Knowledge and cities by design

Revisiting the concept of university *campuses* and science parks in modern societies
*CITIES4K*

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A working paper and discussion note for establishing an international research network on “Designing Cities for Knowledge”, [Cities4K ]

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“I never teach my pupils. I only attempt to provide the conditions in which they can learn.”

Albert Einstein

Abstract
How far the growth in higher education worldwide and the prospects for the rapid evolution of research-based activities in many emerging economies and societies is calling for the need to better understand and frame potential evolving scenarios for spatially integrating universities, science parks and related “knowledge infrastructures and facilities” in growing urban areas worldwide?

The recent explosion in demand for higher education by millions of young people around the world, associated with a growing perceived evidence of the potential benefits resulting from economic appropriation of the results and methods of science by society, have changed the perception of the “academic divide” or “scientific divide” at world level. Consequently, does it make sense revisiting the “university campus” concept at a global scale? How far technology-enabled active learning environments and new types of students are changing the “University campus” concept? How far social and cultural requirements on the sustainability of future learning environments should be further considered?

In addition, university campuses and science parks have been built in urban peripheries all over the world and this has facilitated new city developments in may regions worldwide, at the same time they are causing the relative isolation of students and part of the academic communities, as well as unsustainable mobility patterns for teachers and other parts of those communities. How far adequate and inclusive urban planning and design of science parks and “knowledge infrastructures” can help engaging people in the “social construction of technological systems” and, consequently, accelerate the modernization of emerging societies worldwide in quite diversified national and regional contexts? Does it make sense to discuss “knowledge urbanism”, as an emerging issue at a global scale?
1. **Introduction: goal and approach**

This working paper is aimed to engage designers, scholars, students and experts worldwide, including policy makers, in deepening the discussion about potential scenarios for helping designing cities for knowledge and integrating “knowledge infrastructures” in growing urban areas worldwide, as well as to guide the design of future “university campus” and science parks, as well as better materialize (spatially) the opportunities for technology-enabled active learning environments.

The goal is to facilitate building a new “narrative” to help guiding the transformation of every working spaces in learning platforms, as well as the design of “university campus” and science parks at a world level and in very different socio-economic and cultural contexts. It should aim to consider design practices that facilitate multi-objectives under diversified contexts, including:

- 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 traditional forms of “experiencing” university campuses;
- Facilitating the interaction of university students, teachers and researchers with key stakeholders, including companies, the labor force and the population at large;
- Preserving the uniqueness of the “university campus”;

Our tentative approach is based in research-based initiative including a series of studios, advanced workshops, doctoral seminars and conferences, information exchange networks to guarantee the involvement of recognized competences worldwide leading to new field research. It considers the identification of case studies and diversified experiences worldwide in urban planning and design of “knowledge infrastructures”. The case studies shall reflect the understanding of the local characteristics of the processes of technical change and of their specific regulatory and institutional constraints, calling upon our knowledge of the social construction of technological systems. They will be structured and implemented through studio work. The field studies and studio work should be done by multidisciplinary teams including urban planners and designers, architects, education and learning experts, ethnographers and sociologist.

The implementation of the project will consider establishing a “Steering Committee”, to guide the development of the work in academic and policy terms, as well as to facilitate its potential impact.

The outcome of the work will consider the publication of a book, academic publications, as well as specific reports about the case studies.

2. **Context and background**

Many developing and emerging regions and countries worldwide are making large investments in science, technology and higher education 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. These investments not only seek new policy actions, but also their continuous assessment and the guarantee from working along together with well established academic and scientific institutions from
developed countries and to actively participate in international knowledge networks and flows.

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 Bagad and Nishapour 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 (see Appendix 1). It mainly surveys the architecture of universities in the United States since the beginning of colonial settlement until the mid 80s, 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.

On the other hand, comparative studies on the performance of university campus planning and design in developing societies has not been published and most of the relevant literature reports specific cases, mostly under reference terms developed elsewhere and in relation to different socio-economic and cultural contexts. Among these, a reference should be made to Oscar Newmeyer’s work in the early 70’s to accomplish the design of the University of Constantine, in Argel, which has involved the preparation of a program following that of the University of Brasilia in the 60’s.

3. Implementation and field research

Comparative field research and studio work is proposed in different urban contexts and cities in order to cover various levels and scales of analysis. A stepwise, dynamic and flexible process is proposed, including the following critical steps:

1. **Field Work**: setting-up local teams, under an international collaborative framework, involving students, designers, scholars and experts worldwide;
2. **Studio Work**: to complement and deepen the field work, as well as to open the discussion to new and creative options and alternatives for campuses design;
3. **Series of Research Workshops**: to discuss the progress of work and help engaging stakeholders, including the organization of international conferences;
4. **Reporting**: engaging in a collaborative work leading to high quality written material and the publication of new reference materials at world leading level.

Appendix 2 includes a preliminary list of cities and institutions (yet to be confirmed), identifying a potential set of case studies.

Possible levels of analysis need to consider urban planning and the design of “knowledge infrastructures” from different scales and levels of analysis and a number of related questions in association with the emerging understanding of “the university” and/or
research facilities and their role in modern societies. Possible scales and levels of analysis may include:

1. **Campus design: work, live and interact in the campus.** The goal is to look at the design of *campuses* and parks in terms of its impact on the social context of the campus and its interaction with academic, scientific and economic goals. The work will consider potential scenarios and paths about the way the built environment interact with people to foster processes of social and economic integration, in a way to both preserve and foster the sophistication necessary to university *campuses* and science parks.

Potential examples may include the comparative analysis of the campus of Tsinghua, in Beijing, Rio de Janeiro Federal University campus at "Ilha do Fundão", as well as their comparative analysis with traditional campus of Harvard in Cambridge/Boston. In addition, the study of new *campuses* and science parks established in urban peripheries in the last twenty years my consider Taguspark, in the vicinity of Lisbon, Luanda, or Istanbul. Emerging plans for new *campuses* may consider Skolkovo and Macao.

To which extent spatial and temporal flexibility should drive new *campuses* designs? How far the campus site overall (including the individual buildings and the spaces within them) should be a place which enables the students, teachers and researchers to undergo experiences that are transformative? Which terms to compare the impact of residential *campuses* versus distributed university environments?

2. **Urban design: the city-campus interaction.** The goal is to revisit large scale urban planning in terms of the spatial integration of knowledge infrastructures in cities, in a way to both preserve the uniqueness necessary to the university campus, or the science park, but also opening the campus concept to foster processes of social and economic integration.

Potential examples include the comparative analysis of cities such as Moscow, with more than 200 universities and other knowledge infrastructures, including the recently established city of Skolkovo, Rio de Janeiro, with the new campus of the local Federal University at the outskirt of the city, or Lisbon, with a number of institutions spread over the entire city. Istanbul and its various university campuses can also serve for in-depth analysis. For comparative terms, the city of Boston/Cambridge and its numerous *campuses* and institutions will be analyzed.

This raises key contemporary issues, including: i) the extent of spatial concentration versus spatial dispersion in campuses structuring; and ii) the definition of inner city locus versus city nodes or outskirts. While the former requires discussing the concept of “campus boundary” and its relative “permeability”, the latter requires understanding the complex social interactions involved in the promotion of university *campuses* or science parks in urban peripheries.

3. **Building design and interaction with the campus: Inside the realm of learning.** The goal is to look inside a diversified set of existing university and science buildings and their spaces and question the need to revisit learning environments in a way to
better accommodate emerging functions for the university. The analysis will consider conventional classrooms and, in alternative, collaborative learning studio spaces, brings emerging issues associated with the requirements for understanding flexibility, together with the necessary “ambience” to provide both formal and informal learning spaces in the decades to come.

What universities require is just more versatile spaces? Or we need to better understand the “places of learning” and a variety of options for students to work in different ways, as well as to stimulate the ability for teachers to adopt different instructional approaches? Do such changes need to be accompanied by broad efforts to overcome the separation of “formal” learning environments (such as classrooms, libraries and laboratories) and “informal” social spaces (such as cafeterias and student lounges), which has characterized traditional campus design?

On the other hand, traditional, teacher-centered instruction is still today central to the design of many university campuses worldwide, particularly the lecture theatres and other formal classrooms. Although the implementation of more student-centered and flexible learning approaches have been introduced in higher education worldwide, recent attempts to create new teaching and learning facilities on university campuses have often resulted in celebrated architecture that has proved to be educationally problematic. What types of physical settings are required to support the teaching and learning processes emerging in higher education?

How to better integrate technology-enabled active learning environments in existing spaces? How far do we need to go beyond existing formal and informal learning spaces and, for example, consider purpose-built spaces for information sharing and “third learning” space concepts?

Also, how to facilitate access to the increasing number, type and diversity of sources of information for the students, but also making sure that student-teacher interaction and, in general, social interaction, is in the realm of learning? In order to improve current “places of learning”, do we need to go beyond flexibility or functionalism?

It should be clear that these three potential levels of analysis will require a stepwise implementation, to be designed and improved along the implementation of the work. At the launching phase it is proposed to start only with the first level of analysis given. Then, the proposed work may move to the remaining levels of analysis in the years to come.

4. Work proposal
A series of different tasks involving comparative field research and studio work is proposed in order to cover the first level of analysis identified above. Potential tasks are listed below, including a preliminary list of cities and institutions, which is to be confirmed.

1. TASK 1 – Paths of urban design and campuses integration
Comparative field research, through teams involved in studio work, will be conducted in different cities to discuss the issues identified and propose future avenues and ideas for
development. The analysis will focus on the discussion of the level of spatial concentration/dispersion, as well as on the development of university campuses or science parks in urban peripheries.

Proposed field work: Brazilia and its three new university campuses; Moscow, including the recently established city of Skolkovo; Rio de Janeiro, including the campus of the local Federal University; Lisbon, including Taguspark at the periphery of the city; Boston/Cambridge. Other cities will be included, as considered adequate.

2. TASK 2 – Evolving scenarios for existing (old and recent) campuses design
The design of existing campuses and parks will be discussed in terms of their evolution and related impact on the social context of the campuses, as well as on their interaction with academic, scientific, cultural and economic goals. Attention will be given to the emergence of technology-enabled active learning environments and their impact on campuses design and the “social construction” of systems increasingly dependent on knowledge and technology.

Proposed field work: Brasilia; Tshingua, in Beijing, Rio de Janeiro Federal University campus at "Ilha do Fundão"; Taguspark, in the vicinity of Lisbon; Harvard in Cambridge/Boston. Other cities will be included, as considered adequate.

3. TASK 3 – Engaging stakeholders and systematic, research-driven, policy action
The continuous interaction of the research team with policy makers and main stakeholders will be guaranteed through a series of policy actions, including specialized meetings and visits. Attention will be given to the local characteristics of the processes of technical change and of their specific regulatory, institutional and organizational constraints, as well as to related processes of stakeholder engagement. The ultimate goal is to maximize the impact of the project and establishing new reference material at a leading world level.

Proposed cities for policy actions: Skolkovo/Moscow; Lisboa; Rio de Janeiro (tbc): Istanbul (tbc). Other cities will be included, as considered adequate.

It is clear that the work proposed under these three tasks require an integrative approach, making use of multidisciplinary teams and collaborative work.

Other potential tasks to be promoted in future phases of the project may include the following:

**Designing future campuses**
The study of emerging and future campuses and science parks will be analyzed making use of comparative assessments and fieldwork. To which extent spatial and temporal flexibility is driving the new designs? How far the campus site overall (including the individual buildings and the spaces within them) should be a place that enables the students (and teachers) to undergo experiences that are transformative?

Proposed fieldwork: Luanda, Istanbul. Emerging plans for new campuses may consider Skolkovo and Macao.

**Building design and integration in the campus**
The analysis will include a diversified set of spaces, from conventional classrooms to collaborative learning studio spaces, promoting the discussion of emerging issues...
associated with the requirements for understanding flexibility, together with the necessary “ambience” to provide both formal and informal learning spaces in the decades to come. Considering the need to preserve and foster the sophistication necessary to university and science buildings, the analysis will consider opening part of those buildings to foster processes of social and economic integration. In other words, to evolve from conventional university buildings based on single-use zoning to mixed-used buildings.

Potential field work: GSD at Harvard; Faculty of Industrial Engineering at TU Delft; others to be defined.
Appendixes:

Appendix 1: background information and sample literature survey

Appendix 2: Preliminary list of cities and institutions for field research: Beijing-Boston-Brasilia-Istanbul-Lisbon-Luanda-Macao-Moscow-Rio de Janeiro.

Appendix 3: A preliminary plan for outreach activities
Appendix 1: background information and sample literature survey

Sample literature: (includes historical and conceptual studies, as well attempts of establishing practical guides in Europe, North America and Australia)


This is considered to be the pioneer comprehensive book dealing specifically with the fundamental aspects of college architecture and planning. It was a joint endeavor of the Association of American Colleges and the Carnegie Corporation, including detailed analysis of large institutions, but discussing fundamental principles also applicable to small colleges.


This book is an effort to give an account of early 20th century developments in college architecture with special reference to the liberal arts college. It was commissioned by the Association of American Colleges and is the result of practical experience in designing college buildings and in giving advice and counsel on issues in the administration and planning of the American College.


This book was written by experienced architects with special reference to university developments in India in the 60’s. It was commissioned by the US Agency for International Development and considers a brief survey of campus built in India (and elsewhere), including a series of Universities (Aligarh Muslim, Banaras Hindu, Delhi), Indian Institutes of Technologies (Kharagpur, Madras, Kanpur,Delhi) and universities of agricultural sciences (Uttar Pradesh, Orissa, Punjab, Andhara Pradesh, Bangalore). It describes very initial “campus” developments in India, in the form of “Buddhist learning centers”, namely in Taxila (6th Century BC and existing until 2nd Century AD, with a serious of learning centres dispersed throughout the city), in Nalanda (3rd Century BC and existing until 12th Century AD, heavily populated with over 3000 monks and a greater number of students, living together in a cluster of monasteries and collective spaces around a stupa, with a quality, scale and identity not unlike the successful campus of today) and Ajanta (2nd Century BC and existing until 2nd Century AD, isolated from worldly distractions to promote serenity, this campus was built around a semi-circular scarp of high rocks, with an utter simplicity).


It considers a throughout historical survey of the American Campus, following the founding ideas of the medieval British universities. It includes an in-depth analysis of the fundamental characteristics that distinguish American campus, as driven by the desire to create an ideal community and often considered to be a vehicle for expressing the utopian social visions of the American imagination. It has been considered throughout the technical literature over the last decades as the most significant review and historical analysis of the evolution of the American Campus until the mid 80s.
A sequence of four practical guides towards campus design and architecture. 

Campus Planning (1983) attempts to establish a base of departure for university planning and design, including three sections. The first considers campus planning through historical examples about the evolution of university campus. The second breaks down the campus into its constituent physical parts and describes each in functional and aesthetic terms. The third discusses the steps in preparing campus planning. It has been used as practical guide for campus planning and design.

Campus Design (1992) considers a survey of procedures related with the design of university campus. It includes the fundamental characteristics of American campus.

Campus Architecture (1996) describes and documents campus architecture, based on the unique American experience of building and maintaining a tradition on campus excellence. It contains examples and references gathered during many years of professional experience and practice.

Campus Landscape (2000) provides information, ideas, and instruction about planning and designing the green environment that situates, serves and symbolizes higher education.

In 2005, Richard Dober published “Campus heritage” (SCUP, Soc. For college and University Planning, Ann Arbor), a brief monograph offering ideas, insights and information about campus heritage.


It considers a survey of higher education organization and spatial policy in Britain, the Netherlands, Sweden, Spain, Belgium (Louvain-la-Neuve), America and, then, builds on the French experience to argue in favor of the need to “open” universities to the urban environment and beyond the pattern typical of the 60’s in terms of closed campus in the peripheries of cities. It includes a detailed analysis of the evolution of French university campus, with an analysis of their diversity, based on the analysis of the campus of Lyon, Aix, Orleans-La-source, Avignon.


It considers a critical overview of the architecture of university campus, with emphasis on Europe and Italy.


It argues that the campus should influence emotions through “works of art” and a true “cultural ambience”. It reviews and criticizes a number of American campus in association with the cultural impact they tend to produce.

This book documents the evolution of the university campus as a discrete social, cultural and architectural entity. The author argues that the discourse on the built environment of the university campus now needs to address explicitly the relationship between the “places” provided on-campus and the quality of the student learning experience. Extolling the virtue of the university campus, and the spaces within it, as an active agent in the learning process, the author says university architecture has a higher mission compared with other architecture, and gives: “the design of buildings a cutting edge to which few other areas of architecture aspire. It is the fashioning of a dialogue through bricks and mortar, or more likely steel and glass, with intellectual mission in the broadest sense. Universities have the almost unique challenge of relating the built fabric to academic discourse ... the university environment is part of the learning experience and buildings need to be silent teachers.”


The author and president (and professor of education) at The University of Akron discusses how major changes in society have created significant implications for the delivery of higher education. The seven chapters of the book explore the development and growth of urban campuses; what an urban campus is and how it works within the community; who makes up the "New Majority" of students; the urban faculty, their challenges and successes; the frustrations and misconceptions related to urban campuses; the ways in which urban colleges and universities play a key role in moving society forward; and the dynamic role urban campuses can play in preparing students for a globally competitive and technologically complex twenty-first century.


The book considers a throughout historical survey of the physical campus of The University of Pennsylvania, following the founding ideas of Benjamin Franklin. It includes an in-depth historical and architectural analysis of the campus and its various constitutes, including detailed descriptions of every single building. It is a full historical guide of the Penn campus.


It follows Paul Turner (1984) book and provides a brief history of the American Campus, but oriented towards the planning of future campus. It considers main implications for campus design in association with information flows in the cyberspace, sustainability issues, the civic metaphor, and the idea of entrepreneurial campus.


It considers a conceptual analysis about the way “places” outside of schools provoke us to think and reshape the activities of education.

It includes eleven different papers on opportunities and challenges for campus planning and commissioning.


It provides an in-depth historical analysis of the undergraduate cultures from the end of the eighteenth century to the present. It focuses on the evolution of human and social aspects of college life, discussing experiences in many American university campuses. It follows the experience of the author in the discussion of women’s colleges, as published in Alma Mater (1980) and considers the way students created systems of meaning and codes of behavior. The analysis considers how the competing student subcultures of the past have been passed down to successive generations and continue to shape the ways in which students work and play in the American college.


It provides an historical analysis of the characteristics of the American university Campus, based on the experience of the author, as student and researcher, through many universities in America. It focuses on the human and social impact of experiencing college campus and towns, with 8 thematic chapters, each focusing on a single college town as an example, ranging from Oregon to Oklahoma and including Cambridge (Massachusetts), Berkeley (California) and Claremont (California). It considers main implications for campus design.


It reports a number of projects developed in England, with emphasis on the Oxford region, and with a special reference to the importance of the context of enquiry in the particular question of knowledge infrastructures, either at a university or school levels.


This book considers a survey of higher education policies and related spatial policies in North America, linking the fields of urban development and higher education strategy and policy.


Linking the fields of urban development and higher education planning, this book considers a survey of higher education policies and related spatial policies in thirteen countries, including Germany, Korea, Scotland, Japan, Portugal, Mexico and South Africa. It builds on the American experience, as published in 2005 (see “The University as Urban developer: case studies and analysis”) to argue in favor of the university as an “urban institution”, in terms of its institutional engagement in reciprocal cultural, social, economic and political relationships.

It describes and discusses the role of the University of Pennsylvania over a period of more than ten years in urban revival, with descriptions relevant to university and urban policy issues.

**Other relevant literature and sample journal publications:**


Robinson, S. (1999), 'Maximising the use and quality of teaching space'. *Perspectives: policy and practice in higher education* 3, 10-15.


Salama, A.M. (2009),"DESIGN INTENTIONS AND USERS RESPONSES: Assessing Outdoor Spaces of Qatar University Campus", *OPEN HOUSE INTERNATIONAL - Shaping..."

W. van Winden et al. (2011), Creating knowledge locations in cities: innovation and integration challenges, Erasmus University, Rotterdam.
Compendia, guides and conference proceedings (OECD; UNESCO; others):


This fourth OECD Compendium illustrates inspiring examples of modern physical learning environments from around the world. Six institutions of higher education were selected, as follows: Cork Institute of Technology (Ireland); MAD-faculty – PHL (Belgium); The Saltire Centre at the Glasgow Caledonian University (UK); Sino-French Centre at the Tongji University (China); Bâtiment Atrium at the Université Pierre et Marie Curie (France); Stephen M. Ross School of Business at the University of Michigan (USA); Akademia Muzyczna im (Karola Szymanowskiego w Katowicach, in Poland).

The metamorphosis of OECD’s PEB into the Centre for Effective Learning Environments, CELE, in 2009 was a natural consequence of the shift in emphasis that had taken place during the first 37 years of PEB’s life.


This ‘handbook’ has been developed as an output of the EC’s funded REDIS project (REstructuring Districts Into Science quarters). It discusses the development of “knowledge hotspots” in eight European cities: Aarhus, Białystok, Halle, Magdeburg, Manresa, Newcastle, Piraeus and Vienna.


Includes summaries of presentations at an OECD International Conference.


Includes summaries of presentations at an OECD International Conference.

Issues that shape the future of higher education institutions and new trends in campus architecture are briefly described, as summaries of presentations at an OECD seminar. Francisco Marmolejo, former consultant to the OECD, presents an overview of the seminar, explaining changes taking place in the area of higher education facilities and providing participants’ views. Presentations from three countries are also described: Mexico’s Monterrey International Knowledge City; the higher education learning environment and the Finnish technology hub of Otaniemi; and, in Spain, the University of Salamanca’s R&D&I Building.


This review was agreed for funding by the Higher Education Academy, London, in July 2006. The aim of the review is to inform the future design of learning spaces, in order to facilitate the changing pedagogical practices needed to support a mass higher education system with its greater student diversity. There is some limited evidence on the role of campus design, as well as the design of individual buildings, in supporting student learning. As learning is a social activity, campus designs are needed that create welcoming, informal spaces for people to meet and talk, and perhaps to work in small groups. It also noted that the question goes well beyond purely physical issues: learning is supported in the university by a range of organizational considerations, some of which may be conceptualized as concerning social capital.

It concludes that redesigning learning space on new, flexible principles may not be enough in itself. But flexibility in space design, allowing adaptation to new uses at reasonable cost, will be more useful than spaces designed expressly for a technology with a short (and shortening) lifespan. It is speculatively suggested that an “architecture of complexity” (but not an “architecture of confusion”) can encourage new ideas and creativity. No evidence is available to support this claim, but further research should be encouraged.


This third OECD Compendium describes new buildings of institutions of higher education in the following selected institutions: Berufsschule fur Gartenbau und Floristik, Cegep de Sainte-Foy, Centre de Formation des Nouvelles Technologies, College Shawinigan, Georgetown University Law Centre, Kaposvari Egyetem, National Maritime College, National University of Ireland, Ngalilwara Study Center, Nyiregyhazi Foiskola, St John Ambulance First Aid School, Szegedi Tudomanyegyetem Tanulmanyi, Universite du Quebec a Montreal.

Issues that shape the future of higher education institutions and new trends in campus architecture are briefly described in the form of case studies.


This second OECD Compendium describes new buildings of institutions of higher education in the following selected institutions: Corona Information Centre at the University of Helsinki, University of Limerick, Library and Information Services Building, Haagse Hogeschool, Faculties of Law and Social and Economic Sciences, Graz, Institut des Hautes Études Commerciales de Liège, Cégep de Saint-Hyacinthe, Faculté d'aménagement, Université de Montréal, Letterkenny Institute of Technology, Chr. Hogeschool De Driestar, La Trobe University.


This is the first OECD Compendium with examples of modern physical learning environments from around the world. Although much of the programme's early work focused on school facilities, higher education facilities became a concern. It includes descriptions of forty-six fine schools from across the OECD area selected by an international jury from almost 200 nominations.


This is a practical guide aimed to orient and advice the planning procedures associated with the design of higher education facilities in developing countries during the period of exceptional expansion in the 70s. It was commissioned to the firm Architects Co-Partnership of Potter's Bar, UK, and is written in a way to illustrate the various procedures involved in planning, design and construction of higher education facilities. The target audience is public administration in different developing countries with small or no experience in the process. It includes six sections (policy, planning, primary brief, secondary brief, primary implementation and secondary implementation), with a detailed discussion of the various steps in preparing campus planning. It does not consider case studies.

This guide was followed, in 1979, by a companion document, including basic guidance towards the implementation of standards for higher education facilities.

• Others to be identified
Sample “Case Studies” in Europe, North America and Australia:

• **University of Harvard, 2000’s, USA:**
  

  It considers a unique contribution to the rich body of scholarly literature examining Harvard’s physical campus. The book reports the result of studio work developed at GSD by several student teams challenged to discuss “how a venerable campus, the three-century-old home of the world’s leading educational institution, prepare to grow?”.

• **MIT, 2007, USA:**


  This book extends the rich body of scholarly literature examining MIT’s campus. It reports a critical overview of the historical evolution of MIT’s physical campus, exploring a number of details about its main historical and symbolic buildings, including those designed by world-renown architects (Aalvar Alto, Eero Saarinen, Kevin Roche, Steven Holl, Frank Ghery, Charles Correa, Fumihiko Maki).

• **University of Chicago, 1998-2000, USA:**


  It considers an alternative to the official master plan for the revitalization of the University of Chicago, which was commissioned in 1998 to architect Michael Sorkin, an alumnus of Chicago. Following the tradition of the series “Pamphlet Architecture”, as launched by architect Steven Holl and publisher Bill Stout in 1978, the monograph provides concrete evidence of a visionary ideal and exemplar of what remarkable architecture and planning can mean today.

• **University of Sidney’s Law School, 2003, Australia:**


  The design of the University of Sidney’s Law School was the result of an international architectural competition held in 2003 that included acclaimed architects from Europe and Australia. The book documents the architectural competition and includes a critical review of the campus evolution. It also discusses the role of key buildings in a university campus, comparing Le Corbusier’s Carpenter Center in Harvard, Louis Kahn’s Yale Center for British Art in Yale and the University of Sidney’s Law School, by Francis-Jones Morehen Thorp.

• **Others to be identified**
Sample “Case Studies” in developing countries:

• **University of Constantine, Argel:**
  This book considers the main program goals and design strategies followed by Oscar Newmeyer in the early 70’s to accomplish the design of the University of Constantine, in Argel, which has involved a large number of Oscar Newmeyer’s friends and close colleagues, while politically exiled in Paris. The preparation of the program and the overall design of the university follow that of the University of Brasilia in the 60’s.

• **University of Technology Petronas, Bandar Seri Iskandar, Malaysia**
  This review report considers the initial operation of the University of Petronas, build between 2002 and 2004. The initial academic master plan for the University Technology Petronas (UTP) was prepared by Arthur D Little in March 1998. It highlighted the need for technically qualified, well rounded graduates who could direct the successful development of key industries in Malaysia. This study formed the basis for the plan, which was further refined by Foster & Partners with GDP Architects. Set within the beautiful and dramatic landscape at Bandar Seri Iskander, 300 kilometres north of Kuala Lumpur, the 450-hectare campus site is characterised by tropical jungles, undulating terrain and lakes formed by flooding disused mines. The design was awarded with the 2007 Aga Kahn Award of Architecture.

• **Others to be identified**
Appendix 2: preliminary list of cities and institutions for field research
Beijing-Boston-Brazilia-Istanbul-Lisbon-Luanda-Moscow-Rio de Janeiro

The practical implementation of the project considers comparative field research and studio work to be implemented in different urban contexts and cities in order to cover the various levels of analysis identified. A preliminary list of cities and institutions is to be confirmed and may include:

Beijing: Tsinghua University Science Park

Boston: city overall and the University of Harvard’s campus, and or MIT campus

Brazilia: city overall and the University of Brazilia

Istanbul: city overall and recently established campuses

Lisbon: city overall, and Taguspark (in Oeiras, 20 km east of the center of Lisbon).

Luanda: city overall, and the new campus of Universidade Agostinho Neto

Moscow: city overall, and Skolkovo

Rio de Janeiro: Rio de Janeiro Federal University, UFRJ, campus at “Ilha do Fundão”
Appendix 3. A preliminary plan for outreach activities

Five different dimensions for capacity building, training and dissemination are proposed, as follows and described in the paragraphs below:

- Advanced Studies Program (annual)
- Policy Fellowship Program
- Doctoral Grants and Consortium
- High level Conferences and International Seminar Series
- Book Series

1. Advanced Studies Program, ASP
It considers an annual event, two weeks long, for advanced, on job training, of high-level officials, politicians, university and science and technology leaders, namely from emerging regions worldwide. It is aimed to guarantee the involvement and networking of recognized competences, bringing together scholars, as well as other experts and politicians from leading universities, intergovernmental organizations and other competence centers worldwide. Practical work will include the identification and discussion of case studies and diversified experiences leading to the development of university campuses and science parks in contemporary societies worldwide.

The technical organization of the Advanced Study Program and its scientific coordination will involve policy leaders and academic experts. However, engaging, step-by-step, active Universities and other institutions from developing countries, namely those contributing students and researchers to the initiative, is one of our objectives from its very start.


2. Policy Fellowship Program
It considers a program of fellowships for fieldwork in developed and developing countries, oriented towards the preparation of policy briefs about selected and specialized themes on university campuses and science parks in contemporary societies.

The ultimate goal is to involve graduate and post-graduate students worldwide in short and medium term research periods (2 to 9 months), with themes and people to be competitively selected at an international level, although under the broad subject of university campuses and science parks in contemporary societies.

The policy briefs will be oriented to guide the design and implementation of university campuses and science parks in contemporary societies. In addition, they will serve to form a collection of brief case studies in a variety of themes and regions.

Potential schedule: 4 to 8 graduate students per year (2 to 4 months grants) and 3 to 6 post-graduate students per year (4 to 9 months grants), starting in 2013, with first public announcement late 2012.

3. Doctoral Grants and Consortium
The goal is to engage doctoral students in leading academic and research institutions in in-depth research on university campuses and science parks in contemporary societies, involving evidence based analysis and the preparation of case studies in developing countries and regions.

It is foreseen that existing Doctoral Programs on “Architecture”, “Urban Planning”, “Engineering and Public Policy, EPP”, “Economics” and “History” may act as one of the “vehicles” to foster doctoral research in the areas of this initiative. The ultimate goal is to launch an international Doctoral Consortium in order to bring together a few selected
Doctoral programs considering research actions on university campuses and science parks in contemporary societies into a network of cooperation and exchange of students and academic staff. An annual meeting of the Doctoral Consortium, involving Universities from both developed and developing countries, should help addressing common issues, attracting participation from developing countries and providing a wider international educational environment for students.

Expected approach and schedule: 4 to 5 new students per year (4 to 5 years grants), starting in 2013, with first public announcement late 2012. We do not foresee the need for a central funding scheme for doctoral grants, unless exceptional circumstances require Foundation support, case by case, for during an initial limited period.

The first annual meeting of the Doctoral Consortium is expected to be held in November 2013.

4. International Seminar Series and High level Conferences
It considers the organization of an International Seminar Series and a few high-level Conferences over the next years aiming at engaging stakeholders, including policy leaders and corporate managers, along with Universities, research students and policy analysts, to jointly discuss emerging issues related with university campuses and science parks in contemporary societies.

The research work and field analysis worldwide will be implemented together with a dissemination and stakeholder engagement strategy. It will consider series of regional, national and international seminars and workshops, to be organized in close relation with each city to be studied. Examples may include the organization of specific workshops, such as the “Skolkovo Seminars on cities and knowledge by design”, as well as annual international seminars, with moving venues worldwide (e.g., Moscow, Rio de Janeiro, Brasilia, Lisbon, Beijing and Cambridge/Boston).

The organization of the various high level conferences over the years and their scientific coordination is expected to consider the institutional involvement of leading academic institutions. In addition, the organization of other Conferences in developing countries will be considered.

Expected approach and schedule: 3-5 high level conferences over the next 5 years, starting in Skolkovo in October 2012. Potential venues in selected countries applying as hosts and co-organizers may include Lisbon, Cambridge/Boston (University of Harvard and MIT), Lausanne (EPFL) or Paris (OECD and UNESCO).

5. Book Series
The goal is to engage experts, scholars and doctoral students worldwide in leading academic and policy research institutions in the preparation of a book series, including a reference guide as a practical critical instrument to assess and steer university campuses and science parks in contemporary societies. This book series will include major case studies, including Skolkovo and Moscow, and should be published in parallel with the new series of policy briefs, described before. It aims at facilitating the building up of coherent strategies towards the design and growth of university campuses and science parks worldwide. The foreseen case studies will consider in-depth analysis of real processes leading to the building up of university campuses and science parks.

Expected launching date: three years after official launching of the project