

**Opening-up higher education in emerging economies:
Autonomy and integrity on the rise of globalization**

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Abstract

We focus this paper on higher education systems and related public policies in emerging societies and developing regions worldwide, with emphasis for Latin America, and observe that effective institutional autonomy and integrity of modern universities are to be promoted in a context where building human capital is a priority and alliances and partnerships among universities worldwide, as well as between them and industry, gain significant relevance. For those societies and regions, our analysis identifies ten different themes oriented towards norms that may be helpful in guiding the development of higher education systems and related public policies.

1. Introduction

In this paper we forward ideas to contribute to the development of modern universities and systems of higher education, with particular attention to new developments in emerging societies and developing regions in Latin America. Our main hypothesis is that universities need to be both *adaptable* and *resilient* and this requires policies towards effective institutional autonomy and integrity of higher education institutions.

Our rationale derives from the fact that universities should consider accommodating new configurations of knowledge production by establishing alliances with an increasingly large range of “knowledgeable” institutions (Nowotny et al., 2003). In addition, they should secure and promote a sufficiently stable environment to train and supply talented people, including researchers for that increasingly large range of “knowledgeable” institutions. This leads to our main observation about the need for higher education systems and related public policies to promote effective institutional autonomy and integrity of modern universities, in a context where alliances and partnerships among

universities worldwide, as well as between them and corporations, gain significant relevance (e.g., Shapiro, 2005).

Two main emerging issues drive the rationale for this paper. First, the recent explosion in demand for higher education by millions of young people around the world (Altbach et al., 2009) related to the growing perceived evidence of the potential benefits resulting from economic appropriation of the results and methods of science by society. This is associated with the changing perception of the “academic/scientific divide” at world level (Ajakaiye and Kimenyi, 2011). Many developing regions and countries are now facing the need and the opportunity of large investments in science, technology and higher education (public and private), aiming at responding to the explosive social demand for higher education and to the vast social and political transformations already induced by new waves of educated youth (Chen, 2004; Willis, 2005; Roberts and Hite, 2007).

This is the case of the recent investments in hundred new *campi* in Northern Brazil, Ecuador, or Colombia (among many others in China, Russia and Africa (e.g, Arusha in Tanzania and other developments in South Africa, Rwanda, Turkey). These investments not only seek to foster new skills and knowledge, but also the certification of quality that may be expected from working along with well-established academic and scientific institutions from developed countries (Gide et al., 2010). Such institutional arrangements provide new forms of expansion, as they tend to help securing new financial or human resources, and to challenge their own traditional competences and agendas (Umemiya, 2008).

Second, a new paradigm of international academic and scientific cooperation seems to emerge as a major shaping factor for development at an unprecedented level. It is well known that universities from developed countries are now operating internationally, addressing not only potential students individually (this was the traditional paradigm), but increasingly addressing foreign universities, local authorities and governments, in order to develop new types of institutional arrangements (Knight, 2011).

These include helping creating, monitoring or evaluating emerging institutions in other countries, transferring organizational skills, operating training programs for teachers and researchers, contributing to higher education and research capacity abroad and to the marketing of its benefits for economic and social progress in other societies (Altbach and Knight, 2007). Such new arrangements

may also include the coaching and steering of research programs in developing countries, their early inclusion in international networks, and the affiliation of private companies to academic and research programs (see Heitor and Bravo, 2010).

However, this new paradigm in international academic cooperation does not appear to match the usual model for exporting services. Franchising, for instance, may seem attractive at short notice but its glamour fades away under increasing academic and political criticism (Kim and Zhu, 2010). It seems that a new reality is emerging, in which the export of services is intimately associated with the development of national institutional capacities deriving their strengths from the much needed accumulation of qualified human resources as well as from institutional participation in and recognition from international academic and research networks.

It is in this context that this paper contributes to address challenges and opportunities for building and modernizing higher education systems and universities in emerging societies and developing regions and countries in coming years. It was written having in mind the unique opportunities many regions worldwide are facing to develop new and modern universities. The key role for policy makers and governments, in those regions where major investments in higher education are being made, is to select priority actions and make the correct decisions: where and how to start the process?

For the purposes of this paper, we will use international comparisons but draw also on examples of the recent Portuguese higher education reform in order to illustrate our main arguments. It should be clear that the paper is not about Portugal. Rather, it uses the evidence provided by reforming higher education in a small south-western European region, mainly because a throughout legal reform of the Portuguese higher education system was successfully completed (OCDE, 2007). It considers significant changes in the internal system of governance of universities (including the management structure), as well as in their external societal relations (including, internationalization, research partnerships and business links, as well as external evaluation and accountability), which have been implemented together with a unique increase in the public investment in science and technology.

It should also be noted that this paper is not intended to provide any type of recipe. Rather, it discusses lessons learned, in a scope where we do strengthen the message of Nowotny et al (2003) in that “science is contextualized”. We attempt to explore the dynamic relationship between society and knowledge production and consider the social construction of technological, scientific and higher

education systems, as seminaly described by Bijker et al. (1987). Following Conceição et al (2001) and Conceição and Heitor (2002), we foster the idea that knowledge diffusion processes, and therefore higher education, are “context-sensitive” and should be pursued towards “inclusive learning”. In other words, any region and university worldwide have to learn their own way and built their own development path. Certainly, continuously adapting and improving lessons learned from others.

2. Promoting higher education in emerging economies

In the following paragraphs we discuss potential norms guiding higher education systems and related public policies in emerging societies and developing regions worldwide. Our analysis draws from our self-experience as researchers and policymakers in the field of science and higher education policy, but also on on-site visits, the literature and many discussions with researchers and policymakers on the challenges for higher education in many Latin America regions.

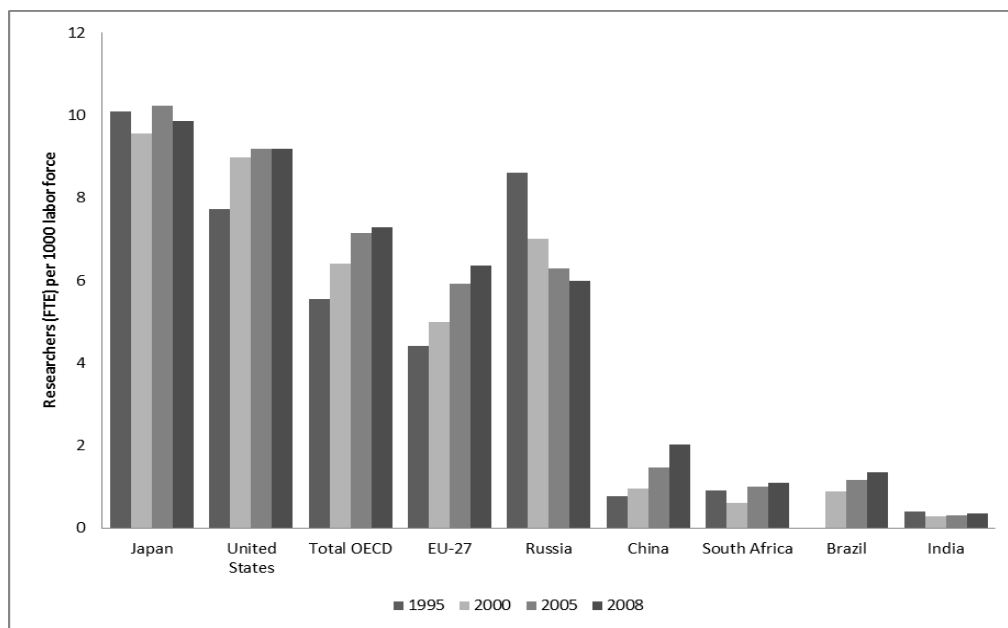
We underline the process of human capital building, and the role that adaptable and resilient universities have in it. Human capital is vital for the creation and dissemination of knowledge, and striving towards greater human capital is of the utmost importance for both developed and developing countries, but particularly for the latter (Lall, 1990). This ultimate goal requires, *per se*, policies and strategies towards effective institutional autonomy and integrity of modern universities in a context where alliances and partnerships among universities worldwide, as well as between them and corporations, gain significant relevance. It also highlights the need to give constant priority to people and knowledge in a way that provides networks of institutions with the necessary critical mass capable of promoting the international standing of scientific and higher education institutions. Two further issues should be emphasized.

First, innovation must be considered together with competence building and advanced training in individual skills through the complex interactions between formal and informal qualifications (Helpman, 2004). This requires a broadening of the social basis for knowledge activities, including higher education enrolment, and strengthening the top of the research system leading to knowledge production at the highest level. Figure 1 underlines the importance of having critical mass of researchers to create and reshape knowledge. The most developed regions of the world have high rates of researchers per 1000 labour force (see Japan and the US), and are striving to increase even

more those rates (see the case of the OECD countries and Europe). With the exception of Russia, all the other regions are striving to attract and accumulate talented people.

Second, strengthening experimentation in social networks necessarily involves flows of people. It is the organized cooperation among networks of knowledge workers, together with different arrays of users that will help diffuse innovation and the design of products and services (Ernst and Kim, 2002). But establishing these innovation communities requires the systematic development of routines of collaboration on the basis of formal education programs, sophisticated research projects, and a diversified and non-structured array of informal processes of networking (see Saxenian, 2006; Tung, 2008). This requires public policies to foster “brain circulation” between leading institutions worldwide.

Figure 1 – Total researchers (FTE) per thousand labor force, 2008 or latest available data



Source: OECD, MSTI dataset; UNESCO, Institute for Statistics

As this point, we must recognize that scientific progress is a source of development and that universities play a critical role in this process (Geiger and Sá, 2008). Public resources invested under rigorous international assessment policies lead to new knowledge, better advanced training of new human resources for the society, new ideas and processes, which increasingly result in innovation, modernization of institutions, improved quality of living, economic productivity and better

employment (European Commission, 2004).

Consequently, our goals require the renovation and expansion of the social basis for scientific and technological development. This calls upon strong conviction not only from the scientific and technical professions and of public and private research organizations, but also from students and the general population. In this context, the growing appropriation of scientific and technological culture by society is of critical importance (see Heitor, 2008).

Under this context, we concentrate our analysis on ten different themes oriented towards norms that may be helpful in guiding the development of higher education systems and related public policies in emerging societies and developing regions worldwide.

2.1 Promoting autonomy: independent legal status

Our initial theme is about the legal status of universities, because we have seen, especially in many regions of continental Europe that raising the level of autonomy for these institutions has become one of the main objectives of sector reforms across different countries in recent years (see Estermann et al., 2011). Granting independent legal status to universities is one means of achieving this goal: it gives institutions greater autonomy to self-govern and function as they see most appropriate, in a free and independent way, in pursuit of work that is deemed essential to society.

In addition, recognizing scientific knowledge as a “public good” introduces the need to consider new policy dimensions designed and implemented in a way that fosters independent scientific and academic institutions. Hasan (2007) identified two directions of change concerning institutional autonomy: 1) expanding the degree of institutional autonomy, and 2) strengthening the regulatory regime to facilitate more autonomous institutions in line with the requirements of public interest.

However, it should also be noted that any of these solutions are very much “context-specific” and should be discussed, above all, as a function of the level of state bureaucracy, which is to be avoided in managing knowledge-based institutions. Also, their implementation is only recommended in “environments” favouring changes in the higher education system.

First, the most important contextual change, shared by all emerging regions and developing countries, is the rapid expansion of the higher education sector associated to social and economic aspirations. Second, along with an expanding demand, there is a need for greater diversity of provision, in order

to better address diversified “publics”. Third, competition among emerging regions is becoming intense, with the realization that quality higher education and research, and its permeability in the economy, holds the key to economic growth. Fourth, pressures for change are also coming from governments towards more responsive institutions associated to new public management approaches and steering at a distance models.

We believe this last issue has become the most important factor behind the recommendation to foster independent legal status to universities and other higher education institutions in emerging and developing regions worldwide. This is because the expanding higher education put pressures on government budgets and the responsiveness of universities to attract additional sources of funding strongly depends on flexible institutions, most of the time requiring “independent legal status” in a way to avoid traditional bureaucratic procedures of public administrations.

It is under this context that lessons learned with the increasingly relevant role that “University Foundations” are playing at the international scene offer instructive insights into the conditions associated with their success. “University Foundations” should not be considered as typical private foundations per se, but rather as public institutions governed by private law. We briefly select four issues from the analysis of Hasan (2007) with application to emerging and developing regions worldwide. First, accepting the foundation status should be voluntary. Second, because not all universities are either willing or capable of taking up the foundation option, the process should be planned on a case-by-case basis. Third, the level of autonomy granted has to be meaningful and based on a carefully decided strategic research and academic agenda. Fourth, the transition to a foundation status requires many support structures and arrangements, as well as, a professional management structure.

It is in this context that legal regimes of higher education should establish the organizational principles of the higher education system, the autonomy and accountability of institutions, setting up governing boards with external participation, diversity of organization and legal status of public institutions, namely as public foundations governed by private law, establishment of consortia, as well as the recognition of research centers as part of university management framework.

Overall, it is clear that the “University Foundation” approach would take time to produce fruitful results and it should not be treated as a panacea for all higher education ills or needs. This requires a

package of reforms addressing various aspects of the autonomy issue. In particular, special attention would need to be paid to ensuring that higher levels of autonomy are appropriately monitored so that they are put into the service of public interest.

2.2 Fostering systems diversification and specialization, together with adequate funding levels

Our research hypothesis considers that the institutional integrity of universities should be preserved and this requires that their public funding should be secured. Both are important points in terms of public policy in any emerging region worldwide. However, these measures by themselves are not enough. From a more pragmatic viewpoint, universities should respond to the needs of society, which include rapid and unforeseeable changes in the structure of the employment market and the need to furnish its graduates with new skills beyond purely technical ones, in particular learning skills. We respond to these two issues in terms of institutional diversification, which *per se* requires an adequate allocation of public funding.

The response to the first issue, relating to changes in the structure of the employment market in developing and emerging regions, involves public policies designed to strengthen and preserve the institutional integrity of higher education. Universities cannot be expected to foresee the demands of the employment market five or six years in advance. If they were to try, this would certainly entail jeopardizing their integrity. This problem could be partially addressed by developing a diversified higher education system, including various institutions with different vocations, in such a way as to promote a functional stratification of the system. In Portugal this issue has been addressed by strengthening the role of polytechnics (i.e., community colleges) and implementing a regulatory actions towards their increasingly diversification from universities.

Non-university institutions are seen in many countries as nearer to the labour market and the more flexible arm of higher education. But, how to identify labour market needs? how to provide the necessary skills, qualifications, and technical know-how? Are non-university institutions more regionally specific institutions and consequently in a better capacity to detect the needs of local industry and promote local and regional clusters of innovation?

At a large extent, these questions remain to be solved. At the same time there is the need to increase the number of adult students in higher education – even in countries with a young demographic

outlook - by removing barriers to their entrance and success with due attention to social and economic roots. This certainly reinforces the need for diversified systems of higher education, leading to greater differences in the learning and teaching systems in professionally oriented and academic-driven programs.

This could be a way to ensure sustained adaptation, and flexibility, capable of providing society with the instruments it needs to deal with instability in employment and, more generally, the inevitable changes in technology, tastes, markets and needs. This seems moreover to be the way to meet the challenge of maintaining excellence. The expansion of higher education is obviously irreversible in emerging regions and developing countries, but this fact cannot be allowed to stand in the way of creating centers of excellence. On the contrary, it should encourage their development, notably by means of the diversification suggested above.

The US higher education system, among many others, can give some pointers towards a possible path to follow, in particular if we understand the range of institutions beyond the so-called “elite universities”. According to the *Carnegie Foundation for the Advancement of Teaching*, which produces a semi-official classification of American higher education institutions, there are around a few hundred “research universities”. These institutions operate within a system of about 6,500 institutions, including those providing vocational training. In this way, the diversity (and functional stratification of the system as a whole) helps to respond to rapid changes in the employment market, particularly through those institutions oriented more towards teaching and with shorter graduation times, without putting undue pressure on the research universities.

A diversified system also presents advantages with relation to the second issue mentioned above, the need to create and promote learning skills, which is analyzed below in this paper under the various sub-functions associated with research activities. Now, we complete our arguments on institutional diversification and specialization by briefly addressing the need to consider the expansion of “distance learning” in developing and emerging regions worldwide.

We prefer to use “distance learning” (DL), as opposed to “distance education” (DE) in order to emphasize the centrality of learners in the teaching and learning process. In addition, it is also important to clarify that the “distance” component of DL is a continuum that ranges from a largely face-to-face or “presential” mode of delivery to a largely distance delivery mode. For example,

distance-learning students interact with tutors in face-to-face situations or undergo assessments under supervision. Hence, the use of on-line systems does not mean that it is a full DL system of provision because the on-line systems could be used simply to support face-to-face mode of provision.

The international experience with DL shows two dominant trends. First, from the paper-based classical pedagogy, DL has moved to virtual and interactive teaching and learning processes, which represent a dramatic shift from the dimension of “space” in distance learning to the dimension of “time”. Second, the use of the blended models by traditional universities, which uses the new DL pedagogy in support of classical face-to-face instruction has spread rapidly and represents the wave of the future.

A leading example worldwide is that of Brazil, where DL has been successfully attained through *Universidade Aberta do Brasil* (UAB) and CEDERJ in Rio de Janeiro. UAB is a publicly funded joint program of Brazil’s Ministry of Education with the State and Municipalities, with a co-operative offer by 70 public higher education institutions, now has more than 100,000 students in undergraduate and graduate programmes. These institutions share some 550 learning centers distributed all over Brazil and several other facilities, like materials production and delivery, internet facilities, training in DL for the professors, tutors and technical staff, among others. The learning centers and the infrastructure are partially provided by the State and Municipal governments.

CEDERJ is a consortium composed of six public universities, offering nine programs for more than twenty thousand students, with 33 learning centres distributed in the State of Rio de Janeiro. The disciplines in one particular program are shared among the universities. To support these activities a State Foundation, CECIERJ, was created with a specific budget, which produces the materials with the professors of the universities, administers the DL process, the learning centres, the platform, the teaching and the DL tutorial systems.

A major argument for DL as a tool for promoting higher education is its lower marginal cost per student compared with face-to-face instruction. On this logic, expansion of DL could be achieved with comparatively smaller investment. Nonetheless, setting up DL programmes requires large initial investments, which can pay-off in lower marginal costs per student only after several years and with high levels of student intake. Quality of provision is other issue, which has been dealt with in many

regions worldwide, namely through specific assessment exercises.

Turning now to the ultimate goal of securing and allocating public funding of higher education in association with policies of institutional diversification, we note that it is important to separate-out real resources from monetary resources and to explain their relationship with other factors relevant to the operation of higher education institutions. This is because the traditional approach in many regions worldwide is that resources (faculty, administrative staff, students, R&D projects) and the university's facilities directly generate income. The latter, in turn, must be spent on maintaining the resources. In fact, in many funding systems, resources are the only element considered in determining public core funding, the logic of determining income being limited to supporting resources.

An alternative model of the university financial flows should explicitly deal with activities and results, as well as resources and infrastructure. This model of the university's operation presents the idea of the institution as a productive system, that is, resources and infrastructure (inputs) are used in activities, producing results (outputs). But these results in turn will generate income that finances activities, which as they unfold entail expenditure in order to support resources. This second part of the cycle represents the financial flows associated with the operation of the university.

Conceição and Heitor (2005) developed this alternative model in the general framework of a "context-input-process-output-outcome" system. The unit of analysis for modeling was the university, with a view to selecting indicators that characterize the institution in such a way as to allow differentiation between different institutions. The model itself is based on the conceptualization of the university's relationship with society and on the modeling of the university's operation, highlighting the existence of intangible flows as well as the tangible flows identified with teaching and research.

Our aim here is to reinforce the role of the university as an autonomous and independent knowledge infrastructure that is able to create knowledge and promote creativity, namely through public funding policies, since the well-established ability to disseminate knowledge through teaching has been traditionally well supported. Our analysis shows that diversified weights should be given to teaching and research activities through the operationalization of funding models that respect the functioning of each institution.

This issue has been addressed by Horta et al (2008) in terms of the evolution of higher education systems along the 20th century, as they adapted to deal with mass education. In this context, higher education diversity became critical to respond to the various needs and several policies were enforced to consolidate it. Two different regulation rationales were implemented worldwide based on “state control” or “market control” type of models. The benefits and problems inherent in each regulation have now been identified and the states are aligning their higher education policies towards a model of state supervision that combines elements of both regulatory frameworks. Based on the evolution of higher education systems in the last century, we follow Horta et al (2008) in terms of the idea to use research funding related mechanisms as a major policy instrument to diversify higher education.

Under this context, our analysis leads us to propose that institutional diversity in higher education can be mostly achieved by funding mechanisms for the component of academic research. There are several benefits to use such competitive funding strategy and one of them is the partly, but strong, competitive nature associated with a well-consolidated evaluation framework. On the other hand, funding for the education component of higher education in emerging and developing regions should be mostly noncompetitive because it mainly supports existing infrastructures and activities. Even when competition exists in the education market, promoting diversity is relatively ineffective. This occurs because of a lack of relevant information for students and also because of the powerful impact of positional goods, which model students' choices.

But this competitive framework has to be very well established in terms of guaranteeing the continuous and periodic opening of competitive calls for research grants and fellowships, as well as the quality of the evaluation process, since it needs to take into account the missions of higher education institutions in order to allow differentiation (otherwise, it would simply backfire and create further homogenization). The other benefit is that the allocation of such funding it is not so strongly impacted by positional goods as it is with respect to education (particularly at undergraduate level).

It should be noted that the starting point for many developing regions is the need to guarantee an adequate organizational structure to organize the periodic calls for applications and their evaluation, which is strongly recommended to use international expertise (see Conceição and Heitor, 2005; Horta, 2010). That is a main lesson learned from the Portuguese experience since the early 1980s,

which has been an important driving mechanism for the evolution of the entire academic system.

It should also be noted that the competitive character of funding seems to be able to differentiate between institutions according to their capabilities to develop research. These capabilities include: available human resources, infrastructure, incentive systems and institutional culture (Conceição et al., 2003). This differentiation is supported by empirical data on the USA and UK higher education systems, where R&D funding is concentrated in relatively few universities (Conceição et al., 2006a). Extrapolation of these observations to emerging and developing regions worldwide should be carefully taken and, above all, looking specifically at local conditions.

2.3 Attracting students and promoting a culture towards knowledge

A key issue in higher education is the need to open-up higher education in emerging economies and developing regions by strengthening the “bottom of the pyramid”. We address this issue in two different, but related levels: i) operationally, looking at the process of attracting and funding students; and ii) strategically, looking at society, in general, and the process of gaining societal trust through a vigorous relationship between universities and the remaining education system.

First, our underlined assumption is that “students matter” and that it should be clear that the main reason for governments to increase funding for higher education is to increase participation rates and extend the recruitment base (Barr, 2004; Barr and Crawford, 2005). At the same time, it is also clear that new opportunities are required to give students more flexible pathways across different types and levels of educational qualification, including through recognition of prior learning and credit transfer, in order to reduce repetition of learning. As a result, increased diversified systems are required, as discussed in the previous section of this paper.

But the need to modernise funding mechanisms and ensure a better balance between institutional and competitive funding for higher education is leading the discussion in governments worldwide. It appears that more important than discussing the details of funding formulas for institutional funding mechanisms, it is to review the overall share of institutional and competitive funding sources (as mentioned in the previous section), as well as to promote student support mechanisms. This certainly includes the need to create flexible financial mechanisms to attract and secure people in academia.

Still, the key issue is how to increase and balance loans and grants for students, as well as to develop

innovative loan systems and to combine them with flexible legislation to accommodate reasonable student incomes through part time work. Barr (2004) keeps reminding us that the goal is to provide free education to all students, by guaranteeing graduates to share the costs. The question is that the correct amount to be shared among the taxpayer and graduates, as well as other private sources, is still to be shown (at least using scientific grounds).

Although income-contingent loan systems are becoming a typical reference worldwide, as acknowledged by the OECD, it should be noted that their applicability is particularly dependent on the characteristic of the existing fiscal system and very much inadequate for most developing and emerging regions worldwide. This is why, as part of the Portuguese higher education reform, an innovative system of student loans with mutual guarantee underwritten by the State, which complements the system of public grants was introduced, thereby improving access to higher education for all students. Michael Gallagher, on a personal comment stated that “the Portuguese initiative satisfies the key policy criteria: it is a horizontally equitable scheme; it represents good value for students; it is financially sustainable at higher volumes of student take-up; it is low risk for government and financial institutions; it avoids the need for additional administrative infrastructure. The loan facility reduces disincentives to study by covering reasonable living costs while deferring repayment obligations till after graduation. The allowable repayment period (twice the period of study) is normally sufficient to permit students to make loan repayments without committing a disproportionate share of their income after graduation”.

Still regarding the new Portuguese Loan System, Nicholas Barr, also on a personal comment, has recently “applaud the facts that: 1) the scheme is universal; 2) supplements existing grants rather than replacing them, hence extends students' options; 3) has no blanket interest subsidy; 4) has a very innovative mutuality element, which is the key that makes it possible for the scheme; 5) to make use of private finance”. The loans scheme also has incidental benefits, by virtue of the progression requirements and the incentives for improving grade point averages. In particular, it has the potential to encourage students to progress and complete their studies, and it may encourage students to undertake courses that are more likely to lead to positive employment outcomes.

Our second level of analysis is associated with the need to strengthen external societal links as critical steps in fostering the role of higher education in society and to meet the needs of global competition

and the knowledge economy. This issue was particularly discussed in the context of the European Union (European Commission, 2004), either in terms of renewing science education, or creating science culture, and here we reinforce this argument with a specific application to emerging and developing regions.

The need is to better explain to society the role universities on scientific and technical development and to foster the public understanding of science. In this regard, Miller et al., (2002) acknowledges the leading role of national programs such as the “La Main a la Pate” in France, or the “Ciência Viva” in Portugal, but also recognize the still difficult climate for promoting science (and knowledge...) culture in Europe. The continued implementation of actions fostering “science for all” is a practice to follow, where the concept of “Knowledge integrated communities” appears particularly suitable to facilitate the joint enrolment of researchers, universities and basic and secondary schools in specific projects driving society at large. It is clear that this requires new knowledge about social behaviors, as well as new methodological developments to help moving emerging regions worldwide towards a knowledge society in a fast moving landscape. The objective is to integrate systems of knowledge and ways of practicing, where schools interact with universities in systematic ways, building routines of cooperative work.

2.4 Fostering the substance of teaching and learning and its relation with research

We move now to learning and teaching with particular application to developing regions. In fact, the challenges facing higher education in contexts characterized by a shortage of qualified human resources and low levels of public expenditures on R&D underscore the need to engage higher education since the very first years to address science and technology challenges.

In this context, here are many lessons to be learnt from the European-wide Bologna process, which was above all an opportunity to address many of the problems that have long existed in Europe. There are, however, challenges that still remain in this movement to adapt higher education in emerging and/or developing regions to the global landscape and to improve funding for R&D. Understanding the relationship between higher education, the social and national contexts in which it takes place, and expanding the policy dialogue in higher education to include a modern rational considering the broad value of “research and learning”, remain significant challenges worldwide.

But, overall, changing the patterns of teaching and learning, promoting active (less passive) work by the students themselves and fostering student-centred education schemes are ultimate goals. We need to allow students to determine their own learning paths and trajectories, namely along education cycles, but also across institutions in different regions and countries.

The debate requires universities, at large, to better understand “how people learn?”. It is clear that learning systems vary considerably across the full spectrum of disciplines, with arts and medicine leading project-based approaches and, probably, engineering and the social sciences following a rather intense “academic drift”. But if the ultimate goal is to enlarge participation rates and the recruitment base of higher education, we believe the debate will gain from current knowledge of basic and secondary education levels.

The US’s National Research Council (2000) provides evidence that “designing effective learning environments include considering the goals for learning and goals for students”. Given the many changes in student populations, tools of technology, and society’s requirements, different curricula have emerged along with needs for new pedagogical approaches that are more child-centred and more culturally sensitive. The requirements for teachers to meet such a diversity of challenges also illustrates why assessment needs to be a tool to help teachers determine if they have achieved their objectives. But supportive learning environments, namely fostering a culture of “*beliefs in science*”, need to focus on the characteristics of classroom environments that affect learning. In this aspect, the authors were referring to the social and organizational structures in which students and teachers operate, including the environments created by teachers, but also the learning environments out of school.

The idea that science should be considered as an open system, with different and diversified ways of participation, mainly derived from the fact that scientific activity is increasingly part of people’s lives, so that the training of researchers should not be closed to a specific group of people, but rather a broad action and part of today’s education. Under this context, it has become clear that the development of education systems has been particularly influenced by constructivism (Bennett, 2003). Following Piaget’s (1973) view of knowledge construction by using “active methods which require that every new truth to be learned be rediscovered or at least reconstructed by the student”, Papert (1991) added the idea that the knowledge construction “happens especially felicitously in a

context where the learner is consciously engaged in constructing a public entity". This occurs because "without knowledge, practice is limited and without practice, knowledge will never be fully realized" (Rotondi and Reeve, 1997). This constructionism viewpoint facilitates the "new milieu of discovery, learning, and sharing" mentioned above, and leading experiences suggest that it allows to expose students to a multi-disciplinary design experience; prompt participants to think about systems architecture; raise issues of organizational processes in a technical context; and build learning communities of students, faculty, and staff.

Following the practices, skills, attitudes and values described above, education at all levels must consider that learning a new practice requires moving through discovery, invention, and production not once, but many times, in different contexts and different combinations (see European Commission, 2007). To achieve these objectives, we must learn from new research and, certainly, we also need to foster evidence based, project and experimental work, as well as to focus our attention on the transferable skills students should acquire. But we also need to reduce drop-out (failure) rates in higher education and to involve students in research activities since their early stages at our institutions. In summary, we need to go beyond the higher education structure and gradually concentrate our efforts in measuring and taking stock of the diversity and evolution of concrete student-centred parameters.

For example, taking Pine and Gilmore's contentions (1999) about what they termed "the experience economy" and the role experiences play in building stronger and more personal relationships in the corporate world, our analysis suggests that universities must deliver authentic experiences to build and encourage sustainable and entrepreneurial growth. Pine and Gilmore explore the idea of experiences as a fourth economic offering, as distinct from services as services are from goods, but one that has until now gone largely unrecognised. While services may be considered as a set of intangible activities carried out on behalf of a person, experiences are memorable events that engage that person in an individual way, so that they determine and guide transformations. Experiencing sustainable and/or entrepreneurial processes at the university thus sets the stage for the societal transformations required to progress successfully towards the future (Conceição et al., 2006b).

In addition, it should also be noted that the potential revolution for learning that the "networked world" provides is the ability to create scalable environments for learning that engages the tacit as

well as the explicit dimensions of knowledge. The term that John Seely Brown (2010) has used for this, borrowed from Polanyi, is “indwelling”. Understanding this notion requires us to think about the connection between experience, embodiment, and learning.

First, that the world of the 21st century is characterized by a sense of constant change and that such a landscape requires us to further rethink our notions of interaction with new knowledge toward a deeper understanding of participation (*knowing*). Second, how the notion of experience (and participation) within new media contexts has shifted from a traditional sense of experiencing content to using content as context to construct a social world with others (*making*). Third, understanding how networked media supports a kind of play (*playing*) that allows people to navigate the complexities of a constantly changing world. What may be most important to understand is that each of these dimensions of learning is in the process of evolving in response to the demands of the 21st century. Following again John Seely Brown (2010), in our emerging societies, *knowing*, *making*, and *playing* emerge as critical components of “*becoming*”.

2.5 Promoting research and teaching relationships: training and attracting a teaching body through “University-Science” relationships

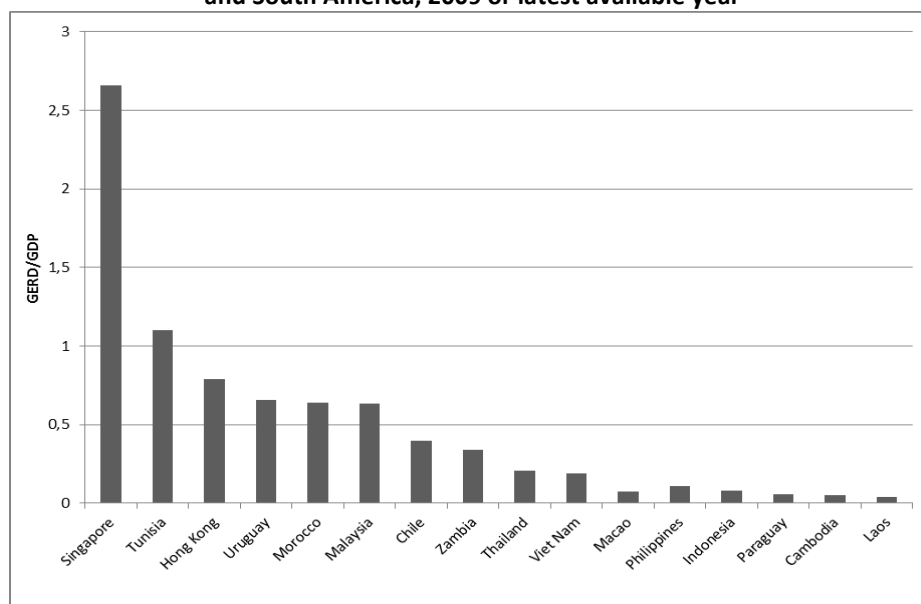
Let us turn now to the issue of reinforcing the top of tertiary education systems in emerging and developing regions worldwide, by attracting and training a quality teaching body and fostering the specialization of universities. The key issue is the creation of the conditions able to strengthen institutions and to form the necessary critical masses to help facilitating quality higher education.

In this respect, and following some of the issues raised by Ziman (1968) and also by Ernst (2003), one critically important and emerging institutional issue refers to the training of students and young scientists in order to provide them with core competencies that help them to become successful researchers and prepare them with the adequate “transferable skills” for the job market outside research and academia. The issue can be further oriented in three different lines of discussion.

First, this requires the adequate public funding to train and attract a teaching body, making use of proper research environments, at home and abroad. It must consider the concentration of funds to spur forms of international academic and scientific cooperation oriented towards the research training of young scientists and future teachers. Increasing the investment in science and technology

in emerging regions worldwide is becoming critical to facilitate the conditions to nurture knowledge intensive environments where researchers and academics can be trained and develop knowledge based activities (Figure 2).

Figure 2 – Gross Expenditure on R&D as a percentage of GDP in emerging countries of Asia, Africa and South America, 2009 or latest available year



Notes: 2009: Macao, Hong Kong, Indonesia, Rwanda; 2008: Morocco, Tunisia, Chile, Paraguay, Uruguay, Singapore; 2007: Philippines, Thailand; Malawi, 2006: Malaysia; 2002: Vietnam, Cambodia, Laos. Source: UNESCO, Institute of Statistics

Second, at the institutional level, attracting teaching staff has been particularly facilitated by establishing *Graduate Schools*, which have been developed progressively worldwide over the past decade in diversified ways, ranging from interdisciplinary structures and based in a single university, to subject-specific inter-university structures. In general they aim to provide a better link between research training and research strengths and, in a few cases, have provided flexible structures to attract and contract researchers and graduate students in a way far beyond that provided in traditional university departments. But, how to ensure that graduate schools in developing regions permit better employability conditions? And how is quality assurance ensured?

Our research shows that international academic and scientific cooperation seems to emerge as a major shaping factor for development at an unprecedented level to address these issues (Heitor, 2012). It is well known that academic institutions from developed countries are now operating internationally, addressing not only potential students individually (this was the traditional paradigm),

public policies is to keep the proper balance between open science and commercially oriented R&D based upon proprietary information.

2.6 Stimulating research and economic development and university-industry relationships

In this section we further extend the issue of reinforcing the top of higher education systems, but now in terms of research and development and university-industry relationships. This has become a “commonplace” worldwide, with the US system often taken as a world reference, although analysis has shown that it is of utmost importance to understand its policy diversity and mix set of public and private incentives (Conceição et al., 2004). Moreover, its long history of past investments and current division of labour or specialization cannot be replicated in systems with a lower scale and complexity. The key elements of the US academic history are those of diversity of policies and increasing “institutional specialization” and of the clarification of the unique roles of the private and public incentives to support science and technology (Conceição et al., 2006a).

The same way the US system as a whole is taken as a worldwide reference, the US university system is also used as a role model for its fast rate of responsiveness to the economic changes and contribution to the creation of wealth through relationships with firms (NAE, 2003). The understanding, that the universities are gradually viewed as important engines of economic growth and development instead of mere institutions of higher education learning is evident for many years (Saxenian, 1986). There is increasing evidence of their importance as developers of regional industrial and technological development (Cooke and Huggins, 1996). This is a role that US universities, especially research universities, have assumed throughout the second half of the 20th century (Rosenberg, 2002).

Here, too, as with the whole US system, there is the perception that private funding associated to a high level of industry-science relationships is very high and stimulates a very dynamic academia, which contributes in a much more direct and with bigger impact to the social economic development at both regional and national level. The possibility of getting funding from private sources and private incentives (e.g. Intellectual Property Rights) is very appealing for universities that strive with increasing demands for change and for being more closely engaged with society. However, research suggests this to be potentially dangerous for the development of universities (Conceição et al, 2006a).

At a time that universities have increasing financial difficulties, derived from public budget constrains,

there is the expectation that these closer links between research and application and usefulness in society will be translated in more direct and immediate financial flows (Neave, 1995). This perception is leading to an institutional convergence between what universities do (and are supposed to do) and what firms and other agents do. In fact, more than a decade after Clark (1998) launched the idea of “Entrepreneurial Universities”, much remains to be learned about their impact and analysis has considered this convergence a potential threat to the institutional integrity of the university and the future of scientific research due to the commoditization of knowledge (Nelson, 2004).

Above all, we follow Charles Vest (2007), former MIT’s President, which stated: “...what is best about American higher education – we create opportunity. That is our mission. That is our business. That is first and foremost what society expects of us.” The issue is not to “save the university”, but rather to understand who will play the fundamental and unique role that universities have played in the overall cumulative system of knowledge generation and diffusion. It appears that the US is willing not to allow this integrity to be jeopardized. By misunderstanding the US policies towards university-based research, there is a grave danger that university policy in developing and emerging regions will destroy these basic functions, which would be detrimental to the global production of knowledge, but also certainly would harm the development prospects of those regions.

To address this issue, international academic and scientific cooperation may help creating, monitoring or coaching and steering research programs with industry in developing countries, their early inclusion in international networks, and the affiliation of private companies to academic and research programs (Heitor, 2012).

In addition, the discussion above leads to the idea that a new paradigm of technology commercialization through international academic and scientific cooperation is also emerging at an unprecedented level. We refer to the capacity to turn science-based inventions into commercially viable innovations and related new potential factors of progress on a global scale, in association with a growing perceived evidence of the potential benefits resulting from economic appropriation of the results and methods of science by society. Our approach is on sustained growth in emerging and developing regions, which can occur only with the continuous introduction of truly new goods and services, namely in the form of radical technological innovations that disrupt markets and create new industries.

At this stage it should be remembered that the accumulation of knowledge by skilled people and institutions in the area of technology-based entrepreneurship require a specific learning process, that takes place together with the building-up of the necessary critical masses in the research community, but needs to be oriented to external and emerging markets worldwide. Making-off local knowledge intensive communities, which are associated with local and specific institutional and university contexts, able to operate in global and sophisticated markets requires organized networks fostering new competences in international technology commercialization and diffusion. In other words, we propose a consideration of the challenges associated with implementing country- and regional-wide “university technology enterprise networks” for stimulating competences in a way that fosters access of technology-based start-ups to emerging markets worldwide.

2.7 Promoting Internationalization

Following our observations in previous sections on the role of international networks on the production and dissemination of knowledge in emerging and developing regions, we now deepen the issue of reinforcing the top of higher education systems in those regions by focusing on the increasingly relevant theme of internationalizing the university.

Although it is well known that this process will depend on the level of foreign faculty and student involved, analysis has also shown that it is critical that the internationalization process is moulded to the characteristics and institutional missions of the university in order to preserve its own institutional integrity. In this context, Horta (2009) argued for the need of research-oriented universities to start focusing the internationalization of the student body on postgraduate students. He also argued that, in research-oriented universities, the internationalization of the faculty is strongly related to the internationalization of postgraduate students and thus, in alignment with the scope of research activities.

It is under this context that our focus is to broaden the ultimate goal of internationalizing the university in emerging economies in terms of university networks able to foster attractive and competitive research and learning environments and to attract and train highly qualified human resources (Horta, 2010). The key issue is the creation of international partnerships able to strengthen institutions and the necessary critical masses to compete at an international level and, at the same

time, guarantee the adequate level of institutional integrity of universities in emerging and developing regions (Marginson, 2004). These networks may have an important impact in doctoral education, helping to attract students, as well as to help training their future teaching staff in times when higher education systems at those regions are becoming increasingly relevant.

Understanding the new paradigm of international partnerships in higher education will gain from our increasing knowledge of the operational advantages and shortcomings of large international research consortia and organizations. It also requires the understanding of the local characteristics of the processes of technical change and of their specific regulatory and institutional constraints and it calls upon our knowledge of the social construction of technological systems. This new model of academic cooperation, that includes but does not seem to be a hostage of the traditional forms of services' international commerce, may derive its uniqueness from the very nature of academic communities and from the strong meritocratic and universalistic ideals that prevail in science on an international scale, as well as by the flow of students and researchers, and by the citizen sense of being part of a "mission" for scientific and social development that motivates some of the best professionals in academic institutions worldwide. However, under which conditions is such a model sustainable?

To answer this question, Table 1 summarizes major lessons learned from the Portuguese experience in setting-up international research networks. It considers three main focuses, including: i) training the trainees, through co-hiring of young researchers and exchange programmes for faculty; ii) institutional building, by promoting the role of scientific institutions in society, their links with the private sector and adopting policies that foster the creation of critical mass, including those oriented towards fostering R&D consortia; and iii) test beds and thematic R&D networks, facilitating the integration of researchers and scientific institutions in international thematic networks with local relevance, as living laboratories for the production and dissemination of knowledge and facilitating ideas for markets worldwide. Test beds should be assembled and integrated in international collaborative programs in a way to boost local companies' capacity to export and access emerging markets.

Table 1 - Potential guidelines to foster international research networks

Major objectives and policy instruments	Justification
<p style="text-align: center;">People</p> <p>Train, attract and co-hire researchers, fostering their exchange and the training of a teaching body</p>	<ul style="list-style-type: none"> • Sustain excellence and internationalization in doctoral programmes • Foster and systematize the hiring of researchers with PhDs
<p style="text-align: center;">Institutions</p> <p>Reinforce and promote the role of scientific institutions in society, and their links with the private sector (promoting R&D in business enterprises)</p>	<ul style="list-style-type: none"> • Reinforce institutional evaluation mechanisms, in order to improve systemic and organizational efficiencies • Adopt policies that foster the creation of critical mass, including policies oriented towards fostering R&D consortia. Promote the training of a new generation of technicians and other human resources to support R&D activities
<p style="text-align: center;">Test beds and thematic R&D networks</p> <p>Facilitate the integration of researchers and scientific institutions in international networks focused on “test beds”, as living laboratories for the production and dissemination of knowledge with local relevance and facilitating ideas for markets worldwide</p>	<ul style="list-style-type: none"> • Reinforce international partnerships and foster participation in international knowledge-based networks as a way to improve scientific quality and the employability of researchers • Foster S&T thematic networks in terms of test beds and living laboratories that can boost companies’ capacity to export and access emerging markets.

2.8 Developing assessment and evaluation practices: beyond quantitative methodologies

In discussing lessons learned from the Portuguese experience over the last decades in the development of science, technology and higher education capacity, we must certainly refer to assessment practices, at two main distinct, but related levels. First, the research evaluation practice set as an independent system from teaching. Second, the implementation of an independent institutional accreditation and assessment of teaching programs and higher education institutions based on the best international practices.

Creating, strengthening and restructuring a network of research centers in emerging and developing regions, including those in universities and/or related non-profit institutions, require the implementation of a systematic research assessment practice, with a periodic nature (e.g., every three years) and with direct impact on funding levels. This has been widely established in industrialized countries and we argue that there is no other way to foster research capacities in emerging regions worldwide. Also, it should be entirely implemented making use of external experts and/or with internationally relevant and independent institutions.

In addition, independent accreditation and assessment of teaching programs and higher education institutions do require flexible and stable organizations to be established for an indeterminate period of time. They should be responsible for the assessment and accreditation of universities and their study cycles, as well as the execution of every task intrinsic to the integration of every region in international systems of quality assurance of higher education.

In this process, a rather important and additional procedure needs to be stressed, which is emerging worldwide. The assessment of knowledge production results should not be based solely on quantitative methodologies. This is because although quantitative evaluative methods may complement peer-review practices, overcoming the recognised criticisms and pointing out the faults of 'pure' peer-review assessments (Relman, 1990), the "extreme" quantification of the academic activity may impose a culture of "bureaucratization of knowledge", which is to be avoided. In addition, whereas research evaluation is a well-consolidated assessment, it is still difficult to measure and evaluate teaching performance (Dixit, 1998).

Also, although certain authors defend the robustness of teaching evaluation processes such as student ratings (Marsh, 2007), faculty and higher education administrators have expressed doubts about their meaningfulness and suitability (Gilliot, 2001). The same problem arises when evaluating faculty work as a whole, or universities as a whole, where institutional evaluation assessments are often revealed to be a paradox as they either rely too much on subjective features or on an excess of quantitative features (Schloegl et al., 2003). In other words, the robustness of performance indicators for research, if complemented by more qualitative procedures provides a sound basis for making judgements.

2.9 Optimizing organizational design

We briefly consider in this section the internal organization of the university and use a range of experimental evidence reported in the literature, as well as on-going projects worldwide, with specific application to developing and emerging regions.

The evolution of the university's organizational environment is characterised by an increase in complexity and instability. In addition, our research shows that the traditional resistance to change of university structures, which can be an advantage in a more stable environment, is slowing the

evolution to adaptive organizations. For example, universities do need to take full advantage of the new opportunities created by the digital economy and communication technologies. Their consideration together with the preservation of the institutional integrity requires that these issues are fully integrated into the university's organizational model.

Analysis also suggests that modern universities in developing and emerging regions should evolve towards a new perspective of departmental functions in the university, exclusively focused on managing their human resources and teaching staff, but avoiding the management, or execution, of teaching or research activities. Those should rely exclusively on undergraduate and graduate schools, preferably run under international collaborative arrangements and in a way to emphasize great adaptation and stability of operation. The links between departments (where the teaching and research resources are located) and the activities themselves should be conducted through a mechanism of mutual adjustment, based on a resource management system for the university, allocating resources to the activities.

In addition, the guiding principles for the university should be knowledge-driven authority. This form of authority establishes different styles of management according to the different types of units found in the university. This principle also implies a bottom-up attitude towards decision-making and the need to guarantee the integrity of the institution through visionary leadership, which brings coherence and unity. A decisive element of the university structure is the external board, which serves to validate the most important decisions and to strive for effectiveness and added value of the university's activities for society.

2.10 Look at the spatial dimension, integration and design

Our final point is about the spatial integrating of "university campus" and related "knowledge infrastructures" in growing urban areas worldwide (OECD, 2011), with emphasis on developing regions and countries. Our starting point considers emerging issues associated with urban environments as complex technological systems and with new paradigms of collaborative research and training, in association with the increasing internationalization of the sources of knowledge production and diffusion.

Sustainable design and related practices has not been always associated with design excellence or

design innovation and requires novel ways of design thinking that can contribute to the trans-disciplinary knowledge required to better understand complex urban environments (Mostafavi and Doherty, 2010). How best to propose a contribution at the intersection of emerging design methodologies and technical solutions (i.e., sustainable energy, intelligent grids, intelligent transportation), but also in line with the urban as site of complex economic, political, social and cultural relations, requires understanding the complexity of integrated systems and imagining new futures as potential factors of progress at a global scale. Consequently, the issue to be discussed is how to apply these considerations to the design of future “university campus” in developing countries and emerging regions.

Our proposed approach is to engage designers, scholars, students and experts worldwide, including policy makers, in deepening the discussion about potential scenarios for integrating “knowledge infrastructures” in growing urban areas worldwide, as well as to guide the design of future “university campus” and better materialize (spatially) the opportunities for technology-enabled active learning environments (Fisher, 2010). It may consider the preparation and development of studios and workshops, together with policy briefs, academic publications and coherent strategies to help guiding the adequate planning and design of “knowledge infrastructures” oriented towards the development of modern societies in emerging world regions.

It should aim to consider design practices that facilitate multi-objectives under diversified contexts, including: 1) fostering the learning capacity of students in modern university environments, by “balancing” an improved usage of technology-enabled active learning environments, social interaction and other forms of “experiencing” the campus; 2) but, preserving the uniqueness of the “university campus”; 3) together with engaging public spaces and lives of people in the cities, with a potential emphasis in facilitating the interaction of university and college students with key stakeholders (e.g., companies) and the population at large, including less favoured people.

Although university campus have existed for more than 2000 years, including the very initial “Buddhist learning centers” in India (namely in Taxila, 6th Century BC, in Nalanda, 3rd Century BC and Ajanta, 2nd Century BC) and at least since the 11th century in Islamic societies (namely with the creation of the Universities of Bagdad and Nishapur in 1060 and, therefore, earlier than the creation of European universities in the 12th century), most of comprehensive and comparative overviews of the historical

development of university design have been published with reference to the American Campus in the 20th century. Notably, the work by Turner (1984) is still today considered throughout the technical literature as the most significant review and historical analysis of the evolution of the university campus. It mainly surveys the architecture of US universities since the beginning of colonial settlement until the mid-1980s, including a brief description of the English college as the precursor of the American college. Nevertheless, emerging opportunities and potential trends for technology-enabled active learning environments, including the way they are changing the traditional “University campus” concept, remain to be understood, namely in spatial terms.

Discussion and summary

The rapid development of science and technology at a world level, particularly in many “transition economies” and developing regions across the world, as well as the growth in higher education worldwide and the prospects for its rapid evolution in many developing countries in the years to come, is calling for the need to better understand and frame inclusive science, technology and higher education policy actions in quite diversified national and regional contexts at a global scale.

But developing research and higher education in emerging and developing regions requires the need to concentrate public policies and institutional strategies on a myriad of issues that will ultimately open the “Black Box” associated with all type of institutions, preserving autonomy while building-up a new set of relationships with society at large and introducing an “intelligent accountability” associated with a renewed structure of incentives.

To cope with such a variety of demands and with a continuously changing environment, we all know that higher education systems, in particular, need to be diversified. But the challenge of establishing modern higher education systems requires effective international networks and a platform of research institutions, notably for stimulating the political debate among the various stakeholders and for assisting in the networking of national constituencies promoting the positioning of our institutions in the emerging paths of brain circulation worldwide.

Following Nowotny et al (2003), the university, even in mass higher-education systems, continues to fulfil two basic functions that depend on it being a relatively *stable* institution. First, it remains the most important incubator of the next generation of researchers, and this do require effective

“University-Science” relationships, because there is no other way to train researchers except in research-intensive environments. No other institution is so well equipped to undertake this task in modern societies (European Commission, 2011). But this function is gaining greater relevance through innovation and the need to secure and explore “University-Industry” relationships (D’Este and Patel, 2007). Among the most precious and valuable roles of the universities, is the supply and training of talented young people. Increasingly, this becomes one of the most essential contributions that universities are expected to make.

Second, is the university function of generating and promoting “cultural norms”, which Nowotny et al. (2003) claim that the university should promote in both substantive and procedural terms. Nussbaum (1997) is more ambitious and claims for the maintenance of a “culture of liberal rationality”. Here we adapt and expand the notion explored by Conceição and Heitor (1999) that on the 21st century, universities should promote the necessary *institutional integrity* to facilitate students to experience environments of free knowledge production and diffusion. Again, no other institution is so well equipped to undertake this task in modern societies. For example, Conceição et al (2006b) explore this idea in terms of building “green campus” and making the university a “living laboratory” to better educate youngsters towards a sustainable society.

It is well known that higher education systems are under pressure to meet demands imposed by a globalised knowledge-society without compromising quality deliverance. For example, in Europe, although most institutions and their staff have recognized the need for change for many years, the way institutions are organized, either internally, or through traditional links with society, as well as their structure of incentives, have continuously delayed reforms (Enders and De Boer, 2009). Consequently, it is only in recent years that reforms have emerged directly conducted by governments in many different countries and political regimes (including Portugal; Gago and Heitor, 2007).

The evidence provided in this paper has been discussed in terms of ten different themes oriented towards norms guiding systems of higher education and related public policies in emerging societies and developing regions worldwide. These themes are associated to challenges that are characteristic of many areas in the world, and most particularly to Asia (see Shin and Harman, 2009). Our discussion is framed in the context of the increasingly relevant role universities play to foster socially-robust

knowledge and to supply talented people and researchers in a globalized society and fully integrated economic context.

In internal organizational terms, this requires *adaptable* and *resilient* institutions. In public policy terms, by focusing governmental activity on strengthening institutional autonomy, we require political actions to concentrate on the external dimension of knowledge institutions and, thereby, universities should strengthen their capacity to make the critical internal changes for building and modernising their systems of teaching and research within a path of *diversity* and *specialisation*, without compromising quality. Furthermore, by strengthening their institutional integrity together with enhancing their external links with society, universities are asked to carefully improve their relationships with economic, social and political actors, thereby creating “new” reinforced institutions that have gained *societal trust*.

Our final observation is that effective institutional autonomy and integrity of modern universities are to be promoted in a context where building human capital is a priority and alliances and partnerships among universities worldwide, as well as between them and firms, gain significant relevance.

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