialized spheres (Brazil, 1969). Education was for our New School pedagogue, an integral whole that develops harmonically, for the formation of the 'integral man' - integral and inclusive education. And this sense of mental education, a concern manifested on a large scale, which was the firm foundation on which all other types of education must be built on.

This study will not focus on analyses of aspects that have already merited monographs and in-depth investigations or systematization of their thinking (Alves, 1967; Cunha, 1997; Vasconcelos, 2012). Heuristically, we used his Complete Works (Calouste Gulbenkian Foundation edition), gathered and analyzed by J.H. Ferreira Marques (1986, 2000, 2009), in addition to other documents gathered in the Studies of Castelo Branco: Journal of History and Culture (Brasil,

1969; Dias, 1969), scattered articles, secondary sources and academic dissertations (National Library Archives, Torre do Tombo (National Archive), municipal libraries of Castelo Branco, Cascais and Library and the Theater Museum Library, scientific repositories, etc.), in order to centralize all our analysis in the scope of the contributions: the experience and actions in the new school; to special education in the organization of schools, methodologies/techniques of diagnosis and intervention with the 'abnormal' (sic) children.

Based on a reflection of a hermeneutical and historiographical-descriptive aspect, centered on the figure of Faria de Vasconcelos "Pioneer of the education of the future[...]", as he was described by A. Ferrière in the Preface to his work Une École Nouvelle en Bélgique (Vasconcelos, 1915, pp.3-4) (**Figure 1**), we will have the following objectives: analyze his pedagogical contributions to the History of Education (Contemporary Pedagogy, Pedagogical Movement of the New Education or 'New School') derived from the Biérges experience, classifying them in the principles of the New School; analyze his perspective of education to abnormal children (special education) or delayed, fitting in the medical pedagogical movement of the time. The education of these 'abnormal scholars' was seen in the perspective of an integral education (social, intellectual, moral and physical), being a preoccupation in his writings, since 1909, including the delinquents (Vasconcelos, 1936), besides addressing the organization of special schools, general and professional culture supplemented by post-school activities, medical pedagogical assistance and support to the needs of those underage's. At that time, there was the section of the Medical-Pedagogical Institute of Casa Pia in Lisbon (1915) and the Prison Colony for Children of S. Bernardino (1912), with prominent action of Aurélio da Costa-Ferreira and Fernando Palyart Pinto, the institute of catholic nature 'Florinhas da Rua – Condessa de Rilvas' (1922), which we discussed in another study (Martins, 2016).

The single school, the education of abnormal minors, coeducation, childcare, school and social hygiene, schools and outdoor activities, psychoanalysis, the use of active methods, etc. boosted contemporary pedagogy, whose principles in the first half of the 20th century appear expressed in several systems of education embodied in innovative educational methodologies and techniques, which led the children to be active, to use observation and intuition in their learning. Faria de Vasconcelos (1923, p.223) bets on the spiritual value of man, in his capacity as an active being, because *"[...] it's worth being a man [...]"*, the fruit of an integral education.

Innovative pedagogical experience in Bruges (Belgium): the psycho-pedagogical and social in the students' integral culture

When Faria de Vasconcelos arrived in Belgium in 1902, in order to advance his studies in the social sciences and especially in psychology and pedagogy, he was involved in the cultural and educational movement (new pedagogies, new schools) which circulated in Europe. He enrolled at the New University of Brus-

sels where he will do his doctorate and, in 1903, edited a small book of psychological and social content, entitled La Psychologie des Foules Infantiles the fruit of a university study. A year later he completed his doctorate in Social Sciences, with the thesis Esquisse d'une Theorie de la sensibilité sociale, which was awarded the rare classification of 'La plus grande distinction'. He exerts teaching positions as Professor of Psychology and Pedagogy at that University, in addition to teaching 'Dramatic Literature' at the University Extension of Belgium.



Figure 1. Some publications of Une École Nouvelle en Bélgique Sources: National Library of Lisbon (1915)

In Portuguese ''*Escolanovista*'' (is the term applied to followers of the Escola Nova – '*New School Movement*') applied his innovative pedagogical ideas at the Biérges School (1912-14), namely at the level of class/classroom, physical education (recreational, pedagogical gymnastics), handwork, non-formal and community education activities (tours, museum visits, activities with other youth and adults, etc.), among others. He went to the detail of the school furniture, linking the comfort, for example, of the desks with the students' learning. He also refers that school desks deformed the body of the child, giving rise to vicious attitudes and diseases – scoliosis, myopia, etc. – imposing an immobility contrary to its nature, to its needs for movement and physical-motor freedom, and thus tiring excessively and barbarously the child (Vasconcelos, 1921).

For the creation of this experimental school, Faria de Vasconcelos sells a large part of his assets, which is understandable in view of his educational ideal, in addition to his unshakable character and strength of dedication to innovative education. He was well-placed in Belgian society, in such a way that A. Ferrière (Vasconcelos, 2012) considers Faria de Vasconcelos as 'Belgian', even by marriage, because he married a citizen of that country, with whom he had a daughter who would come to die. According to J. Ferreira Gomes (1980b, p. 255), also

in Cuba (between 1915 and 1917), he was known at the time as "*[...] the great Belgian educator [...]*", so that he integrated the group of Belgian pedagogues (influenced by Ferrière and Claparéde), invited in Teaching and Reform Mission to Bolivia (period of 1917-20)[1].

The experience of the Biérges-les-Wavre school ensures the necessary connection to nature (pedagogical naturalism) and the calmness of rural life in the urban environment, whose motto was '*School to children'* (Vasconcelos, 1915, pp. 14-15). In it he introduces almost all the guiding principles of the New School, insisting on *"[...] teaching methods that grant an identity*" (Gomes, 1984, p.123) compared with other experiences of the time[2]. Although without coeducation, neither separate single-family houses for groups of 10 to 15 students, with a family environment, under the material and moral direction of an educator (Vasconcelos, 1915), it represented for Ferrière a sui generis model of a new school. The fundamental characteristics of the School of Biérges were based on the following pedagogical ideas (Meireles-Coelho, 2005):

– The school is a laboratory of practical pedagogy integrated in paidologia or modern psychology, both in the means that it puts into action, in the necessities of the material and spiritual life and in the objective that fixes on its activity.
– The new school was a boarding school (housing, locker rooms, rooms, bathrooms, pavilions for classes, pedagogical farm, etc.), with influence of the surroundings in which the child develops and performs an effective integral education.
– The new school was located in the countryside surrounded by nature, whose influence favors the growth of the child and allows to perform *"[...]*

[1] The documents of the Ministry of Public Instruction of the Bolivian Republic of 1917 indicate that in 1911 the Government hires teachers to the Normal School of Teachers in Sucre, for example: Constant Lurquin and Adhemar Gehain. A year later they invited Raymond Hoffmann to direct and reorganize the National Institute of Commerce of La Paz, as well as teachers for that teacher training establishment, professors Raymond Lurquin and Elie DeLulle (Dias, 1969). In 1913 it was the turn of Emile Jacobs, Júlio Fischer, Terese Réquile, Julia Degand, Emile Cambier, Henri de Genst, Adrien Hock, Henri Mettewie, Adolfo Lambert, Lea Leroy, 'A. S. Faria de Vasconcelos', Emile Siroux and Maurice Sluys. At the same time, they invited other teachers of various nationalities, for example: the French Andrée Dubois-Niboyet, Louis Busch, Julio Harriague, Eugene Bultingaire, Cossec and Guy de Chazal; the Italians Prieto Bruno, Domenico Cartesegna, José Bacigalupo and José Torreggiani; the Germans and Austrians Federico Kiessling, Antónia Maluska and Elene K. de Schneider; the Polish Roman Koslowsky; the Peruvians Germán Morales and Roberto Valverde; the Argentine Bernabé Sosa and the Spanish Juan Bardina (Marques, 2000).

[2] For example: Abbotsholme School (England), founded by Cecil Reddie, in 1899 who applied in practice the theories of Herbart's interest; the public school of coeducation Bedales School (England), founded by J. Haden Badley, in 1893; the Landerziehungsheim Hermann Lietz Schule (Germany) created by Hermann Lietz in 1898; the Odenwaldschule (Germany) who following the pestalozzian principles ('forming the head, the heart and the hand'), created by Paul Geheeb in 1910; the French school École des Roches, founded by Edmond Demolins in 1899; etc. (Martins, 2015 and 2016)

tasks and works in the field, physical culture and moral education, in addition to other resources with an impact on the intellectual culture" (Vasconcelos, 1915, pp.16-17).

– The new school organizes handicrafts for the students, *"[...] obligatory community tasks, with a professional and educational purpose*" (Vasconcelos, 1915, p. 114). They practice games, sports activities, tours, scout-style camps, etc. which satisfied the children's manual needs and to awaken interests, aptitudes and tendencies that allowed them to know better and better guide them in their inclinations and interests: *"[...] personal and school guidance*" (Vasconcelos, 1915, pp.22-26). Among the handiwork, we highlight woodworking, agricultural cultivation, animal husbandry, weaving, modeling (**Figure 2**), pottery, binding, working with wood and iron (**Figure 3**), etc. which contributed to physical and intellectual development.
– Body and corporeality were cultivated, guaranteed by natural and pedagogical gymnastics, games and sports, articulated with trips on foot and bicycle, tent camps, visits to museums, monuments and factories, etc. (Vasconcelos, 1915; 2012).
– The new school developed intellectual education, through a general culture, developing the critical and observational spirit (scientific methodology), in a range of obligatory areas promoting *"[...] integral education*" (Vasconcelos, 1915, p.50).
– General culture is completed with a professional, spontaneous and systematic specialization to develop the interests, abilities and faculties of the students oriented in a professional sense (**Figures 3 and 4**), according to age *"[...] professional guidance for a job*" (Vasconcelos, 1915, p.51).
– The teaching was based on facts and experiences of the students, acquir-



Figure 2. Working in the modeling room – School of Bièrges, 1913. Source: Vasconcelos (2012).



Figure 3. Working the iron in the forge – School of Biérges, 1913. Source: Vasconcelos (2012).



Figure 4. Working in the carpentry and in laboratory – School of Biérges, 1913. Source: Vasconcelos (2012).

ing useful knowledge from natural and participant observations and induction (theory followed practice) by placing them in contact with the" *[...] forms of life and human labor*" (Vasconcelos, 1915, p.102).

– The teaching was based on the personal activity of the child, supposing the association with the intellectual study (drawing, manual works, math-

ematical initiation, notions of arithmetic, metric system and geometry), that is, an educational instruction, in an individual effort of research and discovery/inquiry (Vasconcelos, 1915). In fact, teaching was based on the spontaneous interests of the child, giving him/her themes that interested him/her and which were within his/her reach, coming from the surrounding reality: "*Let the child freely tell in his/her own way what he/she sees, does and thinks, to allow his/her initiative to be manifested, his/her person to express his/her skills*" and *"[...] should sincerely reflect his/her personal preferences*" (Vasconcelos, 1915, p.96).

– The new school promotes, on the one hand, the student's individual work, based on observations, experiments and personal notes of record, whether in the field, in *"[…] studios or in laboratories*" (Vasconcelos, 1915, p.53) and, on the other hand, the collective work, in the ordination and/or common logical elaboration, through phases of programming the project work.
– Moral education, as the intellectual, is done from the inside out, through experience and oriented practice and gradual, with critical sense and freedom. The ideal of the new school was the application of the system of '*school republic'* or 'school self-government' (used in schools in the 1920s by António Sérgio and in a community and familial mode from the 1940s on the Casas do Gaiato -Obra da Rua by Padre Américo) (Martins, 2016). For Faria de Vasconcelos (1915, pp.117-118), 'Physical and intellectual education are not only the prelude to moral and social education; well oriented, constitute the widest and most effective preparation', that is, the qualities of character, the spirit of initiative, autonomy, the sense of personal responsibility, self-governing, so that *"[...] the orientation, type, value of the environment in which the child is called to develop is one of the most considerable factors in his/her moral evolution*". The child was allowed *"[...] to practice social life and to acquire the feeling of collective life*" (Vasconcelos, 1915, pp.126-127).
– In the new school, there are positive prizes or sanctions consisted of opportunities given to creative spirits to increase the child's creative capacity and power of initiative, providing him/her with free and interest free works/tasks (Vasconcelos, 1929). Negative punishments or sanctions were in direct correlation with faults committed, once "*The important thing is to help the child become bette*r" (Vasconcelos, 1915, p.132). Emulation was applied by comparing the child between his/her present work and past work and not by comparing his/her work with his/her friends (unlike the Jesuit model in school teaching.
– The school constituted a means of '*beauty*' (meaning of E. Key) in which order was the first condition and starting point (Martins, 2016). Thus, the industrial art practiced and that surrounded the daily life of the children led to the pure art, proper to awaken the artistic sense and the noble feelings. Hence, music, singing and the orchestra exerted a deep and purifying influence on them, creating in children positive emotions: *"[...] every-*

one learn to sing and choirs are the most beautiful effect of the parties and concerts we organize at school" (Vasconcelos, 1915, p.138).

– The education of the moral conscience consisted of narratives that provided spontaneous reactions, judgments of value that articulate the relationship of the self with others (practice of "*[...] hour of tales" and "night readings*" (Vasconcelos, 1915, p.94).
– The education of practical reason (Kantian influence) consisted of reflections and studies on natural laws of spiritual, individual and social progress, i.e., to appeal to collaboration, power of initiative, curiosity and personal interest, since "[...] strengthens the spirit of tolerance and charity" (Vasconcelos, 1915, p.134).

All those pedagogical characteristics, experimented in Biérges, will guide F. Vasconcelos (1929) at the Institute of Mental and Pedagogical Rehabilitation (1929) to deepen the methodologies of analysis/diagnosis and intervention with the abnormal children at school.

António S. Nóvoa (2005, p.83) points out that after a *"[...] century of pedagogical theories [...]*" it was important at the time to concretely explain what was being done, hoping that this illustration would be inspiring and contribute to sow the 'seed' of the new school. This sowing metaphor is, since this time, the one that best characterizes the discourse of pedagogical innovation. It was necessary to move from ideas to practices and, at the same time, to transform practices into a laboratory of experimentation. Not everything should have the right to call itself '*new school'*. For this reason, Ferrière used the Preface of the work of Faria de Vasconcelos (1915) to publish the thirty points of the new school and establish a minimum program to be respected: Family internships, in the field, where the child's personal experience is at the base, both intellectual education (in particular by the use of manual labor) and moral and social education, through the practice of the system of relative autonomy of students. Here were the four core points of the new education: the relationship with nature and a healthy life; the child, his/her experience and his/her interest as central elements of the pedagogical work; the defense of an integral education, if possible in boarding schools that recreate the family environment; the principle of self-government. For a school to be considered new, it had to satisfy at least 15 of the 30 requirements/principles defined by the Bureau International des Écoles Nouvelles (Meireles-Coelho, 2005)

Faria de Vasconcelos (1915) conceived the system of autonomy according to the following pedagogical foundations: the creation of a well-organized set of rules, physical activities, habits and moral customs; the creation of a true social spirit through the *"[...] rational division of labor and the real and effective cooperation of the student in school life"* - this allows him/her to learn to live in society and *"[...] to acquire little by little the feeling of collective life*" (Vasconcelos, 2012, pp.208-209). In addition to this social organization, he cultivated feelings of initiative, independence and personal responsibility. They were supporters of leaving the child in great freedom. He was not an apologist for any authoritarian discipline that

would impose on the child moral habits of which he/she neither understands reason nor purpose. He allowed each child to create for himself/herself an inner rule, the result of his/her personal experiences, and the result of spontaneous adaptation to school life, social life with colleagues and teachers. In all areas of school, in physical life, in manual work, in classes, he appealed to active collaboration, interest, curiosity, initiative and individual effort. He believed in freedom of movement and action, in creation, organization and research, in everything the school had for the student. The student does not abuse the freedom granted. This does not mean that there was no authority (Vasconcelos, 2012).

It is interesting to note that Faria de Vasconcelos (1909), in relation to education, appealed to the self-esteem and self-knowledge of 'being a person', because this aspect had a positive influence on the child, to make him/her live in a climate without oppression and recriminations. He says that, in Biérges, children are led to pay attention to their own progress, to measure their strength, to appreciate and compare their intellectual work and/or moral effort as to achieve lovers. Individual emulation is emphasized, not forgetting the social emulation that, used with great tact, became a lever of moral education (Alves, 1967).

Educate in a special and inclusive way the 'abnormal pedagogical' children

In the 19th century, pedagogical classes for abnormal children in Casa Pia began to develop special education for these children, although in the 18th century some experimental lessons had already begun. In some of these institutions, for children known as delayed or abnormal, there was a 'Pedagogy for the abnormal (sic) children', but in parallel with that of normal students, advocating the possibility of a special education, since this determination of limited abilities will condition the possibilities and the advantages of a special pedagogical technology that improves the correlative possibilities of educating them.

This differentiated pedagogy also served to recognize the abnormality (screening) and to facilitate the work of the teacher in the classes, the determination of a basic pedagogy to apply to the normal student, which would allow the construction of a special pedagogy that should be individualized and integrating these 'school abnormalities'. These groups were the retarded intelligence, the unstable and the mixed. This idea is the result of a national history of teaching for abnormal children, where everything is shown according to the advances of medicine (psychiatry) and psychology, integrated in the medical pedagogical movement where the figure of Aurélio da Costa Ferreira (Martins, 2016) stood out. The results of one and another pedagogy are introduced in the educational practices of the so called normal students who, therefore, gain from this experimental research the distinction between what is normal behavior and what is not: from the deviations the special educational needs of students (school children) are defined.

One of the (social) issues that Faria de Vasconcelos questioned, after the Geneva Declaration in 1926, was society's duties towards these abnormal children and young people, since the document mentions in paragraph 5 'Protection of the destitute, abandoned and abnormal', insisting on the fulfillment of the duties to these children, since: *"[…] it is not only a duty of defense, since the contact of these children constitutes for the normal ones a manifest danger, beyond the dead weight, of the formidable burden that they represent later to society itself if an appropriate adequacy [...]"* (Vasconcelos, 1929, pp.20-21).

In addition to his activity as a teacher - at the Higher Normal School until its closure, and at the Faculty of Letters until his death, the activity linked to popular education, education reform, vocational guidance, scientific research, his participation in Congresses, etc., another idea encouraged the ''Escolanovista'' from Castelo Branco: to dedicate himself to the education of the abnormal ones, idea that comes to him since the first times which he lived in Belgium. He defines, from the theses of O. Decroly and Yonckeer and the 'pedagogical anomalies', whose delay in development was caused by a long illness, an irregular school attendance or a weakness of spirit, of a special nature. There is in this definition the distinction between the ignorant and the 'delayed'. The latter term seems in many cases to be the perverse result of a social and family environment (promiscuous, irregular, and unstructured) that causes delays in the development of children. He demonstrates how the school, understood as social organization, can cause dysfunctions in the development of those children. He assumes that the school works well for the students and that the possible delay in the studies could be a good indication of difficulties derived from failures in the nature of their intelligence. Thus, a two-year school delay could lead to a different educational regime and should be the subject of special schools of improvement. All these observations are the concrete result of his work in 1903 on La Psychologie des Foules Infantiles.

We know that in the late 19th and early 20th centuries a new paradigm (medical-pedagogical) emerges in the country, which articulates and makes coherent the knowledge of psychology and pedagogy (paidologia- '*Child Science'*), as we understand the intervention of Faria de Vasconcelos (1909) on the problem of protection and education of abnormal children, analyzing and comparing the various types of abnormalities (with several international classifications, for example that of S. Hall) and establishes their classifications (investigations at the Institute of Vocational Guidance and expressed at the Bulletin of the Institute), indicating the social solutions adopted in several countries, mainly based on the studies of O. Decroly. It is worth mentioning that he brings to Portugal a knowledge of the psychology of abnormal children (psychopedagogical principles of screening and intervention) and proposes the creation of several types of schools: asylum-schools for idiots and deep imbeciles; special schools for mental and pedagogical backwardness. These schools were supported in the medical-pedagogical (doctor and school nurse, school and social hygiene) and care (child and family) aspects. In a long report he explains the feasibility and

advantages of his *"[...] project of organizing special education for abnormal children*" (Gomes, 1980a, p.68).

Although it was not a novelty (just remember the activity developed by Aurélio da Costa Ferreira at the Medical-Pedagogical Institute of Casa Pia in Lisbon and the Prison Colony for Children of S. Bernardino - Peniche), his coexistence and contacts with the work of Decroly, in Brussels, and other French-speaking pedagogues, will have fueled his interest in special education, including the specific training of teachers, is that interest in the education of the abnormal child was the starting point of the most interesting for the new pedagogical research (Martins, 2016) .

The presence of the ideas of the New School, which was linked to the study of the deviations of the psychological normality (psychopedagogical of the students in the school) was already very evident, with knowledge about the studies of Decroly, which brought back in the country an attention to the Special Pedagogy (differentiated and individualized), from the observational analysis and diagnosis of the deficiencies, forcing the change of the pedagogical paradigm in force. This knowledge was most evident in the teaching of the blind and deaf, but also made it possible to create the social need for protection of juvenile delinquents, who were also children and young people at moral risk, and hence the collaboration of the Institute of Vocational Guidance with Children Courts and their Children Protection Observatories annexes (1911-1919) or reformatory schools (from 1919 onwards), which merited some studies (Martins, 2015).

In 1903, Faria de Vasconcelos wrote a Memoir on the Psychology of Children's Multitudes, defending a reorganization of all schools, in order to control this emergence of children's criminality at the time. For him these 'abnormal' or delinquent children progressed by the methodology of intervention and individualization of collective processes (inclusion). He took advantage of the project that he had done on the special teaching of the abnormal, assigned by the Directorate General of Primary Education and made, at the invitation of the League of National Education, at the facilities of the Geography Society, a conference on 'Abnormal'. In April 1909, he presented a thesis on '*Pedagogical Abnormal'* at the 2nd Pedagogical Congress (Lisbon) and collaborated on the drafting of the most important conclusions, voted by congressmen. Faria de Vasconcelos (1909) discloses his learned and experimented psychopedagogical knowledge during the stay in Belgium, Switzerland and Bolivia. He shows well what has been thought by a great variety of psychologists and pedagogues about these 'anomalous' aspects of the children, who should be worked as a team, with doctors, to detect what must be medical-pedagogical work and what should be work of medicine and psychopedagogy, in addition to social workers and other technicians (Vasconcelos, 1924). He believes in the effectiveness of the school, since some empirical data proved that the percentage of cured or improved by psychopedagogical methods was 75 to 80 percent at the time.

The creation, in October 1929, of the Institute for Mental and Pedagogical Rehabilitation (Vasconcelos, 1931), under the sponsorship of the National Board of Education and in conjunction with the Institute of Vocational Guidance, was

aimed at children: with severe or minor deficiencies in their mental capacities (intelligence, attention, memory, will, language, etc.); the delayed both in their mental development and in their studies (learning); the 'normal' but who needed a special education and training scheme (psichopedagocial supports). In this establishment were performed: clinical, physiological, mental and pedagogical examinations for the diagnosis of the causes, nature and amplitude of the defects and delays; Interventions, treatments or corrections of behavioral anomalies, in harmony with the results of the exams, through special exercises, within an organic plan of activities and studies (**Figure 5:** one of the seven laboratories of the Institute).

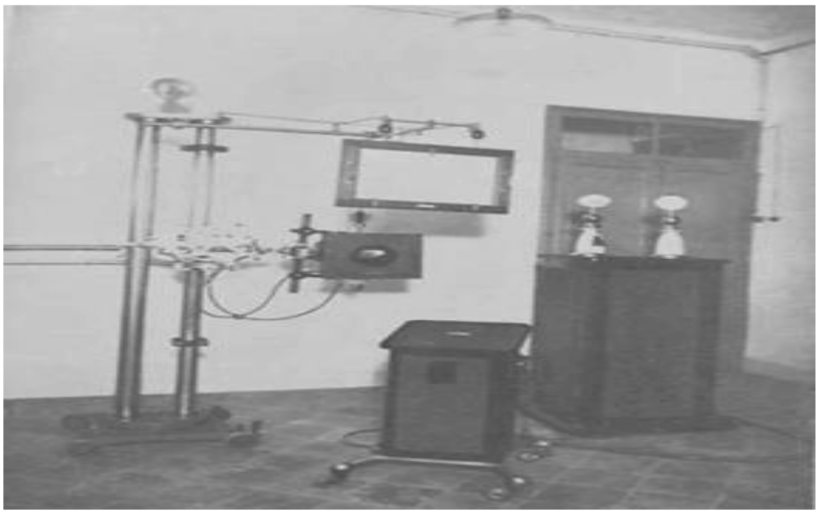


Figure 5. Apparatus from the Laboratories of the Institute for Mental and Pedagogical Reabilition. Source: Municipal Library of Lisbon (1929-1932).

For the Portuguese *'Escolanovista'*, there was the advantage of creating a good school organization and, therefore, it proposes a system of education for the pathological and pedagogical backwardness, as we have already said:

a) creation of Asylum-Schools for idiots and deep imbeciles and special schools for mental and pedagogical delayed children (schools with boarding school or semi-boarding school, special classes attached to primary schools, but separated from these for specialized intervention).

b) exclusion of students from normal schools must be determined by a medical-pedagogical committee (diagnostic report), with a *"[...] medical, psychic and pedagogical examination of the child"* (Vasconcelos, 1928, p.53).

c) distribution of 'abnormal' students in classes should be made, according

to the diagnosis made, but privileging, if possible, their inclusion in the normal classes (maximum classes of 20 students) (Alves, 1967).

d) education should be simple, concrete, practical, individualized and adapted to the physical and psychological state of the child and to his/her social use (adaptation).

e) mixed, compulsory and free education, with a soft but firm discipline, valuing the physical-motor, cognitive and manual work scopes, reducing the theoretical aspects to very short classes.

f) completion of a medical-pedagogical examination (semester), with systematic records (observational and intervention) in a book school, with the support of the doctor and the pedagogue, in constant collaboration.

g) the teachers of special schools must have a special preparation, but with the possibility of being extended to other teachers and doctors (and auxiliary staff).

h) organization of an annual statistical service on these abnormal children, who must have, at the end, a professional classification when leaving those schools

i) creation of post-school protection committees, in order to exercise a discreet and friendly guardianship with the children.

Children, who had serious anomalies and required special treatment, had only such support and intervention in an asylum-school, hospital or a specific school, as was done with the blind, deaf and dumb (Martins, 2015). That is, it was necessary to cover all the deeply affected physical anomalies, the deep idiots and imbeciles, the abnormal by severe hysterical neurosis, epilepsy and the moral anomalies as the infantile criminals, giving them a special education. All children who, in general, had minor, mental, moral or physical anomalies should be eliminated from primary schools, which implied an incomplete or irregular physical and psychological development, in order to be admitted to special schools, avoiding the teaching of ordinary processes and methods in primary schools. The delayed is a child whose psychic processes are slow, weak, difficult and superficial, that is, he/she was a light imbecile.

In a detailed analysis, mental abnormality did not constitute a single species, it was manifested in various forms. Faria de Vasconcelos (1921) recalls that Soller divided into two categories: idiots (organic brain lesions) and imbeciles (simple functional disorders without organic lesions). However, neither idiocy and imbecility, nor mental retardation, are strictly delimited clinical entities, and so the difficulty, at the time, of classifying mental anomalies was understood. Thus, the ''*Escolanovista*'' distinguished: delayed as a child whose physical processes are slow, weak, difficult and superficial; he/she is a light imbecile; the unstable as an unbalanced intellectual, an exuberant, disconcerting physical-psychic mobility, in such a way that the family/parents called him/her 'nervous', the 'undisciplined' teachers and the doctor sees mental defects in this neurosis; the asthenic as an apathetic, depressed, intellectually and physically inactive, inert, who the teachers and the family call 'lazy'.

Each country and each line had its own classification, and each classification had different points of view and purposes, ranging from the pedagogical, to the medical, to the legal, to the psychological, according to the professional analysis. The truth is that the pedagogical backwards, not being mentally abnormal, could however be exposed to the influence of the school, the multiple factors and phenomena that occur in it, becoming moral, vicious, undisciplined abnormalities (Vasconcelos, 1936). The school, or its material conditions, or the methods it applies, or the regime it imposes, can develop latent anomalies or create them (Gomes, 1980b).

In this work at the Institute for Vocational Guidance and the Institute for Mental and Pedagogical Rehabilitation, he maintains contact with Belgian friends in scientific cooperation, such as A. G. Chistiaens, who was the director of the Institute for Vocational Guidance in Brussels and an active member of the Belgian Pedagogical Society, occupied in *"[...] school and professional orientation of schoolchildren*" (Alves, 1969, p.58). He is concerned with the lack of useful knowledge of young people, the result of an education that *"[...] acts more on memory than on intelligence"* (Marques, 1986, p.93) and, therefore, fought for a discipline of infant psychophysiology in the training of teachers in Normal Schools in accordance with ideas about the problem of protection and education of abnormal childhood (Vasconcelos, 1909). He showed, therefore, that educational science was based on the scientific study of the child, on the effective association of the doctor-teacher/school, on the sincere collaboration of the family-school, and finally on the habilitation and training of the teacher.

It is noteworthy that in the Congress of the International Association for the Protection of Children (October 1931, in Lisbon), he participated in his work with a multifaceted role, proposing that alongside mental training and knowledge acquisition, it was necessary to understand physical and moral culture of the child in a special way. This proposal was approved in this scientific event and was in tune with the services of school, social and professional orientation, in order to give the Portuguese pedagogic system a professionalizing and humanizing way. Later, in 1937, Faria de Vasconcelos participated in Paris at the 12th Session of the International Association for the Protection of Children, presenting the communication "*Les sanctions en éducation, leur legitimité, leurs modes, leus résultats*", published by the Jean Vromans Publishers in Brussels, where he insists on the guiding principles of psychic functions in child development (Alves, 1969).

Final considerations

We analyzed the main features of the New School movement applied in Biérges by Faria de Vasconcelos (1915), with pedagogical impact at the time, of which we highlight: school located in the countryside, in the middle of nature but close to the city; a pedagogical model that values manual work, physical culture and practical and experimental training, along with intellectual and scientific educa-

tion in which theory always follows the practice (not the opposite), from the individual interests and work of each student, completed by group work, by trips and camping; a student centered learning based on facts and experiences; the development of a general culture supplemented by a specialization, the first spontaneous and then systematic; a moral, personal, and social education not imposed from the outside to the inside, but built from the inside out by the experience reflected in the critical sense and in the exercise of freedom; an education that values individual progress, in which each compares his/her present work with his/her own works in the past and not with the works of his/her companions; an education for the autonomy in which students learn to do, namely their own meals; a school that develops effective aid and participatory democracy; a liberating, purifying, and creative art education that develops the noblest emotions; a school which is a "[…] laboratory of practical pedagogy, grounded on scientific research and the development of spiritual and material life" (Vasconcelos, 1915, p.73).

This school of Biérges and its educational practice was a stimulating challenge for us to understand the expansion of innovative pedagogical ideas and methodologies and their repercussions that have been extended to us (Alves, 1967; Cunha, 1997). It was a cooperative school, of effective mutual aid and a participatory democracy, and therefore was considered a laboratory of practical and active pedagogy, based on observation, experimentation and scientific research, favoring the integral education of students.

In relation to the contributions to special education of the so-called 'abnormal' children, for the pedagogue from Castelo Branco the principle of the pedagogy of the anomalies consisted of providing and adapting the teaching to the physical and psychological status of the children. The physical, muscular and sensory education of the abnormalities preceded their intellectual education (Vasconcelos, 1909). Special schools should think more about education, the social value of 'abnormal' than on their actual instruction, implementing in them a manual, technical, professional education, because it is from this integral education that the abnormal has to live and it is through it that the abnormal socializes.

For Faria de Vasconcelos, special schools could be called schools of improvement, since they comprised three types: autonomous schools with boarding school; autonomous schools with semi boarding school; special classes attached to primary schools, but completely separate from them. The exclusion of children from primary schools and their admission to special schools should be determined by medical and pedagogical commissions, which are responsible for carrying out the medical, psychological and pedagogical examination of the child. The distribution of the children in these special schools was made in relation to the diagnosis of the medical-pedagogical commission (Vasconcelos, 1928). The problem of the protection and education of abnormal childhood was of paramount importance to the country and its solution constituted a social duty (prophylaxis and valorization) and solidarity. It was in this sense that at the invitation of Counselor Manuel Marques, he elaborated a project to organize the

special education of abnormal children, which was not materialized, but the ideas were innovative for history.

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6

European and Latin American Higher Education Between Mirrors. Designing possible futures

António Teodoro

Introduction

The creation of institutional networks has contributed decisively to the processes of construction and strengthening of the social sciences, as a whole, and education, in particular. These processes can be explained within the scope of the so-called knowledge society and social reflexivity. Both phenomena – the configuration of a network society and the growing access to information – are the product of a time when producers of social networks and knowledge live simultaneously with the specific experiences that allow the construction of those networks and that shared knowledge.

Manuel Castells devoted the first volume of his trilogy on the contemporary world to the characterization of the *Network Society* (Castells, 1996). According to the Spanish sociologist, the concept of network society characterizes the social structure emerging in the information age, gradually replacing the society of the industrial age. The network society is global, but with specific features for each country, according to its history, its culture and its institutions. The *network society* does not arise because of information and communication technologies (ICT), but without ICT it could not exist. In the last twenty years the concept started to characterize nearly all social practices, including sociability and the social-political mobilization based on the internet and mobile platforms.

Anthony Giddens, when attempting to explain contemporary social phenomena, developed the concept of social reflexivity (Giddens, 1994). According to the British sociologist, reflexivity concerns knowledge disseminated outside what is commonly known as "expert systems", precisely through information and communication networks which came to be established thanks to the development of computing technologies and the internet. In other words, thanks to these new communication media, information, even that which comes from

expertise, become accessible to the set of internet users, going beyond the limits of the universes of the initiated (researchers and scientists).

We know that access to the information does not automatically produce a social network by its users. It is necessary that, apart from access, there is the appropriation of the information by the network agents.

The enlightened vision of the dissemination of knowledge was a one-way street: it went from its producer (researcher, scientist, thinker, intellectual) to the receiving mass. If, on the one hand, 18th century Western thinkers developed rationalist optimism – the ability to know and change everything through knowledge – as well as encyclopaedic optimism – it only takes knowing everything to control and transform everything – on the other hand, they also developed a kind of gnoseological pessimism and, in this way, the epistemological elitism commonly known as "vanguardism".

Paulo Freire, in several of his works (e.g, *Politics and Education*, 1998) mentioned the evil of "vanguardism" but also warned against the perils of its counterface, "basism". Not everything which is devised by the intellectual elites solves the problems of mankind, but not everything that comes from the social base is necessarily better, or is alternative knowledge to hegemonic knowledge, also because for the most part the masses "host" what is dominant and read the world from its perspective.

The social networks of knowledge have restored the possibility of gnoseological democracy, already insinuated in the concept of reflexivity, and then amplified in the concept of "dialogic democracy" (Giddens, 1994). In a more reflexive and globalized social order there is the need to foster more radical forms of democratization. Dialogic democracy is part of a process to democratize democracy, consisting in the creation of a public arena where controversial issues may be sorted out through dialogue, and not by pre-established forms of power (Arendt, 1959; Habermas, 1989[1962]). Both in daily activities and in social organizations, or even in the formal political sphere, individuals weave social practices and act together to find alternatives and overcome their problems and shortcomings collectively and reflexively.

Other concepts may emerge when we talk about social networks: shared knowledge and experiences, participative democracy, interlocution, alliances, collective action, ties, communicational process, entwining, culture of compromise, among many others. The common undertone to all of them is unity in diversity, in thought and in action, in theory and in practice (Freire, 1998).

It is then possible to define a social network as a set of connections, involuntary or voluntary, of people or groups, the boundaries of which are not the same, but which are presented as a structure which, in particular contexts, acts aiming for common goals. The social network is something of a response to social fragmentation, asserting itself sometimes as alternative and other times as mediation between the State and society, between the public sphere and the private sphere. In all social networks norms of complementarity and reciprocity are defined, norms that are not always explicit, but which are implied in the common contextual interests. Just as in communication, besides the sender, the

receiver, the common code, the channels and the message, the interaction of social networks evidences the different competencies that complement one another and the various interests that are realized by the action of the other. Hence the pacts, the agreements and the adjustments regarding network access and permanence, so that the types of expertise, different and mutually complementary, mediatized by the challenges of reality, may overcome those challenges.

Networks emerged in the sociological literature in the 1980s, especially when the political coordination of Western societies started to shift to the market. Networks arose as a kind of response to that shift, since the market cannot aggregate social interests. Most often, social networks respond to a deficit in representativeness and political coordination, previously hailed as assigned to the State and to which the market cannot respond with efficiency, not even with efficacy. To a certain extent, social networks, as social fabric armed in the mesh of daily life and expressing ideas, concepts, doctrines, collective aspirations and projects, end up becoming instruments of active citizenship and of participative democracy.

In 2006, a set of social scientists (and activists) of different fields – education, sociology, anthropology, political science, economics – and from different countries (Argentina, Brazil, Chile, Spain, Mexico, Paraguay and Portugal) formed the Ibero-American Network of Research in Education Policies (RIAIPE), within the scope of funding from the Science and Technology for Development Programme (CYTED), which exists in the Organization of Ibero-American States (OEI). In that first stage, the main goal of the RIAIPE network was to coordinate research in the field of the education policies of the countries researchers belonged to.

In 2010, this network expanded and started including researchers from other countries in Europe and Latin America (besides those already mentioned, Bolivia, Columbia, Costa Rica, Cuba, France, Guatemala, Honduras, Italy, Netherlands, Peru, United Kingdom, Uruguay); it obtained funding from the Alfa III programme, of the European Commission, for the years 2011 to 2013, with the purpose of fostering cooperation among Higher Education Institutions (HEI) of the European Union (EU) and Latin America (LA), favouring the process of regional integration in LA and developing its synergies with the university system of the EU [1]. We started by acknowledging the need to uphold a high degree of collaboration among the network participants, which allowed the group to identify decisive causes and factors in the existing situation, and present (as well as carry out) some proposals aiming to overcome processes and mechanisms which exclude from attendance (and success) in higher education whole populations (indigenous ethnical groups, of African descent, the poor, impaired people, people in situations of disability, minorities).

[1] The website www.riaipe-alfa.eu has large amounts of information on the activity carried out and the products of the work done.

The present paper gathers some of the ideas and proposals presented within the scope of this immense collective work. As is the case with all collective work, it implies the establishment of platforms and compromises resulting from many hours of discussion and common work, and its objective is to contribute to a radically democratic university and higher education, attended by students from all social classes and strata, and from all ethnical and cultural groups, where conditions can be created for the dialogue of knowledge types and cultures.

Europe: the Bologna process, the crisis of sovereign debts and the hard consequences in higher education

In the first decade of the 21st century in Europe, changes in higher education have fundamentally been associated with the implementation of the Bologna process. The goal was to establish a European Space for Higher Education which would allow an increase in competitiveness, attractiveness and comparability of European higher education. To this end, various objectives were defined: the creation of a system of easy comparison and reading of the degrees of the education system; the establishment of a transferrable credit system; the promotion of student, teacher and researcher mobility; and the construction of quality assurance systems according to European recommendations and guidelines. These changes were reinforced by the Lisbon Strategy and the European modernization agenda for universities.

The assessment of the results and the consequences of the Bologna process depends on the perspective of those who conduct it. On a political level, it is easy to conclude that the Bologna process was a success, since it allowed for greater integration and harmonization among the different systems from 46 countries that participated in it. However, on an institutional and local level, what dominates is a cautious answer, resulting from a wide diversity of contexts. On the one hand, the objective of achieving greater competitiveness and attractiveness of the European universities is yet to be empirically verified. On the other hand, different studies point to critical analyses of the processes and consequences observed in different national spaces [2]. The present dynamics of the European Space for Higher Education and for Research are characterized by a simultaneous tendency to convergence and to diversification, as well as by the tension between cooperation and competition.

Several authors have underlined the neoliberal rationale underlying the Bologna Process, based on the decrease of the social responsibility of the State and on the idea of education as a private asset, favouring the constitution of a European higher education market. Amaral and Magalhães (2004) question the

[2] For example, the *European Educational Research Journal* entitles its special issue on the Bologna Process as "help or hindrance to the development of European higher education?" (vol. 9,1, 2010), and in it its editors question: "how much can we actually talk about a *European* higher education?" (Ursin et al. 2010: 30).

possible contribution of the Bologna Process to the decrease in autonomy of the higher education institutions, the marketing of education, the development of a centralized European bureaucracy and a decrease in diversity of the higher education systems.

The importance of the social dimension, aiming at the equality of opportunities in access, participation and completion of studies has been reinforced as regards educational policies for higher education within the scope of the Bologna Process. In 2012, at the Bucharest meeting, the Ministers reiterated the objective of broadening access to higher education, increasing participation and approval rates for under-represented or disadvantaged groups, so as to reflect the diversity of the population of Member states. Also, the Europe 2020 Strategy defines as one of its objectives the completion of higher education for at least 40% of adults between the ages of 30 and 34 (European Commission, 2010).

Nevertheless, despite the policies aiming to promote participation, there subsist important inequalities in access, success and results. Growing competitiveness in attracting publics and financial resources has fostered stratification and inequality in higher education systems. Also, the neoliberal and meritocratic rationale which constitute the basis of the policies for broader participation do not seem to favour the development of an inclusive higher education system, committed to social justice.

Moreover, the end of the implementation of the Bologna process and the first years of the 2010s coincided with the debt crisis in several Southern European countries (Greece, Portugal, Spain, Italy) but also of Ireland, the United Kingdom, Slovakia, Holland or even France. This crisis has led to strongly authoritarian policies, with profound consequences in higher education policies. In the United Kingdom, the conservative government implemented a strong rise in the fees paid by the students, with predictable consequences in the access to higher education by the social layers with lower incomes. In Greece, the external intervention of international creditors, represented by the troika, European Commission, European Central Bank and IMF, has forced thousands of teachers and researchers to be fired from universities and led to a contingency budget, where many of the universities' basic functions have all but disappeared. In Portugal and Spain, the radical cuts in universities' budgets have led to regression in such areas as research and scientific development.

Throughout the European Union, the ideal of European construction, of a united Europe of solidarity, constituted by different peoples, rich in their diversity and history, has suffered several setbacks; national egoisms and the directory of the strongest once again prevail. Europe has become the world laboratory of the responses that neoliberalism, in its ordoliberal version, is giving the crisis it caused in 2008.

Latin America: the (difficult) transition to post-neoliberalism

In Latin America, the time contexts were different. Latin America was the first region where the neoliberal policies were implemented after Pinochet's mil-

itary coup in Chile in 1973, which overthrew Salvador Allende's legitimate government. Later, in the 1980s, as a result of the crisis of the external debts in several countries (Argentina, Mexico, Brazil, just to mention the largest, geographically), the World Bank and the IMF intervened, through their "letters of intentions", with a view to restructuring their economies and reducing the fiscal deficit, following the traditional orthodoxy of these institutions: devaluation of the currency, privatization of public companies, elimination of customs barriers, sharp cuts in public expenditure on education, health and housing (Espinoza 2002). In education, the policies carried out meant privatization of the educational supply (particularly in higher education), decentralization, assessment and accountability (Arnove, Franz & Torres, 2013; Gazzola & Didriksson, 2008).

The end of the 20th century was, for Latin America, what several authors called "lost decades" (e.g. Didriksson, 2008): a long period of economic stagnation (and, in some cases, contraction), with a severe decrease in per capita income, the rise of social inequalities and the sharp reduction of public resources for universities and other higher education institutions. At the same time, there was a commodification of the basic and secondary education supply for middle and high classes, the trans-nationalization of the higher education supply in many countries, after the purchase of universities and the multiplication of distance programmes, and a new common sense was built based on the criticism to the State's inefficiency and the defence of the virtues of creating markets in areas so far protected, such as education and health (Ginsburg, Espinoza, Popa & Terrano, 2005). Thus, in many Latin American countries, enrolling in private higher education institutions exceeded 60%, most of which were commercial in nature and of very low scientific quality – known as "garage" universities or "*patito*" universities (Fernandez Lamarra, 2010).

The 21st century brought about important changes in this landscape. The election of progressive governments in some Latin American countries, in general connected with social and ethnical movements with strong representation and long-standing tradition in fighting and resisting neoliberal policies, allowed for the development of policies of wealth redistribution and satisfaction of basic needs of the more disadvantaged sectors of the populations. At the same time, in countries with strong indigenous communities, there was recognition of the cultures of those peoples and the development of intercultural policies (for the case of Bolivia, see Teodoro, Mendizabal, Lourenço & Villegas, 2013). Universities and education in general once again received more public resources, and in some countries there was affirmative action policies aimed at populations historically removed from higher education (of African descent, indigenous communities, poor students). It is not without meaning that it was in Latin America, where the first neoliberal experiment was carried out, that the search for alternatives to neoliberal policies and the construction of other rationales started (e.g. Alcántara, Llomovatte & Romão, 2013).

Some policies of institutional experimentation deserve special reference. In Brazil, the action of Lula's and Dilma's post-neoliberal governments (Sader, 2013) also focused on the creation of *popular* universities (Santos, Mafra &Romão,

2013), evidencing differentiated profiles and responding to specific goals of political action. Some, like the Federal University of the Southern Border (Universidade Federal da Fronteira Sul), resulted from a strong connection to social movements, especially peasant movements. Others, like the University for the International Integration of African-Brazilian Lusophony (Universidade da Integração Internacional da Lusofonia Afro-Brasileira – UNILAB), or the Federal University of Latin American Integration (Universidade Federal da Integração Latino-Americana – UNILA), from the options of geostrategic nature of the Brazilian foreign policy. Others still, like the Federal University of Southern Bahia (Universidade Federal do Sul da Bahia), involved profound changes in the curricular structure, in the organization of teaching hours and in the connection to the public school and to the region's poorer and more marginalized social sectors (*quilombola* communities, indigenous populations, poor peasants without land).

Despite these policies, in most Latin American countries, including Brazil, private universities have grown more than state-owned universities, and have the largest numbers of enrolled students, which means that on the regional level it has not yet been possible to revert the privatization and commodification process of higher education that began in the 1990s.

Social Justice and the relevance of Higher Education

The adequacy of higher education to society, globally speaking, while it presents new challenges it also enables us to reflect on how we can make universities more committed to social justice. Considering higher education, and especially the university, as *public good* is being systematically brought into question. Its social function and its purpose of rendering service to society have led the way to an idea of university understood as a company carrying out an activity in the free market. Thus is placed the first dilemma related to the *social function* of higher education.

In the context of the neoliberal trend, it is necessary to question the business terms that currently dominate the educational discourses (and practices), in the face of the multiple problems of a social and environmental nature, or before recent phenomena such as the increase in university enrolment fees, the process of covert elitism, or even professional precariousness, intensified by austerity policies which discard the democratic conception of university.

This questioning is what allows us to reformulate the concepts: first of all, understand the contradiction that derives from implementing business rationales associated with such concepts as quality, efficacy and efficiency, while aiming to preserve the academic ethos connected to the public interest and the common good; and, secondly, identify the constant de-legitimization of the university as public institution by means of a managerial discourse which leads to the radicalization of its discourses on *quality*, *efficacy* and *efficiency*, leading to a business rationality of its institutions.

The assumption that higher education (and specifically the university) is a

public good implies that it cannot be predominantly subject to the dictates of the market; its relevance lies in its contribution to the development of a fairer society, as defended by De Ketele (2008), transcending the demands of the productive system; in other words, it determines its purpose as the construction of public citizenship of democratic, sustainable and fair societies (Sobrinho & Goergen, 2006).

The mission of the university is stated in such documents as the *World Declaration on Higher Education for the 21st Century: vision and action* (UNESCO, 1998), where it is postulated that "higher education institutions must educate students so that they can become well-informed and deeply motivated citizens, provided with critical sense and capable of analysing society's problems, seek solutions for those problems, apply them and assume their respective social responsibilities". More recently, in Guadalajara, representatives from 1,009 Ibero-American universities (and from other countries outside this region) approved a Declaration entitled: *The committed university: the University's social dimension* (UNIVERSIA, 2010), where they emphasize the universities' firm commitment with social cohesion and inclusion, biological and cultural diversity, indigenous cultures, the promotion of economic and social development, progress and well-being, and with the resolution of the serious problems of inequality, poverty, gender discrimination, and the sustainability of societies in vast Ibero-American region.

The Declaration signed in Guadalajara insisted on the idea that the responsibility of today's university is based on acknowledging that education and knowledge are the most powerful tools for transformation, development, assurance of equality of opportunities, social cohesion and mobility. The Agenda drawn up in that meeting defined five working axes, where universities must act so as to fulfill their responsibilities: (i) the committed university – the social dimension of universities; (ii) the university without borders – mobility and internationalization; (iii) the training university – teaching quality and renovation of teaching methods and contents; (iv) the creative and innovative university – research and knowledge creation; and (v) the efficient university – good use of resources.

Accepting these proposals on the social function and mission of higher education, and reclaiming the need to place social justice first, a new dilemma is presented around the *social responsibility* of higher education, which implies the participation of a part of society in the definition of development projects with a view to achieving a better fit to social needs. However, the dominant discourse and guidelines basically seek the participation of instances of economic power, and in many cases there is an underrepresentation of groups with great social importance, such as unions and associations that defend the rights of various sectors of the civil society, traditionally discriminated for reasons of gender, ethnicity, skin colour, economic level, or migratory origin. Although this situation often derives from the need to seek financial support or infrastructure, in the context of an understanding of universities as public good we can only speak of true participating democracy when social groups are represented that were tra-

ditionally excluded from higher education, so that their interests and needs can be presented and considered within the university.

Generally speaking, the manifestation of social responsibility is connected with the re-contextualization of the concepts of *pertinence* and *quality*, presented as a formula that transcends the adequacy of higher education to market dictates. Both concepts are ambiguous and ambivalent, and comprise a challenge: university, in order to fulfil its mission, must have as common denominator social justice, that is, its affiliation with social ends (Naidorf, Giordana & Horn, 2007).

We acknowledge that there are serious warnings as regards the use of the phrase *social responsibility*, widely used in business and political sectors. Its use has de-politized public references of fighting social injustice, proving unable to solve the serious problems of social exclusion. Nevertheless, the social responsibility of higher education institutions implies producing socially significant knowledge, training professionals with a social conscience and contributing to culture and to the transformation of the reality they integrate. In other words, social responsibility is directly related with relevance, thus constituting the means that allow the quality of an institution to be assessed.

For this, the quality so often mentioned today can only be assessed in all its dimensions when it is *relevant* to the issues and the contexts it integrates and develops. And that *relevance* implies, for universities and other higher education institutions, a participation in the search for answers and solutions to the social complexity of today's injustices, which takes us back to the social, cultural and economic dimensions, the possibilities of integral and sustainable development for a dignified and fair life. The relevance must therefore be based on social justice and the basic rights inherent to the human dignity. The concept of quality, traditionally disembodied of all contextualization (and politization), is conditioned by social relevance, which implies recovering the social, public, value of the commitment to the community. In this context, it may be considered that *there is no quality without social justice.*

Social justice, referred to fundamental notions of equality of opportunities and human rights, transcends the traditional concept of formal justice (Montané, 2013), which gives rise to a new dilemma, that of establishing socially fair criteria to determine the social and public value of the collective asset that is higher education.

The challenge of considering *justice as equity*, while part of the social relevance, responds to a distributive concept of resources built upon three axes: (i) *the principle of equal freedom*, where the fundamental freedoms are ensured for all; (ii) *the principle of equitable equality of opportunities*, where equal access possibility is provided to all regardless of their social and economic origin; and (iii) *the principle of the difference*, where differences in gender, skin colour or ethnical origin, sexual orientation, or religion are respected. Distributive justice stems from a moral principle that establishes how *human beings* must be treated, protecting the individual freedom and the working needs of the State.

In this second decade of the 21st century, the right to education is assumed

as a human right, not merely regarding basic education but on every level, including higher education. This position brings to the fore the dimensions of equality of access, permanence, academic success and job opportunities for young people of lower economic means, of cultures that are distant from the highbrow cultures of the school (or the university) or faced with greater difficulties in accumulating cultural capital. This implies adopting policies of positive discrimination and changes in curricula and in pedagogic methods, which highlight the diversity of experiences, life paths, cultures and knowledge types.

In this context, Amartya Sen's position is strongly supportive of our view when he claims that it is not *enough* to think of ideal models of justice based on the distribution of economic resources, but also proposes a *distribution of capabilities* (Sen, 2009). According to Sen, the axis of analysis must shift to people's ability to achieve certain situations considered fair, which implies generating possibilities for freedom which enable them to choose between different ways of living.

The notion of capabilities has been fundamental in the approach to *human development* ("capability approach"), which values the increase in wealth of human life and the amplification of their options, thus allowing them to face the perspective of economic development based on the theory of human capital. This notion was expressed in the creation of the *human development index* (HDI) which, under the mandate of the United Nations Development Programme (UNDP), has generated reports that have positively influenced authorities responsible for preparing public policies.

The concept of human development put forward by Amartya Sen (2009) and Marta Nussbaum (2002), or by other authors in the field of higher education, such as Boni (2011) or Walker (2012), lead us to uphold the idea of a *transforming university*. Boni and Gasper (2011) suggest a list of dimensions, such as well-being, participation and empowerment, equity and diversity, or sustainability, so as to allow a different way of understanding the university's quality and responsibility, and analyse university functions and activities, from teaching to researching. Tickly (2011) defends that the notion of quality and educational relevance, which underlies the approach to human development, may provide a new model to think the university.

Thus, quality education will be that which allows all students to be aware of the capabilities they need to be economically productive, develop sustainable means of living and contribute to the construction of peaceful, democratic societies, assessing social justice and the quality of life in terms of human capability.

The distributive justice of resources and capabilities take us to a sense of relevance which involves: (i) financial, social and cultural resources; (ii) equity in higher education access; (iii) equity in higher education permanence, avoiding early drop-out; (iv) equality in results; and (v) the possibility to develop capabilities (Montané, Naidorf & Teodoro, 2014).

Democracy in higher education is expressed both in expectations, mandates and perceptions of society regarding the university, and in the commitment and social responsibility that the university assumes before society and the social players.

This perspective opens up a new dilemma: by considering that the relevance of higher education must contemplate that inequalities do not arise merely due to a question of distribution of resources or capabilities, but are also a social issue, of conviviality and of alterity, that they manifest by means of cultural dominance in terms of difference in ethnicity, gender, or sexual orientation, it also assumes including the paradigm of *justice as acknowledgement* (also known as relational or cultural justice). The feminist scholar Nancy Fraser, starting from studies in the fields of gender and difference (Fraser, 1997), speaks of a type of claims for social justice that stem from a set of injustices she interprets as *primarily cultural*, rooted in social patterns of representation, interpretation and communication. Fraser later expands her contributions to include a political dimension, defending a *radical democracy* which allows the acknowledgement of all groups in the public sphere (Fraser, 2008).

The recognition of all social groups and, especially, those that throughout history have been silenced, made invisible and oppressed (Estermann, 2008), as well as their inclusion in the public sphere, involves the recovery of other non-colonial epistemologies from the perspective of colonizes subjects, or, using Frantz Fanon's phrase, of the "wretched of the earth" (Fanon, 2004 [1961]). There is no law in Physics which prevents the world from being represented in reverse, as Estermann reminds us (2008). In our imagination, the South has always been below and the North has always been above; this archetype, perhaps of Platonic or Parmenidean origin, deepened and consolidated throughout the Middle Ages and modernity, has us believe that what is above is superior to what is below; the North would then be hierarchically superior to the South and this, for the reverse reason, inferior to the North. It was this archetypical and conventional idea, based on a dualistic, ethnocentric, androcentric and colonial view of the Western thought that organized our whole way of thinking, knowing and interacting with the world, with the others, and with other cultures, and at the same time conditioned the intercultural dialogue between the North and the South, and which, above all, has prevented Southern cultures from asserting themselves on an equal footing to the Eurocentric cultures self-entitled as superior which have globally asserted themselves from an ethnocentric perspective.

Overcoming the Western ethnocentrism and androcentrism as well as the coloniality of knowledge (Quijano, 2009) implies acknowledging other cultures, with other visions of the world and of life, and confronting their respective cultural othernesses. No culture can be self-designated superior and more important than any other, or consider itself as bearer of a single, true vision of the world. The possibilities and potential of the human being and the diverse ways of telling the world and life are not concentrated on a single cultural vision: «no culture, no philosophical *tópos*, can comprehend each and every possibility for mankind» (Estermann, 2008: 27). The breadth of interrogations that philosophical and epistemological questioning can comprehend largely exceeds modern rationality, «with its areas of light and shadow, its strengths and weaknesses» (Meneses, 2008, p.5).

Hence, the issue of modernity and the participation of non-European peoples in the movement of modernity raises some reflections. E. Dussel (1998) and W. Mignolo (2000) prefer to speak of trans-modernity to express the exteriority of the victims vis-à-vis the modern movement, the alternative provided by the victims as resistance. Santos (2006), in turn, prefers to call it alternative modernity. Whatever the concept to be adopted, there is the acknowledgement of other rationalities in the South, promoters of other epistemologies; they are silenced reasons that open up space for an epistemological pluralism capable of giving other senses to the world, life and education. Latin American and European authors committed with the South have worked other reasons considered to be subordinate by the dominating reason, and suggest other concepts with differentiated ontological densities which point to other epistemologies: *hybrid reason* (Canclini), *external reason* (Dussel), *border reason* and *liminar thinking* or *gnose* (Mignolo), *crossbred reason* (Darcy Ribeiro and Gruzinski), *in-between place* (Silviano Santiago), *silenced reason* (Boaventura Santos), *oppressed reason* (Freire), *denunciated reasons* (Eustáquio Romão).

From the unveiling of the hegemonic reasons bearing a kind of "epistemological myopia", one must recover other epistemologies with a view to building a new geopolitics of knowledge, from the acknowledgement of various types of knowledge and the plurality of their places of enunciation. The rescue of the epistemologies of the South may lead to a global alliance of *invisiblized* epistemologies and the persons and groups that are aware of their colonized situation and of coloniality: indigenous peoples, people of African descent, women and the elderly, "indignants", "occupy", "altermundists", etc. The vision of another possible world, of equity and global cognitive and social justice, and of a democratic radicality presupposes the ability to see the world in another way and a break with a violent epistemology that must be confronted with epistemologies of globalized solidarity.

A Citizen University in the 21st century

The future is a collective construction which takes into consideration the past and the present, but which also takes into account our aspirations, or our "viable unknowns", to use the phrase coined by Paulo Freire. The conceptions and challenges that were equated in the debates and workings of the RIAIPE network integrate this goal of influencing the construction of that future, the possibility of building a *citizen university*, where the ideals of equality, social justice and freedom are the guiding principles of all the changes and reforms to be adopted in this vast sector of higher education.

The approach to a radically democratic and citizen higher education gives rise to some important challenges in education policies and in university practices, which are briefly presented below, as an utopistics [3] (and not an agency orientated).

[3] "Utopias? Utopistics? Is this just a play on words? I do not think so. Utopia, as we know, is a word invented by Sir Thomas More, and it means literally "nowhere". […] What I mean by utopis-

Considering higher education as a public good for the construction of a fairer society. As prerequisite to the debate on the model of society and the relevance of higher education as social justice, it is upheld that this be considered a public good at the service of society and a right for all, a social good that explicitly seeks to educate free, autonomous and independent citizens, capable of making political, economic and social decisions aiming for a better and fairer development of society. The debate on this issue is not trivial, since if higher education is considered a service that is performed under a market rationale, the responsibilities that States and public powers must respond to will be different. As public good, higher education must be permanently subject to public scrutiny and citizen participation, so as to be able to respond to its economic, social, scientific and cultural purposes. To build a participative, inclusive, perfecting and renewing type of management, capable of responding both to local requirements and the global challenges of knowledge is a crucial challenge for universities in the 21st century.

Thinking universities and higher education outside the rationality imposed by neoliberalism. Neoliberalism was not just an economic doctrine. It is a whole new rationality (Laval & Dardot, 2010) based on the idea that the market is omniscient and that competition is the only human action generating innovation and progress; on this assumption, this new rationality has penetrated deeply in universities and in higher education policies. Locating the assumptions and consequences of this rationality and building other rationalities constitutes one of the missions of thinkers, scholars and political agents invested in overcoming one of the most dangerous periods in mankind's recent history.

Building the relevance of higher education based on social justice. Considering education as a public good, social justice becomes an ethical, political and legal imperative, which is implemented first and foremost in the field of social and educational policies and in the ethics of relations (Montané, 2013) and is directly linked with the social relevance of higher education and the adequacy of its functions. The reflection on this concept related with distribution, recognition and representation leads to the need to redefine its meaning, assigning it a dimension that lays the emphasis on development and social emancipation. The traditional vision, that quality in higher education depends on its relevance, must include, as relevant, the debate on its contribution to social justice, in its more radical view, which articulates the distributive view with recognition and cognitive justice.

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tics, a substitute word I have invented, is something rather different. Utopistics is the serious assessment of historical alternatives, the exercise of our judgment as to the substantive rationality of alternative possible historical systems. It is the sober, rational, and realistic evaluation of human social systems, the constraints on what they can be, and the zones open to human creativity. Not the face of the perfect (and inevitable) future, but the face of an alternative, credibly better, and historically possible (but far from certain) future. It is thus an exercise simultaneously in science, in politics, and in morality" (Wallerstein, 1998, p. 1-2).

Relevance of knowledge and empowerment. The definition of what is relevant knowledge is related to how this is understood: *a public good or a competitive advantage? A personal shared construction or a commodity acquired through the purchase of a service?* There is a vast bibliography, especially from international organizations such as the OECD or the World Bank, progressively transformed into think tanks, which build the new rationalities later transformed into common sense on the role of universities in the "knowledge economy". Alternatively, we propose the development of the ability to think the university as a community of practices, open to change and innovation, capable of including and allowing empowerment, or awareness (*conscientização*), if we favour Freire's concept, of a growing number of youth and adults who, without discrimination of gender, class or ethnicity, seeks and accesses university education. Little by little, the university has stopped being a space for "the chosen ones", where through violent meritocratic selection, the most violent and effective forms of reproduction of inequalities and symbolic violence, as Pierre Bourdieu so clearly showed us, hid (and continue to hide). The recognition of the importance of knowledge and the role of HEIs in its generation and socialization is an imperative of present times.

Revising the governance modes in universities. In the last decades we have witnessed in many countries profound changes in the governance modes of universities, taking as model and bringing it closer to business management modes. As a direct consequence of the application of new public management theories, the modes of collective participation (of professors, researchers, students) in the definition of scientific and training policies were considered to be ineffective and replaced by the concept and influence of stakeholders, by definition external to the university. Deans were then chosen like CEOs of companies and acted according to their standards of efficiency. In other countries, these changes were not implemented and the governance of universities went on being done according to the ancient modes of corporate domination, based on the decisive influence of professors and the student body organized in parties. The challenge presented is to think a ***citizen university***. Is there an alternative to this dilemma: either a university based on the corporate weight of its teaching staff and student body (those that are in), or a company-university, where the dominating criteria are those of efficiency and efficacy measured by its economic outputs?

How to combine competition and cooperation? The main regulation mode for the policies in these times of neoliberal competition is done, above all, by international (and national) comparisons established from large statistical studies. These are tests similar to PISA (its extension to higher education has been announced to happen in the near future), rankings of universities, schools, states and countries, "academic productivism". Quality and excellence, on the individual and institutional levels, have (almost) always been regarded as the result of competition systems and rarely (or never) of cooperation. Excellence is, in general, considered to be the opposite of massification. The question that needs asking is this: *is academic excellence possible in a mass-based, universal and radically democratic (higher) education?*

The regulation modes of higher education, and the role of the State, the market and the community. Recent trends indicate a withdrawal (sometimes apparent) of the State, assigning regulation to accreditation and assessment agencies presented as "independent", and to a presence, which is sometimes overwhelming, of the market in the regulation in public policies. Is it possible to have modes where the three regulation pillars (State, market, community) are in balance, particularly highlighting the community pillar, all but absent from the dominating regulation modes?

The internationalization of universities. In present times, it is the world class universities that act as hegemonic models of organization and of training. This being a little debated issue, it is important to analyse the consequences of the affirmation and dissemination of teaching and research models, especially to countries in the periphery or semi-periphery of the world system. The internationalization of the university activity must be seen as the university's response to *knowledge without borders*. To this end, it is stated that the organization of research networks and the mobility of teachers and students constitute the best response to the challenges and impacts of mundialization, restoring the possibility of a gnoseologic democracy and assuming *cosmopolitism* as a natural vocation and part of the university *ethos*.

Knowledge types and the dialogue between epistemologies. Scientific knowledge is not the only way of knowing. The radical divide between valid knowledge – science – and other types of knowledge, reduced to local, traditional, indigenous experiences, attributes to the former the universal monopoly in telling true from false, which has led to deep contradictions at the centre of the contemporary epistemic debates (Santos, Nunes & Meneses, 2004). The challenge faced is that of converting universities into cosmopolitan centres capable of building bridges between different cultures and types of knowledge in a process of epistemological decolonization.

Conclusion

We are living times of transition and times of fighting, of *crossroads*. In many ways, these times appear to be chaotic, but from them a "new order" will most likely arise. As stated by the American social scientist I. Wallerstein, talking about the structures of knowledge, a statement which can nevertheless be extended to all the forms of human action, *that order is not determined but determinable*: "we can only have *fortuna* if we seize it" (Wallerstein, 2003, p.123).

The set of analyses and proposals presented are part of that purpose of acting by "a new order", an *order* that has in *education for all* a tool of cohesion and social justice. And, since there cannot be social justice without cognitive justice, higher education plays a privileged role in this historic process of building fairer and more humane societies, "rounder and less edgy" societies, as Paulo Freire liked to put it.

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7

The evolution of Teacher Training in Mozambique and the contexts of its emergence

Ana Carita | Moisés Cau | Óscar Mofate | Rosa Serradas Duarte

Introduction

Mozambique became an independent country from the Portuguese colonial regime in 1975, after ten years of armed struggle led by FRELIMO. Its legacy was a country with poorly developed natural resources, serious problems regarding the population's sanitation and health, an extremely high illiteracy rate, very low qualification of human capital. There was a country to build, and this construction was willed within the framework of a socialist transformation of society. Despite the significance of the efforts and advances achieved, that construction was brutally hindered by a heavy civil war (1976-92), successive natural catastrophes, serious setbacks in the devised economic strategy. Apart from these difficulties, the exponential population growth encumbered the implementation of services capable of responding in such areas as health, education and population qualification, not only in the necessary numbers but also in quality. And this despite the fact that education, and therefore teacher recruitment and training, was considered one of the most powerful tools for the country's promotion and development.

This chapter aims to report on the teacher training strategies in the 1975-2014 period, highlighting the main landmarks of their evolution as well as their benefits and constraints, illuminating the geographic, economic, political and cultural contexts where they emerged, as well as the education system they are supposed to serve. To this effect, we resorted to documental research, based on bibliographic and empirical studies, legislation and official documents, and documents produced by international entities. It should be noted that there is little documentation and empirical research on some fields we would be interested in deepening, in particular information concerning the curricula of teacher training.

The chapter is organized in three sections: Geographical, Demographical, Social, Economic, Political and Cultural Context; Educational System; and Teacher Training. In the first section, the general context of training is analysed in its evolution along the dimensions stated in the heading. The second section is dedicated to describing and analysing the evolution of the formal education system, its goals and organization, population and challenges. The third section is dedicated to teacher training strategies, their evolution, objectives, access conditions, duration, institutions responsible for the programmes and challenges. The chapter ends with a concluding section, where the essential traits of the previous analyses are highlighted, and the increase in the number of teachers, the rise in their qualifications and the actual development of the teaching competencies are highlighted as the main challenges of teacher training.

Geographic, Demographic, Social, Economic, Political and Cultural Context

Mozambique, with an area of 799,380 km^2, is located on the eastern coast of Southern Africa, benefiting from a geostrategic location which, reinforced by major rail and port infrastructures along the coast, gives it a privileged position in freight distribution to and from the hinterland countries, to the west (Maloa, 2016). In administrative terms, the country is divided into eleven provinces, districts, administrative posts, towns and villages (Constitution of the Republic of Mozambique/CRM, 2004).

The country has a predominantly tropical climate, with two main seasons: summer, which is hot, wet and rainy, and winter, usually dry and cold. Mozambique is vulnerable to natural disasters, namely floods, cyclones and droughts, resulting from climate changes and its geography (Cunguara & Garrett, 2011).

Three types of relief can be identified: (1) planes, on the coast, with altitudes up to 200 metres, which take up about 44% of the land, (2) low plateaus, which range from 200 to 1,000 metres of altitude and take up 51% of the land, and (3) high plateaus and mountains, with altitudes over 1,000 metres, covering only about 5% of the land (Cumbe, 2007). In these regions, various types of vegetation grow, especially forest, coastal undergrowth, miombo woodland, acacia and shrub land, palm tree and acacia savannah, mangrove forests (Sitoe, Macandza, Remane & Mamugy, 2015).

The population currently inhabiting Mozambique is heterogeneous, multicultural and multi-ethnic, resulting mainly from the migratory flow from the area of the great lakes, which began in the 3rd and 4th centuries. Some of these groups came to the region which is now Mozambique in several periods and using various points of entry, thus beginning a long settlement process. From the 9th century, peoples from the Persian Gulf also began to establish themselves along the coast (Kok, 2012; Serra, 2000). The Portuguese population is present, too, but less than might be supposed, since the Portuguese penetration in the ter-

ritory, albeit initiated in the 15th century, would only intensify in the late 19th century, following the military and administrative occupation.

As regards the growth stages of these populations throughout time, there is a shortage of statistical data, a situation that prevailed until the 1940 census, the first survey with reliable data, and the 1950 census were conducted (Arnaldo & Muanamoha, 2014). The latter, the first to include data on education, registered 5,738,911 inhabitants, of which 5,615,053 were considered illiterate (Castiano, Ngoenha & Berthoud, 2005).

During the three decades after the 1950 census, the population of Mozambique doubled, coming to 10 million inhabitants in 1970 (Tsandzana, 2010; Langa, 2010). The continuous population growth has been maintained in the subsequent decades to the present time: in 2007, year of the latest census, the population had increased to about 21 million (Tsandzana, 2010; Langa, 2010; National Statistical Institute / INE, 2012).

Bearing in mind this growth rate, the number of inhabitants projected by the INE for 2014 was 24 million. Thus, the population growth rate in Mozambique is among the highest in the world, at a pace of about 2.5% per year. The following are important factors for that growth: (1) high fertility rate; (2) decrease in mortality rates, especially under-five, which dropped from 201 per 1,000 live births in 1997, to 138 per 1,000 in 2007, and 64 per 1,000 in 2011; (3) low educational level and (4) low use of family planning services (Ministry of Planning and Development/MPD, 2010; INE, 2012).

The population of Mozambique is characterized as predominantly young (50%) and mostly feminine (51,87%), and lives for the most part in rural areas: 70%, against 40% in urban areas (Tsandzana, 2010; Langa, 2010; INE, 2012).

The distribution of the population in the territory shows strong concentration in the provinces of Zambezia and Nampula, in each of which around 38% of the population lived between 1997 and 2007; the remainder was distributed rather uniformly among the remaining eight provinces. In the same period, the growth in population per province varied unevenly; special reference should be made to the provinces of Niassa, Tete and Maputo, with growth rates of over 50%, due to migrations both from other provinces and from other countries. Despite this increase in the Maputo province, the population of the city of Maputo, the country's capital, rose only slightly, since a large part of the migration went to the suburbs; at present about 5.4% of the country's total population is concentrated in this city (Tsandzana, 2010; Langa, 2010).

The progressive growth of the population was followed by the emergence and worsening of various social problems, prominent among which poverty, a condition that affects most of the population (MPD, 2006). Mozambique continues to have high poverty rates, despite governmental efforts, which nonetheless have managed to decrease the section of the population living in extreme poverty (under 1.25 US$ per day) from 81% in 1996-97, to 60% in 2008 (Fox et al., 2012). Besides demography, the following are also important poverty factors: the constraints on available resources, the low productivity of family farming, the working-age population's low level of education and the poor infrastructural

development (MPD, 2001; MPD, 2006). Moreover, natural disasters, which have afflicted the country in several regions year after year, have resulted in displacement as well as resettlement problems of the affected populations, contributing to the increase in the hunger and malnutrition rates (MPD, 2006).

Hand in hand with poverty, the country faces a number of serious social problems, as is the case of AIDS: Mozambique has the 8th highest prevalence rate in the world, with about 11.5% of the population aged between 15 and 45 years HIV-positive (UNICEF, 2011). The spread of the disease is associated with poverty, local cultural practices, and the migratory flows that occur in the border regions with neighbouring countries.

In sociocultural terms, it must be pointed out that, as a result of its historic relation with Portugal, Mozambique is a Portuguese-speaking country and the only such nation in the whole of the African eastern coast (Constitution of the Republic of Mozambique/CRPM, 1975). Still, the country has several ethnolinguistic communities, the result of a long process of cultural crossings and transformations, which includes both the cultures of the first Bantu peoples, and the cultures brought by consecutive invasions before the Portuguese colonization (Kok, 2012). This reality gives the country a considerable linguistic diversity, which at the same time represents one of its main cultural assets, as well as a challenge to the full inclusion of all populations, especially in the field of education. A consequence of this linguistic diversity, as well as of the foreign influence, is that the languages spoken in Mozambique are divided into two main groups: (1) the indigenous languages, of Bantu-origin, in particular Macua, Tsonga, Sena, Lomwe, Shona, Tswa, Shuabo, Ronga, Marenje, among others; and (2) the group of languages of foreign origin, in particular Portuguese, spoken only by about 25% of the population, English and French. We should conclude by pointing out that, notwithstanding the fact that the official language is Portuguese, the mother tongue of about 85% of the population is one of the Bantu languages (Weglarz, 2010).

From an economic perspective, at present Mozambique is undergoing crucial changes resulting from the discovery and exploration of natural resources, especially minerals, which represent an opportunity to make the national economy stronger and more competitive. Despite regional conflicts, devastating floods and world fluctuations in the price of the main goods, in the past decade Mozambique has made remarkable advancements regarding its growth, stabilization and reform (USAID, 2004). Thus, between 1995 and 2012, the country registered one of the highest average annual economic growth rates of GDP in the world (8.1%), (INE, 2013a; END, 2014), a phenomenon also associated with such factors as the increase in national and foreign investment, access to funding, technology transfer, and gains from the investment in education and in infrastructures (USAID, 2004). More specifically, in the period from 2003 to 2012, the economy proved to be more robust and resistant to external and internal blows, and therefore the county has continued to present high stable economic growth, with an average inflation rate of 7.1%, and an average real GDP growth

rate of about 7.0% a year. In 2012, real GDP rose by 7.2% and *per capita* GDP by 608.1 USD (Report of the Bank of Mozambique/RBM, 2012; INE, 2013a).

This macroeconomic stability has fostered the relaunch of the country's economic and social development, indicated by the state budget for Education. Thus, in 2015, as in 2013 and 2014, the state budget for Education represented 18.6% do total state budget. Basic education was the privileged sector, budget-wise, as had also happened in previous years (UNICEF, 2015). However, despite that expressive percentage, incidentally higher than that of many other African countries, Mozambique still displays lower levels of expenditure per student and a poorer performance regarding completion of basic and secondary education, when compared with the average rates of sub-Saharan Africa (UNICEF, 2015).

Vis-à-vis its economic base, Mozambique is a fundamentally agricultural country: 45% of the territory has the potential for agriculture and 70% of the population live in a rural environment, the majority having agriculture as their base for subsistence (PNUD, 2014; INE, 2013). Also, the GDP shows that agriculture is the sector that contributes the most to domestic production, with an average participation of 23.3%, in the period from 2003 to 2012 (RBM, 2012; END, 2014). Nevertheless, the country is rich in natural resources, some still in research stage and others at the start of exploration, especially natural gas and coal. Hence the investment in industrialization as a factor of prosperity and competitiveness, framed by an inclusive and sustainable development model, and backed by natural assets (END, 2014).

The distribution of national wealth is ensured by the state, based on the recognition and appreciation of the role of the productive zones (CRM, 2004). Still, despite the improvements found, the challenges of the fight against poverty persist.

On the one hand, the population's poverty rate decreased from 69.4% in 1997 to 54.1% in 2002-2003, combined with the adoption of policies and actions to reduce poverty and regional asymmetries. We should highlight the improvement in basic welfare services and the increase in business initiatives that contribute to more production and employment (Agenda/2025, 2003; USAID, 2004).

Yet, on the other hand, the growth of the Human Development Index by about 23.6% in the period between 1999 and 2000 was not enough to change the setting of shortcomings in basic needs for a considerable part of the population. The situation remains critical: almost 10 million Mozambicans, from a population of 20,632,434, live in poverty, with problems of food insecurity, low income, and unemployment. Mozambique continues to hold a place in the list of the poorest countries in the world (USAID, 2004; INE, 2013a).

Another element that characterizes the economic climate lies in the fluctuations that the Metical, Mozambique's currency, has known, particularly since 1998, when it was depreciated by between 15% and 20% in real terms, against the US Dollar and the Rand. On the one hand, currency fluctuations, and, in particular, depreciation, are understood as causes for concern; on the other hand, depreciation helped attract foreign investment for megaprojects, and improved

the competitive position of Mozambican products. Those projects have contributed to increase exports very quickly, as was the case of aluminium, coal and gas, and have introduced advanced technologies, management, training and a more qualified workforce in the country (USAID, 2004).

Regarding the political system, four important periods can be identified. The precolonial period, dominated by the existence of various reigns and empires, governed on the basis of customary law and traditions, some of which coexisted with the exercise of colonial power. The colonial period, lasting five centuries (1498-1974), characterized by the presence of the Portuguese colonial authority, particularly from the end of the 19th century, which imposed repressive and discriminatory legislation and power. Among the natives, customary law was maintained within the limits defined by power (Agenda/2025, 2003; Castiano et al., 2005; Serra et al., 2000). Resistance to colonial power flared up in the last years of the regime, with the onset of the liberation war, which broke out in 1962 incited by the Mozambique Liberation Front (FRELIMO), led by Eduardo Mondlane, followed, after his assassination (1969), by Samora Machel (Agenda/2025, 2003; Vieira, 2006).

The post-independence period began with the proclamation of the National Independence in June 1975, as a result of the liberation war. It ended in 1974 following the Carnation Revolution which took place in Portugal, and which contributed positively to the final denouement of the liberation process (Agenda/2025, 2003; FIDH, 2004; Vieira, 2006). When it took over the country's destiny, FRELIMO adopted a Marxist-Leninist one-party political regime. This orientation met with the opposition of some sectors of the population, and this resulted in the constitution of the Mozambican National Resistance (RENAMO) (Agenda/2025, 2003; FIDH, 2004). In the same context, severe tensions sparked off with South Africa and Rhodesia, countries with different orientations. A brutal civil war then broke out in Mozambique: the health and education systems collapsed, agricultural production and various infrastructures were destroyed, thousands of civilians were massacred (FIDH, 2004).

Finally, the forth historic period responds to Mozambique's need to overcome the long-standing social and economic crisis and achieve peace. It is marked by several facts, more notably, at the beginning: Mozambique joining the Bretton Woods institutions in 1984; the start of macroeconomic reforms aiming at stabilizing the economy in 1987; Frelimo, now a political party, abandoning Marxism-Leninism (FIDH, 2004; Castiano et al, 2005); and the approval of a new Constitution of the Republic in 1990 (Agenda/2025, 2003; Castiano et al., 2005).

The new constitutional framework (CRM-90) defines Mozambique as an independent, sovereign, democratic, welfare state, based on pluralism of expression and party organization as well as the respect for and guarantee of the fundamental rights and liberties of citizens. The state is subject to the Constitution and is founded on legality; the people can choose their representatives by direct, equal, secret and periodic ballot. From the point of view of political organization, the system is characterized as representative democratic, it is based on the separation of powers and adopts as sovereign organs, besides the President of

the Republic, also the head of government, the Assembly of the Republic, the Government, the Courts and the Constitutional Council. The unity, indivisibility and inalienability of the territory are strong constitutional determinations, as well as the identitarian appreciation of the country's linguistic diversity. Regarding foreign policy, Mozambique is defined as a non-aligned state, with an independent foreign policy, favouring peace policies and negotiated solutions in conflict regulation. In the same vein, the country pledges to honour the United Nations Charter and the African Unity Charter (CRM-90).

The CRM-90, besides introducing party plurality in the political system, also brought important changes to the economic life, defining a legal framework for the market economy (Agenda/2025, 2003; Castiano et al., 2005). This situation, combined with the political stability resulting from the end of the civil war in 1992, sixteen years after it began, and the multi-party general elections of 1994, allowed the country to know considerable improvement in the growth rates, stimulated by domestic and foreign investment, as well as by the assistance of the international community (Agenda/2025, 2003; FIDH, 2004; Vieira, 2006).

In any case, internally, the electoral processes continued to be afflicted by strong conflict, with claims of voter fraud submitted by the opposition parties, especially by RENAMO (Vieira, 2006), which, nonetheless, assured parliamentary representation, besides ruling, at local level, five municipalities in the central and northern regions of the country.

According to the CRM-90, Mozambique is also defined as a secular state, based on the separation between the state and the religious denominations. Individuals are ensured freedom of conscience, religion and worship, and religious denominations have the liberty to organize and carry out their functions, within the framework of the state laws. The state, in turn, has the responsibility to ensure and guarantee the protection of the places of worship.

The religious denominations have played an important role in the socialization of the citizens, through initiatives of various scopes and natures. Hence the government considers religious denominations to be important interlocutors when it comes to designing national development strategies (END, 2014).

Concerning the distribution of the main religious creeds, approximately one third of the total number of believers in the country is Catholic (28.4%); the second position is occupied by the Islamic religion (17.9%) and the third by the Zion/Sion religion (15.5%). It should be noted that 18.7% of the population has stated that they do not adhere to any religion or faith (INE, 2013a). Despite this religious diversity, the various communities have coexisted peacefully, which reflects the country's assumption of cultural diversity as its inalienable heritage.

The Education System

The development of a formal education system only intensified in the first half of the 20th century with the publication of its legal framework, with special reference to Law No. 238 of May 17, 1930. It establishes the organization of the

native education system into rudimentary, professional and normal basic education, giving it the task of preparing future rural workers and skilled workers, and of moralizing the natives, in other words, of «gradually elevating the native population of the overseas provinces from the wild life to the civilized life of the learned peoples». Rudimentary basic education was intended to "civilize and nationalize the colony's native peoples, disseminating among them the Portuguese language and customs" (Castiano et al., 2005, p.19) and was structured in three classes. This level of education was later redefined successively as Adaptation Education and Pre-Primary Education, by the Ministerial Order No. 15.971 of 1962, and by the Decree No. 45.908 of 1964, respectively (Castiano et al., 2005; Rocha, Hedges, Liesegang & Chilundo, 1993). The mission of professional education was to "prepare the natives of both genders, over ten years of age, to acquire honestly the means to maintain civilized life and contribute to the advancement of the colony" (Castiano et al., 2005, p.19); it was taught in Arts and Crafts Schools, for boys, and in Professional Schools, for native girls. Normal education was meant to train native teachers for Rudimentary Schools.

The intervention of the Portuguese state in the working of this education system was mediated by Catholic missions, to which it entrusted the direct responsibility for running it, generally in rural areas (Missionary Agreement Holy See-Portugal, 7th May, 1940).

Alongside native education, from the first quarter of the 20th century the Colonial Official Education had already been implemented in Mozambique, aimed at populations from the mainland and, later, to the assimilated. This system was taught in urban areas, it followed closely the mainland's education system, in its structure and curricula, and was organized into Basic Education, High School Education, and Technical Vocational Education; it was the only one, in fact, to allow the subsequent access to Higher Education (Castiano et al., 2005). As regards higher education, from 1963/64 the General and University Studies existed in the capital, extensions of the Portuguese university, where degrees in medicine, engineering, veterinarian medicine, agronomy and pedagogical sciences were taught.

In short, the existence of two modalities of education, native and official, is a clear demonstration of the policy of discrimination and colonial domination of which the education system was a tool, a situation that remained in place until the independence.

Even so, in the 1960s, the Portuguese colonial regime's isolation in the international community, the shortage of labour and qualified staff, as well as the regime's need to respond to the intensification of the liberation struggle, forced it to make some adjustments to the education system (Rodrigues, 2007, cited by Matavele, 2015; Mazula, 1995).

In any case, the considerable discrimination persisted to such an extent that, for instance, in 1966/67, from a population of 444,983 educated Africans, 439,979, in other words 98.9%, only attended primary school; and on the same date black people represented only 1.1% of students in secondary education (Gasperin, 1989). According to the 1970 census, the last carried out by the colonial regime, at

the time there were 89.7% of illiterate people, with only 16.8% of the population enrolled in Primary Education and 0.23% in Secondary Education. And in 1973, the University of Lourenço Marques, the only one in this colony, was attended by 3,000 students, of which 40 were black (Mazula, 1995; Goméz, 1999). This is a very heavy legacy to overcome!

At the same time, during the armed struggle, the resistance developed innovative education experiments in the liberated areas, particularly at the level of primary education. The creation of these schools, alongside literacy and adult education, were core concerns of FRELIMO whenever it liberated a new part of the country. In these schools, those who had studied taught those who had not had that chance, on a creative basis, not bound to the belief in restrictive universal pedagogic principles: "The main indication of method that the Front derived from dialectical materialism was that of deducing the demand of connecting study and work from the same contradictions of the social production of its time" (Gasperini, 1989, p. 26). In turn, teaching the FRELIMO fighters at secondary-education level was carried out in the schools of countries that supported this movement, and also at the Mozambican Institute, in Tanzania, founded in 1963 (Gasperini, 1989).

It was probably upon the basis of these two processes, action from the regime and action from the resistance, that the education system was shaped throughout the past 41 years, since the end of the Portuguese colonialism in 1975. Besides, the experience that the education sector lived in the year immediately following the end of the colonial regime also left a very strong mark in the education system. In that period, despite all the efforts made, it proved hard both to reformulate the system in accordance with the new political orientations and to implement a school network which would in fact enable compulsory education and train the *cadres* necessary to form the new state. Not only the deterioration of the economic situation and of the relation with the neighbouring countries, but also war and drought hindered the enactment of the defined guidelines.

In 1983, as a response to this situation, Law 4/83 of March 23rd was approved, creating the National Education Service (NES): education was set at the centre of the government's priorities, leading to a process of intense structural change in the sector, within the context of the construction of the Socialist State (Basílio, 2010; MINED, 2012a).

Thus, the process of creating and implementing Mozambique's NES began, and had two distinct moments. The first starts with the passing of Law 4/83 and takes place in a context of construction of the Socialist State: education is planned and controlled by the state, and its main role is to train the new man who, besides freeing himself from obscurantism, should take on the values of the socialist society, namely a strong appreciation of national unity, love for the motherland, a fondness for studying. The following strategic objectives of the NES should be highlighted: to eradicate illiteracy; to achieve universal and compulsory schooling to the first seven grades; and to intensify the technical training of the *cadres* needed for the state apparatus and for the major economic projects, ba-

sed on an equally new and socialist pedagogy (Castiano et al., 2005; Law 4/83). This law articulates the NES in five subsystems: General Education, Adult Education, Technical and Vocational Education, Teacher Training, and Higher Education.

The second period of the implementation of the NES began in 1992, with the reformulation of Law 4/83, which culminated with the passing of Law 6/92 of May 6th. So as to adapt the education system, both pedagogically and organizationally, to the country's new social, economic and political conditions, the Mozambican government reformulated some of the foundations of the previous system (Castiano et al., 2005). Thus, although the state remained at the forefront of the educational process, the new law opened the sector to the participation of communities, cooperatives, companies and other non-governmental organizations. Concerning objectives, the present NES keeps and broadens the objectives previously attributed to education, as it aims to, among other, (1) eradicate illiteracy, (2) ensure basic education to all citizens, in accordance with the development of the country and through the progressive introduction of compulsory schooling, (3) ensure that all Mozambicans have access to technical vocational training, (4) train citizens with a solid scientific, technical, cultural and physical preparation, as well as high moral civic and patriotic education, (5) train the teacher as self-aware educator and professional, with a solid scientific and pedagogic preparation, capable of educating youths and adults.

About the organization of education, Law 6/92 establishes three subsystems: pre-school education, which takes place in nurseries and kindergartens for children under the age of six; school education, constituted by general education, technical vocational education, and higher education; and the extra school education, which comprehends activities in the areas of literacy, as well as cultural and scientific improvement and refresher activities (Law 6/92; Uaciquete, 2010).

General education is the main axis of the NES, and it is organized in two cycles: primary education and secondary education. The mission of Primary Education (PE), of free and compulsory attendance, is to prepare students to access secondary education, and its objectives are (1) to provide basic training in the areas of communication, life and social sciences, as well as physical, aesthetic and cultural education; (2) to impart knowledge of basic techniques; and (3) to ensure basic personality training. This level is organized in two stages: the first, from the 1st to the 5th grades, for children from 6 to 10 years old; the second, comprehending the 6th and 7th grades, for children of 11 and 12 years of age. The mission of General Secondary Education (GSE) is to consolidate, broaden and deepen the knowledge acquired in the previous stage. It is organized in two cycles: the first (GSE1), from the 8th to the 10th grade, for children from 13 to 15 years old; the second (GSE2), formed by the 11th and 12th grades, for 16- and 17-year-old youths. Completing each of the cycles awards a corresponding certificate (Law 6/92; MINED, 2012a).

Technical Vocation Education (TVE) aims to ensure the technical, integral training of school-age youths. It is organized in elementary, basic and intermediate education. Access to each one of these three levels is articulated with the

output of general education. Their mission is to train *cadres* for the economic and social sectors, in successive levels of professional qualification and certification, in conjunction with the levels of organization of those sectors of society (Law 6/92). At present, TVE is being reformed, focusing on the introduction of a modular system and the development of curricula that foster the participation of various actors, especially the manufacturing sector (MINED, 2012a).

The school education also contemplates Higher Education (HE), which is aimed at students that have completed the 12th grade. Its mission is to train technical and specialized *cadres* at the highest level, in the various fields of knowledge necessary to the development of the country. Upon completion, the following degrees are awarded, depending on the level achieved: *bacharel*, *licenciado* [1], master and doctorate. At present, state and private HE covers all the provinces of the country: in 2010, the former had about 76,000 students enrolled in 17 institutions, and the latter about 28,000 students enrolled in 19 institutions (MINED, 2012a; MINED, 2012b). The number of HE graduates has been rising in the past years: for example, in 2004, 2,878 students graduated and in 2010 the number was 8,600, which corresponds to an increase by 259% (MINED, 2012a).

Analysing the situation of the system at present and from the point of view of its population, it should be noted that in the past five years, the NES annually enrolled about 1,200,000 new students in the first academic year. In total, the headcount in basic education came to about 5,500,000 students in 2013, and 5,705,343, in 2014 (MINED, 2012a; MINED, 2012c; MINED 2013, MINED, 2014). Table 1 shows the global figures for students enrolled in basic and secondary state education, including day and night courses, in the period from 2010 to 2013.

Table 1 highlights the exponential increase in enrolled students, putting pressure on all levels of the system, especially on GSE, which was proving increasingly incapable of absorbing PE graduates (MINED, 2009): the table shows that EP enrolled students, potential candidates of GSE, are about seven times more in number than the students enrolled in that cycle. It can also be noted that, in under five years, the GSE, pressured by the growth of PE, nearly doubled its headcount, from 300,000 students in 2007, to 563,352 in 2010, coming to 854,567 students 2011, 855,180 in 2012 and 864,160 in 2013.

The boom in the school population in the last two decades, both at EP and at GSE levels, reflected alarmingly in the rise of the student-teacher and the student-class ratios. For instance, at GSE level, the student-teacher ratio reported in 2007, per province, varied between 56:1 and 70:1 in GSE1, and 51:1 and 85:1 in GSE2. In a more recent period, between 2010 and 2013, the trend towards higher student-teacher ratios continued and, in some regions, it even worsened (Mofate

[1] In Portugal, prior to the adoption of the Bologna Declaration, *bacharel* was the title awarded to the first higher education degree (*Bacharelato*) by Polytechnic Institutions after a three-year programme; *licenciado* was the title of awarded to the honours degree (Licenciatura) by Universities after a four- to six-year programme, or a *Bacharelato* complemented with two extra years in a Polytechnic (dual-stage *licenciatura*).

and Carita, 2015). At PE level, in this same period, the student-class ratio was on average 52, and the student-teacher ratio was on average 56.

Table 1

Students enrolled in state schools in Mozambique, 2010-2013 (day and night courses)

	Primary Education				General Secondary Education 1st and 2nd Cycles			
Year	Total Students	Total Teachers	SCR	STR	Total Students	Total Teachers	SCR	STR
2010	5,189,601	***	51	***	563,352	***	63	***
2011	5,225,994	92,163	53	57	854,567	14,593	89	59
2012	5,326,255	95,188	52	56	855,180	16,087	83	53
2013	5,475,691	98,554	52	56	864,160	17,814	79	49

*SCR – Student-Class Ratio; STR – Student-Teacher Ratio; *** – No data available.*

Mofate and Carita (2015), with recourse to the annual statistics of the Ministry of Education (2010-2013).

A similar expansion did not take place in TVE, which has grown more slowly when compared with general education. For example, in 2014, there were 47 institutions of TVE with about 46,000 students enrolled in the various levels and courses, versus 17,483 general education institutions, taking in about six million students (MINED, 2012a; MINED, 2014).

To explain the slow growth of TVE, several factors can be presented such as (1) high costs per student, (2) lack of qualified teachers, (3) insufficient funds for the necessary working conditions (MEC, 2006). Still, despite this slow progress, it should be pointed out that the number of students in agricultural, industrial and business courses evolved positively in the last decade, going from 32,000 in 2004 to 45,000 in 2011 (MINED, 2012a).

Besides the characterization aspects that we have been highlighting, two other features that compromise the system's fairness and efficacy should be pointed out: the school drop-out and school failure rates.

The NES shows alarming levels of drop-out rates. According to official data, in 2010, it was estimated that the average drop-out rate had risen to figures above 10% in PE. In 2011 drop-out rates of 14%, in the 5th grade, and 13% in the 7th grade were reported, and they tended to rise (MINED, 2012a). In the case of GSE1 and GSE2, in the same year, drop-out rates of 8% and 31.4%, respectively, were reported. In the Strategic Plan for Education and Culture/2006, it is considered that several factors contribute to drop-outs, a phenomenon which affects especially girls, namely (1) poverty, (2) hunger, (3) long distances between home and school, and (4) aspects of a sociocultural nature, specifically, early marriages, parents' education, and initiation rites (MEC, 2006).

In 2013, for example, the system showed equally alarming school drop-out rates, as can be deduced from the success rates reported by the INE (2013b),

based on the 2012/13 school survey carried out by MINED. Thus, in PE1 83.7% of students succeeded; in PE2, 77.6%; in GSE1, 66.3%; and in GSE2, 74.2%. The system identified as factors that contributed to failure: (1) lack of infrastructures, insufficient in quality and quantity; (2) lack of laboratories, (3) financial inadequacy to meet the needs of the sector; and (4) teacher absenteeism (MEC, 2006; MINED, 2012a).

To conclude, the development of public education since the post-independence period resulted in substantial advances towards equality in access to education, with special reference to: (1) the decrease in illiteracy rates from about 93% in 1975 to 48% in 2008; (2) the increase in primary education enrolment rate, which went from 44% in 1997 to 77.1% in 2008; and, (3) the increase in the proportion of girls in primary education, from 33% after the independence to 47.2% in 2009 (AfriMAP, 2012; MEC, 2006). We can say that significant steps were taken towards the fulfilment of the strategic constitutional goals assigned to the NES, regarding the eradication of illiteracy, universal and free schooling to the first seven grades, and the intensification of technical training of *cadres* for the state apparatus and for the major economic projects.

Still, despite the reinforcement of equalitarian justice in the field of education, apparent in the advances mentioned above, the sector faces countless challenges. Special reference must be made, first and foremost, to the progressive population growth and the consequent rise in educational demand. This fair demand, together with a shortage of structures, equipment and teachers, both in number and quality, and on a national scale, make the situation extremely difficult, presenting a substantial challenge to consistent investment in these fronts (Mofate & Carita, 2015).

Equally important challenges for the NES are the development of integrated educational and social programmes, aiming at preventing school drop-out and school failure at all levels, as well as the expansion of TVE as qualifying response for youth, capable of contributing to reduce poverty and increase employment opportunities (MINED, 2012a). The full satisfaction of these challenges can only be achieved, and must be achieved, in synergy with the country's economic and cultural development.

Teacher training

In this section, we intend to describe and analyse how teacher training began and evolved in Mozambique, the challenges it faced along the way, taking as reference three distinct periods of the history of education in this country: the colonial period, the 1975-1982 period, and the period after the creation of the National Education System, with Law 4/83, between 1983-2014 (Matavele, 2015).

As we have seen, in the 19th century the colonial regime created, and maintained up to the country's independence, two different education systems: one aimed at the majority of the population, the black native population, run by missions (Missionary Statute, art. 66º of April 5th, 1941); and the other, reserved for

the white population and the assimilated, entrusted to state and private institutions (Preamble of Law 4/83; Castiano et al., 2005). To respond to these two education systems, largely lacking in qualified teachers, two corresponding teacher training systems were instituted in 1926, associated with two types of schools (Madeira, 2010, cited by Matavele, 2015): the Qualification Schools for Native Teachers (QSNT) and the Primary Education Schools (PES), the former aimed at training teachers for native education; the latter intended to train teachers for schools for the white population and the assimilated (Decree 312, of May, 1st, 1926, cited by Guro, 1999).

The QSNTs were only regulated in 1930, when the legal framework of teacher training for the rudimentary basic education of natives was established, determining curriculum, duration (3 years), profile of applicants, and certification (preparatory cycle, equivalent to a 6th grade), among other elements. Thus, the native people of this colony could apply to this training course provided they met the following criteria: "16 years of age or older; good civic behaviour; basic education exam and entrance exam; exemption from diseases or physical deficiencies not compatible with the profession" (Education Yearbook of the May 1st, 1930, cited by Mudiue, 1999). Also in 1930 the first QSNT was created, in Alvor, Manhiça. From 1941 onwards, these schools were handed to the Catholic Church (Decree 4469, of August 13th, 1941), and the missions were charged with running and implementing the whole training process, including candidate selection, subject to superior approval (Guro, 1999; Niquice, 2005; Castiano et al, 2005).

Starting in 1964, the Schools for Station Teacher Qualification (SSTQ) were also established, to train teachers for the rudimentary native education in rural areas. Eleven schools were created, one per district, and the trainers were missionaries recruted through the submission of adequate qualifications for the subjects that were supposed to teach. This training had a four-year duration and awarded a degree equivalent to the 2nd year of the preparatory cycle (Mudiue, 1999; Niquice, 2005).

For the official basic education, PTSs were created during the 1960s and beginning of the 1970s in the district capitals, modelled closely on their counterparts in the metropole, which admitted as applicants Europeans or assimilated, with a 5th grade qualification (Guro, 1999; Niquice, 2005).

In the meantime, the teacher training system suffered the influence of the policies of school expansion and improvement of the teaching conditions which take place from the 1960s onwards, as a result of international pressures and recommendations on the colonial regime and its need for qualified staff. Also, the progression of the liberation war favoured the elimination of some barriers which prevent the natives from accessing education, namely qualified education (Rodrigues, 2007). And thus, to respond to the growth of school enrollments, the teacher training system for basic education was adjusted, and from then on contemplated three types of basic school teachers: (1) monitor, with low professional training – three months of pedagogic training, after completing basic education, aimed at teaching in missionary schools; (2) station teachers, trained at the

SSTQs, aimed at teaching in schools of the school station, rural areas and urban peripheries; and (3) the teachers whose training was carried out at the PTS, where they obtained a qualification corresponding to middle level, and who were aimed at teaching European children and the children of the assimilated in basic schools, both state-run and private (Robate, 2006).

At the same time, in the last years of the colonial regime, in the areas liberated by FRELIMO, access to schooling was seriously lacking in teachers. Hence, it was assumed that education should be everyone's task and, in particular, of all who had obtained their education in the country's schools. They could attend short-range teacher training courses, six months in duration, the curriculum of which included, besides basic academic schooling, training in teaching methodologies, pedagogy and psychology. Teachers in service continued their professional development within the context of school districts, known as ZIPs, where they participated in seminars, and, cooperatively, planned their work and produced their pedagogic resources (Robate, 2006).

Considering now the second period in the country's history of education (1975-1982), we should highlight that, in the first years of the independence, there were, in the whole country, only about 10,300 teachers working in basic education, and about 1,800 in secondary education. From these teachers, around 10,000 had the status of monitors, in other words, they had the lowest professional qualification, or maybe even none at all (Castiano et al., 2005). Thus, with few underqualified teachers, the training and recruitment of new teachers was a crucial challenge for the new regime after the independence.

The identification of this situation, the quick intensification of the school demand and consequent exponential growth of school enrolments, especially in basic education, and also the exodus of a substantial part of Portuguese teachers, all this led the new regime to broaden the teacher recruitment base pool, through the militant drafting of young students (an initiative known as the «8th March Generation») and of all individuals with the minimum requirements for teaching, and to adopt expedite measures to retrain existing teachers as well as train new ones, first and foremost for basic education, on a national scale.

Thus, a Basic Education Teacher Training Centre (BETTC) was created in every province. Candidates with the 4th grade could access the training provided there. At the same time, until 1977, ten Schools for Training and Educating Basic Education Teachers (STEBET) for the 5th and 6th grades of that study cycle were created (Table 2). The curriculum of both institutions, taught by retrained teachers who had graduated from the old PTSs and SSTQs, laid strong emphasis on political-ideological as well as on didactic-pedagogic aspects. Courses were distinct in the form of access and duration: application to the former was made with the 4th grade and the course lasted one year; the requirements to access the latter were 9th grade schooling or teaching experience, in the case of working teachers, and course lasted seven and four months, respectively (Guro, 1999; Goméz, 1999; Matavele, 2002; Castiano et al., 2005). From 1977 onwards, secondary school teachers, in turn, were trained at the Faculty of Education of the Eduardo Mondlane University (EMU). The recruitment base started at the 9th grade, for

the 7th to 9th grades, and at the 11th grade, for the 10th and 11th grades, in two-year training courses, which awarded a middle-level degree, to the former, and a *bacharel* degree, to the latter (Matavele, 2015) (Table 2).

The support to initial training, namely for the many teachers with no pedagogic training that slowly accessed the education system, was ensured by specially-created pedagogic structures: the school clusters, known as ZIPs, for basic education teachers, and the Pedagogic Support Commissions, for secondary education teachers (Matavele, 2002).

Table 2
Teacher Training in the period immediately after the independence (1975/1977)

Goal	Place	Access	Duration
Primary Education	Training Centres for Primary Education Teachers (one in each Province)	4th grade	1 year
Primary Education 5th and 6th grades	Training and Education Schools for Primary Teachers	9th grade Retraining	4 to 7 months
Secondary Education Teachers (from 1977): 7th to 9th grade	Eduardo Mondlane University (EMU)/Faculty of Education	9th grade	2 years (middle-level degree)
Secondary Education Teachers (from 1977): 10th and 11th grades	Eduardo Mondlane University (EMU)/Faculty of Education	11th grade	2 years (*bacharelato*)

After this emergency stage in training and recruitment, it was urgent to reorganize the process of teacher training on a different basis, stressing not only the increase in their numbers, but also the elevation of recruitment conditions and training quality, which were becoming rather insufficient. Thus, the qualification requirements in the access to some training levels were raised according to the education levels they were aimed at, as well as the nature of the institutions responsible for training, as specified in Table 3 (Castiano et al., 2005).

Finally, in the period from 1983 to 2014, which began with the passing of Lei 4/83, creating the new NES, an attempt was made to organize the very disperse and unstable teacher training system. That law defined teacher training as a subsystem of the NES which, besides ensuring the pedagogic, methodological, scientific and technical qualification of teachers for all education subsystems, should adopt a deeply ideological nature, in accordance with the socialist state principles, providing integral training to the teachers. The same law defined initial training as one of the fields of teacher training, together with on-the-job training and continuing training, and determined that it should cover "youths and adults with the academic or technical-vocational qualifications of an immediately lower level" to that which would be acquired with training, through the

Table 3
Changes in the training system still in the period immediately after the independence (1979/1982)

Goal	Place	Access	Duration
Primary Education: 1st to 4th grade	Training Centres for Primary School Teachers (TCPST)	6th grade	1 year
Secondary Education: 5th and 6th grades	Middle Pedagogic Institutes (MPI)	9th grade of general education or corresponding degree	2 years
Secondary Education: 7th , 8th and 9th grades	Faculty of Education of the Eduardo Mondlane University (EMU)	9th grade	2 years (*bacharelato*)
Secondary Education: 10th and 11th grade	Faculty of Education of the Eduardo Mondlane University (EMU)	11th grade	2 years (*bacharelato*)

professional training course suitable to the desired degree or education branch (art. 34). From the point of view of its structure, Law 4/83 defined two levels of initial teacher training (Table 4).

However, following Law 4/83, successive changes continued to be introduced in teacher training, many of which then coexisted with solutions they were supposed to replace, particularly regarding the institutions responsible for teacher training for primary education (Training Centres for Primary Teachers-TCPT, Primary Education Schools-IMAP, Teacher Training Institutes-TTI, among others).

The coexistence of a diversity of solutions was also true of access conditions, duration and certification level of training. In any case, it can be said that the trend was for the conditions to access training to be pushed up – 10th grade certificate, admission exam with a minimum score, and an interview became requirements, although the same could not be said of the training duration, which dropped to one year (Decree 41/2007 of May 16).

In the meantime, due to the constitutional and political changes that took place, adjustments to the legal framework of teacher training were introduced

Table 4
Teacher Training Courses established in Law 4/83

Training Levels	Desired Degree	Access	Duration
Middle	Primary Education and Practical Subjects of Technical Vocational Education 1st Level of Adult Education	2nd Level of General Education	3 to 4 years
Higher	Secondary and Middle Education	Middle Level of General Education	4 to 5 years

through Law 6/92 of May 6. This law determines that training for all education subsystems would thereafter be imparted in specialized institutions, and defined as general goals for this training: to integrally train teachers, providing them with solid scientific, psycho-pedagogical and methodological skills as well as the ability to continuously develop them. Regarding its structure, Law 6/92 defined three levels of teacher training (Table 5).

Table 5
Teacher Training courses defined by Law 6/92

Training Levels	Institution	Desired Degree	Access
Basic	TCPT	PE1	7th grade
Middle	IMAP and ADPP	PE2 and VE	10th grade or equivalent
Higher	EMU	All education levels	12th grade

Despite this new legislative effort, nearly ten years later, in 2004, in the document entitled *Strategy for Teacher Training* (STT.04-15), the inability to train the number of teachers necessary for this system is still quite clear, as are the immediate consequences on teacher recruitment: for instance, most of the graduates of the IMAP and the ADPP Schools were placed in the 1st cycle of secondary education, although they were trained for the 2nd cycle of primary education. The same document identified those that seemed to be at the time the main training institutions: CFPP for training teachers for 1st Degree Primary Education, IMAP and ADPP Schools to train teachers for 2nd Degree Primary Education, and the PU and the EMU to train Secondary Education teachers.

Also in the same document, teacher training was characterized, from the perspective of its internal dynamics, as follows (MINED, 2004, p. 14):

- "Various teacher training models and lack of consensus on the characteristics of the appropriate delivery of courses;
- The curriculum of teacher training is outdated and needs revision to correspond to the curricular change in basic education;
- Inadequate balance and lack of systematic connection between the *education theory* and *its practice*;
- Courses are held in an extremely prescriptive manner with a practice generally *teacher-centred* and not *student-centred*, and students are not sufficiently encouraged to reflect upon the practice;
- Lack of connection between the course elements *based on the institution* and *elements based on the school;*
- The opportunities for on-the-job training and for continuing professional development for teachers are scarce;
- Teacher trainers often lack preparation and experience, especially in the practice of contemporary basic education;
- The institutions responsible for teacher training often lack appropriate teaching and learning resources".

We can then conclude that from 1983 to 2004 various training models coexisted, especially for primary education, which varied between 6th grade + 1 year of training to 10th grade + 2 years of training, thus presenting different statutes and natures, corresponding more to responses to emergency situations than integrated training strategies (MINED, 2004).

From the TTS.04-15 sharp criticism also emerges regarding a situation that has little presence in the available information and which still has not quite made it as object of academic research, namely training curricula. In this respect, the following features stand out: their outdatedness, lack of connection between theory and practice, and the recourse to traditional pedagogies (MINED, 2004). The poor preparation of teacher trainers and their isolation vis-à-vis partners in the field, the limited resources of training schools and the immense frailties of continuing training depict a picture of the existing situation that is clearly not positive.

In short, the scarcity of resources of various nature as well as the social pressure to expand the education system, "led to the implementation of emergency programmes, (…) to training models characterized by fragmentation and discontinuity, resulting in a system without coherence" (MINED, 2004, pp.7-8). This situation seemed to derive, also, both from the meandering nature of governmental measures and the diversity of influences and/or impositions introduced in the system by international agencies (Castiano, Ngoenha, & Guro, 2012).

The TTS.04-15 comes into being as a response to this situation. This strategy's policy proposals suggest the need to (1) improve training, (2) take a coordinated approach to the issue, (3) integrate initial training and on-the-job training with each other and the two with continuing professional development of teachers, and also (4) decentralize the system, whenever feasible and appropriate (MINED, 2004). As short-term strategy, it considers the need to respond to pre-school education and to children with special educational needs, a unique model of teacher training from the 1st to the 7th grade, a new teacher training course for teachers of the 1st cycle of GSE and TVE, distance-education courses for teachers already working as well as foster training institutions for distance-learning programmes, so as to achieve better provision of the teachers the system needed. To improve trainers' training, an intensive training programme was considered and, in the medium term, raising their academic and professional certification. The revision of access methodologies and teacher qualification was also contemplated (Table 6) (MINED, 2004).

In the meantime, the evaluation of the implementation of the Strategic Plan for Education and Culture 2006-2010/11 (PEEC06-10/11), despite confirming the progress achieved with the expansion of the education system and the increase in equity in participation, notes that great challenges still remain, teacher training being one of them: "We emphasize, in particular, the need to make Primary Education teacher training more practical, focused on learning Portuguese and on teaching-learning methodology" (MEC, 2006, p.11). Moreover, the training profile for primary education was still not widespread, which was intended as more

Table 6
Strategy 04-15 for Teacher Training: Short-, medium- and long-term training models

Deadline	Goal	Access	Duration
2004/2008	1st to 5th grade	Seven years' schooling Other mechanisms projected	1 year
	6th to 7th grade	Ten years' schooling Other mechanisms projected	1 year
	8th to 10th grade	Twelve years' schooling Other mechanisms projected	1 year
	1st cycle of Secondary and Vocational	To be revised	
2009-2012	1st to 5th grade	Ten years' schooling, if feasible	2 years
	6th to 7th grade	Ten years' schooling, if feasible	2 years
	8th to 10th grade	Twelve years' schooling	2 years
	1st cycle of Secondary General Education	To be revised	Possible extension to 2 years
2013-2015	Projects degree for all teachers, *bacharelato* being the initial qualification		

ambitious than what had been envisioned in 2004 (10th + 3 years; strategy in two stages with two years of initial, face-to-face training and one year of on-the-job training, in principle in the distance-learning format of middle professional level).

In short, despite the political intentions, teacher training as a whole, due to a series of factors weighing on the education and training system as well as on all the social services, found it hard to provide the specialized qualified staff that are supposed to serve that system, both in number and quality. Furthermore, in many situations, learning continues to be ministered by teachers with no pedagogical training, a situation which in 2011 came to 21% of PE1, 17% of PE2 and 21% SE1 (MINED, 2012a).

The creation of such structures as the National Institute for Distance Learning and the National Directorate for Teacher Training may contribute to improve this situation. They are intended, respectively, to broaden access to all subsystems, namely of Teacher Training, and to implement a training strategy in the context of the professionalization of teaching (MINED, 2012a).

In any case, serious challenges regarding teacher training persist, challenges which society and the state need to address.

Conclusions

With the programme of economic reforms that started in the mid-1980s, the peace agreements of 1992 and the multi-party elections of 1994, a new period in

the history of Mozambique began, with receptiveness to foreign investment and other conditions for reactivation of the economic and social activity. Albeit essentially agricultural, the country invested in exploring its natural resources and industrialization, and in the 1990s it achieved important macroeconomic stability. This setting has persisted, albeit with some fluctuations and some deceleration. And yet, Mozambique is still one of the poorest countries in the world, with endemic health problems, low average life expectancy, extremely low qualification levels of its resources, fragile economic and institutional structures, heavy dependence on international aid (Gaspar, Cossa, Santos, Manjate & Schoemaker, 1998; Worldbank, 2016).

The education system, which is expected to strongly contribute to the education of *cadres* indispensable to the country, has followed the changes in the political and economic process. And thus, despite the advances (more budget, more access, more qualification), the shortage of structures, facilities and qualified teachers persists. Moreover, the increase in population and the fair demand of education for children and youth contributed to the rise in student-teacher and student-class ratios, further compromising the quality of the educational service provided, making the response to school drop-out and school failure all the more difficult (Mofate & Carita, 2015).

The teacher training system, particularly in the critical sector of primary education, besides not training the necessary number of teachers, has presented a myriad of solutions, not always articulated or coherent, internally as well as among one another, which have generated disappointing training initiatives incapable of contributing decisively to improve the quality of teaching. Thus, the main challenges facing teacher training are the increase in the number of teachers, the rise of their qualification, and the actual development of their teaching competencies. In accordance with the recommendations put forward by the SPE 12/16, the response to these challenges may benefit from a more rigorous system management, translated into an emphasis on its stability and coherence, the actual execution and evaluation of the measures designed, more and better control of allocated resources. From a qualitative point of view, teacher training could benefit from raising access conditions and increasing the duration of training, from a curriculum more focused on teaching competencies as well as from the openness and the cooperation between the training entities and the education field, in order to test and foster the training process.

List de Acronyms

ADPP – Development Aid from People to People
AIDS – Acquired Immune Deficiency Syndrome
CRPM – Constitution of the Popular Republic of Mozambique
CRM – Constitution of the Republic of Mozambique
CRM-90 – Constitution of the Republic of Mozambique
EMU – Eduardo Mondlane University

END – National Development Strategy
EP1 – Primary Education 1st stage
EP2 – Primary Education 2nd stage
ESG – General Secondary Education
ESG1 – General Secondary Education 1st cycle
ESG2 – General Secondary Education 2nd cycle
FRELIMO – Mozambique Liberation Front
GDP – Gross Domestic Product
HDI – Human Development Index
HE – Higher Education
IFHR – International Federation for Human Rights
IMAP – Primary Education Institutes
INE – National Statistical Institute
MEC – Ministry of Education and Culture
MINED – Ministry of Education
MPD – Ministry of Planning and Development
NES – National Education System
PE – Primary Education
PEEC06-10/11 – Strategic Plan for Education and Culture 2006-2010/11
PEE 12/16 – Strategic Plan for Education 2012-2016
PEI – Primary Education Institutes
PES – Primary Education Schools
PMI – Pedagogic Middle Institute
PU – Pedagogic University
QSNT – Qualification Schools for Native Teachers
RBM – Report of the Bank of Mozambique
RENAMO – Mozambican National Resistance
SSTQ – Schools for Station Teacher Qualification
STEPET – Schools for Training and Educating Primary Education Teachers
TCPST – Training Centre for Primary School Teachers
TTI – Teacher Training Institutes
TTS – Teacher Training Strategy
TVE – Technical Vocational Education
UNICEF – United Nations Children's Fund
UNDP – United Nations Development Programme
USAID – United States Agency for International Development

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8

The Role of Vocational Training Centres in the Local Development Process. The Case of the Urban District of Samba, Luanda, Angola

Eduardo Figueira | Teresa de Jesus

Introduction

The study object of the present research has arised from the need to understand how the VET centres of Angola, in general, and those located in the urban district of Samba (Luanda), in particular, contribute to the local development process. As it is known, the rate at which, in the last three decades, innovation and technological change have been happening, constitutes the main motive for the obsolescence of almost all aspects directly related to the work contexts. In fact, thanks to technological innovation, both instruments and techniques necessary for the proper and effective performance of various functions in the workplace have been undergoing transformations that require new personal and professional skills. Given this reality, qualification strategies and forms of acquisition of occupational skills by individuals must be rethink. In fact, transformations resulting from the ongoing social, economic and technological developments has showed the need to adapt the qualification systems to the paradigm of lifelong learning. As reality of everyday life shows, the context of ever-changing technological, social, economic and cultural environment has changed the traditional paradigm in which the learning process has been viewed and understood. The learning process is not anymore a process that takes place during individuals' first phase of life with the purpose to prepare themselves for the second phase of life, the occupational life (Moniz & Kóvacs, 1997).

Whether in the professional field as in the social area, people have been, lately, facing more and bigger challenges and problems for which new and updated skills are required. In fact, professionals from the various fields of activity are, at present, facing changes occurring at breakneck speed, making quickly outdated the knowledge they have obtained in their initial training. Moreover,

enlargement of the effective working time due to increased life expectancy has created new learning requirements for active adults. Thus, continuing training and lifelong learning are currently a requirement for maintaining professionals updated and competent to effective and adequately deal with the new challenges and problems. Given those evidences, studying and understanding the role that VET centres play in local development was considered appropriate and relevant to understand how VET offerings contribute to improvement of local economies.

1. Adult Vocational Training and Local Development

1.1 Continuing Vocational Training of Adults

The natural process of evolution of societies and the consequent need for continuous qualification of human resources clearly show the relevance of the role of vocational training, in general, and of continuous professional training of adults, in particular, to address effectively the challenges of the modern world.

Some time ago the training of individuals was based, fundamentally, on the skills and knowledge acquired in the initial education. Currently, given the dizzying pace of technological change, the continuing vocational training acquired crucial importance for the good professional and social performance due to the constant need for new skills to respond effectively to the demands currently placed to any occupation. The continuous qualification of human resources constitutes the basis for success of any society since the development of a region is highly dependent from the resolution of the problems and challenges that lie ahead. Thus, the vocational training aimed at the active population should be diversified and directed towards the continuous improvement of professional and personal performance of individuals throughout their life. The factors influencing everyday's life are changing on such a pace that no one can go throughout life without having to learn many new things. In fact, the changes that are happening nowadays in the scientific and technological domains complemented by the interest and democratic relevance of people's participation in cultural and political life imply the need for individuals to acquire new skills.

Given the present pace of change, the most effective way to ensure that a community have the right skills to meet the continuing challenges it faces daily is by the continuous training offerings which, permanently, can meet the needs in terms of professional and social performance of adults. For this purpose, the continuous training programs must be based on the constant research and analysis of social and professional needs related with the problems and challenges faced on a daily basis and not, as in traditional school education, pre-designed study plans based in scientific knowledge. There are not therefore doubts regarding the need to implement effective systems of continuing vocational training in order to provide appropriate responses to the challenges posed by progress in general and the development of local economies in particular.

Mindful of all these aspects, UNESCO has been promoting international conferences on adult education where the improvement, retraining and preparing individuals for new ocupations have always occupied central aspect in the analysis of the various experts who participated in them. For UNESCO, adult education consists of all the organized processes of education, of formal or non-formal nature, which are intended to update and/or improve the set of knowledge and skills acquired in the initial education allowing adults to improve their professional and social skills and thus participate more effectively in society. This means that the adult education strategy should be closely related to the social and economic development of a region and, consequently, be geared to meeting individuals' needs and aspirations, as well as to promote their participation in the life, destination and activities of the community in which they live. In this sense, the programmatic contents of the adult education programmes should have no theoretical boundaries and their methods, means and techniques of teaching/learning must respect the freedom and experience of each adult individual (Canário & Cabrito, 2005).

Based on all these aspects, the UNESCO at its nineteenth session, held on 26 November 1976 in Nairobi, has recommended to all member countries to promote the development of an adult education programme (Gusmão & Marques, 1977). In this line of thought, the continuing education of adults should be considered by societies as a subset integrated into the overall strategy of public education in which the human being should be seen as an agent of his own education through continuous interaction of his reflection and action in daily life. In this sense, education must be understood and planned by the societies as a non-limited action to initial education period. It should last for the entire life of individuals, encompass all areas of knowledge and use all means in order to allow full development of their personality. That is, the educational and learning processes should be planned to integrate individuals throughout their life which means that children, youth and adults should be looked at as a whole (Freire, 1986) within the educational strategy for society. The continuing education of adults is assumed as the best strategy to facilitate the resolution of problems that societies presently face since it transfers to individuals the necessary skills to deal with the constant technical and technological changes of the modern world.

In summary, being the continuing vocational training one of the needs of the present society, the School institution is, simultaneously, the starting point and the arrival point in terms of development of a society. The continuing vocational training is a strategy to make individuals able to become agents of transformation, that is, for better understanding the world around them and acting on the contexts in which they live transforming them for the purpose of creating conditions for better quality of life. Therefore, the continuing vocational training constitutes an effective educational investment for the different socio-professional domains by promoting adults' vision as individuals with the capacity to change and transform the education system in an ongoing process, dialectic and multiform.

1.2. Local Development

Although the concept of development is universal, its effective implementation requires that the process be closely linked to the social, economic and cultural environment in which it is implemented. In this sense, a real development strategy can only be realized through processes designed and implemented at the level of local territories. In addition, despite the economic growth be essential for any development process, the sustainability of any economy cannot be reached without taking into account the welfare of the people, the preservation of the natural environment and be framed by a cultural animation process. It is thus necessary to abandon once and for all the paradigm based on economic growth and adopt one that takes into account all the dimensions of sustainable development.

"The development is a Good for everyone and not just for some people and is promoted and carried out by human beings with the purpose to improve their quality of life, in individual and collective terms" (Figueira, 2013). It is thus unavoidable the need to integrate the issues concerning citizen participation, integration of all sectors of human activity, social solidarity and preservation of the natural and built environment into the development process (Figueira, 2013). On the other hand, the concrete actions of development for a given local territory should be designed and implemented taking into account the reality and specific conditions of that local. In fact, the "Development is a process that is only real when centred on the realities of the world in which people live" (Figueira, 2013). In addition, the development processes require integrated approaches that are most easily and properly implemented in local territories because the integration of public policies and sectoral incentives is more effective at local level. Human communities and their economy are based on the territory characteristics and the relationships that human beings establish among themselves and with it. Therefore, a local community will only be able to promote their own development through the implementation of appropriate change of realities in which people live if it takes into account the relationship among people and with the territory. Thus, the development process should be centred on people and their values as well as in their expectations and skills taking into consideration the community context in which they live (Figueira, 2013). In this sense, and given the present pace of innovation, promoting people's qualification on the basis of the present and future local needs and opportunities is indispensable to maintain and improve people's initial qualification and, consequently, to promote local development. That is, any local development plan should include a continuing qualification strategy for the individuals living in the respective territory.. Only with qualified human resources is possible to achieve a genuine process of Sustainable Local Development suited to the local territories, especially those which are located in marginal areas of the so-called more developed regions.

On the other hand, the local community should be seen as a relevant resource for the success of the qualification of individuals due to community breakdown effect caused by the globalization phenomenon. In this sense, any

local development strategy must take into account the need to promote social cohesion and integration in order to establish and strengthen social networks that act as qualifying agents of both individuals and communities.

2. Study purpose and context

2.1 Study Objectives

The object of the study was focused on the analysis and understanding of the contribution that vocational training centres give to the local development process in Angola, in general, and in the territory of the urban district of Samba, in particular. The vocational training centres can be seen as development factors once their main activity is the qualification of individuals with skills that enable them to have a more effective professional and social performance and, consequently, meeting the individual and collective needs of the community. In this sense, the study aimed to describe and understand the contribution that vocational training centres located in the urban district of Samba, Luanda, Angola, give to the local development of respective territory.

Understanding the role that VET centres play in qualifying people allows to define and implement the best training strategies to meet professional and social needs of specific social and economic contexts. For this purpose, the study was designed to describe and understand how the training strategies developed and implemented by vocational training centres of the urban district of Samba contribute to the satisfaction of local business needs and to what extent the professional profiles of their training offerings contribute to the development of the territory and the community.

At a time when the changes are very fast, and the competitiveness of a territory mainly depends on the performance of its human resources, it is clear that the training offerings of professional nature plays an important and decisive role in the promotion and implementation of any strategy of local development. However, the relevance of the contribution of vocational training to local development is not always visible and, moreover, can vary from location to location. Thus, in order to estimate the relevance of the contribution of vocational training centres for the development strategy of the Urban District of Samba was considered appropriate to formulate and evaluate the following hypothesis: The vocational training centres of the urban district of Samba, Luanda, contribute relevant and significantly to the local development of its territory through training and maintaining the professionals qualified to carry out activities deemed necessary for the design and implementation of an adequate development strategy for the territory.

2.2. The Urban District of Samba

The urban district of Samba with an area of 345.30 km2 is administratively

composed by 5 communes and comprises 14 villages with a total population of 407,900 inhabitants. It is a territory with a humid tropical climate whose community predominantly lives from artisanal fishing, subsistence farming and trade in informal markets. Given its position at the gates of the country's capital and its economic resources, the territory of Samba has been a pole of attraction for the inhabitants of the territories of the nearby provinces situation that naturally put pressure on the need to increase the supply of vocational training offerings.

In order to give an adequate response to this pressure, the vocational training centres of Samba have been concerned to identify and analyse the needs in terms of professional skills of the resident population to prepare training plans and strategies that can provide appropriate training opportunities to the development of the territory.

3. Methodological Approach

3.1 General Design and procedures

The study was conducted through a non-experimental approach of qualitative nature (case study) complemented with quantitative measurements (questionnaire survey and the use of statistical analysis) to analyze and better understand the relationship between vocational training and local development processes. The "case study" approach was used once it was intended to study a phenomenon closely related with its own context (Yin, 2003), i.e, the relevance of vocational training provision for the development of the territory of the Samba Urban District, Luanda province, Angola. In addition, the study aimed to acquire knowledge to base the planning of future research concerning the same phenomenon in the different regions (provinces) of Angola whose results are essential for promoting local development strategies in the country.

3.2 Study object, context and target population

The qualification of human resources plays a key role in promoting the development of societies. Given this reality, developing countries, such as Angola, have been creating and implementing vocational education & training centers with the aim of qualifying individuals and local communities through initial and continuing vocational training offers in order to make the local communities better able to overcome the challenges and problems they face. In addition, initial and continuing vocational training contributes significantly to the socio-professional integration of individuals in their social and economic context. In this sense, the study object was to analyze and understand the relationship between the offer of vocational training and the local development process in the territory of the Samba Urban District, Luanda, Angola.

The target population of this study was composed of all individuals who

attended the vocational training courses offered by the VET centres located in the district of Samba, Luanda, Angola, in the years 2010 to 2014. Data was collected from a sample of 215 individuals drawn from the population by a random sampling strategy stratified by Vocational education & Training Centre in order to ensure the best possible representativeness of the study population. In addition, complementary information was gathered through interviews conducted with the six responsible people for the coordination and programming of the VET centres and two people involved in fields related to the local development of Samba urban District.

The variables (indicators) operationally subject to measurement and analysis are framed by the concepts of vocational training, training strategies, needs and professional profile and local development. Vocational training is understood in this study as an ongoing process of organized education and training in order to enable individuals of a community to acquire knowledge and social, technical and professional skills and improve their attitudes and behaviour in order to participate effectively in socio-economic and cultural development of the community where they live (Santos, 1999). The training strategies are understood as the pedagogical and didactic methods and forms in which the process of training and learning is organized with the purpose to offer audiences the right skills for a competent and responsible professional performance. Professional needs are understood as shortages, absence or gaps in skills or knowledge needed to perform effectively and efficiently a professional activity. The professional profile is regarded as the set of characteristics and skills necessary for the proper and effective performance of a given occupation.

Local development is understood as the process focused on the realities and characteristics of a local territory in which it is implemented through an integrated and sustained approach participated by the respective community. This type of approach considers that the local territory is the privileged area of intervention due to fact that integration of public policies and promotion of sectoral incentives are more effective and properly implemented at local level (Figueira, 2013).

3.3 Instrumentation and data analysis

Data collection from the sample of individuals who attended the Vocational Training Centres was conducted through a questionnaire specifically developed for this study. Given the objectives set for the study, the questionnaire was divided into four parts: 1) Characteristics of the respondents; 2) The relevance of vocational training and of vocational training centers; 3) training strategies, professional needs and professional profile; and 4) understanding of the local development process.

The questionnaire was subjected to a pre-test conducted with 15 individuals with the same characteristics of the study target population in order to estimate its content validity and reliability. Content validity was estimated with the help of a panel of judges (4 vocational training experts and an expert on local devel-

opment). The reliability was estimated with the use of "alpha" coefficient of Cronbach.

The analysis of data collected by questionnaire was conducted using measures of descriptive statistical analysis using SPSS. The descriptive treatment focused mainly on determining the measures of central tendency and dispersion for each variable. For the relevant cases, association between variables was studied based on correlation measures, namely Spearman coefficient. Differences between individuals of different gender were estimated by using non-parametric techniques for two non-related groups, namely the Kolmogorov-Smirnov and the Mann-Whitney statistical tests. Relevance of training strategies, of correspondence of contents to training objectives, of adequation of trainees' learning assessment to learning process and adequation of professional profile of the training offerings of the VET centres was estimated by using the non-parametric Friedman test which is appropriate to rank a set of indicators measured by an ordinal scale. The information collected through the interviews was submitted to content analysis.

4. Findings

4.1 Characteristics of the target group

The characterization of the target group was based on socio-demographic variables including age, gender, marital status, education level, family size to which people belongs, type of housing they live and monthly household income.

Most of former trainees (72.2%) that have attended the vocational training courses were aged below 25 years, female (54.1%), single and lived in nuclear families of more than 4 people (75.4%) with a monthly income (62.1%) below the 20,000 Kz (€ 110.00). In terms of education, the majority (86.5%) of the former trainees had finished the high school or a medium level technical school and lived (69.2%) in villas or houses built on own land.

In summary, it can be said that the studied group of former trainees, consists of young single people, mostly of female gender living in households from 2 to 6 people with a monthly income of less than 20,000 kz (€ 110.00).

4.2 Training strategies used by the VET Centres

To understand the training strategies used by the Vocational Training Centres, a set of indicators concerning adaptation of VET programming to learning needs, correspondence of the content to the learning objectives, adequacy and distribution of loading teaching time to training contents, adequacy of trainees' learning assessment to the progressive nature of the learning process was submitted to the target group. To estimate the most relevant of the above indicators according former trainees' perception, the nonparametric Friedman test, appropriate to rank a set of indicators measured by an ordinal scale, was used.

According to former trainees' perception, the strategy to assess trainees' learning is the most important aspect of the training strategies of the VET centres which appears to indicate that it reliably reflects the skills acquired in training. Furthermore, the contents that are part of the training programming curriculum are organized taking into account the progression of learning which is in line with the fact that the planning of objectives and training content are relatively relevant to the training strategies of VET centres. This same line of thought is accompanied by the heads of the VET centres that have said the Centres implement training programmes directed to develop and deliver skills based on identification of learning needs in terms of professional skills. In this way, it can be said that the VET Centres help people to be integrated into the labour market by improving their skills and abilities to the exercise of their profession. This is in line with results of other studies that show the relevance of the professional skills of residents for the development of the territory in which they live and work.

4.3 Professional output profiles of VET Centres

In order to describe and understand the professional output profiles of the Samba's VET Centres, the target-group was asked to evaluate a set of indicators related to the acquisition of autonomy for the use of new knowledge and new skills, new attitudes to work, and ability to read the work environments in order to use the new knowledge, skills and attitudes acquired. To estimate the relative relevance of the above indicators according former trainees' perception, the non-parametric Friedman test, appropriate to rank a set of indicators measured by an ordinal scale, was used.

According to former trainees' perception, the ability to identify work environments conducive to the use of new knowledge and new skills acquired in training is the most important aspect in terms of professional output profiles offered by the Vocational Training Centres of Samba. The acquisition of autonomy for the use of new knowledge and attitudes at work is also very relevant to the professional profile output of the VET centres. These results indicate that young people trained by the VET centres located in the urban district of Samba essentially favour autonomy for the use of new knowledge and new skills as a relevant aspect to be considered in professional profile of VET training offerings. These results are corroborated by the heads of VET centres who have argued that the centres should design and implement training programmes directed to output professional profiles compatible with the needs of the territory. Thus, it can be said that the VET centres, in addition to help people to be integrated into the labour market, contribute significantly to meet the needs of businesses in terms of professional skills.

4.4 The role of Vet Centres in promoting local development

In order to characterize the role of VET centres in promoting local development, a set of indicators to measure the former trainees' perceptions concerning

acquired professional skills, needs of territory met by training, professional profiles of the VET offerings and level of employability of former trainees, was submitted to a sample of the target group. To estimate the most relevant indicators according former trainees' perception, the nonparametric Friedman test, appropriate to rank a set of indicators measured by an ordinal scale, was used.

According to former trainees' perception, the role of the VET centres for the development of the local territory mainly focuses on the development and offer of relevant professional skills to the local economy and, for this reason, VET centres can be considered as a lever for development of the territory.

This same perception is taken by the heads of the VET Centres and by the Deputy Administrator of the Urban District of Samba that said the VET Centres have helped trainees to integrate the local labour market by enhancing their skills and abilities to the exercise of their occupation. This is in line with results of other studies that show the relevance of the professional skills of residents for the development of the territory in which they live and work.

4.5 Synthesis of results

The perception of the former graduates of the VET centres of the urban district of Samba as well as of heads of the centres clearly indicate that the role of those centres is very relevant for development of the local economy. This is true not only due to skills and knowledge transferred to individuals who attend the VET centres giving adequate response to the needs of the territory but also through the autonomy provided to trainees for using new knowledge and new professional skills.

5. Final Considerations

5.1. Conclusions

According to results, it can be said that both former trainees and the directors of today of VET centres located in the Urban District of Samba are aware that changes are occurring at breakneck speed resulting in the rapid obsolescence of knowledge and skills obtained in the initial training and, for this reason, a supply of continuing vocational training is essential for keeping professionals updated with the skills needed to meet the daily challenges.

In summary, from the analysis of the results, the following conclusions can be drawn:

1 – The VET Centres of Samba Urban District develop and offer to individuals who attend them professional skills relevant to the local economy and, therefore, the training centres can be seen as a lever for the development of the territory.

2 – The use by the Vocational Training Centres of a planning tool based on

training objectives and contents previously defined is relevant to define their training strategies and, naturally, to adapt more effectively the training offer to needs of the territory in professional skills for their development.

3 – Assessment strategies of learning followed by the VET centres reflect reliably the skills people acquired in training and, on the other hand, the training contents that are part of the curriculum programme take into account the progressive nature of the learning process.

4 – The Vocational Training Centres transmit to their trainees the ability to identify propitious working environments for using new knowledge and new skills enabling them to gain autonomy for the use of new knowledge, new skills and have new attitudes at work.

Based on these results, it can be said that the Vocational Training Centres of the Urban District of Samba have been developing and offering relevant professional skills to the local economy, being for this reason a lever for the development of the territory where they work.

This is in line with results of other studies that show the relevance of the professional skills of residents for the development of the territory. It can thus be said that the provision of initial and continuing vocational training constitutes currently a requirement for the permanent state of competence of professionals from various fields of activity. Therefore, the initial e continuing VET offerings and, naturally, the VET centres, can be assumed as relevant and unique strategy to maintain adequate and effective the professional activity in a local territory and, as such, be essential for promoting the development of territories and local economies in developing countries.

5.2 Recommendations

Taking into account the main conclusions of this study, it is appropriate to make some recommendations to improve the effectiveness of vocational training centres with the purpose to make their role even more effective in the local development processes of territories and communities where they are inserted. Thus, the following recommendations are suggested:

1 – The Vocational Training Centres must increasingly invest in programmes and training strategies that take into account the identified needs by the diagnosis studies made for the Local Development Plans;

2 – The Vocational Training Centres should plan objectives and training content based on the diagnosed needs in order to make the training programmes as effective responses to the needs of professional skills for the development of the territory.

3 – The vocational training centres should adopt appropriate and effective evaluation strategies of trainees' learning which take into account the progressive nature of learning.

4 – The training strategies offered by the vocational training centres should

focus on the acquisition by trainees of the ability to identify conducive working environments for using new knowledge so that, once in the labour market, have autonomy to use new knowledge, new skills and have new attitudes at work.

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9

Portuguese All-Day Schooling: improving social and educational policies

Jorge Martins | Ana Vale | Ana Mouraz

Introduction

In contemporary societies, thousands of children and adolescents are left every day to their own devices after they leave school. As a result of a change of the patterns of employment, as well as of the family typology, many parents do not succeed in guaranteeing the care and supervision of their children after school (Armstrong & Armstrong, 2004). It is estimated that in 2008, in the USA, 7.5 million children were left without supervision after school.

In Europe, this situation has reached alarming dimensions, namely in Germany, a country which particularly penalises the children of divorced parents, of single parents, and resource-poor families, who have to work in order to guarantee the well-being of their children (Pfeifer & Holtappels, 2008).

After-school hours have thus become a problematic period, on the one hand, because children are more susceptible to being neglected, and on the other hand, due to the relationship that has been established, both in Germany and the United States of America, between that period of time and the academic difficulties experienced by the students. In the USA that time is still associated with the emotional and behavioural problems experienced by children and adolescents, as well as with delinquency and the use of drugs (Armstrong & Armstrong, 2004).

In the last decade, acknowledging the need to guarantee the guard of all children, as well as to ensure equal opportunities for academic success to the children and adolescents from socio-economic disadvantaged backgrounds, several European countries have implemented policies and programmes which led to the introduction of 'all-day schooling', i.e., to the expansion of school time. Amongst these countries were Germany (Reh, Rabenstein & Fritzche, 2011; Pfeifer & Holtappels, 2008; den Besten, 2010; Schnniter & Häselhorff, n.d.) and Portugal.

In the case of Germany, as stated by the above mentioned authors, the cre-

ation of 'all-day schooling' programmes was a strategy to avoid the low levels of performance of the students that had been disclosed by the Programme for International Student Assessment (PISA) in 2000. Those low levels were seen as a negative result of the fact that a remarkable number of children and adolescents were left to their own devices, i.e., were left without adult supervision in the period between the end of school and the end of their parent(s)' day at work. In this country, the all-day schooling programme, which was implemented over a decade ago, has won increasing importance. Still, it has not been extended to all the state schools yet (Reh, Rabenstein & Fritzche, 2011; Pfeifer & Holtappels, 2008; den Besten, 2010; Schnniter & Häselhorff, n.d.).

In Portugal, however, the all-day schooling programme has been generalised to the 1st cycle of all the state schools during the school year of 2006-2007, through the AEC (Curricular Enrichment Activities) programme [1]. This programme became a relevant political tool for the fulfilment of the PETI (All-Day Schooling Programme) [2], a decentralised educational public service meant for social intervention with a double finality: 1) to provide, free of charge, a number of activities capable of enriching the curriculum of the 1st cycle of elementary education; 2) to provide social measures for family support. When compared to the above-mentioned German case, the Portuguese case reveals greater concern for the social dimension of the measure.

This study aimed to evaluate the scope of the political measures associated with all-day schooling as it was implemented in Portugal by the AEC programme and put into practice in 2009/2010. The two fundamental dimensions of its means of operating were identified: the political and the curricular. The study focuses on two cases of different local decision.

Political Dimensions of the Programme

The Curricular Enrichment Activities Programme is a powerful instrument for intervention and change in several domains of the educational field and in particular in the administration and management of the 1st cycle of elementary education. This programme has asserted itself as a relevant component of a decentralised educational public service, which is contracted and open to the laws of the educational market.

Designed at first by the Socialist Government (2005-2009) as a tool for the policy of 'modernisation' of the country, in line with the prevailing European policies, the programme aimed to promote the early teaching of the English language in the 1st cycle of elementary education. It thus aspired to pair the Portuguese educational system with the 'European patterns' with respect to the 'high level of training and qualification of the future generations', as well as to

[1] AEC – in Portuguese, Atividades de Enriquecimento Curricular.
[2] In Portuguese, "Programa Escola a Tempo Inteiro".

the 'early development of competencies, in the framework of the increasing mobility of people in the space of the European Union' (Ordinance no. 16 795/2005). However, the Programme for the generalisation of the teaching of English in the 3rd and 4th years of the 1st cycle of elementary education was soon extended and converted, by the diverse dynamics of its decentralised development, into the AEC, a programme with strong social concerns that aimed to promote relative equality of educational opportunities.

Many were the changes the programme introduced in the curricular offer of basic education: (i) it put forward, right from the beginning, the concept of 'enrichment' in the context of an 'old' curriculum which had reached a critical point, (ii) it reformulated the finalities of the 1st cycle in the framework of the pedagogical continuity desired by the schools groups, (iii) it led to the recruitment of new professional profiles meant to work with children within the same class-space, (iv) it established new relationships with respect to the way schools and groups of schools were supposed to work, (v) and it forced the sharing of educational tasks between the central administration, the municipalities and the schools. However, the programme took root mainly in the social sphere. This happened not only because it provided answers to many problems families had with the management of their daily lives – when it was reconfigured as PETI –, but also because it democratised a number of educational advantages, which were within reach of certain social strata only. The programme also innovated as it provided ground for the compatibility of the promotion of those apparent educational equal opportunities and the diverse curricular proposals made by different entities, having thus tried to respond to the interest evinced by local communities.

In spite of some criticism on the part of the ANMP – Associação Nacional de Municípios Portugueses (Portuguese Association of Municipalities), who put back on the agenda the discussion about the circumstances pertinent to the operating of that measure, the programme relies on a strong involvement on behalf of the municipalities. It was, in fact, mainly the gradual juridical recognition of the social importance of the autonomous educational intervention of the municipalities that led the Government to successively change the normative definition of the support activities offered by the municipalities to the 1st cycle of elementary education: being at first described as 'extra-school activities for the occupation of leisure-time', they were subsequently named 'support and complementary educational activities', then 'complementary curricular activities', and finally 'curricular enrichment activities'.

For the first time, 'subject areas' chosen by the promoting entities (municipalities, parent associations and groups of schools) among a number of areas considered by the Ministry of Education relevant for the promotion of success (thus being funded) were integrated into the curriculum of the 1st cycle. These 'subjects' have 'programming guidelines', support material, staff and schedules specially designed for them and defined by the promoting entities as if they were real curricular subjects. It is thus a form of educational decentralisation, which manifested itself in the first and most significant reconfiguration of the

old relationship between the two powers that used to oversee the 1st cycle. In spite of a renewed 'school-centrism' (Correia and Matos, 2001), the doors of a field that had so far been of the exclusive responsibility of the central administration were opened to local institutions and entities: they now define the curriculum – what 'enriches' –, as well as which classroom is going to be used for that purpose.

The support component for families that the programme works with is mainly characterised by an expansion of the time children are now spending in educational activities in the school environment (Table I). The implications of this extension of the opening hours of 1st cycle schools forced the adoption of new equipment and changes to physical and human resources.

Table 1

Characterisation of the AEC Programme in the context of the PETI

	AEC Programme Optional	Formal Curriculum Compulsory	Family support component Optional
Entity in charge	Local Authority: municipalities, parent associations, school groups	Central Administration Ministry of Education	Central Administration and Local Administration
Length of stay at school (40 hours per week)	7.5 hours	25 hours	Variable Up to 15 hours
Place	Classroom /other spaces around the school building / spaces outside the school facilities (swimming pools)	Classroom/School	Classroom / other spaces around the school building / spaces outside the school facilities
Compulsory offer Optional offer	. English . Learning support . Music . Physical and Sport activities . Artistic expression . Other	Formal Curriculum	Meals and surveillance
Operational staff	AEC teachers of each specific area	Head Teacher	Non-teaching staff
Attendance control	Regulated by schools, but without any effect on the students	Regulated by the Ministry of Education, with effect on the students	Not applicable
Assessment of student learning	Without any effect on academic progression	With effect on academic progression	

Besides the characteristics mentioned in Table I, it is necessary to clarify that the planning of the activities is carried out by coordinators of the AEC programme, while the pedagogical supervision is of the responsibility of the head

teachers of each class. It is also worth noting that those in charge of schools may, when necessary, render the schedule of the curricular activities more flexible in order to provide the best conditions for the implementation of curricular and enrichment activities.

Curricular Issues

The AEC programme aims to achieve the double objective of guaranteeing, to all students of the 1st cycle, the offer – free of charge – of a variety of learning activities that may contribute to the enrichment of the curriculum, as well as the accomplishment of the Government's priority of promoting the articulation between the operational conditions of schools and the organisation of the social response to families' needs. The student's length of stay at school is thus extended, and all is done to render that period pedagogically enriching and complementary to the learning associated with the acquisition of key competencies.

This brief description of the intentionality behind the AEC programme, as well as of the way it has been put into action, entails two concepts, which are worth revisiting: the concept of all-day schooling and the concept of informal curriculum.

The concept of all-day schooling can be defined as the 'full-time educational occupation of students over the course of school time and in the physical space of the school' (Pires, 2007, p.78). As it corresponds to an important change of the learning time, as well as of the agents that are in charge of its definition, the concept defies what one usually understands as schooling.

All-day schooling is a response to the challenges – never before experienced – raised by mass schooling in Portugal, and has forced people to face new issues, such as the idea that social justice should be guaranteed above all. This new reality of having all children at school involves thinking about what should be taught, and how it would serve the goals (which goals?) of the education provided by the State (Leite, 2006). This worry is ever more relevant at a time such as the one we are currently living, when political speeches resort to the flag of qualification as a way to reach the 2015 targets for Education and contribute to the Europe of knowledge defined by the Lisbon Strategy.

The concept of all-day schooling is often associated with an egalitarian intent, as it aims to ensure equal educational opportunities to all children (Dobert, Echard & Sroka, 2004; OCDE, 2007). In this regard it is essential to guarantee that the 'real and effective equality offers adequate and differentiated opportunities so that all students, no matter their starting points, their needs or circumstances, can go beyond the minimum knowledge and acquire basic school learning' (Muñoz, 2005, p.17).

With the AEC programme, Portugal is following the political measures that have been implemented in other European countries for the past twenty years, with the same purpose of positive discrimination (Demeuse et al, 2008). Such measures were conceived in order to resolve or minimise, in one go, some social

inequality, thus contributing to improve the level of success of students, during their years of formal schooling, as prescribed by the tendencies identified by the OECD with regard to the forms of promoting equity in the field of education. 'To strengthen the links between school and home to help disadvantaged parents help their children to learn; to provide strong education for all, giving priority to early childhood provision and basic schooling' (OECD, 2007, p.9) are two of the ten steps to support social equity.

The concept of all-day schooling also incorporates the idea that some of the learning provided by the school, during that supplementary time, is more important and becomes socially more homogeneous over time than the activities that the families and the children themselves would be able to arrange. As argue by authors like Magalhães and Stoer (2002) this effort contributes also to a new commitment that middle class addresses to school system. An additional finality associated with all-day schooling concerns its capacity to prevent marginal behaviour on the part of the students that could occur if they were left alone without adult supervision. Furthermore, the national policy chose to value structured educational action, to be held, in most cases, at school, or to resort to a model of schooling, as happens with the AEC programme.

Finally, all-day schooling is associated with the idea that students, in their capacity as learners, are somehow unaccountable. In fact, although it is said that the intent is to promote the autonomy of students, it contributes instead to a more extended reliance on adults, who are taken as their reference.

It is precisely within the dimension of the offer that characterises all-day schooling that it makes sense to examine the concept of informal curriculum, as well as the links that the concept has established with other concepts, which may contribute to the understanding of its theoretical density, namely the concepts of territorialisation, of curricular coherence and curricular articulation.

The concept of informal curriculum is defined by the learning that the school intends to foster in its students, which results from the values that shape their educational projects or their identities in their role as educational organisations, but which are not an explicit target of a formal instruction and of an evaluation of the results evinced by the students (Pacheco, 1996). The underlying conviction, shared by many authors of the critical sociology of the curriculum (Forquin, 1993), is that the walls around schools are merely symbols of other social control walls, which the school conveys. Therefore, when an educational system does not just give shape and determine the formal curriculum, but chooses and funds a number of choices regarding the offer for the occupation of free time instead, it is formatting the school culture twice, thus contradicting the idea of curricular territorialisation. In other words, it formats school culture as it chooses a formal curriculum, but also because, taking over the parents' role of conveying the values that are closer to their family experiences, it forgets the principle that all learning should be locally significant and that it should depend on local agencies, as vindicated by curricular territorialisation.

As mentioned by Leite, 'the foundations that legitimise the curricular contextualisation, at a micro level, refer to the possibilities of local action in the

process of curricular decisions, within the logic of territorialisation of education" (2005, p.5). This concept is founded upon the possibility offered to local territories, as well as to their agents, to decide matters concerning education in accordance with principles and interests that are locally relevant.

In Portugal, curricular territorialisation has been commonly used to justify a curricular offer of a compensatory nature, in the context of elementary education, as it has been primarily oriented to the formative offer aimed at students who have failed regular schooling. On the contrary, the rationale behind the AECs has been to enrich the formal curriculum or to provide a number of physical or artistic activities of a more universal nature. We believe it is legitimate to read in that difference evidence of a certain return to the movement *Back to Basics*. It certainly is what the practice (also preached in contemporary political speeches) of maintaining the pressure on the areas of learning considered more noble and more basic – thus making time available for the learning of those activities – indicates. Thus, as a result of the inscription of a set of findings associated with artistic expressions in an area of informal curriculum, it has made room for what is considered essential. That is why all-day schooling – and the AECs in particular – is seen today as a way of implementing the tendency of the back to basics, of the fundamental literacies (reading, writing, numeracy, communication). The dimensions of the curriculum that are more connoted with the achievement of projects or with a training of a more humanistic nature are thereby relegated to other periods of time. As a result, we would have two kinds of schools: in the morning, the school of the essential curriculum with the aim to ensure the basic literacies, and at the end of the day the school of the territorialised curriculum with a more informal and experiential nature.

Two objections can be made to this unfulfilled promise of articulating the formal with the informal curricula: 1) If the curricular coherence and significance is entrusted with the informal part of the curriculum, do we not risk a divide between the experiential and the official curricula? In fact, the experiential curriculum can very well transform experiences into learning, whereas the official curriculum is based on the idea of an external knowledge appropriated by a student who has in mind the final exam that will confirm that appropriation. 2) Should we not beware of the results of a relative inconsequential superficiality of the educational offers as they risk the temptation of trying to ensure a high range of educational experiences, which is very close to the exaggerated experientialism that characterises contemporary society? (Lipovetsky, 1989). From another point of view, the curricular coherence is not restricted in regard to the application of the knowledge which derives from the formal curriculum to the informal one, or vice-versa, to the continuity between knowing and acting, but rather to the transforming potential that the learned knowledge can have on the lives and the contexts of the learning individuals. Such is its potentiality, such is its frailty.

The concept of curricular articulation has acquired increasing importance in the curricular development, as it is discursively presented in the documents which shape the curricular decisions of the schools, and results both from the

legal acts and the observation that the curriculum cannot just be a conglomerate of juxtaposed parts. Theoretically associated with the globalising dimension of the curriculum, the concept has been split into two vectors that explain how that totality has been achieved, either from a diachronic or a synchronic perspective. This is what we call the vertical or the horizontal articulation.

1. The 'vertical curricular articulation is present in the continuity of the levels/ /cycles/years, in the hierarchy of decisions and in the balance between the formative curricular components and their extension;
2. The horizontal curricular articulation can be observed in the correlation which exists inside each unity and each organ, in the transversal relationship between areas/subjects in the same year and in the coherence between the components that make the curriculum operational'. (Leite & Pacheco, 2010, p. 6)

The curricular articulation reaches its full sustainability in three planes that correspond to three other relevant axes of the curricular work, namely: the development of the students; the work of teachers and curricular agents; the structure of the system where the articulation is politically shaped. These three axes define what is to be understood as a good practice of curricular articulation, i.e., an articulation able to identify and intervene in each school at the level of decision or curricular implementation where it seems to be most needed. A good practice of curricular articulation also ensures a work of curricular coherence, which is centred on the curricular alignment and made available to the collective subject responsible for its implementation – the teachers who, over time, work with the same student. As an extension of the former reason, a good practice of curricular articulation values the availability of teachers to work in a collaborative way with their peers.

Methodology

In order to evaluate the implementation of the AEC programme in the district of Porto, we decided for a 'multi-case' qualitative study (Triviños, 1987), as it is the most adequate for the study of contemporary events (Yin, 2002). As it is customary in this methodology, the choice of two cases, in a total of four schools, was made in order to ensure the variability that is present in the universe of the promoting entities responsible for the AECs in that district. Case A, chosen among the universe of groups of schools of which the Porto Town Council was in charge, represents 16 cases (Stake, 2005), or groups of schools. Case B, on the other hand, stands for the exception to the rule: schools integrating an alternative offer promoted by a Parish Council. In all cases, we selected groups of schools that might contribute, on a voluntary basis, to a better understanding of the circumstances, as well as of the implications and the problems resulting from the implementation of the AEC programme.

The data collecting tools were: official documents, interviews, observation of the AEC activities, texts and drawings by the students.

The set of documents that have been examined is composed of:

– Legal documents by the Ministry of Education
– Programming Guidelines issued by the Ministry of Education
– Educational Projects and Annual Activities Plans
– AEC Annual Planning
– AEC Evaluation Forms

The interviews, individual or in group, according to an open and complex model, were made to the representatives of the local promoting entities, to the people in charge of the administration and management of the AECs, to the directors of the groups of schools and the directors of the schools, to the head teachers and to the AEC schools, to the representatives of the companies (hired as a result of the political option of the Town Council) and to the entities responsible for the provision of services, and also to the students' parents and guardians. The criterion of availability was used for the selection of all the participants, as well as for the phases of observation and gathering of the students' work.

The observations were both informal and formal. The latter were based on 'observation protocols', whereas the former, made over the course of field visits, originated a number of research notes that were examined as well. A qualitative analysis of all the sources was implemented, and NVivo software was used. The referential analysis, initially oriented by the research questions, was subsequently enlarged by emerging categories.

Results

In this section, we present the results of the research carried out in order to meet the research questions. These were as follows:

1. What distinguishes the organisational model of the programme of the submitting entities?
2. What characterises the educational offer of the submitting entities?
3. What are the effects of the different offers on students' learning?
4. What are the effects of the different offers on personal and social development?
5. The text follows the axes: i) characterisation of the offer and working regulations; ii) impacts on the AEC programme.

Characterisation of the Offer and Work Regulations

With regard to the nature of the offer, we observed that, in both cases, it was composed of a pack of activities that would grant the highest funding on the part of the

Ministry of Education (English, Music, Physical and Sport Activities and Other). Thus, although there were small variances regarding the selected optional activities and week workload of the activities, there were no significant differences.

In the first year, except for the optional activity, the offers were fairly homogeneous: Music, English, and Learning Support. In case B, the optional activity consisted of two weekly slots of Portuguese Learning Support. In case A, in two of the schools the optional activity consisted of ICT (Information and Communication Technology) and in the third one of Math Learning Support. In the 2nd year, the coincidence was even bigger: besides Music, English and Learning Support, the optional activities consisted, in both cases, of Math Learning Support. In the 3rd and 4th years, the offer was exactly the same.

Although the promoting entities were different, we came to the conclusion that the offer was not very different (1st and 2nd years) or even quite the same (3rd and 4th years). Probably, this may have resulted from the situation created by the Ministry of Education when it defined the funding of the activities. On the other hand, in breach of what has been established by the founding text of the AEC programme, the definition of the offer counted, in both cases, with a modest participation of the school groups, which – it is important to emphasise – should have been more substantial.

As was happening at the national level, in the schools of Case A the activities were held in the classrooms or the school facilities. In case B, because of the high number of students and of the low number of rooms available, alternative places had to be found for the extra-curricular activities, and protocols with neighbouring entities were signed, as Bernet (1999) recommends, in order to make the best use of the educational resources of local institutions.

With regard to the working hours of the AECs, as stated above, there were big differences between the school in case B and the schools in case A. In the latter, the activities were held from 4:00 pm to 5:30 pm, i.e., after the curricular activities. In case B, the activities were held in the morning when the students had their curricular activities in the afternoon, and vice-versa.

As a rule, AEC classes integrated students of the same year, and each group had no more than 20 students, in case A, and no more than 15, in case B. In both cases, however, there were some classes where children from the 1st and 2nd years, on the one hand, and from the 3rd and 4th years, on the other, were brought together. Also in both cases, the students' parents and guardians could decide whether they wanted their children to attend the activities, and in case they enrolled their children, the latter were bound to attend all the offered activities. Nonetheless, because of the situation described above, only in case B did that option involve the choice for the physical space of the institution where they wanted their children to attend the AECs.

Setup and Human Resources

In their quality as promoting entities of the AEC Programme, both the Town Council and the Parish Council felt they should create new structures to coordi-

nate and accompany the implementation of the activities in the schools for which they were responsible.

In case A, a 'technical team' was established, and they directly depended on the Office for Educational Policies, and were trusted with the accompaniment, coordination and evaluation of the programme. In case B, a team called 'technical device' was brought into being, and they depended on the Vice-President of the Parish Council. In both cases, the above-mentioned structures had forms of coordination of their own and very specific competencies.

As we can conclude from **Table II**, part of the competencies of those teams were very similar, from the meetings with the representatives of the groups of schools to the method used for the evaluation of the activities and the AEC programme, as a whole. However, in case B the competencies of the coordinating team included a pedagogical dimension. On the other hand, both the team of case A and the companies – according to what had been established by law – left the pedagogical issues to be managed by the head teachers of each class.

The team in case A centred its action on the control and monitoring of the fulfilment of the contract documents signed with the companies hired for the implementation of the programme. The team in case B revealed a veritable preoccupation with the pedagogical dimension, and this resulted in the elaboration of a teaching pack – a portfolio – that aimed to provide support for the people involved in the implementation of the programme, as well as in the work of pedagogical guidance provided by the team coordinator to the AEC programme teachers, which included the articulation of the AECs with the schools' plans of activities and the curricular projects of each class. It should be further noted that the promoting entity, in case A, delegated to the companies which acted as service providers the hiring of the activities, whereas the promoting entity B took charge of that responsibility. In both cases, the teachers who were hired were graduates.

Impact of the AEC Programme

On the Schools

One of the most obvious impacts of the programme was the expansion of the school offer to eight daily hours, five for the formal curriculum and three for the enrichment activities. In most Portuguese schools, all the activities are held in the same physical space. This redefinition of the 'intra-scholar temporality' originated relevant changes in the organisation and management of the schools in case A, namely with regard to the need to monitor students during the extension periods and between the time when the curricular activities of the school end and the AECs begin, and to the need to provide lunch for the students.

This extension of time in the same physical space has fostered conflicts and has originated disciplinary problems. This idea has, in fact, been mentioned by the children, who have often referred to the existence of conflicts in their texts.

Table 2
Devices created by the promoting entities

	Parish Council	Town Council
Human Resources	Sport, Education and Youth Office	Technical Team
Dependency	Vice-President of the PC	Alderman in charge of Education
Composition	Coordinator Area Coordinator School Coordinator	Coordinator of the Educational Services Head of Office Companies Company Coordinator Area Coordinator
Mission	Management, Coordination and Evaluation of the implementation of the programme Pedagogical Accompaniment of the AECs Pedagogical Accompaniment of Family Support Activities	Management, Coordination and Evaluation of the implementation of the programme
Duties	Relationship with entities Elaboration of a Pedagogical Portfolio Production of Pedagogical Documents Curricular articulation with the structures of the schools and of the groups of schools Evaluation of the AEC teachers Update of the evaluation methodologies of the AECs	Relationship with other entities, namely the coordinators of the hired companies (EDUTEC, Espalha Ideias, PortoLazer) and with the coordinators of the schools and of the groups of schools Production of Documents connected with the programme Elaboration and Management of the Questionnaires to be sent to schools Evaluation of the AEC teachers Annual meetings with representatives of the groups of schools

The fact that there was not enough staff to ensure the supervision of the children, in most schools, also contributed to the situation.

In case B, for the aforementioned reasons, there was no need neither to resort to the flexibility of the timetables of the head teachers, nor to extend the period of supervision of the students, so the school management was able to keep to its routine. The temporal impact was not thus felt in the same way.

Another sort of impact is the one connected with the changes produced by the integration of 'Learning Support' activities into the head teachers' set of tasks and timetables. Although this activity is part of the AEC programme, as the school was responsible for its implementation, the effect was particularly felt in case B: in fact, it originated an increase of the head teachers' weekly workload and forced them to go to one or more physical spaces outside of the school facilities during the periods when they were not teaching curricular subjects.

Finally, it should be noted that, in order to achieve the aims that have been

set for the programme, the curricular enrichment activities still call for a significant horizontal and vertical articulation with both the 1st and the 2nd cycle curricula. According to the testimonies, the conditions that would enable that articulation have not been met yet, either from the point of view of the formal conditions, or from the subjective point of view of the intervening people. In that sense, the curricula need to be redefined and the teachers' timetables need to be changed. Even the concept of having one teacher responsible for the teaching of all the curricular subjects in the 1st cycle would have to be altered in order to strengthen the co-operation.

On The Relationship between the Students and the School, as well as on the Learned Knowledge

In both cases, those in charge of the pedagogical and administrative managements of the schools, as well as the head teachers, acknowledged the pertinence of the social dimension of the programme and the role that the AECs can potentially play in the development of children. However, at the same time, they identified a number of adverse effects on the students, both with respect to their behaviour and attitudes, and to their relationship with the school and learned knowledge. Some of the worries and reservations concerning the AEC programme have been based on this idea, namely:

- the exhaustion provoked by an excess of school hours, i.e., the hyper scholarisation of children. According to the head teachers, this has negative consequences on the process of teaching and learning, such as student distraction, and loss of interest and demotivation with regard to the curricular learning, which is far more complex and non-ludic;
- the lack of interest conveyed by some students for most curricular activities;
- the anomie (according to several head teachers, the enrichment activities can favour indiscipline and loss of the sense of 'rules', and have negative effects on the formal curricular activities);
- The reduction, almost annulment, of time for individual work and study and the consequent diminishment of academic achievement;
- The 'pedagogisation of leisure' which significantly reduces the time children have to play and, as such, carries with it the risk of getting tired of school.

Until the current moment, a systematic evaluation of the effects of the AEC programme on the progression of the students' learning has not yet been carried out. In the absence of that process, the nonexistence of benefits, on the plane of the acquisition of knowledge and development of competencies, underlined by the majority of the PTTs, is based on an 'impressionistic' evaluation which cannot, and should not, be devaluated, but which calls for a better substantiation.

On The Relationship between the Parents and Guardians and the School

In both cases, the parents and guardians valued the All-day Schooling Programme and the free of charge offer of activities and lunch, as well as the prolongation of the period of supervision of the children. The degree of involvement of parents in the All-day Schooling and in the implementation of the programme was diverse. In school B, where the offer was locally promoted, parents played a relevant role in the establishment of cooperation protocols with partner institutions. In case A, parents did not play any sort of role in the implementation of the programme. That is perhaps why they kept themselves at a distance from the AEC programme, as well as from the school, and why they somehow devaluated the activities and showed no respect neither for the way the AEC programme was organised nor for the teachers' work. It should be noted that this devaluation has been reinforced by the lack of influence on the evaluation of the students.

On the other hand, and having the two cases in mind, we can say that the parents were confronted, in the process, with new fields of knowledge and new forms or methodologies of teaching and learning. Although this dimension still needs to be thoroughly studied, we admit that the introduction of the AECs has changed the way parents and guardians perceive the educational institution and the people who work there, namely the teaching work of the head teachers.

Final Reflections

The unanimous valorisation of the philosophy and objectives of the AEC Programme – stated in the introduction – on the part of all the involved subjects, and in particular on the part of the parents and guardians, gives clear evidence that this programme was a 'good measure' of public educational policy, and was coherent with the nuclear project of 'All-day Schooling'.

The effectiveness of this socio-educational measure depends, however, on a set of factors that have not yet been consolidated, and thus call for a deep reflection. Among these, we should mention the weak articulation between 1st cycle teachers (and particularly AEC programme teachers) and the technical team responsible for the local implementation and evaluation of the activities. One of the conditioning aspects of that connection lies in the curricular articulation. Most of the head teachers, of the AEC programme teachers, as well as schools in general, discursively value the curricular articulation (one of its formal competencies) and believe that it should exist, but – as they themselves recognize – it has not been enough to change practices. This dimension is still evidencing low levels of satisfaction and is even one of the most acknowledged weaknesses.

Another critical factor stems from the overlapping of formal and non-formal education in the same educational space, which gave rise to some misunderstandings with regard to the aims of the activities. If we look at the terminology used by all the subjects involved in this programme (the recurrent use of words

such as classes, students, teachers, textbooks, pedagogical material, evaluation…) we will come to the conclusion that for both parents and the children in general, and also for some head teachers and AEC programme teachers, the specificity of the AECs has not been identified yet. In spite of that, curiously enough, for a group of children from João de Deus Elementary School, the AECs do clearly belong to the field of Free Time Occupation. The absence of a thorough clarification of this issue has, meanwhile, led to the devaluation of the activities, either on the part of the parents and guardians or on the part of the head teachers.

One of the central reasons for their criticism lies on the weariness of the students as a result of their remaining in the same physical space (mainly in the classroom). This worry with the consequences of physical space is present in the studies by Schnitter & Haselhoff (n.d.) and Reh, Rabenstein & Fritzche (2011), who underline the need for a diversification and flexibility in terms of physical spaces as a way to foster the socio-educational development of the students.

Incited by a similar worry, and with the aim to avoid the repetition of the model of the school and to minimise the weariness and/or the annoyance generated by the activities on the children, the parents and their representatives put forward a set of proposals. These, however, have not been as welcome as described in other European experiences (Schnitter & Haselhoff, n.d.; Reh, Rabenstein & Fritzche, 2011).

Although they did not put it precisely in the same terms as Bernet (1998), underlying the proposals presented by the parents we can clearly see the idea of citizenship education. This is evident in the recommendation to make the most of the educational resources of the parish or of neighbouring parishes, of having the activities held in local studios or workshops, of organising visits to exhibitions, planning to attend concerts or participate in other cultural local events. These suggestions aim no doubt to overcome the 'poverty' of the children's cultural world. According to den Besten (2010), this should in fact be a measure of public policy and one of the aims of the AECs, especially in culturally disfavoured and resource-poor families.

Another nonconsolidated factor relates to the 'time and its use', as described by Roldão (2008). According to this researcher, the AECs cannot originate an unbearable and inadmissible pressure on children in case the municipalities and the children decide to invest in many areas, thus taking away the effective free time the children have. The promoters, be they the town councils, the parish councils or the groups of schools, have the possibility to put into practice curricular differentiation through the selection of part of the offer that best suits the local needs and meets the problems felt by the local community.

But instability was also caused by the fact that although the offer of activities was compulsory, the children's attendance was not obligatory – especially with regard to the teaching of English. This incongruence potentiates inequalities in the process of learning this foreign language and has negative consequences in the transition to the next cycle (Madureira, 2011). The solution to this problem lies in the decision to integrate – or not – this activity into the curricu-

lum of the school.

Finally, the success of the AEC programme is compromised by the absence of an ample and rigorous system of evaluation, which allows for the identification, in a sustainable way, of the measures needed for its improvement.

The directions towards which the AEC programme seem to evolve oscillate among the social dimension of the programme, the concern with the curricular articulation and the curricular differentiation. The tendency to exaggerate one of these dimensions is a risk associated with some of the interveners. It is fundamental to balance these dimensions. The uncertainty with regard to the funding of the programme is no doubt another menace to this balance.

The AEC programme was created with the stated aim of promoting the improvement of the quality of the schools of the 1st cycle and consequently to contribute to the progress of the students in terms of learning, as well as to provide a social response in the field of the support to families, namely in the harmonisation between the professional and the family life. If it is true that the latter aim has been reasonably met, further improvements still have to be implemented in order to meet the former.

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10

How Teachers Experience Practical Reflectivity in Schools: A Case Study

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Introduction

Teachers are facing new demands and complex challenges pertaining to the social, cultural and political changes that have occurred in recent years. This implies a critical reflection by teachers about their daily practices.

The evolution of concepts and supervision practice itself tend to be, increasingly, the purpose of teachers' professional development. This development is guided by reflective teaching, with the purpose of improving performance, through the continuous training of collaborative work between colleagues. It is focused on the promotion of students' learning, as well as the teachers' own development (Perrenoud, 1999).

The training of teachers is directly related to personal, professional and organizational development. Therefore, it is essential to the emergence of a professional and organizational culture within the schools (Robson, 2006). As a consequence, an attempt is being made to deepen the reflection on the importance of teaching practice and continuous training. Practical reflectivity is a crucial engine in the construction of a dynamic process which provides teachers with autonomous thinking and professional identity.

Introducing a reflective practice within the school and into teachers' work implies that teachers should dominate cognitive and metacognitive skills. These are essential not only as a support in the act of criticizing their practice, embedded beliefs and principles, but also in understanding the context where it is developed and the benefits they can have in their performance. The complexity of a reflective process, focused on the classroom and the community, justifies the present study on practical reflectivity in schools and professional growth of teachers, through collective work which is shared between pairs.

1. Teacher's Reflectivity

The search for more efficiency in the professional performance of teachers has led to a constant (re)formulation of their role, level of responsibility and missions attached to it. Reflective teaching is vital to this complex and multifaceted process. The concepts of 'reflection-in-action', '*reflection*-on-*action*' and 'reflective practitioner' were first introduced by Donald Schön in 1983, in his book *The* Reflective Practitioner.

Reflection refers to an activity in which an experience is recalled. It is a response that involves the conscious recall and examination of experiences, as a basis for evaluation and as a source for planning and action (Schön, 1983). However, experience alone is not sufficient for professional improvement. Experience combined with reflection, on the other hand, is a powerful tool for the teachers' professional development. Exploring their own teaching through critical reflectivity, teachers can develop awareness and change, which benefit their professional growth (Hillier, 2005) re)elaborate creatively the pathways of pedagogical actions. It implies paying attention to routine practices, which, through reflection, assume a different meaning, or are perceived under a new light. Reflectivity promotes the 'artistry' of Schön (1983), which means inserting the sensibility of the artist in teaching. It is a reflection-in-action, allowing professionals to develop and progress their training and knowledge of themselves and their actions (Tabachnik & Zeichner, 2002)

Schön (1983; 1987) identified ways in which professionals, as 'reflective practitioners', could become aware of their knowledge and learn from their experience and *reflection.* One of his most important contributions was establishing a clear distinction between two types of reflection used in the field of education: reflection-in-action and reflection-on-action.

To Schön, reflection-in-action is private, very fast and intuitive. It takes place in the context itself and works as a self-correction tool, tending to focus interactively on the action, its outcomes, and the intuitive knowledge implicit in it (Argyris & Schön, 1996). By reflecting in action, a teacher can become a researcher in the context of his practice, improving it and deepening his or her professional knowledge. As a researcher, the teacher does not separate teaching and experimentation from implementation, because implementation is built on permanent enquiring. Reflection-in-action can often take place in situations of uncertainty (Tabachnik & Zeichner, 2002). Reflection-on-action happens afterwards, focusing on intentional improvement. In reflection-on-action, teachers consciously review, analyze and evaluate their practices, with the intention of gaining insight to improve these practices.

Reflection implies undertaking an attempt to analyze carefully the consequences of teaching strategies and to elaborate different hypotheses, in order to find the most suitable and consistent solution. It also implies anticipating results through the interpretation of actions and their consequences. Reflective teachers have the task of finding and recognizing the issues for which there is no imme-

diate or simple answer in the classroom. This leads teachers to enquire, investigate and search for possible answers. Such posture is intrinsic to professionals, who seek a reflective practice and recognize that they do not have all the answers, while retaining the necessary self-confidence to risk a new approach (Schön, 1991; Hargreaves & Shirley, 2009). One of the most important aspects of reflection through practice is that teachers are not just looking back to their past actions, but also to their emotions, experiences and answers. These are added to existing knowledge, so as to build new knowledge to be shared in *schools as learning communities.*

The school is not an isolated place in relation to its environment. We belong to a society that is constantly undergoing transformations. The school needs the capacity of renovating and adapting to these changes, in order to improve the quality of teaching and make it more approachable in the interaction with the world. The reflective school must provide a connection between the work in the classroom and the real world (Pring, 2010).

There are good reasons for teachers to reflect on their practice: firstly, while some practices might be convenient in the short term, they will not help students to learn effectively in the long term; secondly, professionals do not teach in a vacuum, they are products of personal and social circumstances that affect what they do and how they think. Therefore, the school, as a learning community, has the responsibility to promote the social, personal and educational development of learners and their educational success (Zeichner & Liston, 1986; Zeichner, 1993).

2. Methodology

The aim of this case study is to analyze the essential capacities and attitudes of teachers, towards the concretization of reflective practices, considering their potentialities and constraints. It is based on the perception of teachers and supervisors, in a public school in Porto, Portugal.

As Yin (2011) point out, a 'case study' is an empirical inquiry that investigates social phenomena within its real-life context, considering the boundaries between phenomenon and context, and multiple sources of evidence. In this case study, centred in a single school community, and bounded by space and time findings, a mixed research strategy was applied.

Although case studies rely mainly on qualitative methods, multiple sources of data and multiple data collection methods are likely to be used as well (Punch, 2011).The purpose of using a mixed research strategy is to intertwine both quantitative and qualitative techniques in a single study (Lichtman, 2013), to develop as full an understanding of this case as possible. Sequential strategic procedures were thus applied, in order to achieve proper 'data triangulation', as suggested by Creswell (2009) for this kind of methodological approach. In this way, we were able to combine the more structured approach of statistics with the descriptive information provided by semi-structured interviews. Data collection

occurred during the 2013-2014 school year, using a deliberate or 'purposive sampling' (Punch, 2011) of fifty-two teachers and supervisors working in the same basic school.

This case *study* was carried out in *two stages.* Firstly, quantitative data was gathered and analyzed, using questionnaires applied to the forty-eight teachers of the school whose practices had recently been observed and evaluated by supervisors. Secondly, we examined the discourse of four of the six school supervisors (two did not agree to be interviewed), looking for categories. These categories were based on attitudes and skills for a reflective teaching, as reported in the literature review. Moreover, subcategories were grouped under each topic, as subsets of the categories (Yin, 2011; Stake, 1995). The supervisors were given the opportunity to read their own transcribed interview, so as to verify the accuracy of the data.

The case study is circumscribed to a specific and unique situation of teachers' supervision, seeking a deep understanding of this special context (Coimbra and Martins, 2013). The selection of the school is justified by its outstanding position in the promotion of training experiences, but even more so by its projects and training courses. In its Educational Project, the school reinforces the objective of continuous and reflective teacher training, in order to achieve better teaching and learning quality, and the educational success of the students.

2.1 The Participants

Concerning the characterization of the teachers and the supervisors, we verify that they are predominantly female, and between forty and fifty years of age. They have been working at this school for 10 years or more. Additionally, the supervisors accumulate teaching and supervision duties in the same school. Their task includes classroom-based supervision as a cyclical process, creating readiness through supportive and positive communication with teachers. This implies continuous inquiry about teacher performance, encouraging teachers to consciously reflect upon and inquire into their practice, and an overall evaluation of the process (Nolan & Hoover, 2004; Pawlas & Oliva, 2007).

It is understood that the participants in the case study have a stable professional situation and know the educational context in analysis well, a criteria for participation in this study. Their professional stability, both as teachers and as supervisors is a factor to take into account, since it influences their work (Lichtman, 2013).

2.2 Analysis of the Questionnaire Enquiry to Teachers

The totality of teachers (100%) says that reflective practices are essential in the classroom, since they contribute to the quality of teaching and learning, through investigation-action. Most consider themselves reflective professionals, presenting, as justification, by decreasing order, reflection before, during and after action, the reformulation of the practices and collaborative reflection in

pairs. Due to the extension of the study, we present a set of three representative tables.

Table 1
Characteristics of reflective teachers

Reflective characteristics	*N*	%
Capacity to reflect before, during and after the action	15	31.2%
Capacity to investigate practices	10	20.8%
Capacity to reformulate the practices	7	14.6%
Capacity of pedagogic-didactic actualization	5	10.4%
Capacity to invest in continuous training	4	8.3%
Participation in collaborative reflection between pairs	3	6.3%
Promotion of collaborative work in the community	3	6.3%
Process evaluation of the practices	1	2.1%
Total	48	100%

Concerning the characteristics that compose the reflective teacher profile, the results are reported in Table 1. As we can see, teachers consider, as the most important characteristic of the reflective teacher, the capacity to reflect before, during and after the action (31.2%), the capacity to investigate practices (20.8%) and to reformulate them (14.6%). However, the collaborative reflection in pairs seems detached from why they consider themselves reflective professionals (6.3%), with collaborative work in the community also being less chosen (6.3%). Such results point out the ongoing predominance of individualized teacher work, in spite of the awareness of the advantages of practical reflectivity and collaboration in pairs. The pedagogic-didactic actualization (10.4%) and the investment in continuous training (8.3%), although with less meaningful results, are seen as the basis of teacher work. Finally, the process evaluation of the practices is mentioned only by one teacher only (2.1%), and thus not seen as a systematic support for the reflection and educational investigation, in the educational context.

In general, teachers understand the profile of a reflective professional, as described by Zeichner (1993), Schön (1987) and Perrenoud (1999). However, it is clear that an effective interconnection between theory and practice is lacking. It would be interesting to know which obstacles exist to the concretization of reflective practices, with the training and performance of teachers in mind.

The results appear in Table 2.

Table 2
Constrains to the concretization of reflective practices

Constrains to the concretization of reflective practices	*N*	%
Overload due to bureaucratic tasks	28	58.3%
Lack of time for joint reflection	10	20.8%
Individualization of teacher's work	8	16.7%
Insufficient continuous training	2	4.2%
Total	48	100%

Concerning to the constraints to the concretization of reflective practices, teachers' answers point out an overload due to bureaucratic tasks (58.3%), and lack of time for joint reflection (20.8%). Given the relation of causality between both, it is evident that management work teachers undertake, in the school as an organization, is seen as preventing a deepening of the pedagogic-didactic intervention and, more concretely, of reflective work in pairs. With regard to the individualization of teachers' work (16.7%), teachers understand it as a hindrance to the improvement of reflective practices. However, compared to the results of the preceding table, the fact that collaborative reflection between pairs, and collaborative work in the community have been pointed out as reflective characteristics by only a few teachers shows the difficulty in letting go of old practices related to individual work. Insufficient continuous training (4.2%) is the result, in the context of the study. This happens in spite of clear reinforcement in teacher training, announced in the Educational Project, as described in the contextualization of this study.

Table 3
Potentialities of the concretization of reflective practices

Potentialities of the reflective practices	*N*	%
Questioning of practices through reflection	12	25.0%
Improvement of teaching methods	9	18.7%
Collaborative reflection between pairs	8	16.7%
Reformulation of practices	8	16.7%
Promotion of investigation-action	7	14.6%
Improvement of professional skills	4	8.3%
Total	48	100%

In what concerns the potentialities of the concretization of reflective practice, the answers of the teachers are elucidative either of their perceptions, or of the educative work developed at the school community.

The questioning of practices through reflection stands out (25.0%). It is followed by the improvement of teaching methods (18.7%), collaborative reflection between pairs (16.7%) reformulation of practices (16.7%) and the promotion of investigation-action (14.6%). These potentialities show teachers as capable of investigating, reflecting and changing pedagogic action in different groups or classes, thus matching the literature review. However, once more, the collaborative reflection between pairs, mentioned by some teachers, is not always achieved, according to the results analyzed in the Table 3. Teachers have the perception of their importance, but they seldom perform a collaborative work in the community. Finally, although the improvement of professional capacities (8.3%) has been mentioned by few teachers, it is implicit in their path of professional learning, linking reflection, collaboration, educative action and continuous learning.

Analysis of the Interview to Supervisors

The interview to the four supervisors began with an auto-characterization of their duties, as internal supervisors of the school. All believe that they follow the educative practices, by motivating teachers to assume a reflective and transforming attitude in the learning community.

The categorical analysis is based on defined *a priori* categories, from an adaptation of the theories of Zeichner (1993), Schön (1987) and Perrenoud (1999). It includes the following categories: (1) receptivity to the reflective practice; (2) responsibility in reflective practices; (3) commitment in reflective practices. Afterwards, the semantic analysis of the discourse (Yin, 2011; Stake, 1995), and the systematization of the interviews of the supervisors were undertaken. The counting of the occurrences is in Table 4.

Subtitle: Oc. – Occurrence.

In the first category, receptivity to the reflective practice, the most significant subcategory is openness to reflective practice (6 occurrences). The prominence of this subcategory matches the teachers' answers, as previously analyzed. In lesser numbers, there is the openness to educative innovation (5) and the integration of reflection into practice (4). The acceptance of the possibility of making mistakes (3) is only mentioned by the supervisors, who consider that teacher supervision and evaluation practices can improve the process of building knowledge. In the perception of supervisors, mistakes can be a source of learning, when they are a basis for reflection. Besides that, criticism among pairs can lead to greater improvement. As Perrenoud (1999) says, no one learns neither evolves without making mistakes, since they are a necessary path for knowledge. As one of the supervisors says:

Sup.2: "Teachers are receptive to reflective practices and to their integration in their daily teachers work. However, at the level of internal supervision usu-

Table 4
Capacities and attitudes of the reflective teacher

Categories	Subcategories	Oc
1. Receptivity to reflective practices	Openness to educative innovation	5
	Openness to reflective practice	6
	Integration of reflection into practice	4
	Acceptance of the possibility of making mistakes	3
2.Responsibility in reflective practices	Reflection before the action	6
	Reflection during the action	3
	Reflection after the action	4
	Concretization of meta reflection	3
3. Commitment in reflective practices	Continuous evaluation of the practice	3
	Concretization of collaborative reflective practices	5
	Capacity for improving practices	4
	Capacity for auto and hetero training	7

ally done by the coordinator of the curricular area, it is not easy to reflect on accomplished work. From my experience, it i always difficult when criticisms are made to pedagogical action (…). Teachers still have problems in accepting criticism from a colleague who works in the same school, accumulating supervisor duties." The discourse evidences the dilemma of internal supervisors that simultaneously perform teacher and supervisor duties. Interpersonal relationships of proximity make the formulation and the acceptance of reflections and constructive critics more difficult. Therefore, it is not possible to make reflective practices advantageous, as there is not a true understanding of the strong and weak points. This prevents the reformulation of the practice, inseparable from the hetero and auto reflection. Regarding the second category (responsibility in the reflective practice) the supervisors consider that teachers reflect the most before action (6 occurrences), when planning school activities. However, it is important this reflection decreases after (4) and during the action (3), confirming the necessity of a continuous reflection process, which many teachers still do not perform. Accordingly, meta reflection (3) and the continuous evaluation of the practice (3) do not always take place into practice, which decreases the learning and teaching quality. As supervisors describe:

Sup.1: "Yes, teachers reflect about the practices, but they still do it in a poorly organized way. They are able to reflect before the action, in the planning of the activities, which is done in a collaboration with all the teachers at the same school year and curricular subject. The collaborative work of planning is already well understood. The problem is with reflection, during and after action, which is not always done. So, as supervisor, my opinion is that reflection about teaching implies a continuous auto regulation, remains unfinished and not always is concretized."

Sup.2: "Teachers know that the true reflective teacher applies practical reflectivity during all teaching and learning process, in planning, concretization in the classroom and evaluation after action. But in practice many teachers work together only in planning, and they do not do it during the action." Both supervisors point out, as constraints to the concretization of reflective practice, the poorly organized reflection, discontinuous and incomplete, performed by many teachers. Concerning the reflection process, teachers focus on the planning stage, forgetting the concretization of didactic planning and the corresponding evaluation, as we can see from the results of the questionnaire to the teachers. As such, they are not used to reflect upon the effectiveness of their performance, or solving possible problems with the subsequent reformulation of practices. Finally, regarding the third category, commitment in reflective practices, collaborative work on the capacity of auto and hetero training prevails (7 occurrences), as well as the concretization of collaborative reflective practices (5). The supervisors agree that, through collaborative work, teachers develop their capacity for improving practices (4). It should be noted that collaborative reflection, as seen by the teachers in the questionnaire, is not always taken into account, in detriment of the valorisation of personal work. In order to clarify this subject, we present the following extracts:

Sup.1: "Training is essential, in order to obtain a responsible, participant and dynamic teacher. In a school that privileges the training of reflective teachers and community work, supervision work is facilitated".

Sup.3: "The reflection is indeed important for professional actualization and training. It is in shared reflection that we can find paths that facilitate didactic and pedagogic processes (….). Only practical reflectivity allows reformulation of pedagogical practice, as well as the students' success".

Sup.4: "It is essential that teachers improve their professional capacities and share between them the acquisition of capacities suitable for a genuine reflective teacher. It is a process that takes time (….). But it is necessary to be a reflective teacher, above all in basic school, an educational stage essential for the development of our students. For that, the teacher has to be committed, in order to achieve a work of quality." For the supervisors, the profile of the reflective teacher is built from the diligence and motivation of teachers in a "process that takes time" (Sup. 4). After all, reflection is a process, and not a sum of unsystematic phases limited to the planning of the activities, the only moment in which some teachers perform reflective and collaborative work. In this way, the supervisors highlight the importance of collaborative work in pairs. In accor-

dance, the school in which the case study took place "privileges the training of reflective teachers and the community work" (Sup.1).

Conclusions

When looking at the study findings, it can be said that teachers and supervisors agree on the importance given to the development of capacities and attitudes necessary to the concretization of reflective practices. Teachers emphasize the capacity to reflect during action, investigating practices and reformulating them, when necessary. However, reflection is superficial and unmethodical, circumscribed to planning, as pointed out by the supervisors. This tendency is aggravated by an evaluation less meaningful of the practices, referred by the teachers, who show less acceptation of the possibility of mistaking, as pointed out by the supervisors. The same happens with collaborative work. While teachers, in theory, value pair work, in practice they frequently prefer individual work. This dichotomy delays a systematic meta reflection to enhance responsibility and investment in reflective practices. To these situations, identified by supervisors, another is added: the overload of daily school tasks, with consequent lack of time for reflective practices, as mentioned by teachers. From these results, we infer that the participants in this case study have a clear perception of the collective and individual transformation that occurs, as consequence of a reflective interaction between pairs.

Finally, overall findings point to the beneficial impact that reflection-in-action and reflection-on-action have on teachers' practical reflexivity. Critical systematic reflection is a necessary condition for quality teaching. The participants believe that reflection can promote construction of professional development, based on a prospective vision of continuous learning and on the consolidation of a school community that privileges dynamic educative community, systematic reflection is seen as a crucial condition for quality teaching. A culture of reflection and inquiry into teaching is anchored in the specificity of a school that believes in their teachers as 'reflective practitioners' (Schön, 1983).

Although the conclusions of this particular case study cannot be generalized (Yin, 2011, since it is unique in its complexity and context, a 'naturalistic generalization' is possible (Stake, 1995), furthered by other case studies and individual experiences. This is particular important when teacher supervision and reflection are involved, since it is a problematic and challenging area. Hence, future research is needed, considering the impact of the supervisory roles in teachers' practical reflectivity, depending on each school context. This area is suitable for practical consideration and future research, due to the active participation of supervisors in building professional learning school communities, through ongoing problem-solving and practical reflectivity.

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11

«On the Origin of Species»: Didactic transposition to curriculum and Portuguese science textbooks (1859-1959)

Bento Cavadas

Introduction

Evolutionism should not be confused with Darwinism. However, there is no doubt that the book *On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life* (Darwin, 1859) brought a coherent explanatory framework for evolutionism. In this book, Darwin (1859) advocated species are the result of evolution, by branches, from a common ancestor, and natural selection is one of the proposed mechanisms for this transformation of species.

According to Almaça (1999), who studied the impact of Darwinism in Portuguese Universities, Darwin became known in Portuguese academic world of 19th century due to French translations of his work, which arrived in the country since 1862. Almaça (1999) argues Portuguese academy of 19th century advocated evolutionism, even at a time when same doctrine had great difficulties of implantation in countries such France, Great-Britain, Germany, Italy and Spain. However, the translation of Darwin's work to Portuguese took about half a century since its initial publication, having only appeared for sale in Oporto in the Chardron bookshop in 1913 (Pereira, 2001). Thus, statements of Almaça (1999) suggest that in 19th century, Portuguese textbooks authors had access to French translations of Darwin's book, while the study of Pereira (2001) suggests access to the Portuguese version since 1913.

This research was influenced by Young's (2010) notion of curriculum, which Pacheco (2013) summarized as a corpus of knowledge and values, socially and culturally recognized as valid. Present study aims to complement the way the origin of species has been expressed in Portuguese Natural Sciences curriculum, through the analyses of didactic transposition of evolutionary ideas presented

by Darwin in the book *On the Origin of Species* to school standards and textbooks published between 1859 and 1959.

A historical approach to origin of species theories in textbooks

Goodson (2001), in his studies about social construction of curriculum, advocates it is necessary to examine the relation between the content and the subject and to analyse deeply the issues about practice and the school processes. Textbooks can give a good help to the enlightenment of those processes. Textbooks are halfway between curriculum prescribed institutionally and curriculum that is taught in the classroom by teachers. Thus, the study of those books may allow access to the teaching of origin of species theories, contributing to understand the process of historical construction that Cuesta Fernández (1997) named as "disciplinary code", in this case, Biology. Study of textbooks is also according to Chervel (1991), who stated: "study of the curriculum effectively taught is the main task of the historian of the subjects" (p.77). For Chervel (1991), content analysis of school discourse, in specially of textbooks, allows the revelation of the ideology that impregnates an educative system. Adding this idea to the fact that 90% of science teachers use science textbook during 95% of class and curriculum is usually taught through only one textbook (Harms and Yager, 1981), we can assume content of textbooks is one of the main responsible ones for the ideology transmitted and the curriculum effectively taught in classrooms. Skoog (1979) also endorsed those ideas by saying a way of assessing whether evolution was taught or neglected in the past is through analysis of science textbooks.

Previous studies (Cavadas, 2009, 2010, 2011) showed teaching of origin of species in Portuguese textbooks was only addressed in secondary school curriculum and expressed through different perspectives or theories in textbooks published between 1859 and 1959: Creationism, Darwinism, Lamarckism, Mutationism, Neo-Lamarckism, Orthogenesis and Theistic evolutionism. None of those ideas reached the status of Kuhnian paradigm (Kuhn, 1996) in textbooks because their analysis showed there was not replacing process of one theory by another one. Different perspectives coexisted at same time, though with different degrees of scientific validation. That conclusion shows, as development of science is inextricably intertwined with various social parameters (Gavroglu, 2007), its expression in textbooks also reflects interaction between science and society, being another evidence of the Goodson's (2001) ideas of social construction of curriculum.

However, the approach to origin of species theories in Portuguese textbooks (Cavadas, 2009, 2010, 2011) shows several authors were strongly evolutionists. An evidence of this statement is their preference to present, in great depth, this explanation of origin of species. In contrast, they lightly addressed creationist approaches. Creationism was explored briefly in textbooks of Amado and Leite (1887) and Lemos (1890), but in early 20th century it was suppressed in textbooks of Aires (1907, 1920). It was addressed again from 1930s to 1950s in text-

books of Aires (1931), Primo (1937) and Pires de Lima & Soeiro (1955), though only within a framework of History of Science of origin of species and as an introit to the evolutionary theories. Later, the same creationist perspective evolved to a new attempt to explain origin of species, the Theist evolutionism, which appeared for first time in textbooks published at the end of 1930s, remaining until the 1950s. However, even though standards imply the presence of Theistic evolutionism in textbooks of Zoology, Primo (1937) and Pires de Lima & Soeiro (1955) did not present empirical arguments to support it, but merely described its meaning. Similarly, in textbooks of United Kingdom, although some works published between 1950s and 1960s mixed religious beliefs with teaching of evolution, scientific facts predominated and references to the influence of divine entities disappeared progressively (Williams, 2008). In Portuguese case, an explanation for the introduction of this creationist upgrade in textbooks may have been the influence, on curriculum, of the dictatorial regime, which was very close to Catholic Church. A similar phenomenon occurred in Spain, as Puellez Benítez and Hernández Laille (2009) concluded the transmission of science in textbooks suffered ideological and religious influences.

Expression of Evolutionism in 19th century Spanish and English textbooks of secondary school was deeply studied by Hernández Laille (2010). This researcher classified textbooks in different categories, according to the defence of creationism or Darwinism. Hernández Laille (2010) concluded creationist textbooks were most common in Spain between 1875 and 1881, due to a big ideological control over school policy. This is another strong evidence of the Goodson (2001) ideas about social construction of curriculum. However, from Albareda law of 1881 and especially from 1890s, period in which Spain felt the effects of Restoration, predominated Darwinist textbooks, a fact also found in Portuguese textbooks of that period (Cavadas, 2009). Among authors who defended Darwinism in textbooks, Hernández Laille (2010) concluded some of them cited Darwin explicitly, others defended their ideas without naming Darwin and others add at evolutionist explanations conciliatory proposals between religion and science. Despite this consolidation of Darwinism in Spanish textbooks, in 19th century it was also published some textbooks which did not refer to Darwin openly, as well as some anti-Darwinist textbooks (Hernández Laille, 2010).

Swarts, Anderson & Swetz (1994) in a comparative study of textbooks of USA, Republic of China and URSS published between 1886 and 1990, concluded the country where evolutionism teaching prevailed was USSR, followed by USA and Republic of China. Despite this prevalence, it is in USA that creationist/evolutionist controversy has generated the sharpest debate (Scott, 2009) and has been the motor of some studies about evolutionism in Biology textbooks. Approach to evolutionism in zoology, botany and geology textbooks published post-*Origin of Species* until 1920 was analysed by Larson (1987). This researcher found in the first two decades Post-*Origin of Species*, textbooks, especially those who addressed zoology and geology, consisted essentially of reviews of pre-Darwinian books. Larson's (1987) explanation to late introduction of evolutionism in

the USA textbooks is due to academic origin of their authors: "These textbooks, typically written by science educators rather than research scientists, lagged far behind those of the masters in recognizing scientific advances" (p. 98). However, after that phase, evolutionist ideas impregnated textbooks gradually, a process that was completed before the turn of 19th century to 20th century (Larson, 1987). Skoog (1979) complemented this study by analysing textbooks published between 1900 and 1977. This researcher found teaching of evolutionism was peripheral and not controversial in textbooks prior to the Biological Sciences Curriculum Study (BSCS) published in the 1960s. Skoog (1979) concluded textbooks published between 1900 and 1919 eclipsed evolutionism and only three of the eight textbooks analysed had chapters in which this subject was handled. In 1920s, despite an increase in the coverage of evolution in textbooks, it has not been treated as an integrative concept in Biology. In 1960s, curricular reconstruction promoted by BSCS stopped the suppression of evolutionism, which happened to have a meaningful expression in textbooks (Skoog, 1979).

Methodology

Considering the problem, objectives and the theoretical approach that support this work, it was carried out under a qualitative study through content analysis (Amado, Costa & Crusoé, 2013; Bardin, 1979; Bogdan & Biklen, 1994). This analysis was influenced by the didactic transposition theory (Chevallard, 1991) and included the following steps:

First step, heuristic, involved selection, recovery or localization of standards and textbooks published between 1859, the year when *On the Origin of Species* was published, and 1959, the year of its first centenary. Considering the representative standards of that period (Cavadas, 2008) (Table 1), it was analysed the first edition of the most relevant textbooks written accordingly those standards (Table 2).

In second step, were created "coding categories" (Bogdan & Biklen, 1994). Coding categories were restricted to items associated with mechanisms of evolution, defined as the conditions or processes that promote evolution. Firstly, categories emerged from a free content analysis of standards and textbooks. Later, they were applied to some textbooks to delimit them. Final categories were: adaptation, variability, growth correlations, hereditability, natural selection and vital competition, geographic isolation [1] and sexual selection (Table 2).

[1] Geographic isolation, which was also taken in consideration by Skoog (1979) as a mechanism of evolution, should not be considered objectively as a mechanism that promotes evolution, but only as a circumstantial element of environment which favours other mechanisms of evolution. However, it will be present in this category due to their indirect contribute to the action of those mechanisms. Some authors also addressed mutations as an agent of evolution. However, it was not considered the analysis of this mechanism due to the discovery of its influence on evolution only after Darwin's work.

Third step, hermeneutics, was based on content analysis of standards to identify the transposition of Darwinism. Then, it was evaluated the presence or absence of each mechanism in science textbooks, followed by their content analysis to assess didactic transposition of mechanisms of evolution. Scientific work of reference was the first edition of *On the Origin of Species* (Darwin, 1859).

Results were compared with similar studies and crossed with other studies that addressed Darwinism, in a history of science perspective (Avelar, 2007; Avelar, Matos & Rego, 2004; Bowler, 1992, 2003; Browne, 2008).

Didactic transposition of Darwinism to school standards

Following table presents year of publication, name, legislation and class year of Natural Sciences standards analysed. Darwinist concepts addressed in those standards were also presented.

Table 1

Darwinist concepts in Portuguese standards of Natural Sciences (1859 – 1959).

Year	Name	Legislation	Year/ Class	Darwinist concepts
1856	Principles of Physics, Chemistry and Introduction to Natural History of Three Kingdoms[2]	Edict (s. d.). Diário do Governo number 122, 26 May 1856, p. 702.	n. i.	Absent.
1872	Standards of Principles of Physics and Chemistry and of Introduction to Natural History	Ordinance of 5 October 1872. Diário do Governo number 231, 12 October 1872, p. 1550.	n. i.	Absent.
1880	Standards of Elements of Physics and Chemistry and Natural History	Ordinance (s.d.). Diário do Governo number 241, 21 October 1880, p. 2754.	n. i.	Absent.
1886	Standards of Introduction to Natural History	Ordinance of 19 November 1886. Diário do Governo number 267, 23 November 1886, pp. 3392-3393.	n. i.	Absent.
1889	Standards of Introduction to Natural History	Ordinance of 10 October 1889. Diário do Governo number 245, 29 October 1889, pp. 2471-2472.	5th year	Brief news on organization, differentiation and selection of living beings. (p. 2472)
1895	Standards of Physical Sciences and Natural Sciences	Decree of 14 September 1895. Diário do Governo number 208, 16 September 1895, pp. 2518-2520.	7th class	Variability. (…) Heredity, its forms and laws. Relations of animals with the environment. Vital competition. (…) struggle for existence; natural and artificial selection. (p. 2519)

[2] Probably only adopted at the Lyceum of Coimbra (Beato, 2011).

1905	Standards for the Teaching of Physics, Chemistry and Natural History	Decree number 3, 3 November 1905. Diário do Governo number 250, 4 November 1905, p. 3871.	7th class	Adaptation and heredity (p. 3871)
1919	Standards of Natural Sciences	Decree number 6.132, 26 September 1919. Diário do Governo, I Series, number 196, 26 September 1919, pp. 2056-2057.	7th class	Notions on adaptation; heredity; Mendelism; Transformism. (p. 2572)
1926	Standards of Natural Sciences	Decree number 12.594, 02 November 1926. Diário do Governo, I Series, number 245, 02 November 1926, pp. 1174-1788.	n. i.	Absent.
1929	Standards of Natural Sciences	Decree number 16.362, 14 January 1929. Diário do Governo, I Series, number 11th, 14 January 1929, pp. 91-107.	n. i.	Absent.
1936	Standards of Sciences	Decree number 27.085, 14 October 1936. Diário do Governo, I Series, number 241, 14 October 1936, pp. 1249-1252; 1270-1271 e 1278.	7th year	Evolution of organisms. Theories of evolution: Lamarckism, Darwinism, Mutationism and Theist Transformism. (p.1278)
1954	Standards of Biological Sciences	Decree number 39.807, 07 September 1954. Diário do Governo, I Series, number 198, 07 September 1954, pp. 1016-1025; 1037-1043.	7th year	Fixism and Transformism. Theories of evolution of organisms. (p. 1039)

n. i: Not indicated.

Standards of 1856 did not refer to explanations about origin of species, at a time that preceded publication of *On the Origin of Species* (Darwin, 1859). Despite the huge debate around this book, its influence in Portuguese curriculum was delayed. Standards of 1872 did not directly prescribe the study of evolutionism. Eight years later, standards of 1880 in second part of Zoology prescribed the study of "Successive improvement of pre-historic man to modern man" (p.2754). This statement may indicate some evolutionary influence. However, it was not possible to identify textbooks written according to standards of 1880, as well as with standards of 1872, which prevented the analysis of didactic transposition of mechanisms of evolution.

Standards of 1886 published a few years later seemed to regress. These standards do not address evolutionism or other subject regarding evolutionism. However, this situation was reversed three years after. Although standards of 1889 do not directly prescribe the study of origin of species, it indicated the concept of selection must be addressed: "Brief news about organization, differentiation and selection of living beings" (p. 2472). This statement may reveal knowledge, by legislator, of Darwinian mechanism of natural selection. However, standards never explicitly mentioned the study of evolutionary theories, such as

Darwinism. Nevertheless, textbooks authors, such as Amado and Leite (1887)[3], understood they should address this subject as an introduction to descriptive Zoology, a theme prescribed in standards of 1886. Another author, Lemos (1890), who also addressed conceptions about origin of species, though that subject was not explicit in standards of 1889.

The most obvious example of didactic transposition of the book *On the Origin of Species* occurred in standards of 1895 because it prescribed directly the study of "Variability. (…) Vital competition. (…) The fight for existence; natural and artificial selection." (p.2519). Unfortunately, it was not possible to locate textbooks written according to these subjects.

In early 20th century, standards of 1905 seemed to take a step back by prescribing only the study of "Adaptation and heredity" in final section of Zoology standards of 7th and last secondary school class. Despite this omission, Aires (1907), a representative author of science textbooks of that period, University Professor of Zoology and director of Zoological Museum of University of Coimbra, considered standards endorsed implicitly the study of Transformism[4]:

> Demanding heredity and adaptability, standards refer implicitly to Transformism, which is an immediate consequence of those principles. So here we show some slight notions of this theory (p.171).

This option of Aires (1907) reflects, in Portuguese science textbooks, the following statement of Larson (1987): "Turn-of-the-century zoology textbooks gave new prominence to evolutionary concepts by replacing the old animal catalog format with a presentation focusing on zoological concepts, including evolution." (p.104).

Next standards, published in 1919, present, for first time, an explicit, but briefly reference to the study of Transformism. Note that, in next decade, the intensity of creationist/evolutionist debate increased in USA. This debate was intensified during Scopes trial, in 1925, and the consequent effort of William Jennings Bryan to decrease or remove teaching of evolution in secondary schools and in Universities (Bleckmann, 2006). Remarkably, in the laconic standards of 1926, succeeded by standards of 1929, this subject was not prescribed, leaving unclear whether this omission will, or will not, have any relation to the events that took place across the Atlantic. Regardless of this absence, it is certain that Aires (1931), as he did during the writing of textbooks post-standards of 1905 and post-standards of 1919, considered, in 7th grade, approach to the classification of vertebrates implied implicitly study of Transformism. Thus, he dedicated the last chapter of the textbook published in 1931 to that subject, naming it "Evolution of animals. Basis for their classification" (p.308).

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[3] At the time he wrote his textbooks, Silva Amado was the Headmaster of Central High School of Lisbon and teacher of the medical-surgical school of Lisbon. Pedro Eusébio Leite was a teacher of Physics, Chemistry and Introduction to Natural History in Central High School of Lisbon.

[4] Transformism was a term used at that epoch instead of evolutionism.

In 1930s other few standards were published. However, this analysis was circumscribed to be published in 1936 because, unlike previous ones, they explicitly prescribed the study of evolution through analysis of different perspectives, all classified as theories of evolution: "Evolution of organisms. Theories of evolution: Lamarckism, Darwinism, Mutationism and Theistic evolution" (p.1278). Legislator presented, inclusively, some instructions about suitable method to teach Biology. Among other recommendations, it indicated teachers should only give very elementary notions of those subjects, and students should acquire their knowledge through study and memorization of textbook for later evaluation in class. Those legislative prescriptions led authors of textbooks, like Primo (1937), to address origin of species theories briefly.

Standards of 1936 were used almost until the end of 1940s and were replaced by standards of Biological Sciences published in 1948 [5]. These last standards were slightly changed by standards of Biological Sciences published in 1954, the ones with greater longevity during the 20th century. These standards went through the 1960s and influenced teaching of sciences in the first years of the 1970s. For this reason, it was preferred the analysis of 1954's standards instead of 1948's. Standards of 1954 prescribed the study of origin of species theories at end of secondary education and based the study of those theories on these subjects: "Fixism and Transformism. Theories of evolution of organisms" (p.1041), which the legislator named "biological philosophy" (p.1041). These standards also presented explicit instructions for the approach to study of origin of species. That indicates an attempt to control this subject at governmental level because legislator advised teachers to address it "very carefully and without exaggeration", because, although he considered those issues as very important ones, "there is no unanimity on some of them" (p.1041). Legislator warned teachers should be limited to neutral arguments of competing versions, excusing himself to utter individual assessments.

Didactic transposition of mechanisms of evolution

One of first Zoology textbooks, named Lessons of Elementary Zoology and organized in two parts, was written by Júnior (1859, 1860) [6]. Edition of the first part of the textbook (Júnior, 1859) is contemporary with On the Origin of Species first edition, therefore, the author probably would not have knowledge of it. Nevertheless, in scientific world other origin of species theories were known, like the one presented in Philosophie Zoologique published by Lamarck fifty years before. However, Júnior's (1859) first textbook shows clear creationist

[5] Decree 37.112, 22 October 1948. *Diário do Governo*, I Series, number 247, 22 October 1948, pp. 1119-1133; 1142-1149.

[6] It was not possible to determine if Júnior (1859, 1860), teacher in High School of Santarém, has considered standards of 1856 when he was writing his textbook because, according to Beato (2011), these standards did not have national coverage and were only used in the High School of Coimbra.

influences (Cavadas, 2009), which indicates this author was not aware of, or at least rejected, evolutionist ideas. Hernández Laille (2010) also identified creationist textbooks in Spain from same epoch of Junior's textbooks. Inclusively, in that study, she found creationist textbooks of natural sciences used in secondary schools in the post-1874 period, associated with the Restauration of Antonio Cánovas del Castillo.

However, Junior's creationist works were the beginning of a series of textbooks where evolutionism became the dominant conception of origin of species (Cavadas, 2009, 2010, 2011). This section presents content analysis of didactic transposition of mechanisms of evolution presented in *On the Origin of Species* for the textbooks analysed (Table 2).

Table 2

Mechanisms of evolution in Portuguese textbooks of Natural Sciences (1859-1959)

Mechanism	Textbooks							
	Júnior (1859) (1860)	Amado and Leite (1887)	Lemos (1890)	Aires (1907)	Aires (1920)	Aires (1931)	Primo (1937)[7]	Pires de Lima and Soeiro (1955)[8]
Adaptation		√		√	√	√	√	
Variability		√	√	√	√	√	√	√
Growth correlations			√	√	√			
Heredity		√	√	√	√	√	√	√
Natural selection & vital competition		√	√	√	√	√	√	√
Geographic isolation				√	√	√		
Sexual selection			√	√	√	√	√	√

√ Presence Absence

[7] Seomara da Costa Primo was a teacher in the High School of Maria Amália Vaz de Carvalho, activity which she accumulated with University teaching in the Faculty of Sciences of the University of Lisbon (Primo, 1943).

[8] Pires de Lima was a teacher of Botany in the University of Porto. Augusto Soeiro was a teacher in D. Manuel II High School (Nóvoa, 2003).

Adaptation

Currently, the adaptation is not understood as a mechanism of evolution itself, but as a result of action of other mechanisms, as natural selection or sexual selection. However, in ancient textbooks, authors seem to have understood adaptation as a promotor and not as a result of those mechanisms. In this line of thinking, adaptation to environment was referred by Amado and Leite (1887), in textbook *Elements of Zoology*, in strict relation to heredity, as an enhancer of process of natural selection because the less adapted individuals would be defeated in the struggle for existence. This transposition of adaptation process associated with natural selection expressed correctly Darwin's (1859) ideas:

> The slightest advantage in one being, at any age or during any season, over those with which it comes into competition, or better adaptation in however slight a degree to the surrounding physical conditions, will turn the balance (…) The most vigorous individuals, or those which have most successfully struggled with their conditions of life, will generally leave most progeny (…) and the slightest advantage will lead to victory (p.468).

Adaptation process was also present in Aires (1907, 1920) textbooks entitled *Lessons of Zoology*. The author dedicated an entire chapter explaining it, arguing adaptation means the "adjustment (…) of the organism to their functions explains their conformations and structures" (1907, p.161; 1920, pp.114-115). However, he did not connect it properly to natural selection, preferring to advocate, in a Lamarckian perspective, living matter was plastic and seemed to have a property, which he called "adaptability", related to the ability of an organism to shape to the natural environment. Because of this property, characters of living beings were generally appropriated to vital conditions and could exercise their functions with minimal effort "as if they were designed to live in the environment where they normally are" (1907, p.161; 1920, p. 114). Primo (1937), in the textbook *Compendium of Biology*, interpreted the mechanism of adaptation in the same way, also approaching Lamarckism when stating variations result from evolutionary process of adaptation to environment. This influence was evident in the thought of Aires, when he stated "animals have the property to modify under the influence of variations of the environment or the exercise of their organs" (1907, p.169; 1920, p.125). This author extended this relationship claiming due to the correlation of organs each change is reflected in other parts of the organism.

Lamarckian concept that members of a species adapted physically and intentionally to changes in environment, differs from the competitive perspective of Darwin, as well as other authors, who saw in these phenomena a clear example of action of natural selection (Bowler, 1992). Actually, Darwin, in the opinion of Bowler (2003), concluded an approach to changes that happen in organisms centred in Lamarckism was inadequate because "although the environment might well be the stimulus, the majority of the changes it produced were

not purposeful (…) they were essentially random" (p. 159). Lamarckism assumed the changes that happened in organisms had a direction, while natural selection assigned randomness to these changes. Those different perspectives are a clear example that same phenomena can be interpreted differently according to theoretical framework being considered.

In fact, a better understanding of the phenomenon of heredity that Mendelism brought, lead Aires, in the textbook published in 1931, to consider "beings do not adapt to environment neither environment adapts them to it" (p.331). Now he states adaptation of living beings to environment is simply the "effect of variations randomly favourable or randomly in accordance with the environment" (p.331). When these changes are unfavourable, he argues organisms come into conflict with environment and may succumb. These considerations show some delay in relation to the considerations that E. Caustier, Spanish author of textbooks, presented in *Ciencias Naturales*, a book published in 1917, considering even then "by the combined action of variation, adaptation, selection and mutation, it is explained how new species can appear" (1917, cited in Hernández Laille, 2010, p.246).

In previous considerations it is possible to observe some ideas that would lead later to the synthetic theory of evolution. In fact, they show understanding of some phenomena that govern laws of heredity and how natural selection acts to favour characters. Rupture with adaptation as a fundamental evolutionary mechanism was followed by Pires de Lima and Soeiro (1955), in the textbook *Compendium of Biology*, because they did not address this phenomenon in their work.

Variability

Almost all authors presented existence of variability as a fact and dedicated a lot of text to clarify the concept of variations (Amado & Leite, 1887; Lemos, 1890; Aires, 1907, 1920, 1931; Primo, 1937; Pires de Lima & Soeiro, 1955). They agreed changes in shape of animals give origin to varieties that naturally occurred in the nature, transposing correctly the considerations of Darwin (1859): "organic beings have varied under nature (…) in the same way as they generally have varied under the changed conditions of domestication" (p.468). In this regard, Amado & Leite (1887) stated, for Darwin, "variety is a species in process of formation" (p.6), in accordance with the following statements of this naturalist: "varieties are species in the process of formation, or are, as I have called them, incipient species" (p.111).

As variability is a fact, authors centred discussion in the hypothesis that explains its origin. They referred the Darwin's cause of variability is natural selection, although, according to Bowler (2003), Darwin had suggested the source of variability was the influence of environment on reproductive system: "Darwin believed there was a source of new variations as a result of the disturbing influence of a changed environment upon the reproductive system.". Darwin sus-

pected variability in offspring was due to changes that occurred in reproductive system of the progenitors. However, he acknowledged: "but why, because the reproductive system is disturbed, this or that part should vary more or less, we are profoundly ignorant" (1859, p.132). Therefore, Darwin could never fully explain origin of variability, admitting "our ignorance of the cause of each particular variation" (1859, p.131). This was, in fact, the most important gap of Darwinism, marked by most authors of textbooks analysed: Darwin did not explain the causes of variation between individuals of the same species, a phenomenon in which the theory itself is founded and that would only be clarified latter by Mutationism. According to Aires, Darwinism explained that process only saying "living matter has as a fundamental property the variability, and, thus, the living beings differ from each other by more or less considerable particularities" (1907, p.177). Therefore, he only admits the experience of variability and does not elucidate its origin. He highlighted, although Darwinism was very coherent, that important gap in its explanatory framework committed the fully understanding of natural selection. This mechanism can only act in individuals of the same species because, within a pattern of common characteristics, they have some individual differences, like Darwin (1859) recognized: "These individual differences are highly important for us, as they afford materials for natural selection to accumulate" (p. 45). However, Aires (1907, 1920) warned, although there is a gap in the explanation of the origin of variability, its existence was a fact, remaining a convinced Darwinist (Cavadas, 2009). A similar situation did not happen with authors of Spanish textbooks, such as Fidel Faulín Ugarte who stated "transformism (and with more reason Darwinism), today lacks evidence showing the evolution of all beings" (1898, cited in Hernández Laille, 2010, p.233).

Growth correlations

Darwin explained growth correlations indicating the "whole organization is so tied together during its growth and development, that when slight variations in any part occur, and are accumulated through natural selection, other parts become modified" (1859, p.143). This mechanism has been transposed similarly by Lemos (1890) arguing that "introducing any change in an organ, and pilling up by selection, other organs are necessarily modified" (p.273). For Lemos (1890), successive changes that occur in specific species give gradually origin to other species, and do not abrupt changes that only occur in a character. This finding met gradualism because highlights the importance of very small changes for evolution, as Darwin (1859) stated: "As natural selection acts solely by accumulating slight, successive, favourable variations, it can produce no great or sudden modification; it can act only by very short and slow steps." (p.471) Aires (1907), unlike Lemos (1890), did not just explain the meaning of growth correlations, but he enhanced that argumentation associating them to the process of adaptation:

> Animals have the property to modify themselves under influence of environmental changes (…) due to the correlations of organs; each change is reflected more or less deeply in the rest of organism and often produces unexpected effects. (p.169)

Aires (1907) also highlighted that processes of adaptation and growth correlations were not only identified in animals, but also in plants, meeting the examples of Darwin (1859) about this subject. In the textbook of 1920 he repeated that argumentation. However, that work delimits a missing period of this mechanism of evolution, because neither Aires (1931) nor following authors approached it again.

Heredity

Darwin (1859) understood heredity as a supporting process of natural selection, as it is shown in his words: "the nature of the affinities of all organic beings may be explained (…) through inheritance and the complex action of natural selection" (pp. 128-129). Hereditary process defended by Darwin (1859) for domestic animals, and transposed to natural environment, approached the Lamarckian ideas, as it can be checked through this statements: "there can be little doubt that use in our domestic animals strengthens and enlarges certain parts, and disuse diminishes them; and that such modifications are inherited" (p.134). [9] Similarly, the way inheritance acts has been interpreted by Lemos (1890) in a Lamarckian framework of transmission of characters to offspring, as reflected in its considerations:

> First if individual was not modified by special causes that acted during their development or after birth, they tend to reproduce in offspring their almost exact image; second if individual suffered any change, they tend to reproduce that character in the next generation (p.270).

Lamarckian hereditary process was also referred by Aires (1907, 1920) when he stated adaptations acquired by individuals are transmitted and accumulated in their offspring through the heredity of those characters.

Darwin tried to find an explanation for mechanism of heredity, but he never

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[9] In certain passages of the book *On the Origin of Species*, Darwin (1859) mixed the process of use and disuse with natural selection: "On the whole, I think we may conclude that habit, use, and disuse, have, in some cases, played a considerable part in the modification of the constitution, and of the structure of various organs; but that the effects of use and disuse have often been largely combined with, and sometimes overmastered by, the natural selection of innate differences." (pp. 142-143). However, Bowler (2003) warned that, for Darwin, an explanation of the changes in an organism using only Lamarckism was not enough: "although the environment might well be the stimulus, the majority of the changes it produced were not purposeful (…) they were essentially random" (p. 159). Lamarckism presupposed changes that occurred in organisms had a direction while the natural selection would give randomness to those changes.

had success on that task (Avelar, 2007). At that time, Mendel's work was not globally known and understood in its usefulness, so naturalists used the best available and known explanation, the law of inheritance of acquired characters. As natural selection, according to ideas of that time, seemed to have serious limitations, inheritance of the acquired characters remained as the only adjustment mechanism and it was inevitable naturalists recovered it (Bowler, 1992). This combination led to the origin of Neo-Lamarckism, explanation that, although acknowledging process of natural selection as one of the causes of species transformation, attributed a higher importance to inheritance of acquired characters.

In accordance, authors of the 19th century, like Lemos (1890), although they described the consequences of inheritance process, had difficulty explaining how it worked. However, this author referred there are certain causes that print a direction to inheritance, like vital competition [10]. Natural selection was also identified by Lemos (1890) as having a strong influence on heredity. Amado and Leite (1887) indicated heredity is, thus, promoter of the process of natural selection, because the most adapted organisms prevail in struggle for existence, transmitting its mechanisms to offspring.

In early 20th century, Aires (1907, 1920) added more ideas to heredity process, explaining it acts in two types of characters, innate ones, inherited from the parents, and acquired ones, that result from influence of environment, exercise or the inaction of the organs. Regarding innate characters, he referred heredity plays a conservative role because "it tends to keep innate characters and transmit them to their offspring" (Aires, 1907, p.170) and "it tends to keep the similarity of the individual with their ancestors" (Aires, 1920, p.125). As for the second ones, he warned "currently there is no hard evidence about inheritance of acquired characters" (1907, p.172; 1920, p. 131). However, he asserted "the hypothesis of that heredity explains satisfactorily the remarkable effects of adaptation" (1907, p.172; 1920, p.132). He also considered inheritance of acquired characters explains the origin of vestigial organs, crossing this with the ideas of Darwin (1859) who attributed its origin to a heredity process of disuse: "I believe that disuse has been the main agency; that it has led in successive generations to the gradual reduction of various organs, until they have become rudimentary." (p. 454). Although Aires assigns inheritance of acquired characters, associated with the adaptation mechanism, a great explanatory power of evolutionism, he also reinforced his doubts about this process when he stated "Heredity offers a considerable resistance to the invasion of acquired characters, keeping, on the contrary, the innate ones with a certain persistence" (1907, p.171; 1920, p.131). Despite previous evidence, textbooks of Aires (1907, 1920) revealed an approach to inheritance of acquired characters, highlighting the influence of neo-Lamarckism and providing a good example of the slowly process of didactic transpo-

[10] Lemos (1890) considered natural selection and the struggle for existence imprinted a direction to heredity. However, what these evolutionary mechanisms actually do is changing the frequency of the characters of organisms, when they are favourable or unfavourable, and not guiding heredity.

sition of new scientific information for science textbooks. This delay may have been caused by the strong bond of Portuguese naturalists to French literature, as shown in the list of authors of books used in Natural History in Portuguese secondary schools since 1854, elaborated by Beato (2011). In that list there are abundant references to Langlebert, a French author of Natural History books. French naturalists were linked to Lamarckism longer than their Anglophone peers and, with few exceptions, there were not Darwinists in France in the first half of the 20th century (Lepeltier, 2009; Avelar, Matos and Rego, 2004). So, due to the probable access of Aires to francophone zoological information, it is natural that he has approached these perspectives.

The acceptance of the Lamarckian thesis of inheritance of acquired characters was a phenomenon that Skoog (1979) also identified in the USA textbooks published between 1920 and 1930. The removal of this mechanism, in Portuguese case, occurred in Primo's (1937) and Pires de Lima and Soeiro (1955) textbooks who explained transmission of characters through laws of Mendelian heredity of uniformity, disjunction and independence. In contrast, Aires (1907) did not present any explanation of how the transmission of characters works, justifying himself with the existing delay in scientific knowledge on this subject. This claim may indicate that he did not know Mendel's works. However, Aires (1907) summarized rules of heredity in two laws that seemed to suggest some approach to Mendelism:

> 1st. A common character to both parents ordinarily appears in offspring and in a more pronounced way;
>
> 2nd. If individuals with common characters intersect with a certain number of successive generations, those characters end up appearing regularly in offspring. (p.170)

In textbooks of 1920 and 1931, Mendelism was already known by Aires because he dedicated part of the text explaining Mendel's laws of dominance, disjunction and independence of characters. He mentioned that the transmission of certain characters obeys to fixed rules, but he warned that the laws are elementary or generalizations of phenomena that occurred in simple conditions and rarely occurred in natural environment. For its part, Primo (1937), Pires de Lima and Soeiro (1955) transposed with some depth the laws of Mendel, assigning them a great explanatory capacity in mechanism of transmission of characters. This change reflects Bowler's (1992) observation that the appearance of heredity experimental studies led to the fact that Darwinism inevitably emerged from its eclipse, when it was possible to gradually show that the interpretation of these mechanisms fitted well to natural selection.

Natural selection and vital competition

Darwin's method to explain how natural selection works was to clarify firstly how the artificial selection worked. Secondly, Darwin transposed that process to

natural environment, advocating that it is responsible for adapting species to their environment (Bowler, 2003). Similarly, all authors of textbooks allude to phenomena associated with artificial selection to support the discourse about natural selection. Another idea that Darwin (1859) used to defend his evolutionism point of view was associating explanation of natural selection with process of struggle for life, summarizing them as follows:

> If variations useful to any organic being do occur, assuredly individuals thus characterised will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance they will tend to produce offspring similarly characterised. This principle of preservation, I have called, for the sake of brevity, Natural Selection. (p.127)

All authors did the correct didactic transposition of those ideas, linking the process of natural selection, or of survival of the fittest, to vital competition [11]. In this regard, Amado & Leite (1887) and Lemos (1890) summarized, in a similar manner, the process of natural selection, stating there are individuals with different characteristics in same species that result from any modification in the original species; from those individuals, ones with favourable characters "to achieve victory in this *struggle for surviving* would be the chosen ones" (Amado & Leite, 1887, p.6; italics in the original). Lemos (1890), in same line of thought, highlighted "variety that represents an improvement in any sense, is most likely to resist and develop" (p.271), adding that the organism which as unfavourable characters will be quickly sacrificed by nature. Therefore, they highlighted one of the main assumptions of Darwinism, persistence of favourable variations, promoted by natural selection, transposing correctly Darwin's (1859) thought: "Only those variations which are in some way profitable will be preserved or naturally selected" (p.117). They also stated, over time, those differences are accentuated with aid of heredity, clearly transposing Darwin's thought: "natural selection, also, leads to divergence of character" (pp.127-128). Amado & Leite (1887) and Lemos (1890) agreed that, after several generations, the sum of small changes originates varieties, those races, and, finally, new species, rightly extrapolating the cumulative process highlighted by Darwin (1859): "natural selection will then accumulate all profitable variations" (p.134). They also stated this process leads to disappearing of intermediate forms, rightly transposing to natural environment Darwin's (1859) ideas on the process of divergence of characters under human influence: "As the differences become greater, the inferior animals with intermediate characters, being neither very swift nor very strong, will have been neglected, and will have tended to disappear." (p.112)

Textbooks of Aires (1907, 1920, 1931) were those where mechanism of vital

[11] It should be mentioned Darwin (1859) focused, essentially, the competition between individuals and not between species: "As the individuals of the same species come in all respects into the closest competition with each other, the struggle will generally be most severe between them" (pp. 467-468).

competition was transposed with a greater development, a phenomenon similar to what happened in the EUA: "Turn-of-the-century zoology textbooks gave new prominence to evolutionary concepts" (Larson, 1987, p.104). Hernández Laille (2010) also stated Spanish textbooks of earlier 20th century explicitly recognized Darwin as founder of theory of evolution and included items that explained concepts of natural selection and struggle for existence, among others. In this regard, Aires considered struggle for existence, or vital competition, acts from embryonic state to adulthood of an organism, meeting Darwin's argumentation (1859): "that every single organic being (…) lives by a struggle at some period of its life" (p.66). Aires (1907) warned that struggle of males for conquest of females is an important example of vital competition. Globally, he considered in struggle for existence: "In all cases victory will belong to the most favoured ones, from the point of view of the special form that takes the struggle in each particular case, that means, *the fittest* ones (p.175; italic in the original). About the expression "surviving of the fittest", Browne (2008) concluded "in the late 19th century and in the beginning of the 20th century, for instance, when the evolutionist imperatives of competition and of progress were expressed in the social sphere (…) the expression «surviving of the fittest one» was in everybody mouths" (p.13). Therefore, it is not surprising it was often used by Aires to explain the process of natural selection.

Aires (1907, 1920, 1931), Primo (1937) and Pires de Lima and Soeiro (1955), doing the didactic transposition of Darwinist ideas, stated from this competition arises mechanism of natural selection, which favours surviving of the fittest individuals, that would transmit their characters to descendants, like Darwin (1859) detailed:

> Owing to this struggle for life, any variation, however slight and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relations to other organic beings and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring. (p.61)

Aires (1907, 1920, 1931) made a clear transposition of those ideas when describing that, through natural selection, wining organisms of struggle for life, the fittest ones, are more likely to multiply than others, so, they are more capable of giving offspring than others, and so on. On the contrary, the number of less apt will decrease and then disappear. When the variation that served as a support of that special ability, and which has been amplified from generation to generation, reaches many individuals, becomes the basis of a new variety that could continue to evolve, giving rise to new species.

This strong allusion to natural selection also occurred in US textbooks between 1900 and 1929, as shown in the word count done by Skoog (1979) concerning this subject (2.092 words in textbooks published between 1900-1919 and 2.657 words in the ones published between 1920-1929). However, there is a difference regarding Portuguese textbooks, because this process has not been con-

sidered ruthless and bloody, on the contrary of US textbooks. Nevertheless, the set of objections previously pointed to Darwinism, and specifically to natural selection, led Aires (1907) to conclude it is not a consensual mechanism for transformation of species. Inclusively, in a footnote he informed Pfeffer, a German botanist pioneer in the study of plant physiology, defended "the natural selection, far from leading to the transformation of species, has the effect of keeping the fixed number and characters of their representatives" [12] (p.177). These words are a strong evidence of eclipse of Darwinism (Bowler, 1992) influence over the evolutionary thought of Aires in that period.

Geographic isolation

Contribution of geographic isolation to process of natural selection was an important argument of Darwin's thought (Bowler, 2003). However, it was lightly addressed in Portuguese textbooks. Those ideas were debated by Darwin (1859) in chapter IV: "isolation, also, is an important element in the process of natural selection." (p.104) Following Darwin's ideas, Aires (1907, 1920, 1931) transposed geographic isolation as a process that contributes to formation of new species. He referred origin of species will be facilitated if there is a segregation of new breeds, formed from an original species, caused by geological barriers, such as mountains or rivers that promote a geographic isolation, avoiding its crossing. Geographic isolation, despite its importance for the process of speciation, was not addressed by other authors, which contrasts with the continuous reference to that evolutionary condition in the US textbooks (Skoog, 1979).

Sexual selection

Darwin (1859) devoted much attention to sexual selection as an evolutionary mechanism with a parallel action to natural selection. This mechanism was based on following idea: "This depends, not on a struggle for existence, but on a struggle between the males for possession of the females" (p.88). Although Darwin (1859) has given some attention to this mechanism, it was vaguely transposed by Portuguese authors of textbooks. Lemos (1890) only said sexual selection, as a natural choice of breeders among winners of struggle of males for possession of females, is one of the most important mechanisms of evolution. Forty years later, Aires (1931) added explicitly a text to explore sexual selection, though in the textbooks of 1907 and 1920 he had addressed indirectly that phe-

[12] Another critic, Fleeming Jenkin, engineer and Regius Professor of Engineering at the University of Edinburgh, in a review of the *Origin of Species*, believed natural selection could not act in a cumulative way. He stated a new characteristic, though it was advantageous, would be quickly diluted due to the crossing of the carrier individual with individuals without that characteristic (Avelar et al., 2004; Bowler, 1992; Browne, 2008).

nomenon when presenting, in a set of examples of advantages in the struggle for life, the attraction of females due to characteristics as colours or more seductive singing, etc. In the textbook of 1931, Aires referred this mechanism was conceived by Darwin to, among other factors, explain development and existence of secondary sexual characters. He repeated the previous example by stating in competition of males for possession of females, these ones are conquered by males who have more effective combat weapons, brighter colours, a more harmonious singing, more accurate sense organs, etc. This competition promotes that "as females remain extraneous to such a selection, males will differ from females more and more with the development of generations, and so they have developed the secondary sexual characters" (p.329). Primo (1937), Pires de Lima and Soeiro (1955) have also made same transposition, when attributing to sexual selection a relevant role in selection of characters to transmission for following generations.

Conclusion

Transposition of *On the Origin of Species* to Portuguese standards of Natural Sciences can be divided in three clusters: Those who do not address Darwinism (Standards of 1856, 1872, 1880, 1886, 1926 and 1929), those who address some Darwiniam mechanisms, as selection (Standards of 1889) and adaptation (Standards of 1905) and those who prescribe an expanded approach to various Darwinists concepts (Standards of 1895), in context of studies about transformism (Standards of 1919), or about evolution (Standards of 1936 and 1954). Evolution was often addressed in the final year of secondary education, a phenomenon which may indicate an analogy to Portuguese case of the following conclusion of Skoog (1979): "study of evolution was a peripheral and neglected part of the biology curriculum prior to the development of the BSCS textbooks in the 1960s" (p. 835). It was also mostly associated with Zoology contents, instead of Botany, a similar phenomenon to what occurred in the US (Larson, 1987).

Authors of Natural Sciences textbooks of Portuguese secondary education probably accessed in the 19th century to French translations of the book *On the Origin of Species*, as it can be concluded from Almaça's (1999) research. Portuguese's translation of this book was only available from 1913, according to Pereira (2001). However, in the present research became evident that textbooks of Natural Sciences of secondary education published since the late 19th century gradually integrated Darwinist theoretical body. This phenomenon also happened in US textbooks, between 1900 and 1950, in which Skoog (1979) found a slowly, but progressive increase of evolutionary theoretical framework. Another point in common with Skoog's (1979) research is human evolution has been ignored in the textbooks analysed.

Unlike what happened in other countries, evolutionist discussion in Portuguese textbooks focused, not in the struggle between creationism and evolutionism, but in mechanisms that explained evolution, in a framework of strong

didactic transposition of the ideas presented by Darwin in *On the Origin of Species*. Textbooks addressed unequally the following mechanisms of evolution: adaptation, variability, growth correlations, heredity, natural selection and vital competition, geographic isolation and sexual selection. However, in some cases, those mechanisms of evolution were transposed to textbooks even when they were not prescribed in standards. The textbooks that developed more deeply those topics were written by Aires (1907, 1920, 1931). In textbooks published in the next decades (Primo, 1937; Pires de Lima & Soeiro, 1950), the approach to the evolutionary theoretical framework was not increased, unlike what happened in US textbooks published between 1930 and 1949.

Although most textbooks have transposed mechanisms of evolution, they have also showed some of Darwinian gaps. This phenomenon reflects a parallelism between Portuguese textbooks and the European and American movement that emerged new explanations for evolution, in a period known as eclipse of Darwinism. Although it was not possible to access the scientific sources used by textbook's authors, it is raised the hypothesis that a strong influence of French scientific literature in Portugal, at expense of anglo-saxon sources (Almaça, 1999; Beato, 2011), have contributed to the questioning of some Darwinist concepts in that period.

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Attitudes and self-beliefs of ability towards mathematics and science and their effects on career choices: A case study with Macao-chinese girls

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Introduction

For more than thirty years research findings pointed out that men outnumbered women in Science, Technology, Engineering and Mathematics (STEM) (American Association of University Women, 2010; Blickenstaff, 2005; Cervantes, 1999; Gándara, 2006; Jones, 2010; Jordan & Yeomans, 2003; Organisation for Economic Co-operation and Development (OECD), 2003; Robinson & Lubienski, 2011). Improvements have been made with regard to the gender imbalance in the science and mathematics related fields. However, the most recent global indicators still call attention to the underrepresentation of females in STEM programmes. This is puzzling because general IQ tests do not show evidence of gender differences regarding average cognitive scores (Halpern & LaMay, 2000), secondary schools' science classrooms are balanced in what concerns gender, and across nations girls are more likely to complete secondary school and graduate from university (Ewert, 2012). A wide spectrum of factors might be mobilised to explain the reasons why the number of girls and women choosing to pursue careers in STEM areas is much lower than boys and men. Among those factors, situational ones such as self-efficacy beliefs, stereotypes, family and teachers' gendered deep-rooted belief systems, and the socio-cultural and economic environment seem to be more significant than factors based on inborn differences (Blickenstaff, 2005; Gándara, 2006; Robinson & Lubienski, 2011). Research findings from the Programme for International Student Assessment (OECD, 2011) suggested that Macao girls do as well as boys in mathematics. Furthermore, Macao girls outnumber boys at the local universities and tend to be more highly educated than men (Marques & Correia, 2012). However, less than 0.5% of Macao girls contemplate pursuing a career in mathematics-related fields and

less than 2% contemplate pursuing a career in science-related fields (Direcção dos Serviços de Estatística e Censos, 2012), which indicates that the scenario of girls' avoidance of mathematics and science related careers in Macao not only follows the international tendency but is even more pronounced than elsewhere.

Some authors (Marques & Correia, 2012) have suggested that the development of the tourism and gaming industry and the consequent easiness of getting semi-qualified jobs at the casinos, hotels, restaurants and other supporting sectors across the city have been deviating youth from universities and particularly from programmes of greater complexity and length.

As Blickenstaff (2005) said, there is not a single explanation for the girls' avoidance of scientific fields, but that a "leaky pipeline carrying students from secondary school through university and on to a job in STEM" (pp.369) seems to be in place. He says that the "leaky pipeline" is formed by a mix of internal and external factors, which act cumulatively and persistently throughout the school years to university and work.

In the current study, focused on attitudes and self-beliefs of ability towards mathematics and science and their effects on the girls' career choices, we attempted to understand the reasons why so few female students show preference for mathematics or science-related programmes at university entrance level. We seek to shed light over this issue by exploring two dimensions: girls' self-assessment of abilities in mathematics and science; girls' attitudes towards mathematics and science. Within the latter, we focused on two particular factors: girls' perception of mathematics and science as a male domain; girls perceiving their teachers' expectations regarding female students' mathematics and science abilities and skills as lower than boys' mathematics and science abilities and skills. The following questions were formulated to steer the research:

1. How do the secondary school girls from this study assess their own abilities in mathematics and science?
2. Are the female students' attitudes regarding mathematics and science positive or negative?
3. Are female students' self-assessment of abilities in mathematics and science related to their intentions to commit themselves to a STEM university degree?
4. Are the female students' attitudes towards mathematics and science related to their intentions to commit themselves to a STEM university degree?
5. Do female students assume mathematics and science as a male domain?
6. Do female students perceive their teachers' attitudes and expectations regarding girls' abilities and skills in mathematics and science as lower than boys' abilities and skills in these subjects?

Review of Literature

Blickenstaff (2005) resorts to the "leaky pipeline" metaphor as a means to explain the underrepresentation of girls in STEM areas.

According to the mentioned author, girls often change the path of their studies or career during transitional points such as the moment of completion secondary studies or even after concluding the university degree, but, for Osborne, Simon and Tytler (2009), the "leaky pipeline" unfolds between the ages of 10 to 14, much before the stage when it comes to choosing a career.

Blickenstaff (2005) views the phenomenon of the gender gap in STEM areas as the result of various factors acting cumulatively. According to the author, schools and teachers are active players in the perpetuation of the gender imbalance in STEM. The lack of meaningful experiences in primary school, an insufficient exposure of girls to female role models in science fields and a selection of class activities commonly designed to motivate boys only are but a few causes that may trigger demotivation of girls towards science during late childhood and adolescence.

Scholars also call attention to a different group of factors, pervasive and yet veiled and rather difficult to address by way of school or classroom interventions: gender stereotypes, which usually favour males over females. Gender stereotypes are enduring social beliefs, which are part of the cultural tissue of societies (American Association of University Women (AAUW), 2010; Correll, 2001; Fox, Sonnert & Nikiforova, 2001). Through the traditional lens of gender stereotypes women's primary role is as wife and mother, and there is a limited number of occupations considered suitable for women to work in, usually those associated with health, care and education.

Girl Scouts Research Institute report (Modi, Schoenberg & Salmond, 2012) acknowledges the effects of gender stereotypes in regards to the STEM areas: "the stereotype that girls are not as good as boys in math can have negative consequences. When girls know or are made aware of this stereotype, they perform much more poorly than boys" (p.5). Gender stereotypes are particularly present in societies, as in the case of Macao, influenced by Confucian values, where men are the primary authority figure in the family and women are expected to assume a subordinate role in both private and public spheres (Bailey, 2012). Girl Scouts Research Institute report (Modi, Schoenberg & Salmond, 2012) also points out the positive contribution of self-beliefs in counteracting the impact of gender stereotypes. Holding positive self-beliefs towards mathematics and science learning abilities has been reported as a strong predictor of academic achievement in those areas (Mousoulides and Philippou, 2005; OECD, 2012). According to the two above mentioned studies, students with high self-confidence are able to use cognitive and metacognitive learning strategies in a more effective fashion that those who are not.

Boys have been reported as having systematically more positive self-beliefs than girls even when they have similar performance and, on the contrary, girls

underestimate their academic performance and their ability towards mathematics when compared with boys (Brotman, & Moore, 2008; Modi, Schoenberg & Salmond, 2012; Murphy & Whitelegg, 2006). These findings reinforce the relevance of undertaking research on this matter.

Methodology

A quantitative approach was adopted in this study to examine girls' believes in their ability to learn mathematics and science and their attitudes towards these areas. The data were collected in a survey through a questionnaire administered to a group of female students enrolled in a language course outside their schools. The information collected was described, explained and explored (Check & Schutt, 2012) allowing us "to quantify a plurality of data and carry therefore numerous correlation analysis" (Quivy & Campenhoudt, 2013, pp.189). This kind of approach, which is not of an experimental nature because there was no manipulation of variables (Muijs, 2011), allowed for collecting data on a single occasion, in an economical and efficient way, and presents several other strengths, such as identification of patterns, provision of data, which could be processed statistically, with an eventual generalization of the findings (Cohen, Manion & Morrison, 2007).

Population and sample

The study population consists of about 350 secondary school female students of Macao who also have attended the course Portuguese Foreign Language at Portuguese School of Macao taught by one of the researchers. We defined a convenience sample formed by 45 girls attending the said course in 2013/14. They were aged 15 to 19 years, enrolled at Form 4 to Form 6 (the final year of upper secondary education), from 21 public and private secondary schools (out of the 47 existing in Macau).

Instruments

The questionnaire comprises two parts. Part 1 accounts for demographic data, namely (a) age, (b) grade, (c) current study area at high school, (d) intended area of study at university, and (em) self-assessment of abilities in mathematics; and (es) in science. The answers to (a) and (b) were numeric and to (c) and (d) were nominal. The field of study at the secondary school was grouped into five categories: a) arts; b) economy and commerce; c) political sciences, geography and history; d) humanities and languages; e) STEM. The intended area of study at university was grouped into eight subcategories, which derived from the above-

mentioned secondary level categories. For the self-assessment of abilities, the answers were given on a Likert scale of 4 levels, from A (weak) to D (excellent).

Part 2 consists of 94 questions about the attitude of each one towards mathematics and science, whose answers are given on a Likert scale of 5 levels, from A (totally agree) to E (totally disagree), adapted from the Fennema-Sherman Attitude Scale, "The Modified Fennema-Sherman Mathematics and Science Attitude Scales". This scale measure the students' attitudes towards mathematics and science in 8 (4x2) domains, namely: (fm) confidence in the abilities to understand and use mathematics and (fs) science; (gm) practical importance and usefulness of mathematics and (gs) science in the life of the student; (hm) mathematics and (hs) science understood as exclusive sphere of the male universe; (im) attitudes and expectations of teachers regarding the mathematical and (is) scientific abilities and skills of girls.

Procedure

For the statistical data analysis, SPSS programme was used. For the inference analysis a significance level a=5 was considered, and either parametric or non-parametric tests were used depending on the characteristics of the variables. Since the same set of 45 individuals answered all the questions, the variables, when compared to each other, were paired. Therefore, in the tests, we treat them as such.

To analyse the questionnaire, 110 variables were set, corresponding to parts one and two: a) 6 variables from Part 1; and b) 104 variables from Part 2. The 6 variables of Part 1 correspond, each one, to the characteristics (a) to (e) (see table of Fig. 1).

For Part 2, 104 variables were defined. Among these, 94 (47 for each subject) reflect the attitude of each student towards mathematics and science and are related to the 4 domains named above: (f) to (i).

These 94 variables were the basis for the remaining 10 variables, which were analysed and compared with each other and with the 6 variables of the Part 1. Eight of these 10 variables refer to the 8 (4x2) domains: (f) to (i).

The last 2 variables correspond to girls' global attitude towards (jm) mathematics and (js) science and resulted from adding the scores of each of the corresponding four variables. The table of Fig. 1 displays these 10 variables too.

Results

Part 1 of the questionnaire shows that 18 out of the 45 students (two-fifths) of the sample were pursuing secondary studies in STEM areas, and 7 had chosen to enrol in the stream of Economy and Commerce, in which mathematics is an important academic subject. In total 25 out of 45 students were pursuing secondary level studies in a STEM related area (see table of Fig. 2). Although more

than half of the students attended areas where mathematics is a core academic subject, none of the respondents wished to attend STEM degrees at the university.

Table 1
Questionnaire variables – part 1 and 2

Part	Variables and their meaning
1	(a) age of each student when she fills the questionnaire
	(b) grade attended by each student
	(c) current study area that each student attends at high school
	(d) study area that each student wish to attend at the university
	(em) assessment that each student makes regarding her own performance in mathematics
	(es) assessment that each student makes regarding her own performance in science
2	(fm) confidence in the abilities to understand and use mathematics
	(fm) practical importance and usefulness of mathematics in the life of the student
	(gm) mathematics understood as exclusive sphere (or not) of the male universe
	(gm) attitude and expectations of teachers regarding the mathematical abilities and skills of girls
	(hs) confidence in the abilities to understand and use science
	(hs) practical importance and usefulness of science in the life of the student
	(is) science understood as exclusive sphere (or not) of the male universe
	(is) attitude and expectations of teachers regarding the scientific abilities and skills of girls
	(jm) global attitude of the students towards mathematics
	(js) global attitude of the students towards science

Table 2
Secondary school choice of field of study

Field of study at secondary school	Number of students
Economy and commerce	7
Political sciences, geography and history	5
STEM	18
Humanities and languages	13
Arts	2
Total	45

None of the variables which represent age, grade, current study area, and desired study area at university is related to any of the two variables which reflect the girls' assessment of performance towards mathematics or science (chi-square test with Monte Carlo simulation). It should be noted that not even the current area of study and the area they intend to enrol at university are related to self-assessment of performance in both subjects. This means that there is no evidence of self-assessment of mathematics and science abilities being influential to the intended choice of a university degree.

We also found out that the averages of variables reflecting the girls' assessment of own performance in mathematics and science, respectively 2.11 and 2.22, are below the average (2.5) of the scale used (t-test: p=0.002 and 0.008, respectively). The tables of Fig. 3 display the outputs of SPSS with the statistical values of these variables and test results. These results mean that girls perceive that their own skills towards these two subjects as low and eventually lower their skills in other areas.

Table 3
T-test comparison of self-beliefs in mathematics and science abilities with scale average

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
performance in mathematics	45	2.11	.775	.116
performance in science	45	2.22	.670	.100

One-Sample Test						
	Test Value = 2.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
performance in mathematics	-3.365	44	.002	-.389	-.62	-.16
performance in science	-2.779	44	.008	-.278	-.48	-.08

The analysis of Part 2 variables led to the following general conclusions: a) the average of each variable that reflect the students' attitudes in the domains (f) confidence in the abilities to understand and use, and (g) practical importance and usefulness, both in mathematics and science, is equal to the average of the scale (t-test: p≥0.194); b) the average of each variable that reflects the students' attitudes in the domains (h) mathematics and science understood as exclusive sphere (or not) of the male universe and (i) attitude and expectations of teachers regarding the mathematical and science and skills of girls is higher than the scale

average (t-test: p≤0.014); c) the average of each variable that reflects the global attitude of the students towards mathematics (159.78) and science (153.91) are significantly higher than the average (141.0) of the scale (t-test: p=0.000 for mathematics and p=0.002 for science). The tables of Fig. 4 display the outputs of SPSS with the results of the latter two tests. The findings suggest that the girls' attitudes are globally positive towards both academic subjects and, at least, no negative for each one of the 4 analysed domains.

Table 4
T-test comparison of global attitude towards mathematics and science with scale average

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
COMPUTE global attitude towards mathematics	45	159.78	29.247	4.360
COMPUTE global attitude towards science	45	153.91	26.516	3.953

One-Sample Test						
	Test Value = 141					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
COMPUTE global attitude towards mathematics	4.307	44	.000	18.778	9.99	27.56
COMPUTE global attitude towards science	3.266	44	.002	12.911	4.94	20.88

We also crossed the variables of Part 1 with the variables of Part 2. Comparing, through the Pearson correlation coefficient, the variables that reflects the girls' assessments of their own performance towards mathematics or science with the variables of Part 2, we found that the girls' assessments of their own abilities in mathematics and science were positively correlated with those variables that reflect their attitudes, globally and in each of the four domains, towards both subjects (p≤0.025). One exception was found, namely the variable related to the practical importance and usefulness of science in the life of the student (p=0.078). These results suggest that girls' self-assessments of abilities towards mathematics and science are strongly related to their attitudes regarding mathematics and science (except the practical importance and usefulness of the latter). These results also show consistency in the girls' answers to the two parts of the questionnaire, which reassures the reliability of the research (Creswell, 2013). As a natural consequence of this correlation, the crosstabs between the intended choice of university degree and each of the two variables concerning the attitudes towards mathematics and science dismissed a relation-

ship between the first and the latter (chi-square test with Monte Carlo simulation: p=0.487 for mathematics and p=0.549 for science). We can not say that girls' attitudes in respect to mathematics and science have influence on the choice of the programme they wish to attend at university, what is a similar result to that we achieved with their self-assessments of performance.

The comparison between girls' self-assessment of abilities towards mathematics and science and the comparison between their attitudes regarding these two subjects led to the following results: a) there is a positive linear correlation (Pearson's correlation coefficient: p=0.027), between the self-assessment of performance towards mathematics and the self-assessment of performance towards science; these variables are mutually dependent (chi-square test with Monte Carlo simulation: p=0.018) and there are no differences between the total scores of both of them (t-test: p=0.354); b) there is a strong positive linear correlation, globally and in each domain (Pearson's correlation coefficient: p=0.000 in all cases) between the attitudes towards mathematics and the attitudes towards science; c) there is no difference between the average of attitudes towards mathematics and science, globally and in each domain, except with regard to the teachers' attitudes and expectations regarding the girls' abilities and skills of girls; in this case, the attitude regarding mathematics is better than regarding science (t-test: p=0.019). These results show no evidence supporting a differentiated self-assessment of abilities and skills towards mathematics or science and no evidence of differentiated attitudes towards either mathematics or science.

Results from Pisa 2012 stated that Macao girls do as well as boys in mathematics and science. However, less than 0,5% of Macao girls contemplate pursuing a career in mathematics related fields and less than 2% contemplate pursuing a career in science related areas.

Conclusions

The findings of the current study are consistent with previous research on the gender gap in STEM areas. Similarly to the findings from the AAUW (2010), stating that the girls underestimate their performance and skills in mathematics and science, the female students from this study expressed low confidence in their own abilities in mathematics and science, although they have a positive attitude with regard to both academic subjects. These two conclusions are correlated and are not mutually incompatible.

Regarding the third and fourth questions, there is no evidence in the current study that self-assessment of mathematics and science abilities or attitudes towards those academic subjects exerts influence on the intended choice of university degree. Other environmental factors might need to be examined, such as family, school, community or culture, as to explain the girls' avoidance of STEM university degrees, rather than the ones included in the study.

Considering the results related to the specific domains of attitudes, we can

answer to the fifth and sixth issues: a) girls don't assume mathematics and science as a male domain; b) girls do not consider that teachers' attitudes and expectations regarding mathematics and science abilities are gendered. However, if in one hand the female students seem to believe that choosing a STEM field at university degree is not related to being a boy or a girl, on the other hand none of them have plans to follow a STEM degree at university.

This fact seems to confirm the "leaky pipeline" that carries the female students from secondary school through university (Blickenstaff, 2005) and the results of Marques and Correia (2012) who declared that, in Macao, the gender gap concerning the interest to pursuit a STEM career is more pronounced than elsewhere

At last and comparing again our findings with studies carried out in other countries (AAUW, 2010; Correll, 2001; Fox, Sonnert & Nikiforova, 2011), perhaps the social beliefs, in particular the Confucian values (Bailey, 2012), are stronger reasons for the perpetuation of the gender imbalance in STEM that affects Macao society (Blickenstaff, 2005). Perhaps the obstacles preventing girls from pursuing studies at university level in STEM shall be looked for at the ages of 10 to 14 as suggested by Osborne, Simon and Tytler (2009), i.e., much earlier than the moment they apply to university. As advocated Marques and Correia (2012) perhaps the foreseeability of obtaining well-paid jobs in the gaming and tourism industry eclipses the advantages of pursuing a career in STEM.

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First language teacher's development: learning from small-scale classroom research

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Introduction

Language learning is an imperative and a challenge these days. The development of communicative skills is essential for the integration of children in a sociolinguistic community, as well as for their training as people and citizens. In a global society, supported by communication networks, it is necessary that, from an inclusive perspective, everyone have access to knowledge, which is not always the case, because of lack of communication or technological skills. It is a major challenge that school faces nowadays, concerning reading and writing competences. This is all the more pertinent in terms of first language teachers, since linguistic cross-cutting shows the influence of Language on school success. However, good practices are not appropriated by many teachers, due to the overload of everyday work. Therefore, given the tutoring role of language teachers across the curriculum, it is important to rethink their ongoing training.

For a long time, there was not a recognition of teachers' ability to produce their own classroom research and to promote self-learning and professional improvement. Teachers´ training centers offered continuing education courses compulsory for teachers´ progression in their educational careers, with contents that often did not answer real training needs. As a consequence, prescriptive and applicationist perspectives of teacher training still prevail over critical and reflective ones (Cochran-Smith & Zeichner, 2005; Coe, Aloisi, Higgins, & Major, 2014).

Thus, this study arises from the understanding that teachers´ training, and particularly of first language teachers, requires a new logic of action, in order to renew teachers' knowledge and skills. In this way, we intend to analyse how small-scale classroom research can improve professional development of first language teachers, and to promote students' reading and writing skills. The research was carried out in the context of two continuous training courses,

encouraging Portuguese teachers to become lifelong learners in a research-based profession.

First language teachers' development and small-scale classroom research

Mastery of the language of schooling is a condition of academic and professional success, since the improvement of transversal reading and writing skills, comprehending linguistic variants and textual typologies, is central to access knowledge in all curricular disciplines.

In the Portuguese educational system, learning of reading and writing skills emerge as a central issue in elementary and secondary education programs, reinforcing Language as the basis of literacy and a powerful teaching and learning tool in all academic subjects. Language improvement is a challenge that requires teachers´ commitment to the development of students´ achievement, by creating effective learning environments. Thus, it is necessary to rethink teaching and learning, connecting the professional development of first language teachers with the improvement of students' reading and writing skills (Calsamiglia & Tusón, 2014; OECD, 2014; Richards & Farrell, 2005; Sá, 2012; Tusón, 2015).

In order to cope with everyday challenges, teachers must acquire a reflexive action, which is based on his practice. Therefore, they need to improve their scientific and pedagogical knowledge. Being the main protagonist of his profession, the teacher (re)builds knowledge for his own use, so his experiences must be integrated into the formative pathways. There is an intrinsic relationship between teacher training and the quality of practice (Conway, Murphy, Rath, & Hall, 2009; Luján, Gaviria, & Ramos, 2009; Peel, 2005; Tusón & Lomas, 2011). As a consequence, teacher's continuous learning became a priority for educational policies, which led to an increase in the supply of continuous training courses. Professional development is now understood as a lifelong process, in and out of school, comprising job embedded learning, through peer supervision and action research, as well as conferences and school and university partnerships, or workshops and courses provided by teachers´ certified training centers.

Nowadays, teacher's professional development, with regard to continuous training, is based on a model of practical rationality or reflection on action, which takes into account the characteristics of practical phenomena, such as complexity, uncertainty, singularity and conflict of values. This model arose in opposition to a technical rationality model, according to an epistemological conception of practice that lasted during the twentieth century (Diniz-Pereira, 2014; Hopkins, 2008).

Among the characteristics that can improve teacher's continuous learning and development, we can mention professional updating, practical reflexivity, small-scale classroom research, collaborative work and the involvement of school as an educational community.

Professional update is a fundamental characteristic to renew practices, by acquiring more knowledge about teaching. The teacher should keep up with scientific theories of his curricular area. However, this knowledge is not sufficient, given the complexity of the teaching and learning process. For effective professional development, it is imperative that any teacher extends his scientific and pedagogical knowledge, incorporating other skills, related to attitudes and interpersonal relations, essential in a pedagogical intervention (Caena, 2011; Pawlas & Oliva, 2007). Besides, there is also the gap between many teachers as "Digital Immigrant educators" and their "Digital Native students" (Prensky, 2001, pp.3-6).

Another characteristic is practical reflection. According to Dewey (1938; 1933; 1910) there is a relation between "reflective thinking" and the educative process, while for Schön (1991; 1987; 1983) "reflection-in-action" forms the basis of professional development of the "reflective practitioners", due to the interactions between teachers and their experiences. Extending Dewey´s and Schön´s concepts, Stenhouse (1988; 1981; 1975) practical reflectivity encourages "teachers as researches" to study their own work in class and to allow other teachers to observe it. Lewin (1946), Corey (1953) and Zeichner (2008; 1993; 1981) reinforce field-based experience and "action research" and the need for teacher training and social reconstruction. Dewey (1938) and Shulman (1987) also stand up for reflective schools viewed as democratic "learning communities".

This type of knowledge is made up of reflection on the practice, including reflection before, during and after the action. The reflective teacher is the one who problematises his/her pedagogical performance, inferring the advantages and disadvantages of decision making, in relation to the quality and effectiveness of teaching models and strategies. This way, the teacher becomes a researcher in his context of action, learning and generating new knowledge in the very act of teaching (Bartlett & Leask, 2016; Hargreaves & Shirley, 2009; McLaughlin, 2004; Rodgers, 2002).

Contradicting the idea that educational research can only be undertaken by specialists, small-scale classroom research arose from teachers´ need to investigate their practices, looking for teaching strategies to enhance students' skills and performance. The first time teachers´ research at the local level has been included as a method, in a Research Handbook, was with Zeichner and Noffke (2001). Large-scale research projects are not necessarily better than small-scale ones. The real value of classroom-based research is in the process of building teachers´ capacity to reflect critically on their own practice, creating practical knowledge and professional expertise through the testing of ideas about teaching and learning (Caena, 2011; Coe et al., 2014).

With regard to language teaching, it is important to mention the transversal nature of some cross-disciplinary research, on the assumption that student's failure in Mathematics or Science often results from the lack of proficiency in scientific language, compromising the resolution of both simple tasks and problem situations (OECD, 2016; Richards & Farrell, 2005).

Although classroom research does not always meet all the requirements of an action research, the advantages of its use by teachers are undeniable, in order

to develop strategies applicable to their own classroom situations. In educational situations, action research aims to develop strategies applicable to teachers´ own practical actions, in a process of improvement and reform on a concrete situation. As systematic inquiry it should be undertaken by groups of participants, although it can also be designed and conducted by individuals (Carr & Kemmis, 1986; Kalmbach-Phillips & Carr, 2006; Zeichner, 1993).

Due to the constraints of the research undertaken by the teachers, there are those who prefer to call it "classroom research by teachers" or "small-scale classroom research" rather than "action-research", which is a too prescriptive framework for action, implying the acquisition of skills and techniques many teachers don´t have. So, the research task, undertaken for professional purposes within a community context, becomes an extension of teaching work, and not an imitation of academic research. Usually, it is not for wider public knowledge but intended to be divulged to a few colleagues inside a school community (McIntyre, 2004).

In general, these are case studies, carried out according to the teacher's available time and focused on a specific problem, such as the effectiveness of a teaching strategy, the evaluation of a classroom project, or the analysis of students´ writing. This way, the case-study approach is ideally suited to the needs and resources of a small-scale researcher, providing in-depth analysis and understanding about educational practices. Data collected will depend upon the nature of the particular case to be investigated (Yin, 2011; 2003). Increasingly, teachers are seeing reflection about practice and classroom research as part of their professional responsibilities.

Another characteristic lies in collaborative work, since it promotes the ability to develop interdependent relationships with others to succeed in achieving goals and to build group cohesion, providing environments for learning. Quality of formal and informal partnerships between teachers at the school level have a significant positive impact on students´ and teachers´ performance (Dewey, 1938; Rubinstein, 2014). Collaborative learning from small-scale classroom studies is essential to build teachers' continuous learning. Sharing tasks and responsibilities among peers should focus on planning, implementation, evaluation and reformulation of the action. For example, work teams of each school year are fundamental to stimulate collaborative reflection and exchange of good practices among teachers. Collaborative work is central in teacher's training and peer supervision, with or without classroom observation (Alarcão, 2009; Coimbra, 2013; Pawlas & Oliva, 2007; Ronfeldt, Farmer, McQueen, & Grissom, 2015).

Finally, in a broader perspective, it is necessary to rethink the school as an educational community capable of creating work teams that break the isolated work of many teachers. The development of the teacher is linked to the construction of collective knowledge of a school that learns and empowers interactions among educational actors. In this sense, school is an organization where people can expand their capacity to create the results they truly desire and where people are continually learning to see the whole together, engaging in

practitioner inquiry and constructing local knowledge within inquiry communities (Cochran-Smith & Zeichner, 2005; McIntyre, 2004; Senge et al., 2000).

Therefore, teachers should make connections between their own classroom research and the school´s development priorities, relating their work to school initiatives and aims (Conway et al., 2009; Hargreaves & Fullan, 2012; Hargreaves & Shirley, 2009; Ronfeldt et al., 2015). School, with its educational project, rooted in a specific historical, geographic and sociocultural environment, can motivate teachers to a quality collaborative work, based on dialogue and innovation, connecting school and family for the same purpose of improvement of the student's communication skills. In this perspective, teachers face specific and complex contexts of action, sharing a collective knowledge in community.

Methodology

This study intends to analyse how small-scale classroom research can improve professional development of first language teachers, as well as promote students' reading and writing skills. The participants included fifty teachers from four elementary and secondary schools of northern Portugal, who attended two continuous training courses for first language teachers, during the academic year 2015/16.

Taking into account the nature of educational research, a qualitative approach was selected, considering that social phenomena are unique and complex, and therefore perceived in a particular way (Lichtman, 2013). So, qualitative research focus on how participants interact and develop their professional knowledge and skills, by bringing their own meanings and beliefs about educational research and effective teaching, linking theory and practice.

In our study, the data were collected in 2016, from fifty teachers´ reports of elementary and secondary school classroom research projects, including description of the pedagogical intervention in classroom and students´ work and written comments. In order to provide an in-depth analysis of teachers´ reports, a content analysis, supported by numerical data, was applied to the corpus (Yin, 2011). Predefined categories were based in the characteristics concerning teachers' continuous learning and development, as mentioned in literature review, although emergent subcategories were also considered.

Results and Discussion

In a global analysis and starting with the structure of the teachers´ reports, the majority of the teachers present a reflective account of the planning, implementation and evaluation of a reading or writing project, developed in classroom, with a diagnostic, objectives, data collection, monitoring, presentation and reflection on results. At the end, conclusions and future developments were

included, as well as examples of students´ work and comments, collected during the process and when evaluating the project.

As mentioned in methodology, fifty teachers' reports were analysed, applying categories and sub-categories. The results for the first category, professional update, are presented in table 1.

Table 1

Professional update Subtitle – Oc: Occurrences.

Category	Subcategories	Oc
1. Professional update	Self-training	19
	Peer-to-peer training	24
	Ongoing training	40
	Training courses	35

Analysing the data in table 1, it is verified that most Portuguese teachers consider that professional update takes place in a process of continuous training (40), in relation to the frequency of training courses (35). Invariably, at the end of their report, teachers list what they have learned in the training course, associating their professional development with the knowledge gained during the course sessions and peer-sharing practices. Thus, teachers valued less self-training (19) and more training between peers (24). This sharing of good practice took place among the teachers from 4 schools, of elementary and secondary education, which are part of the same training center.

The importance of professional update is outlined by teachers in the following way:

> **Teacher 9**: "Ongoing training is essential to our professional development. Training courses can motivate us to rethink and innovate practices. (...) In a daily life burdened with tasks, we only think about arriving at the end of the day with all the classes and meetings fulfilled and we forget the most important, to start thinking about what could be altered and improved. Therefore, I enrolled in this training course, which is always at the end of the work day, sacrificing time with the family."

> **Teacher 13**: "Professional updating is imperative. The knowledge of the teacher must include scientific and pedagogical knowledge, interconnecting the knowledge of the Portuguese subject with pedagogical-didactic knowledge, taking into account the transversality of the Language, which is an increased responsibility of the Portuguese teacher (...) You must know and apply new strategies and technologies and know how to prepare teaching materials."

In these comments, from which we selected some significant examples, teachers highlight the influence of professional update on the renewal of prac-

tices, connecting scientific and pedagogical knowledge. Therefore, these teachers show their commitment to attend a course that allows them to rethink their practices, "about what could be altered and improved", as T9 writes. In addition, they recall the increased responsibility of Portuguese language transversality throughout the curriculum (T13).

As for the second category, results concerning practical reflectivity are shown in table 2.

Table 2

Practical reflectivity Subtitle – Oc: Occurrences.

Category	Subcategories	Oc.
1. Practical reflectivity	Questioning of teachers´ practice	58
	Reflection before, during and after action	46
	Reflective teacher	18
	Practical reflectivity as the basis for pedagogical update	17

All teachers recognise the potential of practical reflectivity, enhancing the possibility of questioning their practice (58), essential to the reflection before, during and after action (46). However, few teachers identify practical reflectivity as the basis for pedagogical update (17). The occurrences for the reflective teacher (18) show that many do not yet have the ability to perform critical reflection. In general, teachers' written records confirm the awareness of the advantages of practical reflectivity (Stenhouse, 1988; 1981; 1975), in contrast to teacher's difficulties in questioning the practices, in order to improve the quality of the teaching process.

Some teachers provided their perspectives about practical reflectivity:

> **Teacher 44**: "I teach Portuguese in a secondary school (…) Teachers need to learn from action, connecting practice with theoretical knowledge (...) so as to renew strategies and improve their competences. Practical reflectivity should always be shared among teachers who are responsible for the same subject and the same year."

> **Teacher 19**: "I do not consider myself a teacher researcher, but an apprentice. Programs are extensive and it is not possible to always do extra work that takes a lot of time. (...) I did a research in the class, but it cannot be considered action-research, because I know I don´t apply specific techniques. (...) Usually, instead of following models, I do research on my own, according to the time available. "

Analysing the texts selected from two reports, the teachers' concern about learning from practice is visible, linking reflection on practice with theoretical knowledge (T44) and valuing collaborative work among peers. Despite the

teachers' awareness of the advantages of practical reflectivity, there is still a gap to be overcome between knowledge and know-how, especially in relation to action research (T19), as already mentioned in the theoretical review. Therefore, among many comments on the profile of teacher researcher, the most representative is the one of the teacher who, in addition to the constraints of programs and workload, continues to insist in classroom research (T19), even if sometimes it only occurs due to the compulsory work of a training course. The same teacher admits that he does not perform his research according to scientific norms, but he recognises the importance of classroom research for a reasoned practical reflectivity (Zeichner & Noffke, 2001), as we will analyse in the third category.

Considering the third category, small-scale classroom research, the results are shown below, in table 3.

Table 3

Small-scale classroom research Subtitle – Oc: Occurrences.

Category	Subcategories	Oc.
1. Small-scale classroom research	Teacher as researcher	42
	More practical reflectivity	24
	More collaborative work	30
	Improvement of teaching skills	62
	Improvement of students´ reading and writing skills	53
	Improvement of students´ **Portuguese Language competences across the curriculum**	45
	Improvement of students´ use of technology as a learning tool	14
	Commitment to **continuous professional learning and development**	37

As for the small-scale classroom research category, emerging subcategories were considered from the content analysis of teacher's reports. Most teachers refer to the "improvement of teaching skills" (62), and the improvement of students' reading and writing skills (53), linking the development of the teacher with that of the student, not only in the Portuguese Language, but also in the other disciplines of the curriculum, due to linguistic transversality. Thus, the improvement of students´ language skills across the curriculum is highlighted (45). In contrast to this subcategory, the enlargement in the use of technology, as a learning tool for students, registers lower values (14), highlighting the resistance of some first language teachers to the use of new technologies in the classroom, as mentioned by Prensky (2001). In general, teachers emphasize the importance of the teacher as a researcher (42), in connection with more collabo-

rative work (30) and more practical reflectivity (24), as already analyzed in category 2. Concerning the involvement of teachers in their learning, it is meaningful the commitment to continuous professional learning and development (37).

Overall, teachers confirm that the small-scale classroom research, undertaken by the teacher as researcher, is the basis for more quality in teaching and learning, improving the professional development of first language teachers, as well as student's reading and writing skills. In order to visualise the pedagogical intervention as a whole, we include two reports of teachers explaining a project work that motivated all the participants, students and teachers, and constituted the focus of the research carried out by the teachers.

> **Teacher 32**: "It was very gratifying to have developed a collaborative work with another teacher, sharing the classroom, presenting various work tools and different approaches to content. (...) It was rewarding to see the elementary students interested every time the collaborating teacher came to the classroom, because they already knew that there would be a more innovative and dynamic class. The students responded very well to all the requests made and worked in a committed and organized way. The positive reaction of the parents, when they visualised the presentation of a Photo Story made by the students (…) was also very important.

> **Teacher 40**: "Among the works are the diagnosis of difficulties and strategies of overcoming indicated by the students, the accomplishment of reading activities and the possibility of working curricular and non-curricular areas, reinforcing Language transversality in Portuguese, Mathematics, Study of the Environment, ICT, Artistic Expressions and Civic Formation. (...) My 3rd year students were happy with the project and showed interest in developing similar projects because, according to them, working like this is "much cooler and funnier than just reading the story." (...) This project gave me more motivation to teach Portuguese language."

> **Teacher 49**: "My research project focuses on the reading of *Os Maias* by Eça de Queirós in a class of the eleventh grade, interconnecting reading and writing. The choice is due to the fact that it is very difficult to motivate students to read literature (…). So as to make a critical reading of this nineteenth-century novel, the Reading Project was successfully implemented, (...) with group work, oral presentations and writing of an expository text about the critical intent of the novel. (...) Although not all the students have finished reading the book, they organised a global reading in group work (...) and 10 students (in 24) concluded their reading, which was very good indeed. In the end, the students evaluated the project with very good and good."

The three selected reports show students´ strong participation in class projects, with a high level of energy and enthusiasm in the classroom learning environment. As the teachers describe, the students "worked in a committed and organized way" (T32), for students it was "much cooler and funnier than just reading the story " (T40), "made a global reading in group work" and evaluated the project with "good" and "very good" (T49). As researchers, teachers also express their enthusiasm, when referring to the classroom positive results due to

the pedagogical intervention process, mentioning "very gratifying", "positive reaction" (T32), "more motivation to teach" (T40) and "was very good indeed" (T49).

In a comparative analysis between different levels some differences arose, due to the students' age, level and year of schooling. On the one hand, in **elementary education**, projects and activities focus on learning to read and write, in a more playful and transversal perspective, adding curricular and non-curricular areas (T32, T40). At this level of education, information and communication technologies are more used in the classroom, for pedagogical-didactic purposes. On the other hand, in **secondary education** there are more projects of literature reading (T49). Furthermore, a significant number of elementary school teachers mention, in their reports, the advantages of collaborative peer-to-peer work in the classroom (T32), which was not mentioned by any secondary school teacher, which means that the collaborative work was done exclusively outside the classroom.

In classroom research, all teachers used reflection to improve their practice. Although the teachers themselves recognise some weaknesses in their role as researchers, they all considered the implementation of small-scale classroom research very positively in the context of school as an educational community. According to the teachers´ records, students also perceived positive changes in a more motivating, collaborative and active teaching and learning, that took into account their interests and tastes. As for the last category, the results, related to professional development in school context, are shown in table 4.

Table 4

Professional development in school context Subtitle – Oc: Occurrences.

Category	Subcategories	Oc
1. Professional development in school context	Schools as learning communities	29
	Professional development within a community of practice	27

The occurrences of the last category and subcategories, "schools as learning communities" (29) and "professional development within a community of practice" (27) show that most teachers recognize their professional development within a democratic, reflective and learning school.

> **Teacher 47**: "Ongoing training is a priority. However, it is no good to attend training courses if we do not learn from our practice and from other teachers. (...) It is best to have an internal training that starts with the teacher´s practice at a specific school community, and goes on externally, at an accredited teacher training center, but always corresponding to the training needs of teachers ".

This comment proves the importance of a school community that motivates teachers for more scientific and pedagogical updating, along with more research, reflection and collaborative work. For most teachers, professional development results both from continuing education, provided by schools as learning communities, and from attending workshops and courses at certified training centers, combining "internal (...) and external training" (T47), to improve teachers' practices and students´ educational success.

Conclusion

The study confirms the change from an individualistic approach to teacher-centered training towards a collaborative, peer-to-peer continuous professional development process, in view of the specificities of each school community.

The results allow us to conclude that teachers are aware that everyday school life and praxis are at the heart of an educational research that aims to describe, interpret and analyse the reality in the classroom, in order to transform and optimize teaching and learning strategies. This is a framework for the improvement of instructional practices, based on professional update, small-scale classroom research, practical reflectivity and collaborative work. Thus, teachers´ professional development occur through their reflection about educational intervention in the classroom. This involvement of teachers in formative strategies, based on small-scale classroom research, requires basic conditions such as more time and resources, so as to support research and peer groups. Moreover, as it is recognized by teachers, it is important to combine internal and external training, provided by ongoing training courses, since, for example, many teachers still lack the knowledge to implement action research.

Despite time constraints, due to the overload of daily work, teachers are willing to attend training courses about pedagogical intervention projects and classroom research, which they believe can improve both teachers´ and students' performance. Moreover, they emphasized the importance of first language teaching from a cross-linguistic perspective, highlighting students' reading and writing skills across the curriculum.

Accordingly, being a teacher researcher is required for the monitoring and improvement of the quality of teaching and learning. This will only be possible through a professional development based on a research-training-action, in the context of schools as learning communities, complemented with continuous training courses that respond to teachers´ training needs. So, in the future, more research will be needed, concerning small-scale research, conducted by teachers in their classrooms, language projects guided by school pedagogical coordinators and teacher training courses held at certified training centres.

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