TRENDS AND ISSUES IN POSTGRADUATE EDUCATION: CHALLENGES FOR RESEARCH INTERNATIONAL EXPERTS’ WORKSHOP

FINAL REPORT

5-7 March 2008
Dublin City University (DCU), Dublin, Ireland
UNESCO Forum on Higher Education, Research and Knowledge

Trends and Issues in Postgraduate Education: Challenges for Research

International Experts’ Workshop

5-7 March 2008
Dublin City University (DCU)
Dublin, Ireland

FINAL REPORT
The authors are responsible for the choice and the presentation of the facts contained in this report and for the opinions expressed therein, which are not necessarily those of UNESCO and do not commit the Organization.

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, city or area of its authorities, or concerning the delimitation of its frontiers or boundaries.

Published by the United Nations Educational, Scientific and Cultural Organization
7, place de Fontenoy
75352 Paris 07 SP

Layout Design: Sabine Lebeau
Editing: Pauline Harvey

Workshop coordinated by the
UNESCO Forum on Higher Education, Research and Knowledge

Office of the Vice-President for Learning Innovation of Dublin City University (DCU)

Graduate Research Office of Dublin City University (DCU)

Irish Research Council for the Humanities and Social Sciences (IRCHSS)

Irish Research Council for Science, Engineering and Technology (IRCSET)

© UNESCO 2008
Printed in France
ED-2008/WS/40REV
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>iii-iv</td>
</tr>
<tr>
<td><strong>Part I.</strong></td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>1-2</td>
</tr>
<tr>
<td><strong>Part II.</strong></td>
<td></td>
</tr>
<tr>
<td>Objectives and expected outcomes of the International Experts’ Workshop</td>
<td>3-14</td>
</tr>
<tr>
<td><em>Introductory Remarks</em></td>
<td></td>
</tr>
<tr>
<td>Summary of latest trends in Postgraduate Education</td>
<td>3-4</td>
</tr>
<tr>
<td>Rapporteur, Ulrich Teichler</td>
<td></td>
</tr>
<tr>
<td><strong>Final Views from the Workshop</strong></td>
<td>5-10</td>
</tr>
<tr>
<td>I. General principles</td>
<td></td>
</tr>
<tr>
<td>II. Specific dimensions of postgraduate education</td>
<td></td>
</tr>
<tr>
<td>III. Assessing and sharing successful experiences in promoting research</td>
<td></td>
</tr>
<tr>
<td>and knowledge</td>
<td></td>
</tr>
<tr>
<td><em>An Informal Prognostic Template</em></td>
<td>11-14</td>
</tr>
<tr>
<td>Assessing innovative approaches to strengthen knowledge and research</td>
<td></td>
</tr>
<tr>
<td>policies and the role of postgraduate education in this process</td>
<td></td>
</tr>
<tr>
<td><strong>Part III.</strong></td>
<td></td>
</tr>
<tr>
<td>Main Keynote and Background Papers</td>
<td>15-27</td>
</tr>
<tr>
<td><em>Keynote Address</em></td>
<td></td>
</tr>
<tr>
<td>Trends and issues in postgraduate education: a global review</td>
<td>15-18</td>
</tr>
<tr>
<td>Heather Eggins</td>
<td></td>
</tr>
<tr>
<td>Role of postgraduate education in research systems</td>
<td>19-23</td>
</tr>
<tr>
<td>Mary-Louise Kearney</td>
<td></td>
</tr>
<tr>
<td>Indicators Concerning Rationales and Modes of Doctoral Study and</td>
<td>24-27</td>
</tr>
<tr>
<td>Research Issues of Doctoral Research and Programmes in</td>
<td></td>
</tr>
<tr>
<td>Economically-Advanced Countries</td>
<td></td>
</tr>
<tr>
<td>Ulrich Teichler</td>
<td></td>
</tr>
</tbody>
</table>
Contents

Part IV. Summaries of Presentations 28-48

Theme 1: Improving postgraduate education in developing countries 28-31
Jamil Salmi

Theme 2: New market for advanced degrees in terms of supply and demand 32-34
Sumitra Dutta

Theme 3: Potential of open learning for postgraduate study 35-37
Brigid Heywood

Theme 4: National planning for postgraduate education including perspectives for international cooperation 38-41
Jaime Arturo Ramirez

Theme 5: New politics of global higher education and implications for international university networking 42-46
Christopher Tremewan

Concluding Analysis 47-48
Sir Peter Scott

List of Participants 49-51

Annex I. Glossary and list of Abbreviations 52-58
Foreword

The UNESCO Forum on Higher Education, Knowledge and Research is pleased to present this publication, entitled “Trends and Issues in Postgraduate Education: Challenges for Research”. This volume emanates from the International Experts’ Workshop on the subject hosted by Dublin City University (DCU), 5 to 7 March 2008.

First and foremost, it is appropriate to situate this publication in relation to the aims of the UNESCO Forum and, thus, to contextualize the specific issues related to postgraduate education today. The UNESCO Forum focuses on the role and status of national research systems and international trends in this domain in relation to the challenges posed by the knowledge-based societies of the twenty-first century. Located at UNESCO and supported by the Swedish International Development Agency (Sida), the UNESCO Forum provides a platform for researchers, policy-makers and relevant stakeholders to engage critically with the key elements underpinning research systems: (i) policy trends; (ii) infrastructure; (iii) human capacity and (iv) investment. This project has assured follow-up action for two major UNESCO world conferences, the 1998 World Conference on Higher Education, “Higher Education in the twenty-first century” and the 1999 World Conference on Science, “Science for the twenty-first century” and is closely linked up with the Management of Social Transformation (MOST) intergovernmental programme of the UNESCO Social and Human Sciences Sector.

Since 2001, the UNESCO Forum has consolidated its efforts to bridge research and policy in a number of ways through facilitating and broadening the space for critical debate and through revisiting the established and dominant views so as to reconceptualize future directions. To date, its various components for attaining these goals: (i) mobilizing experts; (ii) stimulating global and regional debate; (iii) producing and disseminating research; (iv) promoting strategic partnerships; (v) facilitating communication and (vi) strengthening the systemic approach have yielded creditable results.

This systemic approach necessitates the study of specific issues arising from the various areas involved. In this regard, postgraduate education – which is being shaped today by new and powerful forces across very different socio-economic contexts and because of its enduring contribution to knowledge systems, to the academic profession and to a highly-skilled workforce – merits serious and forward-looking analysis.

The International Experts’ Workshop held in Dublin focused on five major aspects which are driving postgraduate education and which involve complex challenges at the present time: (i) regional needs regarding research-based qualifications; (ii) new markets for advanced academic credentials; (iii) the potential of open learning for research degrees; (iv) planning postgraduate education in large-scale economies including the role of international cooperation in this respect, and (v) shifting geopolitical imperatives which affect research university networks.
The authors contributing to the Report presented a strong case for continuing to recognize the importance of postgraduate education, both in terms of renewing the academic profession and in relation to building the skilled workforce needed for knowledge-based societies and knowledge-based economies.

Against this background of global change, knowledge systems today must demonstrate flexibility and innovation, while still maintaining their traditional commitments to quality and relevance. As this research workshop reiterated, postgraduate qualifications, through their emphasis on research-based higher education, have a unique and invaluable contribution to make to this systemic renewal.

The debates always kept sight of how best to share useful lessons about the evolution of postgraduate education in high-income countries with other contexts searching for innovative approaches. In this regard, indicators were suggested by the Rapporteur and an informal template was proposed by the UNESCO Forum to help policy-makers address their priorities and benefit from successful strategies now in progress.

The UNESCO Forum expresses its gratitude to Professor Maria Slowey, Vice-President for Learning Innovation at Dublin City University (DCU) and to her colleagues Grainne Curran and Tanya Keogh for their dedicated efforts in organizing the Workshop. Special thanks are also due to Professor Ulrich Teichler, Director of the International Centre for Higher Education Research (INCHER) at Kassel University, Germany, who also acted as Rapporteur, for his guidance in producing a rich and thoughtful Report. The outcomes of this research workshop are intended to provide fresh insights both for policy-makers and the higher education community alike as they address the main challenges facing postgraduate education in the Knowledge Society of the twenty-first century.

Mary-Louise Kearney, Director
Forum Secretariat,
UNESCO Forum on Higher Education,
Research and Knowledge
Introduction

The International Experts’ Workshop was held under the auspices of the UNESCO Forum on Higher Education, Research and Knowledge and hosted by Dublin City University (DCU) with support from the Office of the Vice-President for Learning Innovation and the Graduate Research Office of Dublin City University (DCU), the Irish Research Council for the Humanities and Social Sciences (IRCHSS) and the Irish Research Council for Science, Engineering and Technology (IRCSET). The organization of this activity in Dublin coincided with the current reflection on the role of postgraduate studies and research which is being carried out by the relevant Irish authorities, in the context of ambitious targets contained in the Strategy for Science Technology and Innovation (SSTI) to double doctoral students by 2013 as part of their future planning to advance the national knowledge system, and its links to relevant international initiatives. In this regard, the Irish exercise becomes part of a similar process underway worldwide as countries reform their knowledge systems where higher education training and research are central elements.

The invited experts came from all regions of the world and represented the considerable diversity of stakeholder interests in the topic, *inter alia*, governments, academia, IGOs, NGOs and bodies specialized in research.

The Workshop took stock of trends and issues in postgraduate research covering a wide variety of socio-economic contexts and the particular challenges for research in this fast changing landscape. The content and structure of advanced research degrees, along with the diverse origins, profiles and choices of the students concerned were studied against varied regional backgrounds. The focus on the role of research in relation to the various dimensions of the overall theme linked the discussion to the UNESCO Forum’s mandate to chart and analyse research systems at national, regional and international levels where very different factors drive the development process.
Against this background, the Workshop focussed on the following areas:

- Introductory remarks on the current status of postgraduate education.
- Improving graduate education in developing countries.
- New markets for advanced degrees in terms of supply and demand.
- Potential of open learning for postgraduate studies.
- National planning for postgraduate education and perspectives for international cooperation.
- New networking initiatives amongst research universities to meet new geo-political challenges.
- Global review of current trends and issues in this area via keynote and background theme papers.
- Concluding analysis of the impacts of change – both in context and in the nature of postgraduate education *per se*.

In addressing these dimensions of the overall theme, the experts also commented on critical components of sound national and international research systems notably: (i) innovation in policy-making; (ii) the provision of the required infrastructure and (iii) investment and the management of human resources.

The final outcomes of the Workshop provided an overview of the current situation and suggested suitable ways to effectively share the lessons of diverse experiences.
Objectives and expected outcomes of the International Experts’ Workshop

Introductory Remarks

Summary of the latest Trends in Postgraduate Education

Ulrich Teichler, Rapporteur

The basic premise – namely, that quality research capacity remains essential for national development agendas and that postgraduate education is a critical component of this – remains unchanged. However, provision in postgraduate education is expanding and diversifying.

The Workshop debates aim to review this situation from different thematic perspectives where research constitutes an important factor.

1. The ambitions of the Workshop

Noting the breadth of experience and international profiles of the participants, their exchanges could advance understanding in relation to postgraduate education which is of growing importance to national knowledge systems:

- Suggesting how overall information about this topic could be improved (for instance, via more effective linking arrangements among recognized centres of expertise).

- Clarifying the value of the research component for both future academics and those pursuing career paths in other fields.

- Reviewing the range of postgraduate provision in both industrial and emerging economies (such as taught postgraduate degree schemes, collaborative research initiatives, joint degree programmes) and drawing lessons from successful collaboration in these areas.

2. The research component of postgraduate education

Today, boundaries have radically changed. Postgraduate (and graduate) education levels, based on the bachelor degree entry level, have expanded so that the once clear divide between academic and professional training is more blurred. As a result:

- In industrialized countries, national approaches to the range of recognized qualifications, their admission requirements and the expected career paths for graduates now vary greatly.

- In contrast, middle- and low-income countries have faced a growing need to balance out traditional graduate degrees for their academies with shorter and more focused training related to their labour market needs.
• This changing landscape has raised complex questions concerning the role and function of research and of research-based degrees. Hence, countries are keen to exchange good practice so as to formulate innovative and sound policies.

3. **The growing variety of research training systems**

Earning a good degree at a top university in an industrialized country remains the mainstream perception of postgraduate education. Yet, significant alternatives exist and these are already affecting the definition of such credentials. Some examples are:

• Initiatives such as the Bologna Process to harmonize degree structures in Europe.

• More integrated approaches to research which affect the classical academic versus professional distinction.

• Defining relevant research agendas for middle- and low-income countries as part of national development plans [which often link to the UN Millennium Development Goals (MDGs) dealing with basic social policies such as education, health and employment].

• Recognizing the varied status of persons engaged in research in different contexts (e.g. students, fellows, junior academics, trainees).

• The lessons learnt from new institutional and supervisory arrangements such as team research and jointly awarded postgraduate degrees.

• According research training as a priority area for Staff Development Programmes in universities.

• Identifying success stories from all regions and socio-economic contexts.

• The potential of open-learning provision for access to research degrees.

• Implications of enhanced international and regional cooperation (including south/south linkages) to help stem the brain drain.
Final Views from the Workshop

It should be emphasized that this section is based on comments of the expert participants and on United Nations’ priorities. The UNESCO Forum on Higher Education, Research and Knowledge takes due account of these views.

I. General principles

1. Equitable access to the Knowledge Society and the Knowledge Economy

- In the twenty-first century, described as the Knowledge Society (with the Knowledge Economy as one vital cornerstone), many nations are reassessing their public policies related to the domains of higher education, science, technology and innovation, as well as major social and economic transformations (including employment and immigration patterns).

- As predicted by the UN (as part of its foresight function) and as encapsulated in the Millennium Development Goals (MDGs), the twenty-first century must strive to bridge the growing divide between rich and poor societies. In particular, Goal 1: Eradicate extreme poverty and hunger, also covers exclusion from the knowledge society/economy. Furthermore, Goal 8: Develop a global partnership for development, states the need for enhanced collective international cooperation to redress socio-economic imbalances.

- All societies make their unique and equally valuable contribution to knowledge. Skills nurtured through the training and research functions of higher education help ensure that this contribution is sustainable.

2. Role of research in a knowledge-based society

- Important principles (such as research and knowledge societies) need clear and precise definitions. Research ‘relevance’ encompasses both the skills acquired and pertinent content.

- Research requiring teamwork (i.e. Mode 2: Knowledge) helps nurture specific cognitive and interpersonal skills.

- Advanced research skills thus have proven practical applications – both in the academic context and in the wider workplace. This process helps create strong scholarly communities and an entrepreneurial workforce. Certain countries (e.g. Brazil, Chile, China, and Singapore) have conducted enquiries about the value of highly-qualified experts (including Ph.D. graduates) in their workforces and have found that these experts are vital for emerging sectors of the economy. As a result, their public polices have been adjusted accordingly.
• Countries which are losing highly-skilled workers (including researchers) are at increasing risk in this socio-economic context. This situation often disadvantages their place in a global society which is increasingly diverse and knowledge-driven.

• Inadequate funding for research remains a grave deterrent to progress (for example, Germany’s investment in research is higher than that of the aggregated Arab States).

3. **Increasing diversity in postgraduate education: realities, benefits and consequences**

• As part of the massification phenomenon, increasingly postgraduate qualifications (Masters and Doctorates) are now available in industrialized countries. Analysis of the purpose of such degrees, their essential contribution to academia, the various skills acquired, their transferability/adaptation to other professional contexts, and their value regarding the quality of the national workforce are important issues for national and institutional decision-makers.

• Overall quality assurance (QA) is a common challenge in this new landscape especially in light of the ever-growing competition (and some would hold ‘commercialization’) in the field of education.

• These diverse experiences are basically national in character but regional and international initiatives also provide important lessons of interest for governments and higher education authorities.

• Optimal use should be made of these diverse experiences – and especially analysis of their impact in varied socio-economic contexts – (for example, via the increasing instance of bilateral cooperation and *via* global entities such as the UNESCO Forum).

4. **Science, Technological and Innovation (STI) triangle and its essential links to research capacity**

• Links between top level Science/Technology/Innovation/Higher Education Systems remain a traditional factor for economic development. Sound Information Technology (IT) connectivity is an essential component of flourishing knowledge and research systems.

• Defining and assuring ‘serious research capacity’ in middle- and low-income countries will involve strategic choices and should be addressed as a priority issue so as to benefit from research advances, notably in STI-related fields.

• In all contexts, the STI area requires the training – and especially the retention or return of highly-skilled persons who can unleash a catalyst effect inside national systems, either within the academic community or as part of the country’s workforce.
II. Specific dimensions of postgraduate education

1. Improving postgraduate education and research in middle- and low-income countries

- The conditions for excellence in postgraduate education are: (i) top-class students; (ii) cutting edge research carried out with solid IT connectivity; (iii) generous resources and (iv) favourable governance conditions. These same conditions pertain for developing countries, but including the specific challenge of retaining highly-qualified graduates.

- Internationalized higher education can help to provide certain positive solutions if national and institutional leaders act with vision to build a multicultural and multilingual environment, attract faculty with broad experience and students with diverse profiles and offer opportunities for joint research and degrees including IT support to conduct remote research.

- An ‘educational paradigm shift’ to promote new and necessary skills (cognitive, analytical and personal) is already apparent. This facilitates ‘learning by doing’ with strong emphasis on creativity, invention and experimentation directed to local problem solving.

- Regarding institutional renewal to help strengthen postgraduate education, options include: (a) upgrading existing institutions which requires serious investment by governments and its partners; (b) institutional mergers to enhance scale and weight; (c) establishing brand new higher education institutions (HEIs) with innovative mandates and management strategies; (d) replication of successful models with due concern for socio-economic and cultural variables.

2. New markets for advanced degrees: supply and demand

- Today, postgraduate degrees in high demand often focus on specific work-related fields as they can lead to professional advancement. Those which primarily target training still must provide quality provision. However, those combining training and research frequently position themselves as offering a prestigious academic credential which is ‘branded’ for excellence. Competition is stiff and instruments such as the university league tables (though unofficial) do exert some influence on faculty and student choices, as well as on government opinion.

- This ‘branding’ involves four complex dimensions: (i) rigorous selection of research-active faculty and students to assure consistent academic quality; (ii) selective admission procedures to promote the exclusivity of the credentials earned; (iii) close attention paid to the relevance of course and research content and (iv) exceptional opportunities offered for networking with future social and business leaders.
• Institutions offering ‘brand’ research – based postgraduate degrees often enjoy (and must maintain) a specific niche since their research excellence often allows them to advise governments and other stakeholders on national, regional and international development priorities.

3. **Potential of open learning for postgraduate study**

• Information Technology (IT) offers access to education – including advanced degrees via alternative learning modalities, which respond to student needs – are sustainable and promote social connectedness. Technology is now ubiquitous and used competently by ever more diverse publics. By the year 2020, continued progress in IT advances are expected to ‘move resources to people’ in ways better suited to the twenty-first century learning environment, thus meeting the rising demand for education more effectively. However, action must accelerate to provide efficient and affordable technology to middle- and low-income countries (and especially to Africa) to facilitate their full participation in the global knowledge-based societies and knowledge-based economies.

• Regarding research, a different kind of ‘laboratory’ already exists offering a range of varied IT instruments which constitute a collective and creative commons for wide-ranging access to knowledge. A key component of postgraduate study is active engagement with a research community, whether local or global. As access to research via distance/open/e-modalities is increasing, concurrent efforts must ensure that postgraduate students are integrated into a positive research environment (virtual and real) through synchronous and asynchronous interaction with faculty and peers.

4. **National planning for postgraduate education and perspectives for international cooperation**

• Planning postgraduate education and research provision in middle- and low-incomes countries are very complex processes. Country scale and population are critical aspects, with some of the world’s most populous nations (E-9 countries: Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan) facing concurrent high demand for both basic education and postgraduate training and research. This situation obliges governments and higher education institutions to strategically choose programmes and delivery likely to: (i) sustain national development priorities; (ii) invest available resources prudently; (iii) provide quality assurance measures, and (iv) foresee career opportunities for postgraduate students. In addition, it is vital that such countries retain their highly-skilled graduates. Thus, international and regional academic cooperation modalities should be geared to this end.

• As an example, Brazil’s efforts to plan the expansion of postgraduate education (including doctorate degrees for both academic and industry) demonstrates: support from federal government for scholarship funding, quality assurance and evaluation; joint research projects and joint doctoral degrees, special colleges for doctoral studies, university partnerships, strong efforts to promote STI expertise (with 1 per cent of GNP spent in this area) both in the country and to help regional development in Latin
America and the Caribbean, and cooperation with the Lusophone countries in Africa. The international cooperation strategy for postgraduate education emphasizes expansion with equity and quality, flexibility and both south/north and south/south cooperation. The higher education system, though less than 100 years old, will graduate 16,000 Ph.D.s annually by 2011. Some 90 per cent of Brazilian graduates return home after advanced study abroad due to an attractive incentive scheme.

• Overall, Brazil’s national planning fits into the wider perspective of the Latin America and Caribbean (LAC) socio-economic development which is mapped by expert entities on regional research needs such as the International Institute for Higher Education in Latin America and the Caribbean, UNESCO/IESALC, Venezuela. The aim is to ensure that high level training and research is monitored in each country to identify and remedy needs and to thus contribute to regional growth. The Brazilian experience may have useful adaptation potential in other contexts.

• In contrast, planning in certain national contexts – notably small, poor and conflict prone countries – presents a different sort of complexity, rendered more difficult due to limited resources. Thus, choices must be studied with special care.

5. The new politics of global higher education and networking research-reputed universities

• As geo-political and economic power patterns shift [such as the burgeoning BRIC (Brazil, Russia, India and China) economies and the dominance of Asia as the world’s most populous region], higher education, research and knowledge capacity and the training of human and social capital are deemed to offer new potential. Mandated for these purposes, universities are natural hubs to meet the rising demand for higher education, although institutions of the Member Countries of OECD face serious challenges to renew their faculty over the next decade.

• Innovative university responses include: (a) accelerated collaboration; (b) attraction of talent; (c) building knowledge banks and (d) orienting global science towards global problem-solving. International strategies to strengthen national knowledge bases are: (i) targeted academic mobility; (ii) long-term investment in knowledge capital; (iii) strategic bilateral partnerships; (iv) enhancement of research collaboration via postgraduate education and more varied institutional alliances.

• Today university networks have become key public policy spaces for international relationships, including knowledge generation and the engagement of academia in collaborative research. New networks [such as Universitas 21 and the Worldwide Universities Network (WUN)] target sustained research excellence and can mobilize considerable resources. Although the national contexts are growing more competitive, university collaboration reaffirms collegiality and the social responsibility of the academy to address local, regional and international development challenges.
III. Assessing and sharing successful experiences in promoting research and knowledge

• Successful and innovative experiences are emerging steadily and thus should be documented as these affect the objectives and modalities of postgraduate education in very significant ways.

• A matrix might be designed to measure the key constants and variables of successful approaches. Such factors might include, *inter alia*: a country’s governance and economic situation, the present status of its education (and higher education) system, the dialogue between higher education and business regarding labour market needs, public/private sources of funding for research, the particular role of the business sector regarding research, reciprocal arrangements for sharing knowledge *via* networking and similar linkages.

• The template for measuring national research systems developed by the UNESCO Forum’s Special Initiative Project already provides a diagnostic base. However, this could be re-shaped in a more prognostic direction to capture the essence of successful experiences in varied contexts (see below). Based on the main concerns expressed by the Experts at the Dublin Workshop, the UNESCO Forum informally proposes this template to help orient national and institutional decision-makers who are seeking to strengthen their knowledge and research systems.
An Informal Prognostic Template

Assessing innovative approaches to strengthen knowledge and research policies and the role of postgraduate education in this process

The following questions cite examples presented or mentioned during the Dublin City University (DCU) Workshop and also collected from various sources by the UNESCO Forum on Higher Education, Research and Knowledge. The purpose of this informal Prognostic Template is to refer to recent instances of change and successful practices, which enhance the sharing of research and knowledge, and to identify similar experiences. It should be pointed out that postgraduate education is often a major factor in this process. More detailed analytical work could follow from this informal proposal.

1. **Objective: Identifying factors affecting new governmental research policies**

What socio-economic or other domestic factors have acted as the main motors influencing a country’s decision to seek more innovative approaches to its national research system and which may include new approaches to postgraduate qualifications?

*Example:* Government decisions to modernize the workforce (Trinidad and Tobago) or to invest in a knowledge-based economy (Chile, Malaysia, Singapore).

2. **Objective: Creation of an innovative national climate for the knowledge generation**

How have regional advances in research management and higher education modernization (including postgraduate education) contributed to a more innovative climate regarding a country’s knowledge generation?

*Example:* Replicating successful policy innovation (Nigeria and Singapore in science policy); the United Arab Emirates/INSEAD Business School partnership for energy research.

3. **Objective: Promotion of collaborative research to address shifting geo-political contexts**

In what way have geo-political shifts required fresh responses to defining and supporting collaborative research amongst academics and postgraduate research students?

*Example:* Networking amongst top research universities regionally and globally: Association of Pacific Rim Universities (APRU), Universitas 21, and Worldwide Universities Network (WUN).
4. **Objective: Assessing the impact of new research/education policies**

What new research/education policies have been formulated and with what impact?

**Example:** Pakistan’s Higher Education Commission: Joint postgraduate degrees in STI fields with universities in China, France, Germany, Italy, Japan, Republic of Korea (ROK), and Sweden.

5. **Objective: Increasing investment in research**

How has investment in research increased, from what sources and what is the impact of this for postgraduate research degrees?

**Example:** Government and/or private funding for Higher Education (HE) and research (such as The Hewlett Foundation funding for research on e-learning/distance education and the Africa Project of the United Kingdom’s Open University to promote wider and affordable IT usage in the region).

6. **Objective: Linking research communities worldwide**

How has the research community – professors, researchers and research students – in a given country developed links to its counterpart(s) in other countries to ensure international connection to the latest findings?

**Example:** Dual laboratories for top scientists (as in Tsinghua University, China and Carnegie Mellon University, USA).

7. **Objective: Enhanced International Communication Technologies (ICTs) connectivity**

What strategies have been designed to strengthen IT connectivity so that it can provide solid support to research activity (including research carried out as part of postgraduate education)?

**Example:** Partnerships with ICT firms – Hewlett Packard, IBM and the UNESCO/Daimler Chrysler awards; increased benefits of mobile phone/Internet access in Africa and the Arab States.

8. **Objective: Modernized institutional infrastructure**

How has the institutional infrastructure for research been modernized, strengthened, adapted or/and expanded so as to play a more effective role in research and knowledge management (including postgraduate education)?

**Example:** New institutions: University of Trinidad and Tobago, Kuwait Council for Private Higher Education, Franklin W. Olin College of Engineering, Massachusetts, USA, Limkokwing University College of Creative Technology, Malaysia, Paris School of Economics (PSE), France.
9. **Objective: Retention of highly-skilled research personnel**

What incentives have been devised to ensure retention (or attraction) of highly-skilled human resources which are essential for research?

**Example:** Scholarships, tax incentives for returning postgraduates, such as those in Brazil and China.

10. **Objective: Wide dissemination of research output**

What strategies are in place to help disseminate research output (patents, publications etc. – both nationally and internationally? Is there a market for nationally generated research outputs?

**Example:** Support for Journals, National Patent Offices, Incubators and Science Parks including those located in universities.

11. **Objective: Engaging civil society in promoting research**

How is civil society encouraged to promote activity related to research and, in particular to support young researchers and postgraduate students?

**Example:** Learned societies, advocacy campaigns, hosting of international meetings, support from university alumni etc.

12. **Objective: Fostering initiatives which support/facilitate research and research outputs**

*What initiatives have been promoted in areas associated with research* to better support commitments to research activities and research outputs and how can researchers and postgraduate students benefit from these?

**Example:** Foreign language teaching – Chile’s plan for Spanish/English bilingual education, wider official use of English in Viet Nam and Rwanda.

13. **Objective: Engaging the private sector in promoting/supporting research**

How has the activity of the private sector (regarding support to research, the monitoring of trends, forecasting studies etc.) helped to encourage innovation in research management?

**Example:** UNESCO/L’Oréal National Prizes for women professors and postgraduate students in science, Knowledge Management Practitioners Group’s (KMPG) Study on the “Competitive Alternatives Knowledge Economy”, Goldman Sachs Microfinance Support to Women with Small Businesses; support for Mexico’s Technology Institute of Monterrey (TIM) by the business community in the State of Nuevo Leon.
14. **Objective: Optimizing the advisory role of International Governmental Organizations (IGOs) and Non-Governmental Organizations (NGOs)**

How has the work of *international and regional agencies* (UN, IGOs and NGOs etc.) helped to encourage some reflection and debate which has led to innovative approaches to research?

**Example:** Impact and advisory value of the World Conference on Higher Education (WCHE), World Science Conference (WSC), World Bank reports, Organisation for Economic Co-operation and Development (OECD) reports.

15. **Objective: Strengthening research capacity via international cooperation**

What are the roles of *current or projected arrangements for international cooperation* which help the strengthening and the innovation of the research system?

**Example:** China aims to train 15,000 Ph.D.s in science fields in selected Asian and other countries.

16. **Objective: Sustaining a national climate of innovation**

When such a climate exists or is starting to emerge, what *factors and/or planning* are useful to continue and consolidate this and what is the specific input expected to this climate from postgraduate education and research?

**Example:** Continued energy revenues to boost the Gross National Product (GNP) and trigger investment in Science, Technology and Innovation (STI) and Higher Education (HE) (Trinidad and Tobago); demonstrated will and support by national and local governments and by the private sector (such as the German Initiative for Excellence Project for ten elite universities, and support by the Shanghai Municipality given to its leading universities); analysis of the various skills acquired through postgraduate training to better understand their value for the labour market [such as the studies on skills acquired via doctoral degrees carried out by The United Kingdom (UK) Grad Programme and the Higher Education Academy, UK].
Part III. Main Keynote and Background Papers

Keynote Address

Trends and issues in postgraduate education: a global review

Heather Eggins

I. Presentation

1. Differentiated approaches

Postgraduate education, which depends on high-quality human capital, is a vital asset and source of skilled mobile labour for the knowledge-based societies and the knowledge-based economies at national, regional and international levels. Today, there has been an explosion in the numbers of Masters and doctoral graduates, as well as increasing diversification in the content and delivery methods of postgraduate degrees and wider interest from the labour market in employing these degree holders. Thus, everywhere, such programmes appear to constitute an important component of national policies for research and for building a skilled workforce.

- The funding of research (and of research degrees) may be linked to the GNP (e.g. South Africa).
- Advanced degrees may be part of a wider educational base (i.e. China, India, the Republic of Korea and Singapore).
- Funding for research degrees may be given either to institutions or to students.
- Annual target numbers for postgraduate students may be set (i.e. Brazil, Finland).
- New types of postgraduate degrees may be proposed (i.e. Brazil).
- Delivery of doctoral degrees is more varied involving, inter alia, the establishment of special doctoral schools, sources of funding, evaluation and quality assurance methods and the provision of social guarantees (i.e. Estonia).

2. Academic student mobility and brain circulation

There is an increase in the traditional ebb and flow of postgraduate students. From low- and middle-income countries, the outward flow to high income countries results in the devastating loss of their necessary human capital to these countries.

In many developing countries, postgraduate degree holders earn low salaries or face other disincentives such as political and economic instability, lack of government support for research and for universities and instances of repression or persecution of the academic community. These are the major reasons for the exodus of skilled people.
To reverse the brain drain, several factors are essential or effective:

- Sound research and technology infrastructure.
- Steady growth in the budget for research (i.e. Tunisia: 1 per cent of the GNP).
- Establishment of a high status and well paid academic profession.
- Promotion linked to research findings and publications.
- Collaboration with international partners.
- A bonus system for research and its regular evaluation (i.e. Mexico).

3. The review and renovation of postgraduate education

The current changing context highlights the wide range of factors which require adequate attention:

- Acquisition of formal research methods.
- Development of transferable skills.
- Studies in professional applied activities.
- Innovative teaching methods.
- Training in reviewing methods.
- Publishing in research journals.
- Diversification of doctoral degrees (the traditional research degree, a Ph.D. based on published work or on practice, joint and professional doctorates).
- Diversification in Masters’ degrees [profession specific, Master of Business Administration (MBA) models, the traditional degree as a step towards a Doctorate].

4. Priorities for governments

Within a context of political and economic stability, it seems important that governments endeavour to:

- Build a broad educational base.
- Invest in research and research infrastructure including strong ICT capacity.
- Formulate policies to support higher education.
- Provide for the regular evaluation and monitoring of programmes.
- Promote Quality Assurance (QA) mechanisms.
- Consider the merits of funding for doctoral studies based on measured outcomes (i.e. Australia).
5  Priorities for universities

Institutions offering doctoral degrees should:

- Provide guidelines and training for supervisors.
- Promote a Code of Practice for research programmes.
- Ensure that supervisors are carefully chosen and encouraged to publish in recognized journals (e.g. China).
- Adjust workloads to allow the time needed for supervision and publications.
- Choose students and research topics with care.

6. Important questions for consideration

- What is the place of postgraduate skills (both research and professional) in the developing world?
- How can Diaspora usefully help to resolve the brain drain?
- How best can sound knowledge-bases be established in all regions?
- How best can developing countries make use of the expansion in postgraduate education?
- How far is personal gain a main driver in the global labour market?
- What is likely future of e-learning and open learning?
- What are global effects of higher education league tables (which are currently dominated by industrialized countries)?

7. Comments and recommendations for future action regarding research

- As a general principle, research capacity is essential for all countries, even the most disadvantaged. Moreover, STI research capacity is directly relevant for development issues.
- Adequate investment (both public and private) is a *sine qua non* for real progress in building research systems. As an example, Germany’s investment in research is higher than that of all the Arab States.
- Today, a broader definition of research is necessary to encompass applied and strategic research which contributes to the GNP and may be done in various environments and often outside academia.
- The monitoring of research trends should take account of innovative reforms in education systems where stronger emphasis on creativity and skill acquisition has useful applications for researchers.
• The research community constitutes a vital area of national, regional and international human capital. Top level researchers who remain at home should be encouraged to focus on development-related areas and receive incentives for such orientation.

• Postgraduate education is expensive, especially in the sciences. Teamwork is a feature of STI research and so positively influences transferable skills.

• Middle- and low-income countries urgently need more effective strategies which promote brain circulation (such as mobilizing the Diaspora) and offer incentives for top class researchers to return home. The exodus of expertise remains critical, notably in Africa where, for example, over 40 per cent of Ghanaian doctors and engineers work abroad.

• Good governance and social stability are essential for a stable yet dynamic research environment.

• Governments and their agencies such as research councils need to find ways to track the careers of their best qualified nationals to demonstrate the value of research degrees, whether these are used in academia or in the wider labour market.
Role of postgraduate education in research systems
Mary-Louise Kearney

1. Challenges for postgraduate education

- Challenges are the growing diversity of credentials, demand/supply, quality/relevance, student choices/incentives and academic mobility/cooperation.
- These challenges concern the building of sound knowledge and research systems (innovative policy-making, infrastructure, human capacity development and investment).
- These challenges are critical for all countries, regardless of socio-economic scale.

2. Postgraduate education: a key source of human capital

Theodore W. Schulz, the American 1979 Nobel Prize winner in Economics, created the concept of human capital (HC). However, training qualified people for today’s Knowledge Society and Knowledge Economy requires investment of physical and monetary resources.

Building Knowledge-Based Societies:

- Defined in various ways and wider than Information Societies, these must foster knowledge sharing, explore innovations via ICT, and help design relevant development approaches for middle and low income countries.
- Both the Knowledge Society and the Knowledge Economy place cognitive resources at the centre of human activity and of social dynamics. This has implications for a country’s human capital base: its citizens and workforce.
- Postgraduate education is a particular investment in human capital. It educates highly skilled citizens and professionals to address the specific issues of their national contexts as part of a globalized society. This investment is vital for achieving the Millennium Development Goals (MDGs) – poverty reduction, wider access to health and education and equitable arrangements for globalized economic progress.

Human Capital (HC) issues today:

- Of the world’s 195 countries, the 25 of the OECD bloc command the prime economic advantages, although they have only 10 per cent of the global population. This discrepancy (the 10/90 gap) must be remedied to arrive at more equitable levels of human development.
- Yet, an increasing number of middle- and low-income nations are posting positive results from their innovative policies. This progress could be widely replicated as other countries see the tangible benefits. Policy lessons include: innovations in education, investing in human capital via education and training, promoting scientific research and STI capacity, improving connectivity levels, and renovating academic cooperation and mobility.
Some success stories are: high GNP expenditure on education by Malaysia and Tunisia, growing enrolment in tertiary education including figures for women in Chile and Iran, rising investment in R&D as part of the GNP such as the 2.25 per cent rate for Singapore, stronger emphasis by countries such as Brazil, China, Jordan and Rwanda and on postgraduate education and research especially in the sciences, improved IT connectivity for Internet and mobile phone use in the Caribbean, Egypt, Morocco and Nigeria, new arrangements (such as those in India, Pakistan and the United Arab Emirate) to promote brain circulation to help stem the brain drain and promote locally relevant education, training and research.

3. **Research universities: growing roles and growing crises**

- Traditionally, universities undertake teaching and research, in contrast with HEIs providing training and skills. Both missions are vital but research universities operate in a competitive environment and must meet recognized levels of excellence.
- Certain research universities [known as the Super RUs (research universities)], with access to generous resources, are special global entities attracting faculty and students of international repute.
- Universities in OECD countries can be major actors in national research contexts where there is currently strong emphasis on science and technology disciplines, the balance between basic and applied research, knowledge and technology transfer activities, technology foresight studies and intellectual property issues.
- In sharp contrast, research capacity in universities of the developing world faces a grave crisis due to the: (i) precarious nature of research; (ii) major cleavages in research between wealthy and emerging countries in terms of capacity, agendas, contexts, criteria, climate and partnerships; (iii) need to accelerate networking and cooperation amongst universities to strengthen research; (iv) urgency of building improved research capacity and of eliminating the isolation of their researchers; (v) research agendas that are increasing political in character; (vi) need for countries to map and analyse their research systems, to pinpoint their major challenges and to benchmark their progress.

4. **Research component of postgraduate studies: Issues at the Dublin Experts’ Workshop**

- **Research degrees in middle- and low-income countries (notably in scientific fields)**

Persisting problems include the low percentage of students in these fields at undergraduate level, inadequate infrastructure of universities in ST disciplines and the brain drain.

The gravity of the brain drain is illustrated by statistics: 47 per cent of Ghana’s college-educated citizens live abroad; 200,000 LAC science and engineering graduates were working in the USA in 1999; some 82 per cent of students from the Arab States were pursuing postgraduate degrees in OECD Member Countries in 1999;
scientific peer-reviewed literature from Africa is around 1 per cent of current publications; immigration policies designed to attract highly-skilled persons (e.g. Australia, Canada, New Zealand and Singapore) can exacerbate the exodus of human capital.

Success stories for regaining and retaining research capacity, such as mobilizing Diasporas and incentives for graduates to return home, should be documented. Asia has some positive results but Africa and the Arab States still offer too few incentives in this regard.

Defining ‘sound research capacity’ is a country-specific matter and linked to national development priorities. Mapping country research capacities and investment to benchmark these against other economies-of-scale has become an essential step towards such definitions.

• ‘In demand’ advanced degrees

Demand for undergraduate and postgraduate degrees in middle-income countries (East Asia, Eastern Europe and the Gulf States) have led the universities of Member Countries of the OECD to establish campuses in response. These qualifications often target training for the labour market (computer science, English, business studies). Flexible timetabling and modalities of instruction attract students but adequate quality assurance measures are needed to guarantee the value of credentials.

In contrast, leading universities have incentives and capacities to offer research-based degrees – the brand-name MBA is a prime example. Institutions can also become important research partners of the host governments and may participate in projects for national development agendas.

Such degrees may have course design requiring applied and strategic research. Students often work in teams, and with their professors, to investigate emerging issues with which they may be directly engaged in their professional lives. This type of research also encourages team-building and interpersonal skills as well as the sophisticated analytical and forecasting capacities needed for the top end of the labour market.

• Open and e-learning postgraduate qualifications

In open and e-postgraduate degrees, the research component can be adapted to mature and motivate students. Moreover, initiatives such as the OpenCourseWare Project led by the Massachusetts Institute of Technology (MIT) help to widen access to research resources.

Research also features in numerous projects to promote open collaborative technologies such as the annual UNESCO King Hamada Bin Isa Al-Khalifa Prize for new uses of Information and Communication Technologies in Education.
Research-based open and e-qualifications are expanding: the University of Phoenix is the USA’s largest accredited private university with 180 centres of learning spread over Asia, Europe, Latin America, and the USA; the Open University, UK offers research degrees with a special focus on industrial, commercial and public sectors issues; Massey University, New Zealand’s principal extramural tertiary institution and rated 108 out of the world’s top 200 universities, emphasizes applied research and community-based education; in Dubai (UAE), 10 American universities offer Masters or doctoral programmes on-line.

International academic cooperation and national postgraduate education

Academic cooperation can help encourage brain circulation and retention so as to share expertise on both north/south and south/south bases. International higher education is growing because the sector is now a lucrative market (notably for major receiving countries such as Australia, Germany, UK and USA) and since scholars can interact for research with increasing ease.

Middle- and low-income countries with diverse socio-economic contexts need to develop their human capital with care. The Education-9 Nations: Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria – with high illiteracy rates and large youth populations – face complex challenges ranging from basic education to advanced training and research. Thus, dual track policies have become essential.

Postgraduate degrees with international opportunities for training and research but which help retain national expertise are increasingly important. The jointly delivered research degrees, which offer fast track and quality credentials for top students, have re-emerged as a useful modality. For example, Pakistan’s Higher Education Commission runs a science and engineering programme to link Pakistani universities to counterparts in nine research universities in OECD Member Countries. However, Africa continues to face serious problems due to reduced investment in higher education and STI over the last two decades. Recent approaches designed to accelerate solutions include the New Economic Partnership for Africa’s Development (NEPAD), the World Bank’s Science and Technology Forum, the Academics Across Borders (AAB) project of the UNITWIN/UNESCO Chairs Programme and efforts by the United Nations University (UNU) to link academic research to complex global problems (as listed by the UN’s Millennium Development Goals).

Networking research-reputed universities

Motors for these linkages include geo-political shifts, trends in global economic growth and stronger government emphasis on STI capacity.

As governments of OECD Member Countries tend to invest more in university research, competition amongst institutions has increased. Attractive salaries, career incentives and excellent research facilities are needed to entice top class researchers. An elitist ‘branding’ is one strategy for success in this arena.
The growing influence of the university ranking tables, notably the THES and Shanghai Listings, relates to this dynamic. These can influence government and public opinion of national universities and their place in a global market place where research excellence is demanded.

Leading brand networks include: the Universitas 21 Group of 21 research-intensive universities in twelve countries; the Russell Group which links the United Kingdom’s twenty best research universities; the Global Business Schools Network (GBSN) sponsored by the International Finance Corporation (IFC) bringing together the world’s top twenty business universities to help strengthen the skills of managers in emerging markets, especially those in Africa.

Common features are: (i) a global focus and perspective; (ii) large-scale budgets; (iii) a commitment to excellence; (iv) demonstrated added value to attract top academics and students; (v) assurance of innovation and multilateral opportunities for members and (vi) an awareness of the socio-economic and political role of research in the global economy.

**Final Conclusions**

- *Research* as part of postgraduate education, research universities and national research capacities are issues to be monitored against the wider context of global human capital flows.

- *Ensuring equity* of opportunity is a global challenge which, unless adequately addressed, will certainly pose serious risk for the further advancement of knowledge-based societies in a global sense. This challenge concerns government policy but also relates to the social responsibility of universities in research and knowledge systems.

- *Opportunities* should be increased so that countries can regularly share data on emerging trends (and especially success stories in dealing with these) in order to formulate appropriate and innovative policies with optimal impact.
Indicators Concerning Rationales and Modes of Doctoral Study and Research in Economically-Advanced Countries

Ulrich Teichler

At the present time, the design and impact of doctoral research and programmes in high-income countries present numerous issues and concerns. Already this level of study today is increasingly varied in character and likely to evolve further. This situation has clear ramifications for postgraduate education in middle- and low-income countries where higher education decision-makers are anxious to design and implement truly innovative and effective qualifications which will help strengthen their academic communities and modernize their workforces. In this regard, it would seem useful to analyze and share lessons of experience to help formulate policies which will help build the optimal knowledge base.

The following objectives and indicators respond to the issues directly raised during the five thematic session discussions, the urgent need for trained people in academia or in the workforce, the need for innovative thinking and varied skills etc., which can be perfected, in limited numbers, via postgraduate education. These indicators draw attention to major points reiterated during the proceedings of the Workshop concerning the rationales and modes of doctoral study and research work discussed in economically-advanced countries; much could be learnt and adapted from these issues for other contexts.

1. General objectives

   • What are the rationales and modes of the calculation of costs for a doctoral degree both for society and for the individual?

   • What definitions and concepts of ‘research’ are underlying the dissertation work in different disciplines, countries, individual institutions and individual dissertations?

   • To what extent are counterbalancing measures needed in order to ensure that not only the instrumental expectations of the ‘knowledge economy’ are served by the qualitative growth and qualitative improvement of doctoral education?

2. Institutional patterns of higher education systems

   • Will doctoral training be concentrated in economically-advanced countries in a small number of top universities, or will a broad range of universities both benefit from involvement in doctoral training and from serving a broad range of rationales and paradigms in doctoral work?

   • What are the potentials and what are the problems of collaborative doctoral programmes between two or more universities in economically-advanced countries?
3. Provisions and activities

• Are the specific issues of the status of doctoral candidates and of the funding of doctoral work relevant for the enhancement of competences and the quality of doctoral work?

• What is the knowledge base with regard to completion rates and time to degree? Differences by country in the definition of the starting point (open completion of bachelor and master), in the moment of registering a person as a doctoral candidate, in perceiving him/her as an employee, student, etc., in encouraging or discouraging registration at a very early stage of decision-making, in time spans between completion of the doctoral dissertation and the awarding of the degree, etc. To what extent are these definitions the indicators of the quality and the efficiency of doctoral programmes?

• What arrangements are embedded into the doctoral phase to help doctoral candidates find their own way in creating a balance between academic quality and the societal relevance of research?

• Diverse understanding of the roles of publishing during the course of doctoral work: between a ‘must’ and an exceptional activity of the most talented candidates; between acceptance of pre-publication and a completely new text of the doctoral dissertation, etc. Is the existing diversity the optimal situation, or are the good practices worth being disseminated more widely?

• Should the dissertation continue to be the creative part of the doctoral phase, with other activities serving to help broaden competences, or do we envisage other activities as also helping to promote ‘creativity’ in the doctoral phase?

• How do the training needs of those doctoral candidates who work part-time on their dissertation in professional or other activities outside academia differ from the training needs of doctoral candidates working full-time in universities?

• What are the different approaches to doctoral supervision and doctoral programmes for predominantly off-campus doctoral candidates compared with those mainly on-campus?

4. Doctoral programmes

• Will the continental European countries keep a link between bachelor and master programmes while organizing doctoral training separately, or will they move towards an US model of graduate education where the master and doctoral stages are closely linked?

• To what extent does the trend towards more highly organized doctoral programmes lead to many common features across disciplines, or to what extent do the individual disciplines go their own way? Do we note a convergence or divergence?
• What are the benefits and problems of jointly supervised doctoral degrees by professors – either in economically-advanced countries or between these and developing countries?

• Similarly, do teams of supervisors play a more important role than merely promoting the acquisition of competences than the core research competences and counterbalancing instances of incompetent and intrusive individual supervisors?

• Are structured doctoral programmes created primarily to promote a range of competences which is broader than simply the research capacity of the doctoral candidates, or do these programmes also play a major role in honing the research capacity itself and in what respect?

• To what extent do doctoral programmes orient doctoral candidates according to their objectives, or to what extent do they provide opportunities beyond what the institution emphasizes?

5. Expected competences

• To what extent is the doctoral dissertation viewed as ‘productive work’ or as a tentative result of a learning process? What understanding is desirable, and how does the organization of doctoral programmes contribute to these different understandings of results?

• What competences should be fostered in doctoral programmes beyond the ability to write a dissertation which is distinguished by its ‘graduateness’? For example, how can collaborative work, presentation and teaching transfer competences also be enhanced?

6. Academic/professional functions

• To what extent does the increased employment of doctoral degree holders in economically-advanced countries indicate the trend towards the construction of a knowledge society in terms of the growing relevance of systematic knowledge in many domains? Or, does this indicate a mismatch between demand and supply of Ph.D. graduates?

• Is the increase in professional doctoral programmes an appropriate sort of training? Or, is it rather a non-creative channelling of a growing number of doctoral degree holders who will probably not be professionally active in higher education and research institutions? Are professional doctorates more valuable than academic doctorates for graduates working outside academia?

• What do we know about how the non-academic workplace (including the private sector) uses the competences of doctoral degree holders? To what extent are they essential for research and development (R&D) and do they contribute to the general wisdom and creativity of the leaders in companies? Do they contribute to ‘innovation’ outside the technology domain? Are they a new mode of ‘credentialism’, or mere wastage?
7. **Doctoral candidates from developing countries**

- Do doctoral candidates from developing countries have distinct training needs compared to the usual needs of doctoral candidates from economically-advanced countries? Have the likely future work tasks been taken into consideration (e.g. broader thematic areas, greater need to prepare them for future leadership roles of coordinators of research, higher education institutes, etc.)?

- What is the composition of positive or negative consequences of high proportions of persons being trained as Ph.D.s in their home country as compared to being trained abroad? (e.g. factors such as quality, local content, mobility after the awarding of the degree, involvement in teaching during the doctoral stage, etc.)?
Theme 1: Improving postgraduate education in developing countries

Jamil Salmi

I. Presentation

1. Excellence in postgraduate education: overarching principles

Excellence in postgraduate education (see Graph 1) may be defined according to self-declaration, reputation and rankings. Results may be measured by the calibre of top graduates, by the leading edge research performed and by vigorous technology transfer. Critical dimensions for success are the: (a) concentration of talent; (b) abundant resources and (c) favourable governance.

[Diagram of Excellence in Graduate Education]

Source: Elaborated by Jamil Salmi
2. **Challenges for developing countries**

For developing countries, excellence in graduate education faces specific challenges:

- Governance.
- Brain drain.
- Inadequate resources.
- Digital divide.

3. **The ongoing connectivity challenge**

The serious inequalities of access are illustrated below in *Graph 2*. The inequality issue also extends to costs: for instance, the bandwidth for an average African university is 100 times more expensive than that of an average household in the USA. Failure to resolve this problem will continue to gravely impede truly equal access to knowledge.

![Graph 2: The Digital Divide](source.png)
4. **Recommended approaches for low- and middle-income countries**

- Research and postgraduate education should be a national priority.
- A clear vision and strategic planning are vital.
- The strategic deployment of resources is necessary.
- Optimal use should be made of relevant international cooperation strategies (i.e. regional cooperation, mobilizing the Diaspora).

5. **Important aspects of internationalization**

- Language and multilingualism.
- Academic mobility (faculty and students).
- Choice of faculty with broad experience.
- Students with diverse profiles and a demonstrated sense of enquiry.
- National and institutional leaders with vision.
- Possibilities for joint/double degrees.
- Supportive technology.
- Distance education.
- Capacity to conduct remote research.

6. **Towards a new educational paradigm**

Social and economic progress is achieved principally through the advancement and application of knowledge as stated in the World Bank’s World Development Report (1998-99): Knowledge for Development. Yet, the traditional way of learning is changing today with much greater focus placed on ‘learning by doing’. Consequently, creativity, invention and experimentation emerge as central elements. Education must encourage students to ‘think outside the box’, break the rules, be prepared to make mistakes and have fun during their learning experiences. Key factors which will help ensure success in this regard are:

- E-learning/blended learning.
- Open education resources.
- Regional/local engagement.
- Resolution of local problems.

Since change always takes time, adaptation and re-alignment, it can be assumed that doctoral programmes will eventually need to be adapted to this new education paradigm. This process will necessitate, *inter alia*, the integration of research with undergraduate studies and wider use of interactive pedagogical methods including e-learning techniques.
7. **Options for institutional renewal**

With regard to institutional renewal to help strengthen postgraduate education, options include: (i) upgrading existing institutions is an option requiring serious investment by governments and its partners; (ii) institutional mergers to enhance scale and weight; (iii) establishing brand new higher education institutions (HEIs) with innovative mandates and management strategies; (iv) replication of successful models with due concern for socio-economic and cultural variables.

II. **Comments and recommendations for future action regarding research**

- The diversity of socio-economic and cultural contexts requires varied approaches and models. Research challenges should be seen in this light.

- The research and advanced training functions should be accorded equal importance in terms of their value for the relevance of education.

- The priority research agendas of middle- and low-income countries should be driven primarily by relevance, given the scale of their development challenges. Defining this relevance is a complex but necessary first step.

- The ‘newest and next’ approach is a regular occurrence. However, over the next five years, numerous barriers are expected to fall, thus broadening access to knowledge still further. Research communities at all levels should follow this evolution closely to monitor its impact for more equitable knowledge-based societies and knowledge-based economies.
Theme 2: New market for advanced degrees in terms of supply and demand
Sumitra Dutta

I. Presentation

1. Different models of Business School postgraduate education

High-level Business Education is one of the major markets for postgraduate education in today’s world. The prime demand is for the Master of Business Administration (MBA) degree but doctoral qualifications are also popular.

There is considerable variation in the range of Business School models which can be categorized according to their emphasis on teaching, research or their combination of both areas of activity. Moreover, certain Business Schools have diversified greatly to meet the rapidly rising demand for these qualifications by offering on-line and tailor-made courses. But the top institutions continue to be distinguished by their dual commitment to research and teaching. By way of example:

   • Traditional models in the USA focusing strongly on research include Stanford, Massachusetts Institute of Technology (MIT), Columbia and the University of Chicago. These offer both executive and MBA programmes and their faculty, who can include prestigious Nobel Prize Winners, are expected to both teach and research.

   • Another variant is exemplified by Institute for Management Development (IMD), Lausanne, Switzerland, which is ranked among the top ten business schools in the world. IMD is closely linked to the business sector and focuses on applied research such as case studies. The faculty publish widely via books on business strategy and beyond traditional academic journals. Ph.D. students come from top universities and teachers have the title of professor and work on three-year contracts.

   • A balanced focus on business and research characterizes the third model, which includes the two highest ranking business schools in the world, Harvard and INSEAD Business School, Paris. Both strive to create and manage the innovative synergies that result from the positive tension between theory and practice.

Tenure for faculty depends on publications in the principal scholarly journals and both schools earn large revenues from short-term and tailor-made executive courses for business executives.
2. **The INSEAD profile and brand**

The main features of INSEAD are as follows:

- Established in 1957 with a global vision.
- As of 2008, INSEAD has campuses in France, Singapore (generating one third of its income) and a centre in Abu Dhabi (UAE) but maintains a single governance structure.
- A total of 80 per cent of income ($120 million) is derived from executive courses.
- Some 150 faculty are tenured with some 100 visiting professors.
- Students’ profiles are varied and inter-campus mobility is encouraged.
- All operations are in English.
- Research has a strong focus in both MBA and Ph.D. degrees.
- Ph.D. students are few in number, receive stipends and usually teach in major universities after graduation.
- The Singapore and UAE campuses function as research observatories to monitor global and local trends in business.
- Partnerships have been forged with select institutions (e.g. a joint MBA with Tsinghua University, China).

The INSEAD brand guarantees:

- Expertise in the complex domain of strategy and innovation.
- Top quality of teaching and research activities geared to the global economy.
- Relevance of programmes.
- Exceptional opportunities for networking with future business and social leaders.

3. **Maintaining excellence**

INSEAD is committed to a clear strategy in this regard:

- Limited student numbers to ensure high quality.
- Intention to retain single governance and management structure regardless of the increased expansion of campuses.
- Commitment to effective leadership and openness to change.
- Continued strong emphasis on top quality research, and the building of a global research community of leading business scholars.
II. Comments and recommendations regarding research

- ‘High demand’ fields of study target distinct markets, thus confirming the dichotomy between specific qualifications offering, respectively, specialized training or advanced research/research-based teaching. Top ranking Business Schools certainly fall into the latter category though both approaches have their individual merits.

- Formal postgraduate education must involve research by definition and as distinct from training. Research figures as part of the course requirements or through high-quality research-informed teaching.

- INSEAD’s successful track record regarding expansion is based on its strategic response to a high-demand market which involves a research component fundamental for the quality of its MBA degree. Also, its emphasis on research based on local and regional priorities (e.g. the Singapore and UAE campuses) has facilitated a positive welcome to the establishment of INSEAD abroad by the host governments concerned.

- The current emphasis on advanced education, including professional training, seems likely to generate a continuing demand for postgraduate qualifications in certain fields. In this regard, competition will remain fierce and the quality branding assumes ever greater importance as a magnet for top students. INSEAD’s successful track record regarding expansion is based on the high demand for excellence in research-based teaching.

- Graduate Schools in fields such as Business Studies are natural subjects for league and ranking tables. Yet, these exercises send mixed signals. For example, the Financial Times 2007 league table places INSEAD and the London Business School among the world’s top ten institutions for Business Studies (others being USA-based schools). INSEAD does not figure in the Times Higher Education’s top 200 universities for 2007 while, for the same source and year, the London School of Economics (LSE) and the Università Commerciale Luigi Bocconi, Milan are listed among the top ten schools by employers. Such diverse results confirm the range of criteria necessary for these assessments – and, perhaps more importantly, the possibilities for defining excellence from widely differing perspectives.

[NB: Summary extracted from notes of author’s presentation].

Theme 3: Potential of open learning for postgraduate study

Brigid Heywood

I. Presentation

1. Global change and new opportunities for educational delivery via ICT

Today the world faces major changes in key areas: demographics, the demand for higher level skills in the workforce and for the labour market, far-reaching advances in technology developments. Increasingly, Information Technology (IT) offers alternatives for access to education (e.g. e-learning, open and distance education). These are responsive, sustainable and aim to promote social connectness.

Technology is becoming more ubiquitous and is used more competently by more people from all nationalities, age groups, and socio-economic levels. For example, there has been a 59 per cent increase in the number of children accessing the Internet since 2000. The number of Internet users is estimated at approximately 500 million worldwide and this is predicted to double by 2008 with a fast growing clientele outside the USA.

2. Predictions for the future

Current models are mainly dominated by processes which move people to resources. Would ‘moving resources to people’ be a more appropriate structure for the twenty-first century?

Expected advances include:

- By the year 2012, many more schools and colleges will routinely use computerized teaching programmes and interactive television lectures and seminars, as well as traditional methods. Video conferencing and other technologies will also help enrich distance media and provide many benefits of face-to-face instruction.

- By 2018, computers will be able to routinely translate languages in real-time with the accuracy and speed necessary for effective communications.

- New technology will transform higher education as we know it today. One example being the changes caused by broader use of e-Texts and Personal Digital Assistants (PDAs).

Regarding research, a different kind of ‘laboratory’ is already available today. This includes systems and strategies such as: U-管, Face Book, BEBO, Second Life (SL) Avatars, Skype, crowd-sourcing, cloud tagging, vlogging, blogging, jumping, open source and the new ‘iPhone Generation’. Together, these instruments constitute a collective and creative commons with wide ranging benefits for knowledge.
3. **Study at the Open University (OU)**

The Open University is responding to the globalization and the opportunities afforded by ICT. The OU has a large scale approach with 250,000 students directly registered who are linked to affiliated research centres. Open supported learning does not require any previous formal education and so differs from distance learning. The OU challenges the current definition of a university since there is no physical location for students. The pedagogical methods combine formal face-to-face lectures with increasing elements of the Virtual Learning Environment (VLE). The broadcasted lectures have raised a debate on property rights, since the professors use both their own material and other sources for their courses.

The OU is mainly centred on the social sciences and business administration and does not usually provide courses in Science, Technology, Engineering and Mathematics (STEM). Where part-time or distance learning programmes are available, the OU looks for evidence of flexible arrangements for access to resources such as libraries and computing facilities. To overcome problems of distance and where materials are not available on the web, access to local HEI facilities for students can be negotiated.

The Open University is recognized by funding bodies and quality assurance agencies including the Economic and Social Research Council (ESRC), Quality Assurance Agency for Higher Education (QAAHE), UK, USA Middle States.

4. **Doctoral study at the Open University**

Doctoral students do have access to physical campus facilities. Study can be full- or part-time study with over 50 per cent of postgraduate research students pursuing their Ph.D.s in the latter mode. Part-time students have more limited opportunities to benefit from experiential group learning activities which are crucial for developing generic skills and the capacity for reflective learning. In addition, many full-time students spend substantial periods away doing ‘fieldwork’ and during such times they cannot participate directly in the experiential group learning activities. Thus, alternatives which offer access to research from a distance are increasingly used.

A key part of doctoral research training is learning what it means to be an active member of a research community, both local and global. This is acquired by osmosis when physically co-located in a research group. Currently, the OU postgraduate research facilities include 534 affiliated research centres in Africa, Asia, the European Union (EU), UK and the USA.

It is important that ‘distance’ research students do not become or feel ‘second-class citizens’, invisible to their host research groups, and unaware of events and daily social life. So, they need to work synchronously and asynchronously with supervisors and other colleagues.

There is a tension between ‘proxy’ for research excellence (e.g. postgraduate research completion rates, funding into institutions) and the sustainable growth of higher level skills and capacity building. As a result, an active debate is surfacing around the purpose and value of doctoral training.
5. **The Open University in Africa**

(i) **The Kodak Project**

Without more and better education, Africa will find it increasingly difficult to benefit from the global knowledge economy. The Open University in Africa offers teaching and learning projects which support students and teachers and trains a new generation of educators, using innovative and affordable new technology to build human capacity in this region. Link: http://www.open.ac.uk/africa/teaching_education_projects.shtml

(ii) **The Flashmeeting Project**

The lightest possible video-conferencing software application provides technology for instant meetings – any time, any place, any platform. Implemented using Adobe’s Flash, which the most widely available and most compatible of browser plug-ins, this modality is extremely lightweight and efficient. Link: http://flashmeeting.open.ac.uk/

II. **Comments and future recommendations regarding research**

• Open learning will continue to require major research on ICT users and their habits (e.g. The Hewlett Foundation Project focuses on this type of investigation).

• The growing funding support from the private sector (notably foundations) constitutes an important contribution to the actual resources available for research. For this reason, it should be monitored for its impact as part of investment in research (rather than simply being explored as a modality of financing).

• As it is already known that research universities will have a different appearance by 2020, it is important to study alternative research communities comprising wider publics with diverse educational backgrounds and levels who use varied modalities of learning. The OU is partnering with the British Broadcasting Corporation (BBC) for this purpose.

• Team research, which is an aggregated mode of knowledge and necessary to analyse the complexity of issues, affects the Knowledge Transfer Process (KTP). Further research on this mode itself is needed to understand its cognitive and social value.
I. Presentation

1. The state of higher education in Latin America and the Caribbean

The expansion and impact of the knowledge-based societies have exerted great influence on higher education systems. Today, knowledge is the main creative force not constrained by geographic proximity and ICT offers many more possibilities for sharing, retrieving and archiving knowledge. Along with the development of new technology, the demand for higher education has expanded exponentially. New providers of graduate and postgraduate studies, as well as of cross-border education, are well established in many countries. Unfortunately, the quality of provision also varies greatly, both between and within countries.

In the LAC region, 60 per cent of enrolments in higher education are concentrated in Argentina, Brazil, and Mexico. The region has approximately 14 million students in higher education. In contrast, it still has 37 million illiterates according to the 2006 UNESCO/EFA Education for All World Report Follow-up of 2005-06.

Brazil and Mexico have the majority of graduate enrolments in Latin America as each of these countries has more than 100,000 students enrolled in the fourth level educational cycle. Moreover, 80 per cent of the Ph.D. programmes in the Region are concentrated in Argentina, Brazil and Mexico. Seven of their institutions are ranked among the 200 top universities of the world.

Brazilian higher education is still in the early stages of expansion/development with the oldest university less than 100 years old. Nevertheless, Brazil is moving ahead at a terrific speed. It graduates just under 10,000 Ph.D.s per year and plans to increase the number to 16,000 by 2011. A total of 25 per cent of the population aged 18-24 is in higher education and the Government intends to increase this number to 40 per cent by 2011. Brazil invests 1 per cent of its GDP in Science and Technology. The population is 185 million and, despite ongoing issues of quality, 97 per cent children between 7 and 14 years are in school.

Because Brazil sees education as a part of national policy, the system is funded by the federal government. Brazil has two funding agencies: CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) Brazilian Federal Agency for support and evaluation of graduate education (established in 1951) undertakes national evaluation of the graduate system and gives scholarships; CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico). National Council of Technological and Scientific Development (also established in 1951) gives grants for researchers. Brazil finances approximately 100,000 scholarships at undergraduate level for top students. The evaluation system is a major priority with 800 evaluators to maintain and improve the quality standards within the higher education system.
2. **Some facts regarding investment in Science and Technology in LAC**

- As of 2004: the average investment in science and technology in relation to GDP in Latin America and the Caribbean was 0.72 per cent.

- Five countries invested above the average: Brazil (1.28 per cent), Costa Rica (1 per cent), Cuba (0.93 per cent), Panama (0.9 per cent) and Paraguay (0.85 per cent). In comparison, Argentina spent 0.49 per cent, Mexico (federal expenditures) 0.38 per cent. These figures can be compared with Canada 1.96 per cent, Spain 1.07 per cent and USA 2.66 per cent.  
  \[\text{Source: The State of Science: Major Ibero-American and Inter-American Science and Technology Indicators, Ciencia y Tecnología para el Desarrollo (CYTED), Argentina, 2006}.\]

- In 1990, Latin America accounted for 1.7 per cent of world scientific production (ISI) but by 2004, the figure for the region exceeded 3.7 per cent.  
  \[\text{Source: Institute of Science Information (ISI)}.\]

- Argentina, Brazil and Mexico are assuring 82.8 per cent of the total scientific production of 24 countries of the region.  
  \[\text{Source: CYTED, Argentina, 2004}.\]

- Argentina, Brazil and Mexico file 78.3 per cent of all patents in the region  
  \[\text{Source: Ciencia y Tecnología para el Desarrollo (CYTED), Argentina, 2004}.\]

3. **New initiatives in Brazil to support international cooperation in postgraduate studies**

Brazil is developing its postgraduate studies within a global context and supports research groups mainly through international exchange programmes. Here, the focus is on quality and flexibility with orientation towards both south/north and south/south cooperation.

**Brazil supports:**

- Scholarships abroad (but only in strategic areas) and CAPES finances 4,100 full scholarships for Brazilians abroad at undergraduate, full Ph.D. sandwich Ph.D. levels.

- Joint research projects.

- Joint doctoral degrees (e.g. Brazil/France).

- University partnerships.

- Doctoral colleges.

- The *Escola de Altos Estudos de CAPES* (School for Advanced Studies).

- Courses abroad in Lusophone countries (i.e. Angola, Mozambique).
4. Challenges for Latin America and the Caribbean

These include:

- Creating a social consciousness which favours the integration process while recognizing diversity, thus fostering a common cultural identity.
- Training human resources to allow the region to successfully compete as a ‘block’ in an increasingly integrated (but not always more unified) world.
- Making education systems both compatible with and attuned to each other, without leading to homogenization.
- Expansion with quality and equity.
- Linking universities to national and regional priorities.
- Fostering sustainable development by integrating projects into the national development agendas of the countries in the Region.
- Strengthening and creating assessment and accreditation systems as strategic instruments to guarantee the quality of higher education and to formulate and implement relevant public policies.
- Recognizing institutions of higher education as strategic instruments for sustainable development and for the successful inclusion of LAC countries within the global knowledge-based societies.
- Mapping and identifying trends in higher education in LAC to provide information to compare different practices via important organizations such as the Institute for Higher Education (IHE) in Latin America and the Caribbean (LAC) [International Institute for Higher Education in Latin America and the Caribbean (IESALC/UNESCO), Venezuela].

II. Comments and recommendations regarding research

- Large-scale countries in all regions (e.g. Argentina, Brazil, and Mexico in LAC) must have dual track approaches to training and research to advance all levels of education for their citizens. Organizing a conference on “The role of high-level research in Education-9 Countries” (world’s biggest populations) would be timely.
- If higher education and research entities do not reform and modernize, they will be overtaken by other actors which regard knowledge as a vital commodity (e.g. the private sector).
- Research must be linked to economic development so as to orient the development of new national markets. In this regard, Brazil needs top research capacity in space technology, agriculture, oil and energy and the aircraft industry.
• Centres of expertise in each region should map and analyze capacity (whether existing or identified as necessary) to optimize resources. For example, UNESCO/IESALC maps higher education institutions, regional trends and accreditation bodies in LAC.

• International academic cooperation targets excellence acquired via exposure to top class training and research capacity abroad. Thus, national investment in this area is fully justified and brings dividends. In Brazil, brain gain is assured thanks to the incentives offered to graduates who return following international study. The current return rate is some 90 per cent which proves the value of this approach.
I. Presentation

1. Shifting geo-political power patterns

Asia-Pacific is the world’s most populous region. Countries, including those which are also Members Countries of the OECD, are acutely aware of the implications of this reality for their future development agendas and have begun to take steps to address the complex challenges involved. As Asia-Pacific plans its future in a globalized world, the issues of higher education, research and knowledge capacity and the training and networking of human and social capital are deemed to offer new potential.

As their political leaders and academic experts forecast, India and China are expected to dominate STI areas by 2020, thus creating new interfaces and new rules in science which may create new opportunities for middle- and low-income countries.

2. Higher education: rising demand and challenges for OECD Member Countries

The strong correlation between public investment in knowledge (via higher education, IT and R&D) and economic performance is well recognized in OECD Member Countries and affects their universities as hubs of research and training.

New Zealand universities, first established by scholars from Cambridge and Oxford, enjoy a solid academic tradition. The higher education system has eight universities and is currently well positioned: five are ranked in the top 500 Shanghai Jiao Tong 2007 rankings and three are in the top 200. Auckland University is ranked fiftieth with higher places in certain disciplines.

However, as demand for higher education rises (notably in Asia); solutions must be found for the changing demographics in view for OECD-based universities:

- Universities will lose between a fifth and a third of their staff in the first decade of the twenty-first century.
- Between 40 and 60 per cent of professors in Australia, Austria, France, Germany, the Netherlands, Sweden and the UK are aged 55 or more.
- The United Kingdom will need to recruit 19,000 faculty to replace those retiring in the next ten years.
- Canada will need 2,500 to 3,000 faculties each year for the next ten years, compared with the 900 who are annually recruited at the moment.
- The primary challenge of the next decade for Australian universities will be the replacement of the Baby Boom Generation.
3. **New politics, new competition – back to the future**

The time when Europe competed mostly with countries that offered low-skilled work at low wages is long gone. Today, countries like China and India are starting to deliver high skills at low costs – and at an ever increasing pace. This is profoundly changing the rules of the game. In the long term and unless immigration flows change radically, there is no way for Europe to stop these rapidly developing countries from producing wave after wave of highly-skilled graduates.


Statistics for science/engineering graduates illustrate major changes:

(i) **USA and the EU**

1970: Over 50 per cent of the world’s science and engineering doctorates came from the USA.
2001: The EU granted 40 per cent more science and engineering doctorates than the USA.
2010: The EU will produce twice as many ST doctorates as the USA.

(ii) **China**

1975: China graduated very few doctoral students.
2003: A total of 3,000 doctoral students graduated (70 per cent in science and engineering).

(iii) **Global Figures for Science/Technology (ST)**

2000: Only 17 per cent of undergraduate degrees in the USA were in science and engineering.

Professor Dani Rodrik, a Harvard University development economist, cites three factors as important for economic growth:

1. Geography (location, transport costs, climate, natural resources, technology diffusion from outside, disease burden).
2. Integration (trade, market integration).
3. Institutions (rule of law, private property, governance, autonomy).

Clearly countries (and their cities and universities) must assess their advantages in relation to these factors. For example, while Hong Kong accesses 37 per cent of world GNP and 58 per cent of world population, the corresponding figures for Auckland, New Zealand are 1 per cent and 0.4 per cent.
4. **Innovative university responses**

“The rise of innovation from China, India and Korea is feeding a climate of anxiety in Europe and the USA that could lead to defensive responses. A combination of knowledge- and information-based jobs being offshore and a heightened techno-nationalism in Asia could provoke a similar response in the West”.

[Source: *The Atlas of ideas: how Asian innovation can benefit us all. www.demos.co.uk*].

The response strategy is as follows:

- Be a magnet for talent.
- Unleash mass collaboration.
- Build the knowledge banks.
- Lead global science towards global goals with a clear and coherent message.

All countries need international strategies for their knowledge bases, *inter alia*:

- Long-term investment in knowledge capital.
- More strategic bilateral partnerships.
- Varied alliances (e.g. Asia-Pacific Association for International Education (APAIE); Association of Pacific Rim Universities (APRU); International Network of Research Universities (UNI.21) etc.).
- Targeted student and faculty mobility.
- Jointly awarded degrees.
- Enhanced research collaboration.
- Stronger emphasis on postgraduate research, notably doctoral education.
- Connecting the life sciences, technology and the social sciences and humanities around global questions.
- Inspiring students to make a life-long commitment to their intellectual development.
- Academic reform and institutional flexibility to strengthen international connectedness.

5. **New approaches to university networking**

Against this changing landscape and despite their institutional history and connectedness to other universities through traditional academic links, New Zealand universities face increased competition. Thus, they are repositioning their networks for optimal benefits within the changing geo-political context. For example, the Asia-Pacific Association for International Education (APAIE), an international education organization of institutions and professionals in the region, builds international cooperation among Asia and Pacific institutions of higher learning. It also reflects the emergence of the Asia-Pacific as a global player in higher education. Other entities are the Association of Pacific Rim Universities (APRU), the International Alliance of Research Universities (IARU), and the Worldwide Universities Network (WUN).
The importance of the research dimension is illustrated by the Universitas 21 network linking 21 universities in 12 countries with 677,000 students, with an annual budget of US$10.4 billion and over 2 million alumni. Its research capacity involves 111,000 postgraduate students, 76 million library items, 555 spin-off companies and US$2.8 billion in annual research and consultancy grants.

6. Current and future challenges for research universities

Ways must be found to ensure that universities continue to act upon the principles of collegiality even if national competitiveness is increasing. Thus, higher education institutions must facilitate collaboration while competing at the same time (thus, embarking on a contradictory yet ultimately complementary exercise).

As global challenges evolve, collaboration will be essential to address competing interests such as energy, water, skills, trade, labour and environment. Without this cooperation (including academic cooperation amongst HEIs as national knowledge hubs with regional and global outreach), the current economic model may not be sustainable.

One of the traditional roles of higher education has been to contest established ideas and models. In a changing geo-political context, this role is proving to be timeless in its relevance.

II. Comments and recommendations regarding the role of research

- While China is assumed to be the future, this may result from linear thinking. Maybe the freer science community in India will prove more effective and Japan still remains a major player in the ‘Knowledge Driven Economy’.

- Since Chinese academics are numerous throughout Asia, they have a major impact in countries in this region. Hence positive intellectual engagement with China is logical.

- There are similarities between China and Russia as both systems devote 50 per cent of their research budget to science and engineering. However, if resources were to be focused on military research and defence, would the development process be helped or hindered?

- The preoccupation with China should not be over exaggerated. The Chinese economy will certainly grow but the country will not easily or rapidly reach the same level as Europe in terms of welfare. China is a country which will not disintegrate due to its deeply grounded history. In this regard, it differs from Russia.

- University networks are public policy spaces for international relations, including knowledge generation and sharing and engaging students in collaborative research. For example, Universitas 21 and APAIE have significant bottom-up collaboration, which is important. Furthermore, there are geographical reasons why the universities should work together on research issues. Problems such as SARS and Tsunamis have regional-wide impact and so these networks will have even stronger value in the long-term. Research to analyse their innovative character and impact as part of knowledge systems is also warranted.
• Scale is important. For example, six of the UNDP’s top ranked countries are small. Moreover, small countries have potential which is helped by networking through research and knowledge.

• An ageing professoriate is not unusual due to the nature of the academic profession. Despite the demographic changes ahead which will impact on the academic profession, quality in research capacity and methodology must never be compromised.

• Higher Education Institutions (HEIs) face both national and international challenges of collaboration and competition in the knowledge-based societies and knowledge-based economies. This is a serious question to study when Europe’s political and economic power may be diminishing and other contexts are gaining importance.
Concluding Analysis

Sir Peter Scott

I. Presentation

This analysis focussed firstly on the present context of postgraduate education (notably doctorate degrees) and secondly on the nature of such qualifications per se.

1. Postgraduate education in a changing world

- *Globalization is a complex* and frequently contradictory phenomenon with social, economic and cultural dimensions. The discussions at the workshop attest to the extremely diverse national and regional contexts at the present time (e.g. rise of the BRIC nations, the success of other middle-level economies such as Singapore and Chile, the future of Europe and North America, Japan’s traditional role in driving economic development).

- *Thus, no model can be recommended* unconditionally as too many variable factors are in play.

- *Moreover, the term ‘world-class’* universities must be used with caution as this can only refer to a very elite number of exceptionally well-endowed institutions.

- *Concurrently*, social inequalities are increasing with serious imbalance in the concentration of people and resources and inadequate solutions to the major issue of the brain drain.

- ‘Knowledge Societies’ have similar diverse interpretations: a society whose members have expertise in emerging fields such as IT or design, or culturally diverse communities with different types of knowledge of equal value such as indigenous medicine.

- *Current expansion* (massification) of higher education and its impact on quality was predicted years ago. But now, this has to be studied in relation to geo-political scale: clearly huge countries need more highly-qualified people to meet manpower needs in all areas of the workforce. At the same time, the knowledge and research capacity needed by small (and very small) countries is still not sufficiently well defined and the question itself has delicate political aspects.

- *R&D excellence* traditionally results from the world’s best research (whether carried out in universities or elsewhere), which is linked to national innovation systems. Today, this research is often team-led with multiple actors involved (i.e. Mode 2: Knowledge). This has important ramifications for academia in general and for countries with fledgling or weak innovation systems.
2. The changing nature of postgraduate education

- **Massification of post-bachelor qualifications** (Masters and Doctorates) has already occurred in certain industrialized countries with varied definitions of titles and boundaries in the content of such degrees.

- **Frequently**, the most academically gifted students pursue careers outside academia.

- **Organization of these studies** varies widely amongst industrialized countries and notably between Europe and the USA. Degrees may be done in graduate schools or in faculties; top research is also carried out in more diverse contexts; European nations are striving to harmonize their academic credentials for stronger regional impact.

- **Increasing diversity** also marks the scope of these degrees. Changing models include degrees funded from grants, industry or personal sources; full- or part-time study, professional and community-based doctorates.

- **Content is also more diverse**: doctorates differ greatly according to discipline and so are difficult to compare; thesis versus dissertation are different end products; intellectual and critical enquiry culture of academia versus the generation of a broader knowledge culture are both legitimate goals.

- **It is very important to monitor** these trends so that their impact can be understood in other contexts where new approaches to postgraduate education are being sought.
List of Participants

John Breen
Assistant Dean for Research
University of Limerick
Limerick
Ireland
john.breen@ul.ie

Patrick Clancy
University College Dublin (UCD)
Belfield
Dublin 4
Ireland
patrick.clancy@ucd.ie

Pamela Denicolo
Director of Postgraduate Education
The School of Pharmacy
University of Reading
United Kingdom
*And Co-convenor*
Postgraduate Issues Network
Society for Research into Higher Education (SRHE)
p.m.denicolo@reading.ac.uk

Soumitra Dutta
Dean of External Relations
Roland Berger Professor of Industry and Technology
INSEAD Business School
Blvd de Constance
F-77305 Fontainebleau Cedex
France
soumitra.dutta@insead.edu
laurence.laemmel@insead.edu

Heather Eggins
Visiting Professor
Staffordshire University
74 Whitehall Park
London W19 3TN
United Kingdom
heggins@btinternet.com

Frank Hegarty
Deputy Chair
Irish Council for Science Engineering and Technology
University College Dublin (UCD)
Belfield
Dublin 4
Ireland
f.hegarty@ucd.ie

Brigid Heywood
Pro-Vice Chancellor for Research and Enterprise
The Open University (OU)
Walton Hall
Milton Keynes MK7 6AA
United Kingdom
PVC-RE@open.ac.uk (Sue Wagstaff)

Mary-Louise Kearney
Director
UNESCO Forum on Higher Education
Research and Knowledge
UNESCO
7 place de Fontenoy
75007 Paris
France
ml.kearney@unesco.org
m.rosset@unesco.org (Mary Rosset)

Eugene Kennedy
Vice President for Research
Dublin City University
Dublin 9
Ireland
eugene.kennedy@dcu.ie

Mammo Muchie
Director
Research Centre on Development Innovation
and International Political Economy (DIIPE)
Aalborg University
Fibigertraede 2
9220-Aalborg
Denmark
mammo@ihis.aau.dk
List of Participants

Gary Murphy
Dean of Graduate Research
Dublin City University (DCU)
Dublin 9
Ireland
gary.murphy@dcu.ie

Conor O’Carroll
Assistant Director for Research
Irish Universities Association (IUE)
48 Merrion Square
Dublin 2
Ireland
connor.ocarroll@iua.ie

Asa Olsson
UNESCO Forum on Higher Education
Research and Knowledge
UNESCO
7 place de Fontenoy
75007 Paris
France
a.olsson@unesco.org

Ray O’Neill
Dean of Graduate Studies
NUI Maynooth
Maynooth
Ireland
ray.oneill@nuim.ie

Lewis Purser
Assistant Director for Academic Affairs
Irish Universities Association IUE
48 Merrion Square
Dublin 2
Ireland
lewis.purser@iua.ie

Jaime Arturo Ramirez
Dean of Post-Graduate Studies
Professor of Electrical engineering
Federal University of Minas Gerais (UFMG)
Belo Horizonte
Brazil
And representing the:
Institute for Higher Education in Latin America and the Caribbean (UNESCO/IESALC)
Avenida Los Chorros con Calle Acueductor
Edif. Asovinhar
Altos de Sebucan
Caracas
Venezuela
jramirez@reitoria.ufmg.br

David Redmond
Registrar
NUI Maynooth
Maynooth
Ireland
david.redmond@nuim.ie

Jamil Salmi
Coordinator for Tertiary Education
The World Bank
1818 H Street NW
Washington DC 20433
USA
jsalmi@worldbank.org

Sir Peter Scott
Vice-Chancellor
Kingston University
River House
53-57 High Street
Kingston upon Thames
Surrey KT1 1LD
United Kingdom
p.scott@kingston.ac.uk
k.hirschel@kingston.ac.uk (Karen Hirschel)
List of Participants

**Dana Sheikh**  
Senior Research and Policy Analyst  
International Association of Universities (IAU)  
UNESCO  
1 rue Miollis  
75015 Paris  
France  
sheikh.iau@unesco.org

**Mary Shine-Thompson**  
Dean  
St Patrick’s College  
Drumcondra  
Dublin 9  
Ireland  
mary-thompson@spd.dcu.ie

**Maria Slowey**  
Vice-President for Learning Innovation  
Dublin City University (DCU)  
Dublin 9  
Ireland  
maria.slowey@dcu.ie

**Ulrich Teichler**  
Director  
International Centre for Higher Education Research (INCHER)  
Kassel University  
17 D-34109 Kassel  
Germany  
teichler@incher.uni-kassel.de

**Christopher Tremewan**  
Pro-Vice-Chancellor for International Affairs  
University of Auckland (UA)  
Private Bag 92019  
Auckland 1142  
New Zealand  
c.tremewan@auckland.ac.nz  
caroline.locke@auckland.ac.nz

**Alpha Tejan Wurie**  
International Consultant for Education  
Former Minister of Education, Science and Technology for Sierra Leone  
5 Ramsy Close  
Off Hill Station  
Forest Gate Regent  
Freetown  
Sierra Leone  
atwurie@aol.com

**Antoine Zahlan**  
Consultant in Higher Education  
14 Monckton Court  
Stangways Terrace  
London W14 8NP  
United Kingdom  
abzahlan@btinternet.com

**Secretariat, Dublin City University (DCU)**  
Grainne Curran  
Grainne.Curran@dcu.ie  
Tanya Keogh  
tanya.keogh@dcu.ie
Annex I. Glossary and list of Abbreviations

1. Glossary

Blended Learning is the combination of multiple approaches to learning. Blended learning can be accomplished through the use of ‘blended’ virtual and physical resources. A typical example of this would be a combination of technology-based materials and face-to-face sessions used together to deliver instruction.

Bologna Process aims to create a European Higher Education Area by 2010, in which students can choose from a wide and transparent range of high quality courses and benefit from smooth recognition procedures. The Bologna Declaration of June 1999 has put in motion a series of reforms needed to make European Higher Education more compatible and comparable, more competitive and more attractive for Europeans and for students and scholars from other continents. Reform was needed then and reform is still needed today if Europe is to match the performance of the best performing systems in the world, notably Asia and the United States of America (USA). The three priorities of the Bologna Process are: Introduction of the three cycle system (bachelor/master/doctorate), quality assurance and recognition of qualifications and periods of study.

Crowdsourcing is a neologism for the act of taking a task traditionally performed by an employee or contractor, and outsourcing it to an undefined, generally large group of people, in the form of an open call.

E-9 Initiative is an unprecedented education drive launched by the heads of state or government of Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria and Pakistan. ‘E’ stands for education and ‘9’ for nine countries. The Initiative took off in New Delhi, India, in 1993 on the occasion of the “Education for All Summit of Nine High-Population Countries”. The nine countries committed themselves to achieve concrete progress in basic education and reduce population growth rates within a limited timeframe.

Flashmeeting Project Research gives insights into how live video-conferencing can be used in novel ways, supporting online communities and creating new reusable learning objects.

Graduate programmes provide the highest level of formal education and thus are crucial for the development of any country. However, official Brazilian data clearly show a dramatic decrease in the number and values of scholarships available to graduate programmes in Brazil over the last few years, despite the importance and growth of such programmes. Between 1995 and 2004, investment by the Coordenadoria de Aperfeiçoamento de Pessoal do Ensino Superior (CAPES), subordinate to the Ministry of Education and Culture, in funding scholarships, corrected for inflation in the period, actually decreased by 51 per cent. In addition, during the period between 1994 and 2004, there was a loss of about 60 per cent in the purchasing power of the graduate scholarships provided by CAPES and the National Council for Science and Technology (CNPq). To reverse this trend, the development of sectorial funding for Brazilian graduate programmes is proposed to guarantee the availability and continuity of financial support for this strategic activity. (Abstract)
Information Society is a society in which the creation, distribution, diffusion, use, and manipulation of information is a significant economic, political, and cultural activity. Our society is now defined as the ‘Information Society’, a society in which low-cost information and ICT are in general use, or as the ‘Knowledge-Based Society’, to stress the fact that the most valuable asset is investment in intangible, human and social capital and that the key factors are knowledge and creativity.

International Finance Corporation (IFC) has worked on the Global Business School Network (GBSN) programme since 2004, helping enhance the institutional capacity of business schools in emerging markets – mainly in Africa – by partnering with faculty at top business and management schools in Europe, the USA, and elsewhere.

Knowledge Economy is the economic counterpart of the Information Society whereby wealth is created through the economic exploitation of understanding. The knowledge economy refers either to an economy of knowledge focused on the production and management of knowledge, or a ‘Knowledge-Based Economy’. In the second meaning, more frequently used, it refers to the use of knowledge to produce economic benefits.

Learned society is an organization that exists to promote an academic discipline or group of disciplines. Learned societies are of key importance in the sociology of science. The formation of a society is an important step in the emergence of a new discipline or sub-discipline. Membership may be open to all, may require possession of some qualification, or may be an honor conferred by election. Most learned societies are non-profit organizations. Their activities typically include holding regular conferences for the presentation and discussion of new research results and publishing or sponsoring academic journals in their discipline. Some also act as professional bodies, regulating the activities of their members in the public interest or the collective interest of the membership.

Lusophone countries include Portugal, Brazil, Mozambique, Angola, São Tomé and Príncipe Cape Verde, Guinea-Bissau, Equatorial Guinea, East Timor, Macau and others in various parts of the world, as well as India’s Goa state. The Community of Portuguese Language Countries (CPLP) is an international organization consisting of the eight independent countries [Angola, Brazil, Cape Verde, East Timor, Guinea-Bissau, Mozambique, Portugal, São Tomé & Principe] where Portuguese is an official language. These countries are also referred to as the ‘Lusosphere’.


MIT OpenCourseWare (MIT OCW) is an initiative of the Massachusetts Institute of Technology (MIT) to put all of the educational materials from its undergraduate- and graduate-level courses online, free and openly available to anyone, anywhere, by the end of the year 2007.
Mode 2: Knowledge. The term was used by Michael Gibbons (then Secretary-General of the Association of Commonwealth Universities) in his 1994 book, *Re-Thinking Science* (co-authored with Helga Nowotny and Peter Scott) and in his paper entitled “Higher Education Relevance in the 21st Century”, presented at UNESCO’s 1998 World Conference on Higher Education (WCHE). It refers to the emergence of a distributed knowledge system where the production and dissemination processes require interaction amongst a group of concerned stakeholders, including universities. Hence, to obtain optimal relevance, new approaches to research and teaching functions are necessary and must take place in socially interactive environments, facilitated by ICTs, rather than in isolated contexts such as mono-disciplinary analysis and institutional isolation.

Russell Group is a collaboration of twenty United Kingdom universities that receive two-thirds of universities’ research grant and contract funding in the UK. It was established in 1994 to represent their interests to the Government, Parliament and other similar bodies. In May of 2004, Russell Group Universities accounted for 65 per cent (over £1.8 billion) of UK Universities’ research grant and contract income, 56 per cent of all doctorates awarded in the UK, and over 30 per cent of all students studying in the UK from outside the European Union (EU).

Shanghai Jiao Tong Rankings. The Institute of Higher Education of the Shanghai Jiao Tong University ranks universities according to indicators of academic or research performance including alumni and staff winning high level awards such as Nobel Prizes, frequently cited researchers and articles published in leading scientific journals. Criteria are: quality of education, quality of faculty, research output, and size of institution.

THES/QS World University Rankings is an annual publication of university rankings around the world, published by The Times Higher Education Supplement (THES) and Quacquarelli Symonds (QS). The full listings feature on the QS website and on the THES website. They have been running since 2004 and are broken down by subject and region.

UNESCO King Hamad Bin Isa Al-Khalifa Prize for the “Use of Information and Communication Technologies in Education” is to reward projects and activities of individuals, institutions, other entities or non-governmental organizations for excellent models, best practice, and creative use of information and communication technologies to enhance learning, teaching and overall educational performance.

United Kingdom Open University will be the first in the UK to offer Open Content Materials under a Creative Commons Licence. Generous funding support is given by The William and Flora Hewlett Foundation.

Video blogging, sometimes shortened to vlogging is a form of blogging for which the medium is video. Entries are made regularly and often combine embedded video or a video link with supporting text, images, and other metadat.
2. Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAB</td>
<td>Academics Across Borders Initiative</td>
</tr>
<tr>
<td>APAIE</td>
<td>Asia-Pacific Association for International Education</td>
</tr>
<tr>
<td>APRU</td>
<td>Association of Pacific Rim Universities</td>
</tr>
<tr>
<td>BBC</td>
<td>British Broadcasting Cooperation</td>
</tr>
<tr>
<td>BEBO</td>
<td>Social Media Network</td>
</tr>
<tr>
<td>BLOG</td>
<td>Website: an abridgment of web log, individually maintained with events or other material such as graphics or video.</td>
</tr>
<tr>
<td>BRIC</td>
<td>Brazil, Russia, India and China</td>
</tr>
<tr>
<td>CAPES</td>
<td>Coordenacao de Aperfeicioamento de Pessoal de Nivel Superior</td>
</tr>
<tr>
<td>CNPq</td>
<td>Conselho Nacional de Desenvolvimento Cientifico e Tecnologico</td>
</tr>
<tr>
<td>CPLP</td>
<td>Community of Portugues Language Countries</td>
</tr>
<tr>
<td>CU</td>
<td>Columbia University</td>
</tr>
<tr>
<td>CYTED</td>
<td>Ciencia y Tecnologia para el Desarrollo</td>
</tr>
<tr>
<td>DCU</td>
<td>Dublin City University</td>
</tr>
<tr>
<td>DIIPE</td>
<td>Research Centre on Development Innovation and International Political Economy</td>
</tr>
<tr>
<td>DIT</td>
<td>Dublin Institute of Technology, Graduate Studies and Research Office</td>
</tr>
<tr>
<td>E-9 Countries</td>
<td>Bangladesh, Brazil, China, Egypt, India, Indonesia, Mexico, Nigeria, Pakistan</td>
</tr>
<tr>
<td>E-learning</td>
<td>Electron learning (on-line technologies)</td>
</tr>
<tr>
<td>EFA</td>
<td>Education For All</td>
</tr>
<tr>
<td>ESRC</td>
<td>Economic and Social Research Council</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FACEBOOK</td>
<td>Software programme to connect people</td>
</tr>
<tr>
<td>GBSN</td>
<td>Global Business Schools Network</td>
</tr>
<tr>
<td>GNP</td>
<td>Gross National Product</td>
</tr>
<tr>
<td>HC</td>
<td>Human Capacity</td>
</tr>
<tr>
<td>HC</td>
<td>Human Capital</td>
</tr>
<tr>
<td>HE</td>
<td>Higher Education</td>
</tr>
<tr>
<td>HEA</td>
<td>Higher Education Academy</td>
</tr>
</tbody>
</table>

---

UNESCO Forum on Higher Education, Research and Knowledge
<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEIs</td>
<td>Higher Education Institutions</td>
</tr>
<tr>
<td>IARU</td>
<td>International Alliance of Research Universities</td>
</tr>
<tr>
<td>IAS</td>
<td>Institute for Access Studies</td>
</tr>
<tr>
<td>IAU</td>
<td>International Association of Universities</td>
</tr>
<tr>
<td>ICTs</td>
<td>Information and Communication Technologies</td>
</tr>
<tr>
<td>IESALC</td>
<td>International Institute for Higher Education in Latin America and the Caribbean/UNESCO</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
</tr>
<tr>
<td>IGOs</td>
<td>International Governmental Organizations</td>
</tr>
<tr>
<td>IMD</td>
<td>Institute for Management Development</td>
</tr>
<tr>
<td>INCHER</td>
<td>International Centre for Higher Education Research</td>
</tr>
<tr>
<td></td>
<td>(Kassel University, Germany)</td>
</tr>
<tr>
<td>INSEAD</td>
<td>Business School, Fontainbleau</td>
</tr>
<tr>
<td>IRCHSS</td>
<td>Irish Research Council for the Humanities and Social Sciences</td>
</tr>
<tr>
<td>IRCS SET</td>
<td>Irish Research Council for Science, Engineering and Technology</td>
</tr>
<tr>
<td>IPHONE</td>
<td>iPhone Generation</td>
</tr>
<tr>
<td>ISI</td>
<td>Information Sciences Institute</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>IUA</td>
<td>Irish Universities Association</td>
</tr>
<tr>
<td>KMPG</td>
<td>Knowledge Management Practitioners Group</td>
</tr>
<tr>
<td>KOPHE</td>
<td>Kuwait Council for Private Higher Education</td>
</tr>
<tr>
<td>KTP</td>
<td>Knowledge Transfer Process</td>
</tr>
<tr>
<td>KU</td>
<td>Kingston University,</td>
</tr>
<tr>
<td>LAC</td>
<td>Latin America and the Caribbean</td>
</tr>
<tr>
<td>LKWU</td>
<td>Limkokwing University of Creative Technology</td>
</tr>
<tr>
<td>LSE</td>
<td>London School of Economic</td>
</tr>
<tr>
<td>MBA</td>
<td>Master of Business Administration</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MIT OCW</td>
<td>Massachusetts Institute of Technology/OpenCourseWare programme</td>
</tr>
<tr>
<td>NEPAD</td>
<td>New Economic Partnership for Africa’s Development</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-Governmental Organizations</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OU</td>
<td>Open University</td>
</tr>
<tr>
<td>PDAs</td>
<td>Personal Digital Assistants</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Doctor of Philosophy, advanced academic degree</td>
</tr>
<tr>
<td>PSE</td>
<td>Paris School of Economics</td>
</tr>
<tr>
<td>PUC</td>
<td>Private Universities Council for Higher Education, Kuwait</td>
</tr>
<tr>
<td>QAAHE</td>
<td>Quality Assurance Agency for Higher Education</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>ROK</td>
<td>Republic of Korea</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe acute respiratory syndrome, a respiratory disease caused by the SARS coronavirus (SARS-CoV).</td>
</tr>
<tr>
<td>SKYPE</td>
<td>Free telephone communication via Internet</td>
</tr>
<tr>
<td>SL</td>
<td>Second Life Avatars, Virtual World</td>
</tr>
<tr>
<td>SRHE</td>
<td>Society for Research in Higher Education</td>
</tr>
<tr>
<td>STEM</td>
<td>Science, Technology, Engineering and Mathematics</td>
</tr>
<tr>
<td>STI</td>
<td>Science, Technology and Innovation</td>
</tr>
<tr>
<td>SU</td>
<td>Staffordshire University</td>
</tr>
<tr>
<td>SUPER RUs</td>
<td>Super Research Universities</td>
</tr>
<tr>
<td>THES</td>
<td>Times Higher Education QS World University Rankings</td>
</tr>
<tr>
<td>TIM</td>
<td>Technology Institute of Monterrey</td>
</tr>
<tr>
<td>TSUNAMIS</td>
<td>Displaced ocean waves during earthquakes</td>
</tr>
<tr>
<td>UA</td>
<td>University of Auckland</td>
</tr>
<tr>
<td>UAE</td>
<td>United Arab Emirates</td>
</tr>
<tr>
<td>UCD</td>
<td>University College Dublin</td>
</tr>
<tr>
<td>UFMG</td>
<td>Federal University of Minas Gerais</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
<tr>
<td>UNI.21</td>
<td>Universitas 21 International Network of Research-Intensive Universities</td>
</tr>
<tr>
<td>UPE</td>
<td>Universal Primary Education</td>
</tr>
</tbody>
</table>
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>United States of America</td>
</tr>
<tr>
<td>U-TUBE</td>
<td>Individual Broadcasting</td>
</tr>
<tr>
<td>UTT</td>
<td>University of Trinidad and Tobago</td>
</tr>
<tr>
<td>VLE</td>
<td>Virtual Learning Environment</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
<tr>
<td>WCHE</td>
<td>World Conference on Higher Education</td>
</tr>
<tr>
<td>WSC</td>
<td>World Conference on Science</td>
</tr>
<tr>
<td>WUN</td>
<td>Worldwide Universities Network</td>
</tr>
</tbody>
</table>
INTERNATIONAL PERSPECTIVES ON POSTGRADUATE EDUCATION
AND RESEARCH FROM:
Brazil
Germany
INSEAD Business School (France/Singapore)
Ireland
Lebanon
New Zealand
Sierra Leone
The International Association of Universities (IAU)
The Open University
The Research Centre on Development Innovation
and International Political Economy (DIPE), Denmark
The Society for Research into Higher Education (SRHE)
The UNESCO Forum on Higher Education,
Research and Knowledge
The World Bank
UNESCO/IESALC, Venezuela
United Kingdom
The New Politics of Global Higher Education
International Networking and Research Universities

Christopher Tremewan

The trend during the past decade or so for research universities to develop new alliances or networks has led observers to ask the usual questions:

- Are these exclusive clubs for the elite?
- Do they really produce benefits for the members?
- How do they sustain or advance quality and excellence?

This address is intended to go some way towards answering such questions or, at the very least, to demonstrate the needs and aspirations which have driven the emergence of this phenomenon in higher education.

Of course, there have been organised relationships amongst groups of universities for a long time. I refer here, however, to networks which have been established in the last decade or so in response to very specific pressures which have changed the face of higher education.

The major shifts in the politics of international higher education can be identified in the following: the changing regional balance in economic development, the explicit re-alignment of public policy which acknowledges the role of research universities in generating growth within national economies, the heightened link between science and technology research and national security and, finally, the increased competition for high quality human capital in the context of demographic decline and a global job market. These are among the pressures which have given salience to the quest to have or to be 'world-class' universities.

Regional Shifts
Over recent decades there have been fundamental changes in the international higher education landscape especially as billions of people have quickly been brought into the global economy as a result of the end of the Cold War and of the opening of China and India to the global market.

Analysts have drawn attention to the massive expansion of the Chinese university system, doubling the number of students in a decade, and making it 'realistic to assume that, 10 years from now, it will have twice the number of graduates as the EU

---

2 Christopher Tremewan is Pro Vice-Chancellor (International) at The University of Auckland and Research Fellow in Political Studies. He has specialised in Southeast Asian politics and currently in the politics of ethnicity and national economic growth strategies.
and the United States together\textsuperscript{3}. In 2006, China overtook Japan to take its place as the 'second largest total investor in R&D after the US'.\textsuperscript{4}

By the end of 2020...China will achieve more science and technological breakthroughs of great world influence, qualifying it to join the ranks of the world's most innovative countries. President Hu Jintao, China, January 2006

India's long history of being a source country for academics and researchers is in the process of taking a quantum leap forward as plans for a similar expansion of the national system are implemented.

In 20 years global science will be driven by Indian scientists. There are new interfaces in science, with new rules, where new countries can contribute on an equal footing. Dr Vijay Raghavan, Director, National Centre for Biological Sciences, Bangalore, January 2006

Both China and India have policies and plans focused on building a differentiated and articulated system which will resource a greatly enhanced sector of flagship research institutions of international quality.

Figure 1:

THE ECONOMIC RISE OF ASIA

\begin{center}
\begin{tikzpicture}
\end{tikzpicture}
\end{center}

Source: OECD, New Zealand Institute

\textsuperscript{3} Andreas Schleicher, 'Universities must face the Chinese challenge', \textit{The Independent}, London, 7 June, 2007. Schleicher is Head of the Indicators and Analysis Division at the Directorate for Education in the Organisation for Economic Co-operation and Development.

\textsuperscript{4} Simon Marginson, 'Shanghai Rankings Set Benchmark', \textit{The Australian}, 28 November, 2007. Marginson is professor of higher education at The University of Melbourne. He further notes: 'Little more than 10 per cent of this R&D money is allocated to universities but investment in basic research capacity is growing rapidly along with the rest.'
These developments are a reflection of the fundamental shifts in global economic power and the associated changes in political influence to set the global agenda. One of the more recent of many reports to note the implications is a policy paper on Germany’s Asia strategy produced by the CDU/CSU Parliamentary Group in Germany. It states:

Asia’s rise also means tectonic change for the global economy – although de facto this simply signifies a return to the pre-colonial balance of power: right into the 19th century Asia accounted for a greater share of global industrial production than Europe and the USA put together. The underlying dynamism is a result of the high and long-lasting rate of growth in Asia and the magnitude of Asia’s population. 10 of the 12 fastest growing economies over the past 25 years are in Asia.5

A similar point is made graphically in Figure 1.

The aspirations of China and India along with other emerging global forces in higher education and research are now taken very seriously not only because of the macro trends in regional economic activity but also because the effects are plain to be seen. This was acknowledged by the Lisbon Council:

The time when Europe competed mostly with countries that offered low-skilled work at low wages is long gone. Today, countries like China and India are starting to deliver high skills at low costs – and at an ever increasing pace. This is profoundly changing the rules of the game. ‘There is no way for Europe to stop these rapidly developing countries from producing wave after wave of highly skilled graduates.’ (Lisbon Council Policy Brief ‘The Economics of Knowledge’ p. 2)

The production of graduates in disciplines which directly underpin technological leadership and economic transformation already has a striking new pattern (fig.2).

<table>
<thead>
<tr>
<th>Science and Engineering Doctorates</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ 1970</td>
</tr>
<tr>
<td>☐ 2001</td>
</tr>
<tr>
<td>☐ 1975</td>
</tr>
<tr>
<td>☐ By 2003</td>
</tr>
<tr>
<td>☐ In 2000</td>
</tr>
<tr>
<td>World average</td>
</tr>
<tr>
<td>China</td>
</tr>
</tbody>
</table>

Source: Harvard Magazine, November/December 2005

As research universities build new networks, the emerging global players are being included. It is no longer possible to have a credible international network which does not include them.

Furthermore, as regional associations of governments or ‘economies’ such as APEC, have grown to manage the economic, political and security issues surrounding the shifting balance, so have research universities responded. The Association of Pacific Rim Universities, formed from the inspiration of Californian universities, parallels APEC membership. Geopolitically, it is where the higher education and research engines of the US and East Asia meet. Now we are beginning to see meetings between networks – such the AAU and APRU summit two years ago. It will not be too long before Asia and Europe meet.

In fact, this is already happening at a different level through the networks of international educators. The Asia-Pacific International Association of International Education (APAIE) has regular meetings with its European and US counterparts, EAIE and NAFSA respectively.

Some may think these trends exhibit a kind of international diplomacy irrelevant to the core research task. However, a UK study in June 2007 showed the sharply increased incidence and impact factor of international co-authorship of research papers in scientific disciplines.6 This was most marked in UK-USA and UK-France / Germany collaboration and there were significant lags with India and China. However, with many leading universities setting up research collaborations around more systematic and well-resourced institutional partnerships in Asia and the Middle East, it can be expected that this imbalance will be corrected.

**Public Policy**

Governments are now very conscious both of how higher education policy has to link economic growth to high quality higher education and research and of how quickly the ground is moving beneath their feet. A recent indication is the announcement on 29 February 2008 by the UK universities secretary, John Denham. ‘I think,’ he said, ‘we should aim to produce a 10 to 15 year framework for expansion and development of higher education.’ He added a warning, ‘Excellence today is no guarantee of excellence in 10 to 15 years’ time.’

Multilateral organisations, such as the World Bank and OECD, have come out with voluminous case studies and reports surveying the capabilities of both developed and developing countries. On its website, UNESCO states

UNESCO is the only UN body with a mandate in higher education. The Organization supports governments and institutions worldwide in building capacity and formulating policies and strategies, so that higher education fully contributes to sustainable national development.7

---

6 Jonathan Adams, Karen Gurney and Stuart Marshall, 'Patterns of international collaboration for the UK and leading partners', a report commissioned by the UK Office of Science and Innovation, June 2007.
7 See: http://portal.unesco.org/education/en/
However, the world seems to bifurcate itself into those countries which are seriously investing in order to make their societies more innovative and their economies more productive; and those which proclaim the policy but fail to invest in support of it, either because they lack the resources or because, although they have the resources, choose not to.

The Vice-Chancellor of Monash University, Professor Richard Larkins, stated at the Melbourne Press Club on 27 February 2008, ‘The investment by the federal government in support of the university education of its citizens fell by about 30 per cent (per) student in real terms between 1996 and 2004’. Noting that student-staff ratios increased from 14 to one to 20 to one, he said, this is ‘A dismal ratio even when compared (with) the best universities in Asia, let alone the elite universities in the US and the UK.’

It was partly the frustration with public policy settings and with the lack of a body of international peers with which to seek counsel and common cause that led Professor Alan Gilbert, then Vice-Chancellor of Melbourne University, to set up Universitas 21 just over ten years ago.

While other U21 members no doubt have varied rationales for joining, for some this resonated strongly. Auckland was one because New Zealand lags behind Australia in its investment in knowledge (fig.3). This is partly due to a comparative decline in New Zealand’s GDP per capita (fig. 4).

This Australasian sub-category appears to derive partly from a short electoral cycle of three years in which the future of university education is not a significant polling issue, and partly from a sense of complacency that existing high quality institutions can be sustained and remain competitive without additional investment.

Since New Zealand, even in its relative decline, still has the national wealth to sustain and build further its education and research capability, it is ultimately a question of priority in public policy. For The University of Auckland, as a highly connected international university in a small higher education sector (roughly the same size as Scotland’s), maintaining active membership of peak networks is vital.

Regrettably, the widening gap between government aspiration and investment is often accompanied by increasing regulation and declining autonomy.

Therefore, in this set of facts lies another driver for research universities to join international networks. Such networks hold out the possibility of emancipation from the provincialism of national policy frameworks, provide a set of benchmarks which enable advocacy to be launched in favour of more ambitious goals of quality and excellence, and may yield the kind of intimacy amongst a limited number of collaborators which will enable the exercise of a collective capability beyond that of any single institution, and together to draw on external funding for larger projects.

**World-class universities**

In his highly informative paper for this conference, Jamil Salmi pulls together the thinking of various scholars on the fundamentals of a world class university:

Highly qualified faculty, excellence in research, quality teaching, high levels of government as well as non-government sources of funding, international
and highly talented students, academic freedom, well-defined autonomous governance structures, and well-equipped facilities for teaching, research, administration, and, often, student life.\(^9\)

He summarises the essentials as depth of talent and resources and ‘favourable governance’.\(^{10}\)

I would add to this list the need for a comprehensive range of disciplines to enable the highly productive synergies which emerge across research domains.

The need to have world-class universities or to be able to claim convincingly to be one arises from the increasingly instrumental role of higher education in relation to economic growth as noted previously. The growth model is competitive and thus the ability to compete through having world-class universities can be related quite directly to the determinants of successful economic development. The Harvard development economist, Dani Rodrik, has set out the key determinants as geography (location and transport costs, climate, natural resources, diffusion of technology from more advanced areas, disease burden), integration (trade, market integration) and institutions (autonomy, rule of law, political participation, property rights)\(^{11}\). Nations which have strength across these dimensions – and particularly the last – are likely to have the advantage in establishing world-class universities.

The function of international networks in this global environment is partly to reinforce a world-class reputation by publicly demonstrating that one is able to keep the company of others of similar or superior rank. This positioning function has been sharpened by international rankings such as the THES and the Shanghai Jiaotung Index, the latter remarkable, as Simon Marginson points out, for the fact that a Chinese institution has now set the most rigorous global benchmarks\(^{12}\).

Therefore, networks of research universities such as Universitas 21, the Association of Pacific Rim Universities (APRU) and the International Association of Research Universities (IARU) aim to position their members in the top echelons of world-class universities and to feedback the reputational benefits to their members. Not all need this to the same extent but it is noticeable that even those institutions acknowledged to be in the global top 20 feel the need to do this in a rapidly changing higher education context.

Just over a year ago, somewhat mischievously, I drew up a table of the current SJT ranking separating out the G6 nations, the BRICs (Brazil, Russia, India, China), and others. Alongside it, I placed my own conjecture on what the 2050 rankings might look like if current shifts in higher education investment were sustained – taking some poetic licence as well. I have found it a very useful tool for stimulating discussion on both the internationalisation and the de-nationalisation of education (fig. 5).

---

\(^{10}\) Salmi, p. 5.

But the point remains, mutual reinforcement of reputation for quality and excellence in a highly competitive environment where ranking affects recruitment, alumni loyalty and support, leverage with government, and research funding has become a function of belonging to international networks.

**Figure 5**

<table>
<thead>
<tr>
<th>Country</th>
<th>2005: No. in Top 50 *</th>
<th>2050: No. in Top 50 **</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>37</td>
<td>15</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Germany</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total: G6+</strong></td>
<td><strong>45</strong></td>
<td><strong>24</strong></td>
</tr>
<tr>
<td>Brazil</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Russia</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>India</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total: BRICS</strong></td>
<td><strong>0</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Korea</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Taiwan</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total: Rest of World</strong></td>
<td><strong>5</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

* Shanghai Jiao Tong Academic Ranking of World Universities 2005
** 2050 "Scenario" Index

**Demographic Shifts**

Most world-class universities are characterised by their cosmopolitan staff and student bodies especially at the graduate student level. To some extent these reflect changes in their host societies (fig. 6). They also reflect the search by students for the best education the world can offer regardless of their own national origins.
The international human resource profiles of research universities also indicate the global competition for talent by developed economies with declining populations. The recruitment of faculty is likely to become increasingly competitive as major transitions occur.

- "Universities will lose between a fifth and a third of their staff in the first decade of the 21st Century"

- "...between 40 and 60 per cent of professors in Australia, Austria, France, Germany, the Netherlands, Sweden and the UK [are] aged 55 or more"

- "Britain ....will need to recruit 19,000 to replace those retiring in next ten years"

- "Canada will need 2,500-3,000 each year for the next 10 years, compared with the 900 who are recruited at the moment."

- "The primary challenge of the next decade for Australian universities will be the replacement of the baby boom generation."

International university networks have only recently begun to consider how they might leverage their association for collaboration in areas of recruitment where they also compete. But there are signs that selected groups of these universities are now recruiting postgraduate students collectively.
Research and national security

Many of the above features of the new politics of global higher education will be familiar to those in the sector. However, one aspect that we all know about is rarely given the attention it deserves and is likely to become a central concern of international university networks. It certainly ought to.

That is, the emergence of major new players in the stiff international competition in science and technology research and innovation is intersecting with national security interests. There are now many reports which seek to understand the effects of emerging growth economies investing heavily in higher education and research. It is instructive to compare some of them.

The Demos report to the Blair Government in the UK stated:

The rise of innovation from China, India and Korea is feeding a climate of anxiety in Europe and the US that could lead to defensive responses. A combination of knowledge jobs being offshored and a heightened techno-nationalism in Asia could provoke a similar response in the West. The Atlas of Ideas: How Asian Innovation Can Benefit Us All (www.demos.co.uk)

The report goes on to say:

Britain must avoid making two big mistakes. First, it must wake up to what is unfolding in China and India, and not respond with too little too late. Second, it must work to prevent a global retreat into techno-nationalism, and instead evangelise for a cosmopolitan approach to innovation.

The rise of Asia will inevitably challenge our position in knowledge-based industries... However, it would be extremely short-sighted to view these developments purely as a competitive threat. Britain can prosper from global innovation networks, as it has from the internationalisation of financial services, but only if we choose NOT to isolate ourselves from global flows of knowledge. We need to act decisively to make ourselves central to global innovation networks ...

The final recommendations constitute a strategy of positive engagement: unleash mass collaboration, be a magnet for talent, build the knowledge banks, and lead global science towards global goals.

The German report alluded to earlier notes that ‘Major companies are starting to relocate parts of their research and development departments to Asia in order to secure access to Asia’s favourably priced pool of talent. This is creating global innovation networks’ 13 Surveying many other aspects of Germany’s relations with Asia, the report also recommends an active networking policy especially in technology, energy and the environment. 14

In 2006, the Association of American Universities appeared constrained, perhaps understandably, to offer their recommendations on the US response to the rise of China and India in terms clearly related to defence and national security. The title provides the clue: ‘National Defense Education and Innovation Initiative – Meeting America’s Economic and Security Challenges in the 21st Century’ (January 2006). An initial quotation states that ‘The inadequacies of our systems of research and education pose a greater threat to US national security over the next quarter century than any potential conventional war that we might imagine.’

The post-9/11 security measures at the US border have, as all of us here know, had a most unfortunate effect on the flow of international students and faculty thus depriving for a time the US science and technology innovation system of many new minds, threatening its capability long-term.

An Australian Report by the Working Group on Asia for the Prime Minister’s Science, Engineering and Innovation Council (PMSEIC) – the previous administration - was entitled ‘Strengthening Australia’s Position in the New World Order’. It begins with the sentence: ‘The emergence of China and India brings with it many challenges, opportunities and threats to Australia – our economy, our standard of living and our research and innovation system.’

It recommends:
• Capturing the opportunities emerging for Australian science and innovation
• Enhancing Australia’s science and technology linkages with China and India
• Strengthening Australia’s science and innovation competitiveness

The overall point to be made with respect to these reports is the tension between a positive kind of competitive engagement and an undertone of defensiveness which might rather easily change the climate of cooperation.

The economic dynamism which underlies these global shifts offer opportunities for universities to diversify and improve their resource base especially in jurisdictions where public funding continues to decline. Universitas 21, through its joint venture in distance education, hoped eventually to derive revenue from a new global enterprise in order to maintain the type of education to which its members are committed: campus-based, face-to-face, research-informed higher learning.

There is also a crucial role for international networks of research universities: that of insisting on the academic values which aspire to serve a common humanity. The range of projects being pursued by these networks on global challenges from the environment and disease to equity and governance holds out this promise.

Conclusion
In placing the emergence of international networks of research universities in the context of broader global trends, it has been my intention to indicate that they are probably only in the early stages of their development.

But, already, they are connecting the old and the emerging research power houses in different regions, they are emancipating universities from purely domestic
frameworks and enabling professional comparisons, they are reinforcing research collaborations and international reputations and they are beginning to provide a mechanism for giving priority to global concerns despite pressures towards narrow loyalties. We can only hope they prove successful.
The UNESCO Forum on Higher Education, Research and Knowledge

*The Role of Post-Graduate Education in Research Systems*  
*Position Paper*

**Paper for the UNESCO/DCU Workshop on Trends in Post-Graduate Education**  
*(Dublin City University, 5-7 March 2008)*

Mary-Louise Kearney,  
Director,  
The UNESCO Forum on Higher Education, Research and Knowledge

I. **Introduction: Challenges for Post-Graduate Education**

Today, post-graduate education faces multiple challenges in terms of demand, supply, quality and returns, both for providers and the clientele concerned. Why students decide to pursue this level of study and the incentives offered by institutions and employers are critical factors in changing and understanding trends.

It is thus important to effect a stocktaking of trends in post-graduate research, primarily with regard to the changing content and structure of advanced research degrees, but also taking into account the impact of this with regard to the origins, profiles and choices of the students concerned. This topic links to the UNESCO Forum’s mandate to monitor research management in relation to innovative policy-making, infrastructure, human capacities and investment.

The current landscape of advanced degrees is increasingly varied. This has resulted from the many changes and developments in recent years within the Higher Education sector where supply must adapt to more diverse demand. On one hand, research degrees continue to denote advanced study in a chosen discipline with a view to the pursuit of an academic career; in this respect expertise in research methodology and investigative skills are acquired. On the other hand, there is a growing demand for Masters and doctorates related to a specific field of professional activity such as business studies or administration. Though sometimes referred to as “taught qualifications” which may be undertaken concurrently with actual workplace activity, these involve a certain degree of research both for the professors and the students involved.

This trend has already become commonplace in Europe and, more widely, in OECD countries. However, there is still much to be learnt about such degrees as they are emerging in other regions of the world. Here again demand is driving supply and national systems are facing increased pressures to rapidly modernize and adapt to the growing interest in these types of qualifications. The issue of quality assurance and measures to ensure this constitute another dimension of this shifting landscape.

An attendant area of interest is the impact of these new degrees on the mobility patterns of students. Traditionally, there are five main receiving countries for international study: USA, UK, Germany, France and Australia. However, with the exponential growth of higher education provision and an ever increasing climate of competition, other countries are emerging as desirable study destinations. Questions also arise concerning the optimal location for these new types of advanced degrees in order to balance exposure to international expertise with the acquisition of skills and knowledge directly related to national contexts – hence the upsurge in off shore campuses to train local experts.
Against this background, five main areas merit special attention:

- **Challenges for students researching advanced degrees in developing countries (notably in scientific fields)**
- **The research component in “in demand” degrees which are awarded on the basis of taught courses**
- **The current advantages offered by open and E-learning with regard to the demand for advanced degrees**
- **The benefits of “jointly delivered” advanced degrees which aim for rapid and quality credentials**
- **The impact of branding and networking strategies for advanced degrees earned from research-reputed universities.**

These areas have features which are often closely linked because they relate to the need for all countries to be competitive in a globalised economy. To do so they must ensure that their own knowledge system (including the critical human capital component of this) remains of the highest calibre or that it is renovated to perform with greater impact.

In reviewing these aspects, the Dublin workshop will address various questions, inter alia:

- What are the objectives of national policies related to academic qualifications which may aim to balance the pursuit of scholarship and research with the acquisition of more practical credentials aimed at providing expertise for the labour market?
- What type of institutional infrastructure is needed to offer various types of academic qualifications, whether traditional or innovative? This may involve institutions of higher learning taking a more entrepreneurial approach toward the development of niche markets and a response to demand via innovative learning methods such as Open and Distance Learning (ODL).
- Which students are seeking this level of study and how are new types of research degrees affecting the traditional mobility patterns (notably the movement from south to north)?
- What are the main financial aspects related to this level of study, including the costs involved for the students?
- What is the impact of the emerging “caste” systems of higher education institutions caused by ranking exercises?
- What are the challenges for the research component of advanced qualifications, whether traditional or more market-oriented in nature?

This paper will comment on these aspects in relation to post-graduate studies as a component of national human capital policies.
II. Post-Graduate Education: A Key Source of Human Capital

- **Building Knowledge Societies**

The last decade of the 20th century witnessed a process of swift and irrevocable change leading to what is now understood to be the third industrial revolution – the advent of new technologies which have facilitated the ongoing march of globalisation. Today the Knowledge Society and the Knowledge Economy place cognitive resources at the centre of human activity and of social dynamics. This situation thus has critical implications for a country’s human capital base: its citizens and workers.

What is a Knowledge Society? UNESCO’s 2005 report *Towards Knowledge Societies* defines this entity as “… a society that is nurtured by its diversity and its capacities.” (UNESCO: 17). Therefore access to education and training for all is clearly the right of all citizens and an obligation for governments. Furthermore each society already has its own kinds of knowledge assets which should be recognised and protected so as to link with the new forms of knowledge promoted by the Knowledge Economy. There are several important guiding principals:

- *This sort of society must foster knowledge sharing*
- *ICT creates new opportunities for reaching this objective*
- *Knowledge Societies are wider and richer than the narrower Information Societies*
- *This society can offer a fresh and relevant approach for the development of countries of the south.*

The UNESCO report considers the foundations for building Knowledge Societies as:

- Ensuring access to information and freedom of expression for all thereby confirming that policies must be based on equity and openness, not just on ICT availability;
- Networking people, their knowledge and their communities via ICT
- Fostering societies where learning can take place in a variety of contexts both formal and informal, thus necessitating new and flexible education systems
- Facilitating lifelong education for all via learning opportunities for all ages
- Protecting the quality and relevance of higher education systems and their institutions. These play a vital role in knowledge societies
- Promoting equitable access to high level research notably in R&D and in science and technology fields. These fields are motors for prosperous societies
- Broadening public awareness and debate on the ethics of science and technology which often leads to complex questions affecting ethical standards
- Understanding the aspects of risk and human security as facets of the knowledge society requiring special attention so as to safeguard the well being citizens
- Recognizing the value of local and indigenous knowledge including linguistic and cultural diversity as legitimate and significant factors in today’s knowledge society
• Moving from access for all citizens towards active participation in knowledge societies in order to govern and shape their positive evolution.

In this context human capital assumes new importance because people must possess the necessary capacities to direct their communities as they continue to develop in a globalised world.

Post–graduate education constitutes a particular investment – whether personal or national – in human capital. Its overall objective is to educate highly skilled citizens and professionals able to address the specific issues of their national contexts as part of a wider globalised society. The wealth drawn from people and from their expertise and talents forms a base for finding viable solutions to the issues of sustainable human development – particularly in poverty reduction, wide access to health care, education for all, population, good governance, equitable arrangements for globalised economic trends, trade patterns and so on. For the United Nations these issues are encapsulated in the 2000 Millennium Development Goals (MDGs) which set the development agenda for the first two decades of the 21st century. This provides that progress would be more equitable for all countries. (See Annex 1)

• A Global Picture of Human Capital Issues

Strengthening education, training and skills is a policy with universal support but one which involves major challenges over a wide range of related areas (inter alia, health, economic growth, labour markets, IT connectivity, immigration policies, security levels, and so on). The obstacles facing countries in the developing world are particularly complex.

Of the world’s 195 countries, the 25 nations of the OECD bloc command the prime economic advantages, although they have only 10% of the global population. Correcting this discrepancy, known as the 10/90 gap is now a central issue for arriving at more equitable levels of human development in the areas defined by the Human Development Index (HDI).

However, an increasing number of middle and low-income nations are posting very positive results as a consequence of their commitment to innovative policies in the fields concerned. The socio-economic progress resulting from these new approaches could well be replicated on a wider scale as other countries see the tangible benefits produced.

The following statistics illustrate the challenges facing countries in various areas which are vital components of the Knowledge Society:

• Education Policies

Education for all goals is most urgent in the E9 countries (i.e. those with the biggest populations with very large youth cohorts - Egypt, Nigeria, India, Bangladesh, Pakistan, China, Indonesia, Mexico and Brazil). For example Egypt has 40 million citizens under 20 years of age - i.e. 60% of the population which requires education and training in the immediate future.

• In Higher Education the world’s leading Research Universities (known as the Super RUs) are mainly located in one country (the USA).

• Increasingly countries are adopting dual track Education policies to address the twin challenges of wider access and the development of research capacity (e.g. China, Nigeria and Pakistan)
Investing in Human Capital via Education*

Expenditure on education as part of the GNP: Malaysia and Tunisia now spend more than OECD countries; Thailand 25%, Madagascar 24%, Ukraine 18%, St Lucia 16%, Lesotho 13%, Congo 85, Chad 2%

Enrolment in tertiary education: Algeria 21%, Australia 72%, Bangladesh 6%, Central African Republic 2%, Chile 48%, Norway 78%, Poland 64%, Trinidad and Tobago 11%

Female enrolments in Tertiary Education: Sweden 60%, South Africa 55%, Iran 51%, Mexico 50%, Japan 46%, Republic of Korea 37%, Guinea 19%

*(Source: UNESCO Institute of Statistics)

These figures provide a varied but improving picture. Progress in Africa continues to fall below expectations and has led to additional donor funding such as the G8 contribution of $500 million in 2007 for Education-related programmes.

STI and Scientific Research

Israel currently leads the world in R&D investment

Only 10% of patents (a key indicator of innovation capacity) come from developing countries

The Arab States suffer an ongoing exodus of PhD recipients, mainly to OECD countries

In China, the China Academy of Sciences (CAS) lists 100 research institutes with 58 000 students enrolled. At its Graduate University (GUCAS), some 50% of the 33 000 students are doing PhDs.

Singapore spent $4 062 million (Singapore Dollars) on R&D in 2004 which is 2.25% of its Gross National Product (GNP) and one of the highest rates in the world.

IT Connectivity Levels*

Connectivity levels per 10 000 persons: 900 in Norway, New Zealand cf .01 Niger, .03 Nigeria, .06 Gambia

IT infrastructure: Japan 100% cf 0% Bangladesh

Connectivity inequalities in developing countries: Rural areas 30% cf urban areas 70%

Language dominance: 75% of internet content is in English although only 10% of the world is proficient in this language.


These statistics show the wide discrepancies in access to information and knowledge, resulting in serious disadvantages countries and particularly within specific areas of their populations.
Human capital issues have emerged as problematic in a world where many areas of the workforce are more mobile.

For highly qualified workers this presents challenges both old and new. While the Brain Drain continues to be a reality for many developing countries (e.g. the mass exodus of Nigerian doctors and teachers and Philippines-trained nurses), returning experts or the circulation of expertise can offer positive aspects but requires innovative approaches to academic and professional credentials. Examples of this include Silicon Valley IT experts returning to India, a high instance of foreign-educated doctors (41% in New Zealand), mobilisation of the diasporas from Africa and the Arab States, and burgeoning cooperative arrangements such as joint professorships, dual research appointments and laboratories (known as “collaboratories”), and jointly awarded graduate degrees.

III. The Growing Role of Research Universities

Universities inherently assure research-based teaching, which is in contrast with other types of higher education institutions devoted to the provision of training and skills. However given the drastic increase in the demand for tertiary education over the past decade, many universities have been obliged to pursue these two missions with equal vigour – even when funding and other resources have been extremely limited.

Though universities in OECD countries have seen considerable increase in research funding from the end of the 1990s onwards, the research setting is varied and complex with little uniformity of strategies for dealing with this area. As summarised by Helen Connell, editor of the 2004 OECD report on research management: “…the research environment of the university is in constant flux. Research management in universities is management of change and diversity.” (Connell: 21) and “Given that resources that can be put into research are not unlimited, declared national research priorities and agenda have become practically universal within OECD countries.” (Connell: 24)

The ramifications of this trend are further explored by Ellen Hazelkorn in the OECD’s 2005 subsequent report on research capacity in new institutions:

“Underpinning higher education’s role as a key economic driver, governments are also placing greater focus on science and technology disciplines, on the balance between basic and applied research, on knowledge and technology transfer activities, and intellectual property. Institutions able to match research priorities with national priorities, as determined by technology foresight studies, are well rewarded” (Hazelkorn: 22) and “…there is no getting away from the fact that research is ultimately dependent on individuals.” (Hazelkorn: 92)

While the industrialised OECD countries grapple with these challenges, it is no surprise that the hurdles faced by universities in middle and low-income countries are much more critical. In a global knowledge-based society, this is a very serious situation. These issues were examined in depth at the
2006 Global Colloquium of the UNESCO Forum on Higher Education Research and Knowledge which debated the status of research universities worldwide. The conclusions stressed the urgency of resolving the major problems identified:

- The precarious nature of research in non-OECD countries
- The major cleavages in research between wealthy and emerging countries in terms of capacity, agendas, contexts, criteria, climate and partnerships
- The need to accelerate networking and cooperation amongst universities to strengthen research
- The urgency of building improved research capacity in countries of the South and elimination of the isolation of their researchers.
- The rapidly increasing political nature of national research agendas
- The need for countries to map and analyse their research systems, to pinpoint their major challenges and to benchmark themselves in relation to similar emerging economies. (Weiler et al: 20-23)

Thus recent trends have illustrated an important dichotomy: the growing role and potential of Research Universities and the increasing struggle to compete with certain institutions and their researchers. As post-graduate studies evolve in relation to demand and supply this global context must be taken into account.

IV. The Research Component of Post Graduate Studies : Issues at the Dublin Workshop (March 2008)

The specific issues under consideration at the workshop jointly hosted by the UNESCO Forum and the Dublin City University in March 2008 have a common focus on the role of research in advanced academic credentials which are increasingly varied in nature. This discussion will be a fitting opportunity to examine these issues in the present context of Higher Education. It demonstrates the characteristics forecast for this sector a decade earlier by two major UNESCO conferences namely the World Conference on Higher Education Paris 1998 and the World Conference on Science, Budapest 1999. These conferences predicted the advent of the Knowledge Society as the 21st century commenced. They further debated the processes of knowledge generation and dissemination, ranging from those related to the growing demand for access to post-secondary education and training to those dealing with the acquisition of high level qualifications, often in fields related to science, technology and engineering (including IT). These fields are vital in assuring the innovation base for national economic development and growth. The dual challenge in store for Higher Education institutions and especially for universities was anticipated since these processes required that access and equity issues should receive the same attention as those necessary for a country’s long-term knowledge base and foresight capacity.

Today, ten years on, as countries address these problems the gap between the haves and the have-nots in the knowledge stakes has widened and constitutes a threat to sharing the benefits of globalisation on an equitable basis. Since research capacity depends on sustained long term investment by governments, the challenge to acquire, maintain and reinforce this capacity is subject to complex and interlinked factors. It would seem that countries can be grouped in three categories:

- Star performers and those whose knowledge-related policies in education, research and innovation illustrate good practice (e.g. Chile, Singapore);
- Those working to formulate more innovative policies which may also help retain their crucial human capital (e.g. Trinidad, Nigeria);
• Countries slow to modernise in these areas for various reasons linked to the poor quality of their infrastructure and limited human resources. These countries risk increased isolation and arrested development due to their lack of competitiveness in a global economy (many low-income countries are in this group).

A few comments on the Dublin issues are as follows:

• *Research degrees in middle and low-income countries (notably in scientific fields)*

The persisting problems in this area are: the low percentage of students in these fields at undergraduate level, inadequate infrastructure of universities in science and technology disciplines and the brain drain caused by the exodus of graduate students and academics working abroad.

The high instance of highly educated people from African and Arab States residing in OECD countries has been pointed out by Johann Mouton (UNESCO 2007), Roland Waast (UNESCO 2007) and Antoine Zahlan (UNESCO 2007) in studies carried out for the UNESCO Forum. Similar statistics are cited for the Latin American and Caribbean region by Roland Waast (UNESCO 2007). Selected examples are:

• 47% of Ghana’s college-educated citizens live abroad
• Between 35- 55% of highly educated people from Angola; Burundi, Kenya, Mauritius, Mozambique, Sierra Leone, Uganda and the United Republic of Tanzania live in OECD countries
• African students accounted for the second highest group of international students in the UK in 2003-4 (after East Asia and the Pacific)
• 200 000 LAC science and engineering graduates were working in the USA in 1999
• 1 300 000 graduates of foreign origin live and work in the USA
• Some 82% of students from Arab States were pursuing post-graduate degrees in OECD countries in 1999; on a per capita basis, the Arab brain drain is estimated to be four times greater than that of China
• Immigration policies designed to attract highly skilled persons (e.g. Canada, Australia, New Zealand and Singapore) have an impact on the brain drain issue
• Scientific peer-reviewed literature from Africa is around 1% of current publications
• Brazil graduated 33 000 PHDs in the last 5 years but only 3000 of these in STI fields, according to a recent UNESCO report on LAC trends in research (Waast 2008).

The negative consequences for building and retaining research capacity in these countries are obvious. Currently, there are considerable movements to mobilise the diasporas and to encourage their relocation to their country or origin. In Asia, these efforts have brought rather positive results and even relocation of experts. Linkages with the African and Arab diaspora remain mainly focused on cooperation due to the lack of incentives for reinsertion in local academic communities.

• “In demand” advanced degrees

Over the past two decades, there has been exponential growth in demand for certain degrees in non-OECD countries including those at graduate level. This has led to the establishment of numerous local campuses by universities from OECD countries. Particular demand is evident for fields such as
computer science, business studies and English. Major clients include the Gulf States, East Asia and Eastern Europe.

Often these academic qualifications are practically oriented towards the labour market and so the focus on teaching excellence supersedes the traditional research component. Moreover, students are often professional motivated to enrol in this type of study which offers flexible timetabling and modalities of instruction.

While leading universities may have the capacity to assure the research dimension notably in areas such as MBA studies, this domain has a very strong competitive dimension which has necessitated the establishment of quality assurance measures to protect academic standards and the value of the credentials earned.

A significant feature of such degrees is the importance attached to assignment-based instruction and to the applied and strategic nature of the research undertaken. Students often work in teams and with their professors to investigate emerging issues with which they may be directly engaged in their professional lives. This type of research also encourages team-building and interpersonal skills as well as the sort of sophisticated analytical and forecasting capacities needed for the top end of the labour market.

- **Open and E-learning Qualifications**

The ongoing demand for access to post-secondary studies via open and E-learning modalities now extends to the level of graduate degrees.

For many years debate has continued on the merits and challenges of this type of educational provision, *per se*. While popular with workers and mature-age students for its flexible delivery, the potential problems for motivation and perseverance posed by individual and mainly isolated study conditions and the heavy dependence on reliable IT connectivity are well documented.

At graduate level the research component required to earn these credentials does not pose particular difficulties for mature and motivated students who have adapted to the specific study mode. In this regard widening access to research is essential and distinguishes initiatives such as the Open Course Ware Project led by the Massachusetts Institute of Technology to ensure equitable entry cross boundaries to the knowledge bases inherent in advanced levels of study. Research is also a feature of the numerous projects designed to promote open collaborative technologies which expand access to learning. By way of example in 2007 the annual UNESCO King Hamad Bin Isa Al-Khalifa Prize for the use of ICTs in Education was awarded to Claroline which is an open-source platform located at the Catholic University of Louvain, Belgium, and reaching 900 institutions in 84 countries. This is a generative network of users, including researchers, who contribute new tools and functions based on their successful experiences of open education.

Judging from the steady or increasing demand for these qualifications at graduate level in industrialized countries, students have consciously selected this form of instruction as being best suited to their needs. Indeed the rage of research-based open and E-qualifications continues to expand. Some examples are:

- The University of Phoenix which is the USA’s largest accredited private university with 180 centres of learning spread over America, Latin America, Asia and Europe, has 800 faculties and offers both regular and on-line instruction. Graduate degrees are available in various fields, inter alia, business, health, law, human resources, and information technology.
• The United Kingdom’s Open University which has a long standing programme of research degrees with the count of post graduate students at over 1200 in 2007. Special attention is given to training researchers to investigate industrial, commercial and public sectors issues.

• Massey University, New Zealand’s principal extramural tertiary institution, is now rated 108 out of the world’s top 200 universities and has a strong focus on applied research and community-based education. Research degrees (4 doctorates, 40 Masters and 29 graduate diplomas) are available in business, science, humanities and the social sciences, the creative arts, and education.

• In Dubai, in the United Arab Emirates, 10 universities from the USA are offering Masters or doctoral programmes on line and in mainly work-related fields.

International Academic Cooperation Initiatives

Academic cooperation initiatives are manifold and emanate from a long established concept of promoting equitable access to high level teaching and research. These are the hallmarks of universities. In today’s globalised knowledge society, this concept has become more necessary than ever before so that expertise may be shared on a North/South – and increasingly South/South – basis. In this regard, the linkages to stemming the brain drain and to encouraging brain gain and brain circulation are evident.

As predicted two decades ago, there is now enormous growth in the internationalisation of Higher Education, due not only to the growth of the sector as a new and lucrative market but also because of the global nature of research expertise as scholars and experts can interact with much greater ease. Countries now need to design higher education policies which include more attractive career packages for academics.

A significant feature of this international cooperation is the increased joint delivery of research degrees which tend to attract top students aiming for fast track and quality credentials. An interesting example is a recent programme launched by Pakistan’s Higher Education Commission in science, technology and engineering which links Pakistani universities to counterparts in nine research-renowned universities in OECD countries. As one of the United Nations’ Education-9 countries (those with the highest illiteracy rates and very large youth populations), Pakistan is counting on these sorts of measures in international academic cooperation to help address the critical and urgent problems of its development agenda. Like other E-9 countries, a dual track approach to education which addresses the full spectrum of needs and levels is essential to compete in the knowledge society. Africa has struggled to pursue this duality with the sad result that it has lost much of its previous standing in higher education and STI fields. This has led to a fresh approach to these domains by African stakeholders themselves (for instance via the NEPD initiative) and by multilateral actors including the World Bank with its new ST Forum.

Another example of international academic cooperation is the UNESCO Chairs and UNITWIN Networking Programme which was established in 1992 and now involves over 750 institutions in 125 countries worldwide. Particular priority is given to helping to refocus and reinforce African universities via the Academics Across Borders initiative which is a sub-project of the programme. Research in fields vital to national development policies is a feature of the UNESCO Chairs/UNITWIN Project. To this end, there is close collaboration with the United Nations University (UNU) which is dedicated to linking academic research to the resolution of complex global problems and notably those related to the UN’s Millennium Development Goals.
As the Knowledge Society and Economy progress and accelerate, governments are tending to invest in research over teaching. OECD countries have witnessed this trend since the late 1990s which has offered universities new and important roles as part of the national research base. This emphasis on research has prompted new levels of competition amongst universities both nationally and on regional and global scales. This competition means that key elements such as attractive salaries and related career incentives for career advancement and high quality research facilities must be provided to entice top class researchers. Universities wishing to compete as internationally recognized institutions of higher education have been forced to adopt a more “corporatist” approach to their mission statements, planning and staffing.

Linked to this is the growing influence exerted by the university Ranking Tables notably the THES and Shanghai listings. Though unofficial, these instruments have gained an undeniable role in shaping both government and public opinion of national universities and their place in a global market place where research excellence is demanded. As Salmi and Saroyan note: “The stakes are high. Governments and the public at large are ever more preoccupied with the relative performance of tertiary education institutions and getting the best perceived value as consumers of education.” (Salmi and Saroyan: 30)

However, the objectives of leading branded networks are global in ambit as illustrated by the examples below:

- The Universitas 21 Group of 21 research-intensive universities in twelve countries with a collective research budget of over $3 billion and a focus on research with global ramifications

- The Russell Group which links the United Kingdom’s twenty best research universities with a view to training future innovators, social leaders and showcasing the best practice and international competitiveness of British research excellence.

- The Global Business Schools Network (GBSN) sponsored by the International Finance Corporation which brings together the world’s top twenty business universities to help strengthen the skills of managers in emerging markets, especially those in Africa, based on the premise that inclusion and efficient performance within the global economy are crucial factors for sustained social development.

Common features are a global focus and perspective, large-scale budgets, a commitment to excellence, demonstrated added value to attract top academics and students, assurance of innovation and multilateral opportunities for members and an awareness of the socio-economic and political role of research in the global economy. These measures may appear to be primarily rooted in prestige and competitiveness but there is also the awareness that the impact of research is global and that development must be equitable to avoid social fragmentation.

V. Concluding Remarks

The aspects discussed in this paper have sought to cover a panorama of issues related to advanced research-oriented degrees and to situate these issues against the wider context of human capital. This concept, originating from Theodore Schulz, the American economist who won the 1979 Nobel Prize, requires “investment of physical resources and monetary capital” (Hudson: 14).
Research capacity cannot exist without this investment because if Knowledge Societies are to flourish, they need to train and retain an adequate cohort of highly skilled experts. This is true for in all countries, whatever their socio-economic status.

Ensuring equity of opportunity and success in this area is a global challenge which, unless adequately addressed, will certainly pose serious risk for the further advancement of the knowledge society. This challenge concerns government policy essentially but also relates directly to the social responsibility of universities as key actors in modern research and knowledge systems.

Countries need to be regularly informed of emerging trends (especially of success stories in dealing with these) in order to formulate appropriate and innovative policies which will help to assure their place in the evolving global socio-economic order.

Annex 1

The 2000 Millennium Development Goals by 2015:

- To eradicate extreme poverty and hunger
- To achieve universal primary education
- To promote gender equality and empower women
- To reduce child mortality
- To improve maternal health
- To combat HIV/AIDS, malaria and other diseases
- To ensure environmental sustainability
- To develop a global partnership for development

Note: Exclusion from full participation in the Knowledge Society and the Knowledge Economy has particular relevance for MDGs 1 and 8. Exclusion from knowledge constitutes a type of poverty; policies and strategies to assure inclusion require cooperation amongst member states on a global scale.
Bibliography and References


Connell Helen ED. *University Research Management. Meeting the Institutional Challenge*. OECD, Paris 2004


Huyer Sophie and Gunnar Westholm. *Gender Indicators in Science, Engineering and Technology*. UNESCO 2007


OECD. Redefining Tertiary Education. OECD, Paris 1999


The Times Higher Education Supplement. World University Rankings. THES, UK, 2007

UNESCO. Academic Across Borders: Opportunities and Options. Final Report, UNESCO 2005


UNESCO. Final Declaration. World Conference on Science. Budapest 1999

UNESCO. Future Directions for National Reviews of Science, Technology and Innovation in Developing Countries. Workshop Report, UNESCO 2003

UNESCO. Towards Knowledge Societies. UNESCO Paris 2005


DCUDublin paper
Introduction

Postgraduate education, and particularly doctoral education, has recently become a topic of huge importance to international communities. The impact of globalization worldwide, combined, in Europe, with developments in the Bologna Process, has heightened awareness of the potential benefits to a country of developing a supply chain of highly skilled personnel who are capable of playing a maximum part in drawing their country to an influential position in knowledge societies and economics. Singapore is such an example.

In formulating this paper, however, it became clear that reliable data worldwide on postgraduate and doctoral education was not available. Most figures give tertiary education numbers with no breakdown. Some countries, including some Western countries, do not collect this information. Even when figures are available, meaningful comparisons are difficult. What is, for instance, a full-time postgraduate student? What is a part-time student? While some countries expect a full-time postgraduate student to undertake their studies for twelve months of the year, others, notably the US, allow the enrolment of their students to lapse for the summer and allow re-enrolment in the autumn. Needless to say, this has knock-on effects on the time taken to complete a doctorate. Even the question of measuring the time taken to complete the degree is difficult. Some countries expect doctoral candidates to enrol for a master’s degree first, and only on completion of that, as in Brazil, enrol for a doctorate. Others begin with enrolment for a masters’ and then, if progress is sufficiently sound, after assessment, allow movement over to a doctorate. How then, does one measure time to completion? Hall, Nerad and Evans argue in a paper on the feasibility of international comparisons of PhD program times-to-degree and completion rates (private communication) that the best measure of total time elapsed to degree completion should be from first registration to completion. But what is completion? The date when approval is given for the doctorate, which is often at the end of the viva, or, as HEFCE (2005) recommends, when completion of all degree requirements are met? This can be anything up to a year later.

Although the issues of definition and data availability might appear somewhat nitpicking, they can cause major difficulties. There are expanding flows of international students who wish to
know what is available and under what conditions. Governments are looking for quality, efficiency and effectiveness in the delivery of their doctoral programmes. The “efficient” production of doctoral graduates is of great importance, particularly if public funding is involved.

Brazil is an excellent example in that completion time to a master’s degree used to be 34 months, and to a doctorate (which followed separately), 53 months. It thus used to take an average of over seven years to gain a doctorate. The cost was massive in that 40% masters and 50% doctoral students were supported by fellowships from public funds. The shorter period in the labour market also affected efficiency. Recently, however, changes have been made. Masters’ degrees are now normally of two years’ duration, and doctorates of four years’ duration.

Within the European Area of Research and Innovation, EU universities are developing a common framework. It is essential that countries are able to compare their doctoral education processes and outcomes. Some efforts are now being made to collect global PhD data: the Center for Innovation and Research in Graduate Education at the University of Washington is active in collecting such information, which, hopefully, will be publicly available during the coming year.

The need for information is urgent: it propels investment. Without detailed figures on postgraduate students and on postgraduate numbers in the labour force, it is difficult for governments to plan future needs and policies. The situation is in a constant state of flux, with more research needed on why people undertake postgraduate degrees, with what expectations. Is there, indeed, a saturation point? How can the present expansion be best managed?

This paper will consider, first, the impact of the global context on government policies, examining the range of policies established by individual countries in relation to postgraduate degrees. The internationalization and mobility of both doctoral students and holders of doctoral degrees is shown to be a critical problem. The role of universities, the organization and structure of doctoral training, and recent developments will then be considered. The final section will address curriculum development and the ways in which postgraduate degrees, and their delivery, are being shaped to meet the needs of the global society of the twenty-first century.

**The Global Context**

The impact of the forces of globalization on postgraduate education has been powerful. It is also, for some countries, proving potentially disastrous. The establishment of knowledge societies and economies requires a pool of highly skilled people. Labour markets worldwide have job openings aplenty for those with the requisite skills, and those openings are commonly seeking people at postgraduate and doctoral level. International companies, with global reach, now often move their employees around the globe, while the developed countries act as magnets for those few from less developed countries who are trained to doctoral level. Doctoral study can thus be seen as part of the globalization of world research, affected by the expansion of international trade and foreign investment, the integration of markets and the mobility of labour.

Hence doctoral education is inextricably bound up with human capital. In any country doctorate holders represent an important element in its human capital resources. They contribute considerably to scientific and technological development in their country and are a part of the science and engineering labour force worldwide. Those with doctorates in other fields offer valuable skills to any country in which they work.
Recent years have seen a steady growth in the number of doctorates awarded in almost every country. The highest numbers for registered students in 2003/5 (Powell and Green p.235, 2007) were in the US 837,000), China (165,000) and the UK (111,000). Japan (75,000), France (70,000) and India (65,000) followed. The highest number for doctorates awarded of those listed were US (42,000), Germany (23,000) UK (15,000) and India (13,000).

**Public Policy**

Indeed, the expansion of doctoral education has been built into public policy in several countries. Estonia, for instance, decided that the output of doctoral students did not match the needs of its society. The government considered that it was vital to link Higher Education with Research and Development Activity and its Innovation System. As a consequence they developed the Estonian Higher Education Strategy 2006-2015 which introduced a number of measures relating to doctoral students:

- the evaluation of research, measuring the effectiveness of doctoral studies
- more effective involvement in doctoral study of research institutions and other partners
- development of a concept for doctoral schools
- stimulation of the role and funding of doctoral schools
- inclusion of EU structural funds in the development of doctoral studies
- provision of social guarantees to doctoral students

A number of Nordic countries and Ireland plan to double the numbers of doctorate holders in the next few years. Finland, for instance, intends to produce 1,600 doctorates a year by 2008. Developing economies such as Mexico and South Africa are also expanding their numbers. In the Far East China, Korea, Singapore and Thailand have seen spectacular growth. Brazil aims to award 15,000 doctorates a years by 2010, a huge rise from the figure of 5,000 in 2000.

China is expanding at great momentum: in 2003 it had 188,000 doctoral graduates: it will be competing successfully with the West in offering postgraduate research in a very short time. India, similarly, has taken a decision to increase its numbers of doctoral candidates fivefold by 2015 from a base of 65,491 in 2005 (Powell and Green 2007).

The growth of masters’ degrees has likewise been a matter for public policy in a number of countries. Governments recognized that, in a global environment, a master’s degree could offer a highly suitable professional degree for those who chose to work outside academia. CAPES, the evaluation agency for the Brazilian government, for instance, proposed a “professional master’s degree” in 1996 to meet this need. By 2001, 64 such programmes had been accredited. This has been accompanied by a marked growth in graduates from all master’s programmes. In 2000, 18,000 masters’ degrees were awarded: in 2006, 29,761 masters’ degrees were awarded.

It is not uncommon for governments to refer explicitly to a relationship between doctoral awards made and economic growth. Powell and Green note that Brazil, India and Thailand talk explicitly about expenditure on doctoral education and their economy. Canada, Denmark and Finland list it as an objective. South Africa states that in the context of the policy objective of increasing spending on research and development from 0.7 to 1% of GDP, there is a need to increase spending on doctoral education by 3 or 4 times. Even so, there appears to be no straight correlation between R and D and the number of doctorates produced or registered in relation to population.
Recognition by governments that there is likely to be a close link between economic policies and science and technology policies and developments has affected decisions about education in general. A number of the world’s fastest developing countries have opted to set up a broad educational base. In 1998, it was clear that the tiger economies of the Far East - Hong Kong, Singapore, Korea and Taiwan - had achieved this. By this year, 2008, the impressive progress made by China and India in developing broad educational bases on which will be built the necessary growth of postgraduate degree holders is well recognized.

Political instability, on the other hand, has been shown to have deleterious consequences for knowledge production and for the pool of doctoral holders within a country. The work of universities is affected, and the damage to the research infrastructure is such that doctoral students will choose to go elsewhere, thus further weakening the capacity of the country. A number of African countries have been particularly adversely affected.

Governments are quite often involved in funding doctoral students either by grants to institutions and/or to students. Where a country has fixed a national target for doctoral students, money can be specifically set aside to meet it. In some countries, such as Australia, Canada and the Nordic states, doctoral education has no fees. In others the fees are sponsored by a range of stakeholders – research councils, institutions, employees and individuals. Loans are available in Thailand and Japan. In the UK, doctoral students, particularly those studying on a part-time basis, frequently fund themselves. One recent problem in the UK was that the public funding provided by government for doctoral candidates was set at such a low figure that suitable candidates (those with the very best degrees) were not able to afford to undertake research. A much more attractive option for those in the hard sciences was to move straight into banking and finance, at hugely higher rates of remuneration. Some improvement in the funding has now been made by government but the numbers of British residents undertaking doctoral degrees, particularly in engineering and the sciences, is unsatisfactorily low.

**Mobility and its Consequences**

One aspect of globalization that has radically affected postgraduate education is the increased capacity of individuals to move easily around the globe, relocating from their home countries to others in a constant ebb and flow. Even a generation ago it was considered advantageous for newly trained doctoral scientists and engineers to spend a period of time elsewhere, working with the latest equipment and contributing to well established research teams. The United States acted as the most powerful magnet but other developed countries attracted some of the postdoctoral students. It was not unusual for developing countries to pay the fees of students to undertake a doctorate abroad. Brazil is an interesting example of a country that has in fact developed its in-house training of doctoral students over the years. In 1985 50% of Brazilian doctoral holders graduated outside the country: by 1996 it had dropped to 30% and since then has been at 20%. Pakistan, for instance, pays for 250 doctoral students per year to study in Germany, France, Austria and China. Many other developing countries offer similar arrangements. However, agreements with the individuals concerned to return to their home countries are often put in place, so the flow of personnel is well managed.

One indicator of increased global mobility is the growth in international students. The UK, for instance, attracts significant numbers of students at first degree, masters and doctoral levels, from
a huge range of African countries. France is in fact the most popular country for Africans, with 34% of those studying abroad going to France. 75% of those from developing countries undertaking doctorates in France come from Africa. (c. 1,500 per year) and very many remain there after gaining their doctorate (Barre and Meyer, Scientific Diasporas, Paris: IRD (2003) p.1329.)

The movement of students from other areas of the world to study in the UK is just as marked. The numbers undertaking postgraduate research include for 2003/2004:

Americas – 6,230
East Asia and Pacific – 12,140
Middle East – 3,600
South Asia – 2595
Africa – 3,315

(Universities UK Patterns of Higher Education Institutions in the UK, p.31)

The anxiety is that while overseas training can greatly enhance the skills of the individual, in the expectation that these skills will then be used in the service of the country of residence, it might serve as a route out for the highly trained workforce, especially in many developing countries.

Even more worrying and potentially disastrous is the brain drain of qualified postgraduates, including doctorates, from the less developed countries where there are poor educational facilities (e.g. obsolete laboratories, out of date equipment) and such a poor research infrastructure that a highly trained scientist would have difficulty practising his craft. A Regional Report on Sub-Saharan Africa compiled by Johann Mouton (2007) examines the effect of brain drain on Africa.

He points out (p.24) that of the 150 million migrants in the world, over 50 million are from Africa. “The extent of human capital outflow from Africa has been described as staggering.” The following facts make sobering reading.

- up to 30% of African scientists are lost to the brain drain
- every year since 1990 at least 20,000 qualified people have left Africa
- 60% of doctors trained in Ghana in the 1980s have left, with 200 leaving in 2002 alone
- there are more African scientists and engineers in the US than in the whole of Africa
- about 50% of the “highly educated” Ghanaians have migrated
- between 33 and 55% of the highly educated people of Angola, Burundi, Kenya, Mauritius, Mozambique, Sierra Leone, Uganda and the United Republic of Tanzania live in OECD countries

Africa, although the worst continent affected, is by no means the only one. Some 100,000 professionally trained people leave India each year to take jobs in the US. As countries in Asia expand their numbers of graduates, so the numbers of those spirited away by the brain drain grow. In Latin America political unrest, combined with mismanagement of professionally trained people, has led to a huge brain drain. It is seen as “a massive and structural problem in Latin America”. 20-25% of the scientific community of Argentina have left for the US. Arab countries, too, are not immune. The movement there of young engineers and scientists tends to be to Europe, especially France, and to Canada. Egypt and Algeria appear to be affected the most.
Perhaps the most sobering statistics, from the point of view of the loss of human capital from the less developed countries to the more highly developed countries, is exemplified by the data published by the NSF (2007). This gives information on doctorate holders in the US science and engineering occupations, by place of birth. Only 62% were born in the US, so, significantly, almost 40% of the USA’s highest level labour force in the area is born abroad. The countries contributing frequently show marked growth in the two years considered: 1990 and 2000. Of particular interest is China, rising from 5,500 to 33,200, India, from 6,200 to 19,000 and smaller Asian countries, from 20,800 to 72,000. By comparison the EU contributed 8,000 doctoral holders in 1990 and 18,000 in 2000.

International mobility, though, ebbs and flows, and in recent years the shapes of the flows are constantly changing. Within Africa there is a marked inward flow to South Africa. In the Middle East, Jordan and Egypt both attract those from surrounding states. India and China have both inward and outward flows.

One growing phenomenon is that of “brain gain”. It is noticeable that as emerging countries become more prosperous, and are successful in establishing a modern, knowledge-based economy, a flow of doctoral holders is beginning to return. Ten years ago, this was true for Ireland, which attracted many skilled Irish back to their homeland. Now the brain gain is of Chinese, Indians and South Koreans. The research infrastructure is much improved: the opportunities are huge and the rates of remuneration are acceptable. It will be interesting to track this aspect of mobility. In ten years’ time will the US be short of expertise?

Unfortunately, Africa is unlikely to be able to take part in “brain gain” due to the current state of its human and infrastructural resources. Its losses of human capital have already been so overwhelming that the problem appears intractable. Unfortunately too, the immigration policies of the US, the UK, Canada and Australia do not help. They have the effect of attracting professionals to fill their own domestic skills gaps and boost their competitiveness. In 2003/4 there were over 13,000 African students engaged in postgraduate research in the UK; in 2005/6 at the University of Cape Coast, Ghana, the leading university, there were over 31,000 enrolled students, only 17 of whom were doctoral students, and Ghana is a stable African country. Those affected by instability suffer markedly more.

**The Brain Drain: is there a solution?**

Governments worldwide have been attempting to put urgent policies in place to stem or reverse the brain drain for a number of years. Tunisia provides one example. State support has been important in establishing a research and technology structure. In 2004 the Ministry set up the Scientific Research, Technology and Competency Department. The budget for grants was doubled between 2002 and 2005. One per cent of GDP goes into research, with special state supervision linked to the presidency. The academic profession has status with good salaries; promotion is linked to research results and publications. There is now growing production of research: in the last ten years the number of publications has almost tripled. Collaboration with international partners is encouraged, thus enhancing capacity building and increased sponsorship. The key seem to be stability, government support, sound professional standing, incentives, international collaboration and institutional capacity building.

Latin America has a number of examples of positive initiatives. Chile puts effort into the development of its human resources through a system of rapidly growing output of doctoral candidates, postdoctoral internships and agreements with foreign countries. It has two agencies for research: a Council which funds fundamental research, high level training and the creation of regional research centres, and another agency (CORFO) which deals with industrial interests and funds innovation, R and D in the regions, applied research and transfers of technology.
Mexico has a well established system, the “National Researchers System”, set up in 1986, which offers bonuses to researchers who are willing to undergo a regular evaluation of their research work, stressing the importance of proven results. This system has been highly successful and has greatly improved the number of publications in international journals. This is in marked contrast to Argentina, which has suffered “low salaries, continued political and economic instability, and frequent persecution and repression” (Latin American Regional Report). Needless to say, such conditions have exacerbated the flow of a large number of those with doctoral degrees out of the country.

**The Role of the Universities**

One can argue that the impact of government policy on the length, funding and delivery of doctoral education has been very powerful in a number of countries. To a large extent the institutions themselves act as the handmaidens of policy decisions. The definition of doctoral education and the academic structures in which the doctoral students work can be laid down by government. Estonia is an interesting example. They undertook a Phare project 2002-4 on ‘The Development of Measures to Strengthen Doctoral Studies in Estonia’. Doctoral education in that country is defined by government as follows:

“Doctoral education shall be the study of the highest stage of higher education during which a student acquires the knowledge and skills necessary for independent research development/or professional creative work.”

Guidelines for the shape of the training are specified;
“In doctoral studies research, development or professional creative work (the doctor’s thesis included) shall comprise at least 70% of the extent of studies determined by the curriculum. A doctor’s thesis shall be an independent treatise presenting a new solution of a significant problem in the field concerned/or a creative work”.

The characteristics of the academic staff who act as supervisors are also defined.

“100% of the subjects in the curriculum shall be instructed by the academic staff being active in research and development and having a doctorate in the fields concerned or having the qualification of an equivalent level/or being internationally acknowledged creative persons in the field of the arts”.

The specification of whom shall be allowed to supervise is not uncommon, though it may be the institutions themselves, rather than a government decree, which decides on the parameters. It is clear, however, that there is a need for rigour in assessing suitable academic staff to undertake doctoral supervision.

Within Europe consideration of the doctorate as an integral part of the Bologna Process has recently become important. The European University Association (EUA) undertook a study from 2005 to 2007 on “Doctoral Programmes in Europe’s Universities: Achievements and Challenges”, which was considered at the London meeting of Education Ministers in 2007. Considerable attention in the report is given to the role of universities.
A major topic is how best to establish organizational structures within the institution to provide high quality doctorate programmes, to make certain the doctoral candidate is not isolated and to put him/her in touch with those from other disciplines, and with community partners outside the university. One of the recent developments has been the emergence of doctoral or graduate schools. Estonia has developed groupings at two levels: the doctoral school, a national body linked to disciplines, and the graduate school set up within a faculty of the individual university.

The doctoral school is an interesting concept, well suited to a country of Estonia’s population size. Under the auspices of the Estonian National Development Plan for implementation of EU Structural Funds, eleven doctoral schools (2005-2008) have been established. The criteria states that “a Doctoral School is an academic consortia with at least three partners, of which at least one is an Estonian public university, the second is an Estonian public university or research and development institution or company, and the third is a foreign university, research and development institution or company”.

Estonian partners of the consortia have to have active doctoral studies, with at least ten defences of doctoral theses in the last three years, and they have to cover a major part of the specific field of study. The aim of the schools is to raise the quality of studies of the doctoral programme, to improve the supervision and strengthen the entire organization of the programme. It makes use of new methods and additional resources to organize cooperation between institutions and with industry, and to monitor and develop the research infrastructure.

An example is the Doctoral School of Behavioural and Health Sciences whose general objective is to offer “a structured, interdisciplinary and internationally oriented training programme”. The institution is created by the University of Tartu and Estonian Centre of Behavioural and Health Sciences in collaboration with the National Institute of Health Development and Tallinn University, private sector enterprises and the Finnish Graduate School of Psychology. The Doctoral School can offer very effective networking and can act as an integrating academic structure for its doctoral candidates.

The EUA report comments on the increasing trend towards the development of structured programmes and doctoral/graduate or research schools in addition to individual training. A mix of these models is frequently found. A Graduate School will normally include both doctoral candidates and Masters’ students. It ensures the delivery of general subjects such as research methods and transferable skills training. It organizes admission, courses and seminars, and is responsible for quality assurance. It can also provide career development opportunities and enhance opportunities for mobility, international collaboration and inter-institutional cooperation.

The role of the universities in overseeing access to doctoral and masters’ programmes is vital. In Europe the EUA report stresses the importance of maintaining flexibility in admissions: “there are good reasons for different access requirements in different institutions and for different programmes provided fairness, transparency and objectivity is ensured.” Equality of access remains a major concern, as important in the third cycle of Bologna (the doctoral cycle) as any other.

**Supervision and Quality Assurance**

In recent years there has been growing interest in supervision. It is common for guidelines to be set for supervisors. Most higher education institutions insist that a supervisor should
herself/himself have a doctorate or equivalent, and have experience in acting as a second supervisor at least twice before becoming the lead supervisor. In the UK all supervisors are expected to have undergone training in supervision, which is usually offered in-house. Some universities develop workload models to make sure that a supervisor dedicates sufficient time in support of each doctoral candidate. A number of countries, including China, expect a supervisor to have published in good quality journals in the particular field. The monitoring and assessment of doctoral researchers has also been growing in importance. In the UK, for instance, a Code of Practice was developed in 2004 by the UK Quality Assurance Agency specifically for research programmes.

Australia offers an interesting example of how a major policy change has affected the delivery of doctoral education. Ruth Neumann (2007) examines the effect of the decision to adopt an outcomes model of funding research education, set out in a White Paper on research and research training in 1999. The findings of a national study on doctoral education indicate that it has had a powerful effect on the core processes of academic work and the student research experience. The increase in students taking doctoral degrees has been marked, quadrupling from 9,298 in 1990 to 37,685 in 2004. At the same time the nature of doctoral studies has diversified. The previous long completion times and high attrition rates were both addressed, and an insistence on judging by measured outcomes and contribution to the Australian economy was instituted.

Universities were encouraged to make more careful student selection, monitor the students’ progress more closely, and make sure that the topics chosen were manageable. It was expected that the research field of the supervisor would be highly relevant to the doctoral candidate’s topic.

The reduction in overall funding by the federal government in the later 1990s brought about reductions in staffing levels, particularly in large research-intensive universities. The change from a budget allocation related to research student numbers to one based on outcomes and performance has thus reshaped the pattern of doctoral research.

The issue of quality assurance of postgraduate education has become of global interest. With this often goes a contractual agreement between the student and the university. In Estonia, for instance, an individual study plan for a doctorate has to be submitted which outlines the topic, notes the period of study, the competencies and transferable skills to be developed and the responsibilities of both student and supervisor. Each year the student has an Attestation Review which reports on the year’s research, the courses followed and other tasks undertaken. Rules are laid down for doctoral boards: in Estonia they comprise three permanent members and one or two internationally recognised researchers in the field. The defence, as in many European countries, is public, and is carried out in the form of an academic debate. In order to be awarded a doctorate the candidate must get a majority of votes in a secret ballot of the Board.

**Curriculum Change**

Postgraduate education and training in many countries is no longer narrowly concerned with researching on topic. It is common to find that doctoral studies include relevant courses which have to be passed before the award can be made. Research methods courses are often listed. So, too, is training in transferable skills. The importance for doctoral candidates of recognising and enhancing the skills they develop and acquire through research is emphasised. Training can be either within a university or offered nationally. In the UK the UKGRAD programmes and the UK Council on Graduate Education both offer training opportunities. Estonia expects its doctoral curricula to include:
- general subjects
- transferable skills development
- studies in core specialist subjects which include professional applied activities such as teaching, supervising research papers, reviewing/reading theses,
- publishing articles
- research and compilation of a doctoral thesis.

**Diversification of Doctorates**

The nature, form and purpose of postgraduate education has been undergoing a shift in the last fifteen years. One major change has been concerned with masters’ degrees. Although some masters’ degrees by research are still extant, many countries have been developing, in response to labour market pressures, masters’ degrees which are tailored to the needs of particular professions. Brazil is an example. In the UK the take up of professionally orientated masters’ degrees has been very marked and now represents a major sector of postgraduate education. The fees for students on these degrees are commonly either paid for by their employers or are self-funded. The mode of study can be either full-time or part-time. Within Europe, the Bologna Process has enabled such masters’ degrees to be established as part of the second cycle. It is expected that these will expand, partly as a response to the demand for ongoing career training throughout life, often referred to as lifelong learning.

The doctorate, also, has been responding to the pressures of the time. The traditional research doctorate is still offered by universities undertaking research. The thesis remains of central importance and is expected to offer an original contribution to the knowledge base of a discipline. Those who hope to follow an academic career tend to have traditional doctorates, except in specialist fields such as Business. A number of countries expect all their academics to hold a doctorate or equivalent e.g. China.

Another well established model of the PhD is the doctorate based on published work. This has been available in Europe since the nineteenth century. This doctorate is based on the cumulative publications of the candidate in book form or articles in scholarly and/or scientific journals. This doctorate is not common, and is most often seen in the case of distinguished individuals who are well on in their careers and whose work is clearly of doctoral standard.

A specific variation of the traditional doctorate developed for faculties and institutes of Art and Design is the “practice-based” doctorate. This is found in British institutions and is related to advanced work in areas such as music. Students have to be familiar with the theories and research methodologies of their topic and present a work of art or a performance in the place of a dissertation. That is accompanied by a text in which the candidate explains how the results have been generated. The new knowledge thus comes through practice.

Another model of the doctorate, entitled the “New Route PhD”, was developed by a consortium of some 34 universities in the UK, aimed at the international market. It is essentially a conventional PhD with embedded subject teaching throughout the process (www.newroute.phd.ac.uk). The taught components are frequently offered in the framework of related masters’ programmes and offer candidates the possibility of writing a master’s level dissertation instead of a doctoral thesis. This in itself offers useful flexibility for international
One variation which even more strongly relates to the international world is the joint doctorate. These are mainly awarded by universities in international networks. Doctoral students undertake their studies at several universities; they can travel between universities; and agreements are concluded by all the participating institutions clarifying funding issues and matters such as quality assurance, supervision arrangements and student mobility.

Perhaps the most successful of the new forms of doctorate has been that of the professional doctorate. A number of factors have favoured its development:
- the majority of doctoral holders now work outside academia
- a number of professionals wish to have doctoral achievement as a professional goal
- mid-career professionals wish to enhance their standing
- there is a growing appreciation of research skills in professional practice
- certain professional doctorates enable the bearer to obtain a licence to establish their own practice.

Professional doctorates were first developed in Canada (1894) but the main expansion has been since the mid 1980s, and particularly in the US, UK and Australia. The first professional doctorates appeared in the UK in 1992: now these number well over 200.

The Professional Doctorate has been defined by the UK Council for Graduate Education (2002) as “a programme of advanced study and research which, whilst satisfying the University criteria for the award of a doctorate, is designed to meet the specific needs of a professional group external to the university, and which develops the capability of individuals to work in their professional context.” Parity with the traditional doctorate is stressed: it should offer a substantial and original contribution to professional practice: the thesis should be some 50,000 words, the work of a scholarly, researching professional and the award is expected to offer an alternative means of “achieving the same advanced level of study and contribution “(UKCGE 2005) as the traditional doctorate. The recommendations of the EUA Bologna Seminar on Doctorates (2006) recognised that Professional Doctorates are doctorates of a special type focussed on embedding research into professional practice, and echoed the insistence on the importance of it presenting work of the same high level of quality as the traditional doctorate. The areas of study which have particularly burgeoned in terms of professional doctorates have been Health, Social Care and Health Science; Medicine; Psychology; Education; Business, Finance, Management and Tourism; and Engineering. Expansion of employment opportunities in many of these areas of study has been a feature of the 21st century employment market.

One other recent development should be commented on: the growth in provision and status of MBAs (Master of Business Administration), and DBAs (Doctor of Business Administration) worldwide. The Association of MBAs, for instance, has been able, over the last forty years, to establish international accreditation around the world. Accreditation is both judgmental and developmental. Schools are encouraged to learn from the best practice of other countries and to place the education they provide in a global context. The network of accredited, peer-reviewed programmes is considerable, spanning China, the Ukraine, New Zealand, Malaysia and South America as well as Europe. The capacity of the students, in terms of the status of their qualifications is thus enhanced internationally.

**The Digital World**
The trends and issues rehearsed in this paper have to be set in the context of a digital world. New technologies offer new opportunities for learning, teaching and research. The global higher education marketplace requires all institutions of higher education to become more outward looking, more involved in collaboration and partnerships, and more responsive to the needs of stakeholders. The delivery of postgraduate degrees by electronic means has mushroomed, particularly for masters’ degrees in professional subjects. For-profit companies, using a mix of online learning and face-to-face tutorials, have become an established part of the higher education scene. The level of connectivity of various countries is, however, crucial, and many of the Sub-Saharan African countries do not have sufficient IT infrastructure to be able to access e-learning effectively.

The mobility of postgraduate students constantly grows. Not only do more students move physically to study in other countries, they study “free of place”, using e-mail, the internet, and internal phones to access learning materials. As yet this is usually linked to traditional campuses but in time the trend may well be towards “virtual mobility”. The use of digital technology is now routine for the young in developed countries. The digital academic environment is likely to become more and more present and important with time.

Conclusions

The issues are stark. Within the developed world and the emerging countries, postgraduate students can hope to have easy access to the materials of their research, in quality assured conditions, with good supervision and governments who recognize and support their work.

The “tiger” countries in the Far East, China, India, several in Latin America, Arab States, South Africa all recognize the importance of establishing a highly skilled workforce which will be capable of positioning the country to take part in the global knowledge society and economy. They are preparing themselves for the future and expect, within a few years, to take their rightful place.

The recommendations that can be drawn from this paper are clear.

- Higher education institutions flourish under conditions of political and economic stability. If such conditions can be achieved then postgraduate education can expand
- Investment by government in a broad education base provides a sound platform for the development of a strong postgraduate sector
- Consistent government and industry investment in research supports the growth of postgraduate studies
- Government policies which support higher education and the development of highly skilled human capital will boost postgraduate education
- Evaluation and monitoring of postgraduate programmes is valuable
- Quality assurance arrangements can be usefully established by government and/or universities
- Institutional rigour should be used in assessing suitable supervisors and choosing suitable candidates for doctoral programmes
• Academic staff should have sufficient knowledge to supervise good quality doctorates
• Staff should be encouraged to publish in international journals, and take part in international collaborative research programmes
• The time and expertise needed for academic staff to carry out their supervisory studies effectively should be recognized in their contracts.

Key questions, though, arise from a consideration of the trends and issues. Our imperfect knowledge of the data on postgraduates, and its impact, only serves to heighten the urgency of the questions:
• What place do advanced degrees hold in the developing world?
• How far can the diaspora be seen as a realistic solution to the brain drain?
• Why is Asia apparently able to move much more rapidly than Africa in establishing a sound knowledge base?
• The phenomenon of the growth in demand for taught masters’ and doctorate degrees is now delivering an increasing supply. Can these be used effectively in developing countries? What are the pros and cons for ‘sending’ and ‘receiving’ countries?
• Should they instead be viewed as individuals’ attempts to make a personal ‘gain’ in a global and increasingly mobile labour market?
• What future has e- and open learning? Can it offer a ‘mass’ solution to demand?
• Is a new market being established for those with advanced degrees where the actual substance of the advanced degree is of declining importance?
• Is the branding of global higher education institutions exemplified by league table exacerbating the knowledge gap between the developed/aspiring countries and those whose impoverishment forbids them taking an effective part in the knowledge society?

The overwhelming issue is that of human capital. Every country should have the opportunity to set its sights on becoming part of the knowledge society. Each country needs, then, to train and retain a group of highly skilled holders of postgraduate degrees. The difficulties of those governments, whose investment in their own human capital results in losses to other, wealthier countries, needs to be acknowledged. The challenge for other countries, developed and developing, is to aid those who are caught in a downward spiral of loss of human capital, lack of resources generated by that human capital, and lack of research infrastructure. Only at the highest international level, with the will of the developed and developing countries, can the threat of ever greater global inequalities be recognised and remedied.

**Select Bibliography**


Elizabeth Balbachevsky (2008), private communication.


The Challenge of Establishing World-Class Universities

Jamil Salmi

“I do believe that it is necessary to stress that for most countries today, human resource development and human capital formation are either extremely important, absolutely vital, or a matter of life and death. In the case of Malaysia…we think it is a matter of life or death.”

Abdullah Bin Ahmed Badawi, Prime Minister of Malaysia (Opening Speech of the 2006 Meeting of the Association of Commonwealth Universities)

1. Introduction

In September 2005, the new world ranking published by the *Times Higher Education Supplement* was received like a bomb shell in Malaysia when it showed the country’s top two universities slipping by almost 100 places compared to the previous year. Notwithstanding the fact that the big drop was mostly due to a change in the ranking methodology, the news was so traumatic that there were widespread calls for the establishment of a Royal Commission of Inquiry to investigate the matter. This strong reaction was not out of character in a nation whose current Ninth Development Plan aims at shaping the transformation of the country into a knowledge-based economy with emphasis on the important contribution of the university sector.

Preoccupations about university rankings reflect the general recognition that economic growth and global competitiveness are increasingly driven by knowledge, and that universities can play a key role in that context. Indeed, rapid advances in science and technology across a wide range of areas from information and communication technologies (ICTs) to biotechnology to new materials provide great potential for countries to accelerate and strengthen their economic development. The application of knowledge results in more efficient ways of producing goods and services and delivering them more effectively and at lower costs to a greater number of people.

---

1 Jamil Salmi is the Tertiary Education Coordinator of the World Bank. The findings, interpretations, and conclusions expressed in this article are entirely those of the author and should not be attributed in any manner to the World Bank, the members of its Board of Executive Directors or the countries they represent. The author wishes to express his gratitude to Roberta Bassett for her excellent research assistance. The author would also like to thank all the colleagues who kindly reviewed earlier drafts and offered invaluable suggestions, in particular Vladimir Briller, Marguerite Clarke, Richard Hopper, Isak Froumin, Nadia Kulikova, Sam Mikhail, William Saint and Alenoush Saroyan. Full responsibility for errors and misinterpretations remains, however, with the author.
The 1999 World Development Report on the Knowledge Economy (World Bank, 1999) proposed an analytical framework emphasizing the complementary role of four key strategic dimensions to guide countries in the transition to a knowledge-based economy: an appropriate economic and institutional regime, a strong human capital base, a dynamic information infrastructure and an efficient national innovation system.

Tertiary education is central to all four pillars of this framework, but its role is particularly crucial in support of building a strong human capital base and contributing to an efficient national innovation system. Tertiary education helps countries build globally competitive economies by developing a skilled, productive and flexible labor force and by creating, applying and spreading new ideas and technologies. A recent global study of patent generation has shown, for example, that universities and research institutes, rather than firms, drive scientific advances in biotechnology (Cookson, 2007). Tertiary education institutions can also play a vital role in their local and regional economy (Yusuf and Nabeshima, 2007).

Within the tertiary education system, research universities play a critical role in training the professionals, scientists and researchers needed by the economy and generating new knowledge in support of the national innovation system (World Bank, 2002). In this context, an increasingly pressing priority of many governments is to make sure that their top universities are actually operating at the cutting edge of intellectual and scientific development.

The main objective of this paper, therefore, is to explore what are the challenges involved in setting up globally competitive universities, also called “world-class”, “elite”, or “flagship” universities, that will be expected to compete effectively with the best of the best. The paper starts by attempting to construct an operational definition of a world-class university. It then outlines possible strategies and pathways for establishing such universities.

2. What does it mean to be a world-class university?

In the past decade, the term “world-class university” has become a catch phrase for not simply improving the quality of learning and research in tertiary education but more importantly for developing the capacity to compete in the global tertiary education marketplace through the acquisition and creation of advanced knowledge. With students looking to attend the best possible institution they can afford, often regardless of national borders, and governments keen on maximizing the returns on their investments on universities, global standing is becoming an increasingly important concern for institutions around the world (Williams and Van Dyke, 2007). The paradox of the world-class university, however, as Altbach has succinctly and accurately observed, is that “everyone wants one, no one knows what it is, and no one knows how to get one” (Altbach, 2004).

To become a member of the exclusive group of world-class university is not something that one achieves by self-declaration. This is an elite status conferred by the outside
world on the basis of international recognition. Until recently, the process involved a subjective qualification based mostly on reputation. For example, Ivy League universities in the United States, such as Harvard, Yale or Cornell, Oxford and Cambridge in the United Kingdom, and Tokyo University have traditionally been counted among the exclusive group of elite universities. But no direct and rigorous measure was available to substantiate their superior status in terms of training of graduates, research output, and technology transfer. Even the higher salaries captured by their graduates could be interpreted as a signaling proxy as much as the true value of their education.

With the proliferation of league tables in the past few years, however, more systematic ways of identifying and classifying world-class universities have appeared (IHEP, 2007). While most of the 45 of the best known rankings purport to categorize universities within a given country, there have also been attempts to establish international rankings. The two most comprehensive international rankings, allowing for broad benchmark comparisons of institutions across national borders, are those prepared by the Times Higher Education Supplement (THES) and Shanghai’s Jiao Tong University (SJTU).

To compare the international stature of institutions, these league tables are constructed by using objective and/or subjective data obtained from the universities themselves or from the public domain. The THES ranking selects the top 200 universities in the world. First presented in 2004, the methodology for this ranking focuses most heavily on international reputation, combining subjective inputs such as peer reviews and employer recruiting surveys and quantitative data, including the numbers of international students and faculty, and the influence of the faculty, as represented by research citations. Operating since 2003, SJTU uses a methodology that focuses on seemingly more objective indicators, such as the academic and research performance of faculty, alumni, and staff. The measures evaluated include publications, citations, and exclusive international awards, such as Nobel prizes and Fields medals. Shanghai’s ranking is also presented slightly differently: the top 100 institutions are listed in ranked ordinal. The remaining 400 institutions are listed by clusters of approximately 50 and 100 (101-152, 153-202, 203-300, etc.), and alphabetically within those clusters. Table 1 shows the results of the 2006 world rankings.
Table 1 - Top Twenty Universities in World Rankings  
(2006)

<table>
<thead>
<tr>
<th>Rank</th>
<th>THES</th>
<th>Rank</th>
<th>SJTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Harvard University</td>
<td>1</td>
<td>Harvard University</td>
</tr>
<tr>
<td>2</td>
<td>University of Cambridge</td>
<td>2</td>
<td>University of Cambridge</td>
</tr>
<tr>
<td>3</td>
<td>University of Oxford</td>
<td>3</td>
<td>Stanford University</td>
</tr>
<tr>
<td>4</td>
<td>Massachusetts Institute of Technology</td>
<td>4</td>
<td>University of California - Berkeley</td>
</tr>
<tr>
<td>4</td>
<td>Yale University</td>
<td>5</td>
<td>Massachusetts Institute of Technology</td>
</tr>
<tr>
<td>6</td>
<td>Stanford University</td>
<td>6</td>
<td>California Institute of Technology</td>
</tr>
<tr>
<td>7</td>
<td>California Institute of Technology, Berkeley</td>
<td>7</td>
<td>Columbia University</td>
</tr>
<tr>
<td>8</td>
<td>University of California, Berkeley</td>
<td>8</td>
<td>Princeton University</td>
</tr>
<tr>
<td>9</td>
<td>Imperial College London</td>
<td>9</td>
<td>University of Chicago</td>
</tr>
<tr>
<td>10</td>
<td>Princeton University</td>
<td>10</td>
<td>University of Oxford</td>
</tr>
<tr>
<td>11</td>
<td>University of Chicago</td>
<td>11</td>
<td>Yale University</td>
</tr>
<tr>
<td>12</td>
<td>Columbia University</td>
<td>12</td>
<td>Cornell University</td>
</tr>
<tr>
<td>13</td>
<td>Duke University</td>
<td>13</td>
<td>University of California - San Diego</td>
</tr>
<tr>
<td>14</td>
<td>Beijing University</td>
<td>14</td>
<td>University of California - Los Angeles</td>
</tr>
<tr>
<td>15</td>
<td>Cornell University</td>
<td>15</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>16</td>
<td>Australian National University</td>
<td>16</td>
<td>University of Wisconsin - Madison</td>
</tr>
<tr>
<td>17</td>
<td>London School of Economics and Political Science</td>
<td>17</td>
<td>University of Washington - Seattle</td>
</tr>
<tr>
<td>18</td>
<td>Ecole Normale Supérieure (Paris)</td>
<td>18</td>
<td>University of California – San Francisco</td>
</tr>
<tr>
<td>19</td>
<td>National University of Singapore</td>
<td>19</td>
<td>Johns Hopkins University</td>
</tr>
<tr>
<td>19</td>
<td>Tokyo University</td>
<td>20</td>
<td>Tokyo University</td>
</tr>
</tbody>
</table>

Notwithstanding the serious methodological limitations of any ranking exercise (Salmi and Saroyan, 2007), world-class universities are recognized in part for their superior outputs. They produce well-qualified graduates who are in high demand on the labor market, they conduct leading-edge research published in top scientific journals and, in the case of science and technology oriented institutions, they contribute to technical innovations through patents and licenses.

As illustrated by Table 1, most universities recognized as world-class originate from a very small number of countries, mostly Western. In fact, Tokyo University is the only non US and non UK university among the top 20 in the SJTU ranking. If one considers that there are between 30 and 50 world-class universities in total, according to the SJTU ranking they all come from a small group of 8 North American and Western European countries, Japan being again the only exception (see Annex 1). THES has a slightly wider range of countries of origin among the top 50 universities (11 countries), including Singapore, Hong Kong and New Zealand besides the usual North American and Western European nations (see Annex 2).
The few scholars who have attempted to define what world-class universities have that regular universities do not possess have identified a number of basic features such as highly qualified faculty, excellence in research, quality teaching, high levels of government as well as non-government sources of funding, international and highly talented students, academic freedom, well-defined autonomous governance structures, and well-equipped facilities for teaching, research, administration, and, often, student life (Altbach, 2004; Khoon, 2005; Niland, 2000, 2007). Recent collaborative research on this theme between UK and Chinese universities (Alden and Lin, 2004) has resulted in an even longer list of key attributes, ranging from the international reputation of the university to more abstract concepts, such as the university’s contribution to society, both very difficult to measure in an objective manner (see Annex 3).

In an attempt to propose a more manageable definition of world-class universities, this policy note makes the case that the superior results of these institutions (highly sought graduates, leading edge research, technology transfer) can essentially be attributed to three complementary sets of factors that can be found at play among most top universities, namely (i) a high concentration of talent (faculty and students), (ii) abundant resources to offer a rich learning environment and conduct advanced research, and (iii) favorable governance features that encourage strategic vision, innovation and flexibility, and enable institutions to make decisions and manage resources without being encumbered by bureaucracy.

2.1 Concentration of Talent. The first and perhaps foremost determinant of excellence is the presence of a critical mass of top students and outstanding faculty. World-class universities are able to select the best students and attract the most qualified professors and researchers.

In the sciences, being at the right university—the one where the most state-of-the-art research is being done in the best equipped labs by the most visible scientists—is extremely important. George Stigler describes this as a snowballing process, where an outstanding scientist gets funded to do exciting research, attracts other faculty, then the best students—until a critical mass is formed that has an irresistible appeal to any young person entering the field. Mihaly Csikszentmihalyi (Flow and the Psychology of Discovery and Invention)

This has always been the hallmark of Ivy League universities in the US or Oxford and Cambridge in the UK. And it is also a feature of the newer world-class universities, such as the National University of Singapore or Tsing Hua University in China.

An important factor in that respect is the ability and the privilege of these universities to select the most academically qualified students. For example, Beijing University, China’s top institution of higher learning, admits the 50 best students of each province every year. Harvard University, the California Institute of Technology, MIT and Yale University are the most selective universities in the United States as measured by the average SAT scores of their incoming undergraduate students.
One corollary of this observation is that tertiary education institutions in countries where there is little internal mobility of students and faculty are at risk of academic in-breeding. Indeed, universities that rely principally on their own undergraduates to continue into graduate programs or that hire many of their own graduates to join the teaching staff are not likely to be at the leading edge of intellectual development.

It is also difficult to maintain high selectivity in institutions with rapidly growing student enrollment and fairly open admission policies. The huge size of the leading universities of Latin American countries such as México or Argentina—the Autonomous University of México (UNAM) has 137,000 students and the University of Buenos Aires (UAB) has 183,000—is certainly a major factor in explaining why these universities have failed to enter the top league, despite having a few excellent departments and research centers which are undoubtedly world-class. At the other extreme, Beijing University maintained its overall enrollment at less than 20,000 until the early 2000s and even today has no more than 30,000 students.

World-class universities also tend to have a high proportion of carefully selected graduate students, as illustrated by Table 2 below, reflecting their strength in research.

<table>
<thead>
<tr>
<th>University</th>
<th>Undergraduate Students</th>
<th>Graduate Students</th>
<th>Share of Graduate Students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard</td>
<td>7,002</td>
<td>10,094</td>
<td>59</td>
</tr>
<tr>
<td>Stanford</td>
<td>6,442</td>
<td>11,325</td>
<td>64</td>
</tr>
<tr>
<td>MIT</td>
<td>4,066</td>
<td>6,140</td>
<td>60</td>
</tr>
<tr>
<td>Oxford</td>
<td>11,106</td>
<td>6,601</td>
<td>37</td>
</tr>
<tr>
<td>Cambridge</td>
<td>12,284</td>
<td>6,649</td>
<td>35</td>
</tr>
<tr>
<td>LSE</td>
<td>4,254</td>
<td>4,386</td>
<td>51</td>
</tr>
<tr>
<td>Beijing</td>
<td>14,662</td>
<td>16,666</td>
<td>53</td>
</tr>
<tr>
<td>Tokyo</td>
<td>15,466</td>
<td>12,676</td>
<td>45</td>
</tr>
</tbody>
</table>

4 2005-2006 http://www.ox.ac.uk/aboutoxford/annualreview/app2ii.shtml
6 Kahn and Malingre (2007)
7 2006-2007 Beijing University Admission Office
8 2004 http://www.u-tokyo.ac.jp/stu04/e08_02_e.html

In many cases, world-class universities have students and faculty who are not exclusively from the country where the university operates. This enables them to attract the most talented people, no matter where they come from, and open themselves to new ideas and approaches. As a matter of fact, the international dimension is becoming increasingly important in determining the configuration of these elite institutions. Both the THES
world ranking of universities and Newsweek's 2006 ranking of Global Universities weighted their rankings to favor institutions with strong international components. Harvard University, for instance, has a student population that is 19 percent international; Stanford has 21 percent; and Columbia, 23 percent. At Cambridge University, 18 percent of the students are not from the UK or EU countries. The US universities ranked at the top of the global surveys also show sizeable proportions of foreign academic staff. For instance, the proportion of international faculty at Harvard, including medical academic staff, is approximately 30 percent. Similarly, the proportion of foreign academics at Oxford and Cambridge is 36 and 33 percent, respectively. By contrast, in France only 7 percent of all researchers are foreign academics. Unquestionably the world's best universities enroll and employ large numbers of foreign students and faculty in their search for the most talented.

The new patterns of knowledge generation and sharing, documented by Gibbons (1994) in his path breaking work on the shift towards a problem-based mode of production of knowledge, are characterized by the growing importance of international knowledge networks. In this respect, the fact that world-class universities succeed in mobilizing a broadly diverse national and international academic staff is likely to maximize these institutions’ knowledge networking capacity.

2.2 Abundant Resources. Abundance of resources is the second element that characterizes most world-class universities, in response to the huge costs involved in running a complex research–intensive university. These universities have four main sources of financing: government budget funding for operational expenditures and research, contract research from public organizations and private firms, the financial returns generated by endowments and gifts, and tuition fees.

In Western Europe, public funding is by far the principal source of finance for teaching and research, although the top UK universities have some endowment funds and top-up fees have been introduced in recent years. In Asia, the National University of Singapore, which became a private corporation in 2006, has been the most successful institution in terms of endowment funding. It has managed to build up a sizeable portfolio of 774 million dollars through effective fund-raising, making it richer than any British university after Cambridge and Oxford. The US and to a lesser extent Japan have thriving private research universities. The sound financial base of the top US universities is due to two factors. First they have large endowments (Table 3) which provide budget security, comfort, and the ability to focus on institutional priorities over medium and long-term. Unlike many universities in Europe, they are not at the short-term mercy of government funding sources or the whims of changing political priorities.
Table 3 – Comparison of US and UK Endowment Levels

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>28,916</td>
<td>Cambridge</td>
<td>4,000</td>
</tr>
<tr>
<td>Yale University</td>
<td>18,031</td>
<td>Oxford</td>
<td>4,000</td>
</tr>
<tr>
<td>Stanford University</td>
<td>14,085</td>
<td>Edinburgh</td>
<td>3,200</td>
</tr>
<tr>
<td>University of Texas</td>
<td>13,235</td>
<td>Glasgow</td>
<td>2,400</td>
</tr>
<tr>
<td>Princeton University</td>
<td>13,045</td>
<td>King’s</td>
<td>2,000</td>
</tr>
</tbody>
</table>


Second they benefit from the success of their faculty in competing for government research funding. At least two-thirds of the research funding captured by the top US research universities comes from public sources. The top ranking Canadian universities in international league tables are also the top universities in research income (Salmi and Saroyan, 2007).

These abundant resources create a virtuous circle that allows the concerned institutions to attract even more top professors and researchers, as is often the case among elite universities in the US. Among the 20 top ranked universities in the US, only two -- Michigan State and Berkeley-- are public. Annual surveys of salaries indicate that private universities in the US pay their professors 30 percent more than public universities on average (CHE, 2007).

2.3 **Appropriate Governance.** The third dimension concerns the overall regulatory framework, the competitive environment and the degree of academic and managerial autonomy that universities enjoy. In a recent survey report, The Economist (2005) referred to the tertiary education system in the United States as “the best in the world” and associated this success not only to its wealth but to its relative independence from the state, the competitive spirit that encompasses every aspect of it, and its ability to make academic work and product relevant and useful to society. The article observed that the environment in which universities operate fosters competitiveness, unrestrained scientific inquiry, critical thinking, innovation, and creativity. Moreover, institutions that have complete autonomy are also more flexible because they are not bound by cumbersome bureaucracies and externally imposed standards, notwithstanding the legitimate accountability mechanisms which bind them. As a result, they can manage their resources with agility and quickly respond to the demands of a rapidly changing global market.

The autonomy elements outlined above are necessary though not sufficient to establish and maintain world-class universities. Other crucial governance features are needed such as inspiring and persistent leaders, a strong strategic vision of where the institution is going, a philosophy of success and excellence, and a culture of constant reflection, organizational learning and change.
The cases of Germany and France are interesting to discuss in this context. Even though they are among the top economies in the world, their universities are hardly recognized as elite institutions. In 2006, the best French university was ranked 46th by SJTU and the first German university was ranked 51. Benchmarking them against the three sets of criteria proposed above shows clearly why universities of these two countries do not shine in international rankings. To begin with, there is very little screening of students entering tertiary education. In most programs, having graduated from secondary school is the only prerequisite to admission (with the exception of the highly selective French engineering and professional “Grandes Ecoles”).

Another important factor is the absolute lack of competition among universities. All universities are treated equally in terms of budget and assignment of personnel, making it quite difficult if not impossible to mobilize the necessary resources to set up centers of excellence with a large concentration of top researchers. For both Germany and France, per student public expenditures on tertiary education are slightly below the OECD average, and half the level of US universities. When the first SJTU ranking was published at the end of 2003, the daily paper *Le Monde* ran an article on January 24, 2004 entitled “The great misery of French universities.” The university presidents and union leaders interviewed for that article argued that the lack of budgetary resources and the rigidities associated with their utilization was one of the main explanations for the demise of the French university system.

Finally, in both countries, universities are government entities constrained by civil service employment rules and rigid management controls. This means, in particular, that it is not possible to pay higher salaries to reward the more productive academics or attract world-class researchers and to invest in leading edge research facilities. For example, the salaries of French business administration professors are 20 percent lower than those of their US counterparts (Egide, 2007).

In the case of France, two additional structural features complicate the situation further. First, according to Orivel (2004), one of the main reasons why French universities are not internationally competitive is the dual structure of the tertiary education system. The top engineering and professional schools (“Grandes Ecoles”) recruit the best students through very competitive national examinations, while the universities receive the bulk of secondary school graduates who have automatic access. Since the *Grandes Ecoles* are predominantly elite professionally-oriented schools, they conduct very little research; as a result, most doctoral students in the research universities do not come from the most academically qualified student groups. This is quite unlike the practice in more competitive university systems in the US, the UK or Japan. Second, the strict separation between the research institutes affiliated with the National Centre for Scientific Research (CNRS) and the research departments of the universities results in the dispersion of human and financial resources. The strength of world-class universities is that research is integrated at all levels.
Box 1 – Watching the Rankings: the French Experience

Each year, when Shanghai's Jiao Tong University publishes its world ranking of universities, France responds with a mix of indignation and consternation. Indignation, because French educators complain that the system favours “Anglo-Saxon” universities and makes no allowance for France's unusual division into elite grandes écoles and mass universities. Consternation, because not a single French university makes it into the world's top 40. Its best-placed institution—Paris VI—manages only 45th place.


2.4 Alignment of Success Factors. Finally, it is important to stress that it is the combination of these three sets of features, concentration of talent / abundant funding / appropriate governance, that makes the difference. The dynamic interaction among these three groups of factors is the distinguishing characteristic of high-ranking universities (Figure 1).
Figure 1 - Characteristics of a World-Class University
Alignment of Key Factors

Source: Elaborated by Jamil Salmi
Just investing money in an institution or making it very selective in terms of student admission is not sufficient to build a world-class university, as illustrated by the case of Brazil’s top university, the University of São Paulo (USP). Brazil is the 5th most populated nation and the 10th largest economy on the planet, it has world class companies such as Embraer and Aracruz Celulose, but there is no Brazilian university among the 100 top ranked universities in the world.

How is it that USP, the country’s foremost university, does not make it into the top group in the international rankings, despite having some of the features of world-class universities? When it was created in 1934, USP leaders made it a point to hire only prominent professors from all over Europe (Schwartzman, 2005). Today it is the most selective institution in Brazil, it has the highest number of top-rated graduate programs and it produces every year more Ph.D. graduates than any US university. At the same time, its ability to manage its resources is constrained by rigid civil service regulations, even though it is the richest university in the country. It has very few linkages with the international research community and only 3 percent of its graduate students are from outside Brazil. The university is very inward-looking: most students come from the State of São Paulo and most professors are USP graduates. Foreign professors cannot be recruited by law and it is forbidden to write a doctoral dissertation in a language other than Portuguese. According to Schwartzman (2005), the key missing element is the absence of a vision of excellence to challenge the status quo and transform the university. This lack of strategic vision can be observed as much at the national and state government level as well as at the helm of the university itself.

3. Paths to Transformation

Infosys and Wipro are great role models. I cannot say that I will be as great as them, but today India is producing more entrepreneurs than any other country. …

As chairman of Jet Airways, I definitely would like to see India able to create a world-class airline. We should not be inferior to Singapore and Cathay Pacific in terms of reliability and standards of service. We will hire the best brains, the best talent. We aim to be second to none.

Jet Airways Founder and Chairman, Naresh Goyal
Newsweek interview, 16 July 2007

Two complementary perspectives need to be considered in examining how to establish new world-class universities. The first dimension, of an external nature, concerns the role of government at the national / state / provincial level and the resources that can be made available to enhance the stature of institutions. The second dimension is internal. It has to do with the individual institutions themselves and the necessary evolution and steps they need to take to elevate themselves to world-class institutions.

3.1 Role of Government

In the past, the role of government in nurturing the growth of world-class universities was not a critical factor. The history of the Ivy Leagues universities in the US reveals that, by and large, they grew to prominence as a result of incremental progress rather than
deliberate government intervention. Similarly, Oxford and Cambridge evolved over the centuries of their own volition, with public funding, but with considerable autonomy in terms of governance, definition of mission and direction. Today, however, it is unlikely that a world-class university can be rapidly created without a favorable policy environment and direct public initiative and support, if only because of the high costs involved in setting up advanced research facilities and capacities.

Altbach (2004) reports a late nineteenth century conversation between John D. Rockefeller and the then President of Harvard University, Charles W. Eliot, where the former asked the latter what would be the cost of establishing a world-class university. Eliot’s answer was “50 million dollars and 200 years.” But in fact the University of Chicago was able, at the beginning of the twentieth century, to achieve this goal within twenty years, at a price tag of less than 100 million dollars. Professor Altbach’s estimate puts the cost of creating a world-class university today at around 500 million dollars.

In that respect, one of the key questions that national authorities need to ponder is how many world-class universities their country can afford and to make sure that investment for that purpose will not cost at the expense of investing in other priority areas. Adopting the goal of building world-class universities, however, does not imply that all universities in a given country can or should aspire to be of international standing. A more attainable goal could rather be to set up an integrated system of teaching, research, and technology-oriented institutions that feed into and support a few centers of excellence that focus on value-added fields and chosen areas of comparative advantage, and can eventually evolve into world-class institutions. Even in the richest OECD countries, only a handful of institutions achieve the kind of concentration of top researchers, professors, students, facilities, and resources that world class universities enjoy as pre-conditions for excellence in scholarship. In the US, for example, of about 5,000 tertiary education institutions no more than 30 universities are among the best in the world; in the UK less than 10 universities and in Japan no more than 5 belong to this category.

The next relevant set of questions is about the most effective approach to achieve the proposed goal of becoming world-class. International experience shows that three basic strategies can be followed to establish world-class universities. First, the government could consider upgrading a small number of existing universities that have the potential of excelling (picking winners). A second strategy would consist in encouraging a number of existing institutions to merge and transform into a new university that would achieve the type of synergies corresponding to a world-class institution (hybrid formula). A third approach would be to create new universities from scratch (clean slate approach). Each one of these approaches presents advantages and drawbacks.

3.1.1 Upgrading Existing Institutions. One of the main benefits of this first approach is that the costs can be significantly less than building new institutions from scratch. This is the strategy followed by China since the early 1980s.
Box 2 - Tertiary Education Reform in China

The Chinese government has been eager to develop a tertiary education system of international stature and recent reform efforts reflect this goal. In 1993, the Government adopted the *Guidelines of China's Educational Reform and Development*, which called among other things to build up 100 key universities with high quality courses of specialized studies. In 1998, then President Jiang Zemin announced the goal of building world-class universities, with a clear focus on the advancement of science and technology. Since then, state financing for tertiary education has more than doubled, reaching $10.4 billion in 2003 or almost 1% of GDP. Several top universities received grants to improve institutional quality under the 985 Project, which reflects a conscious strategy to concentrate resources on a few institutions with the greatest potential for success at the international level.

Chinese universities are currently spending millions of dollars to recruit internationally renowned, foreign-trained Chinese and Chinese-American scholars and build state of the art research laboratories, particularly in science and technology. The strategy is to surround their star faculty with the brightest students, give them academic leeway and provide competitive salary and additional non-salary incentives. With low labor costs, structural upgrades are achievable at a tenth of the cost in industrial countries. All this is happening in the context of a new regime of financial autonomy, significant cost sharing, and intense efforts to develop management expertise at all levels of university leadership.


But this approach is unlikely to succeed in countries where the governance structure and arrangements that prevented the emergence of world-class universities in the first place are not drastically revised. A comparison of the experiences of Malaysia and Singapore can serve to illustrate this point. Since Singapore was initially one of the provinces of the Malaysian Kingdom during the first few years following independence from the British, contrasting the stories of the University of Malaya and of the National University of Singapore (NUS) can be quite instructive given that they departed from common cultural and colonial origins. At independence, the University of Malaya operated as a two-campus university, one in Kuala Lumpur and the other in Singapore. The former evolved into the flagship University of Malaya from the very beginning, and the other became the University of Singapore (before merging with Nanyang University in 1980 to create the National University of Singapore). Today, NUS functions as a true world-class university (ranked 19th by the 2006 THES) while the University of Malaya struggles as a second-tier research university (ranked 192nd).

In examining the different evolutionary paths of these two institutions, several factor appear to be constraining the University of Malaya’s capacity to improve and innovate as the NUS has. The first one is the affirmative action policy implemented by the Malaysian government in favor of the children of the Malay majority population (*Bumiputras*), which prevents the university from being selective in its student admissions and targeting only the best and brightest in the country. In addition the Ministry of Higher Education places a 5 percent cap on the number of foreign undergraduate students that public universities can enroll, while the proportion of foreign students at NUS is 20 percent at undergraduate level and 43 percent at graduate level.
Second, NUS is able to mobilize almost twice as many financial resources as the University of Malaya ($205 million annual budget vs. $118 million) through cost-sharing, investment revenue, fund raising and government resources. As a result, the annual per student expenditures were $6,300 and $4,053, respectively. Third, in Malaysia, civil service regulations and a rigid financial framework make it difficult, if not impossible, to provide competitive compensation packages to attract the most competent professors and researchers, including foreign faculty. NUS, on the contrary, is free to bring in top researchers and professors from all over the world, pay a global market rate for them, and provide performance incentives to stimulate competition and to retain the best and the brightest. As a matter of fact, a good number of Malaysia’s top researchers have been recruited by NUS.

Box 3 - Do Governments Care about Higher Education?
Lessons from the Soccer Field

For the sake of argument, let us consider the following: how would Barcelona’s professional soccer team (FC Barcelona) perform if it were constrained by all the rules that burden our universities? What would happen if all the players were civil servants with salaries determined by a government ministry and if they were allowed to continue playing every day regardless of their performance during official games and behavior during practice sessions? What would happen if the club’s income was not linked to its game results, if it could not pay higher salaries to attract the best players in the world or if it could not quickly get rid of the under-performing players? What would happen if team strategy and tactics were decided by the government rather than by the coach? Wouldn’t such an approach risk relegating the Barcelona team to the sidelines of mediocrity? If we agree that such an approach is unwise for a sports team, why do we allow our universities to operate under such conditions? This suggests that, deep down, we care more about soccer than about the education of our children.

Professor Sala I Martín teaches at Colombia University in the US and Universidad Pompeu Fabra in Spain

Governments need therefore to construct a supportive external policy environment and create the financing and regulatory conditions that will enable and encourage their universities to compete at an international level on a host of indicators on which the quality and relevance of university education are commonly assessed (see box 3) including reputation and awards, foreign students and faculty, and research grants. One way to facilitate this is to grant management autonomy to the universities, another is provide performance-based financing, and yet another one is to put in place favorable taxation systems that will allow companies and philanthropists to make tax-free donations to universities. The US and India provide good examples of this practice.
3.1.2 Merging Existing Institutions. The second possible approach consists of promoting mergers among existing institutions. France and Denmark are two countries that have diligently embarked on this path in recent years. In France, individual universities and “grandes écoles” are exploring the feasibility of merging on a regional basis. In Denmark, the government has set up an Innovation Fund that would reward, among other things, the combination of similar institutions. In China, too, a number of mergers have taken place to consolidate existing institutions. For example, Beijing Medical University merged with Beijing University in 2000; similarly in Shanghai Fudan University merged with a medical university, and Zhejiang University was created out of the merger of five universities. In 2004, in the UK, the Victoria University of Manchester (VUM) and the University of Manchester Institute of Science and Technology (UMIST) merged, creating the largest university in the UK, with the purposefully stated goal of being “top 25 by 2015” (http://www.manchester.ac.uk/research/about/strategy/). Also in the UK recently, Cardiff University and South Wales School of Medicine have merged as a deliberate step to establish a world-class university in Wales. These mergers to create larger universities are a clear response to the fact that international rankings compare the number of research publications of institutions independently from the size of their student enrollment.

The great advantage of mergers is that they can result in stronger institutions able to capitalize on the new synergies that their combined human and financial resources may generate. But mergers can work both ways, carrying also the risk of aggregating problems instead of resolving them. In the case of France, for example, mergers would augment the critical mass of researchers and bring about a higher place in the SJTU ranking that favors research output. But they would not address the fundamental limitations that French universities suffer from, namely the inability to select incoming students, a weak financial basis, rigid governance arrangements and outdated management practices. The Danish case has greater chances of success since the push for mergers is taking place within the context of an overall governance reform aiming at transforming all universities in the country into more flexible and dynamic institutions (see Annex 4).

The second danger associated with mergers is that the newly consolidated institution could be dysfunctional because of clashing institutional cultures. It has become clear, for example, that the previously mentioned merger between VUM and UMIST has not been as successful as expected. Currently acknowledging a £30 million budget deficit and the likelihood of up to 400 jobs lost on the campus (Qureshi, 2007), the University of Manchester has had immediate experience with the complexities of merging—including duplication of staff and curricular offerings, and the short-term absorption of labor contracts and institutional debt. In addition, the newly formed institution, with its commitment to achieving world-class status, invested heavily in hiring ‘superstar’ academic staff and supplying them with correspondingly ‘superstar’ facilities. This exacerbating further the staffing debt that the institution inherited with the merging of the distinct and separate institutional staffs—and their individual cultures, norms, and labor contracts—into the one university. It remains to be seen how Manchester will address these financial, cultural and inter-personal obstacles while simultaneously maintaining is quest for world-class status.
Thus, one of the main challenges when undertaking a merger is to create a shared academic culture and transformation vision among all constituting units (faculties, schools, departments) and bring internal coherence to the newly-established institution. In many cases, the leaders of merged universities are severely constrained by the high level of independence claimed by constituting units. The new university established by merging existing universities may carry the legacy of the old brands which in many cases can be an obstacle in attracting excellent students and staff.

3.1.3 Creating New Institutions. In countries where institutional habits, cumbersome governance structures and bureaucratic management practices prevent traditional universities from being innovative, creating new institutions maybe the best approach, provided that it is possible to staff them with people not influenced by the culture of the traditional universities and provided that financial resources are not a constraint. New institutions can emerge from the private sector or governments can allow new public institutions to operate under a more favorable regulatory framework. Kazakhstan is a country intent on following this path as it seeks to make its economy less dependent on oil and more competitive overall. The Government of Kazakhstan has decided to set up a new International University in Astana. The plan is that this university will follow a highly innovative multidisciplinary curriculum in cooperation with leading international universities.

One of the earlier success stories in that respect was the establishment of the Indian Institutes of Technology which, in the past decades, have gradually risen to world-class status (Box 4).
A third promising example is the creation of the Paris School of Economics (PSE) in February 2007, modeled after the London School of Economics. This initiative combines elements of mergers with the creation of a brand new type of institution in the French context (Kahn and Malingre, 2007). Co-sponsored by 4 *grandes écoles*, the Paris I University (Sorbonne) and the National Research Institute (CNRS), PSE will operate as a

---

**Box 4 - The Indian Institutes of Technology: a Success Story**

Soon after becoming independent, India placed science and technology high on its economic development agenda. The first Indian Institute of Technology (IIT) was established in 1951 at Kharagpur, (West Bengal) with support from UNESCO, based on the MIT model. The Second IIT was established at Bombay (now Mumbai) in 1958 with assistance from the Soviet Union through UNESCO. In 1959, IIT Madras (now Chennai) was established with assistance from Germany; and IIT Kanpur with help from a consortium of US Universities. British industry and the UK Government supported the establishment of IIT Delhi in 1961. In 1994, IIT Guwahati was brought under the IIT family as the seventh such institution.

While taking advantage of experience and best practices in industrial countries, India ensured that the “institutions represented India’s urges and India’s future in making” (Prime Minister Nehru, 1956). The Indian Parliament designated them as “Institutes of National Importance” - publicly funded institutions enjoying maximum academic and managerial freedom- offering programs of high quality and relevance in engineering, technology, applied sciences and management at undergraduate, masters, and doctorate level and offering their own degrees. Student admissions are made strictly according to merit through a highly competitive common entrance test.

Today, the IITs attract the best students interested in a career in engineering and applied sciences. With 4,000 new students selected out of 250,000 applicants every year, the IITs are more selective than the top US Ivy League schools. Several IIT alumni occupy the highest positions of responsibility in education, research, business and innovation in several parts of the world. In 2005, The Times Higher Education Supplement ranked the IITs as globally third best engineering school after MIT and the University of California, Berkeley.

The main strength of the IITs has been their sustained ability to attract the best students and turn them into “creative engineers” or “engineer entrepreneurs”. Initially IITs were criticized for their contribution to the brain- drain as about 40% of the graduates went abroad. Today, with the opening and fast growth of the Indian economy, this “weakness” is turning into a big strength for international cooperation and investments. Much of the success of Bangalore, for instance, is attributed to the phenomenon of reverse brain drain.

Elaborated by Shashi Shrivastava and Jamil Salmi

---

[18]
private foundation regrouping the best economics departments from the participating institutions. Its initial funding comes not only from the State and the Region but also from private companies and a US foundation. Unlike traditional French universities, PSE will be highly selective in terms of incoming students. Many of the core professors will come from the most prestigious universities in the world.

The creation of new institutions may also have the side benefit of stimulating existing ones into becoming more responsive to a more competitive environment. Examples from many parts of the world showing that the emergence of high quality private universities in countries with a predominantly public tertiary education sector has provoked the public universities into becoming more strategically focused. In Uruguay, the venerable University of the Republic—which had exercised a monopoly over tertiary education in the country for 150 years—started a strategic planning process and considered establishing postgraduate programs for the first time only after being confronted in the mid-1990s with competition from newly established private universities. Similarly, in Russia, the creation of the Higher School of Economics and of the Moscow School of Social and Economic Sciences in the 1990s pressured the department of economics at the State University of Moscow to revamp its curriculum and get more actively involved in international exchanges.

To maintain the favorable conditions that were instrumental for the establishment of a new world-class institution requires constant vigilance, as the growing faculty shortage faced by the Indian Institutes of Technology illustrates. India’s economic success has translated into a much larger income gap than in the past between the Institutes and industry. As a result, fewer promising graduates seek an academic career (Neelakantan, 2007). Without the autonomy to raise salaries and offer more competitive employment packages, the IITs are at risk of losing their competitive edge. The younger Indian Institutes of Management face the same hurdle in their quest for world-class status (Bradshaw, 2007).

3.1.4 Evaluation of these Approaches. Table 4 attempts to summarize the positive and negative aspects linked to each approach (upgrading, merging or creating new institutions). It should be noted that these generic approaches are not mutually incompatible and that countries may pursue a combination of strategies based on these models.
Table 4 – Costs and Benefits of Strategic Approaches for Establishing World-Class Universities

<table>
<thead>
<tr>
<th>Approach Conditions</th>
<th>Upgrading Existing Institutions</th>
<th>Merging Existing Institutions</th>
<th>Creation New Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to Attract Talent</td>
<td>Difficult to renew staff and change the brand to attract top students</td>
<td>Opportunity to change the leadership and to attract new staff. Existing staff may resist</td>
<td>Opportunity to select the best (staff and students). Difficulties in recruiting top students to “unknown” institution. Need to build up research and teaching traditions.</td>
</tr>
<tr>
<td>Costs</td>
<td>Less expensive</td>
<td>Neutral</td>
<td>More expensive</td>
</tr>
<tr>
<td>Governance</td>
<td>Difficult to change mode of operation within same regulatory framework</td>
<td>More likely to work with different legal status than existing institutions</td>
<td>Opportunity to create appropriate framework</td>
</tr>
<tr>
<td>Institutional Culture</td>
<td>Difficult to transform from within</td>
<td>May be difficult to create a new identity out of distinct institutional cultures</td>
<td>Opportunity to create culture of excellence</td>
</tr>
<tr>
<td>Change Management</td>
<td>Major consultation and communication campaign with all stakeholders</td>
<td>“Normative” approach to educate all stakeholders about expected norms and institutional culture</td>
<td>“Environmental adaptive” approach to communicate and socially market the new institution</td>
</tr>
</tbody>
</table>

Countries deciding to establish world-class universities by upgrading or merging existing ones must also choose an appropriate methodology to select among existing universities. Governments need to assess the degree to which they want to manage the process in a centralized way, cherry-picking institutions where centers of excellence could be established or boosted, or whether it would be preferable to steer the tertiary education system at a distance, relying on broad strategic orientations and financial incentives to entice the most dynamic universities to transform themselves.

International experience suggests that, in medium to large-size countries, the latter approach could be more effective in the long run. The China ‘211’ project, the Brain 21 program in South Korea, the German “Initiative for Excellence” and the Millenium Institutes recently established in Chile are examples of how countries stimulate the
creation or consolidation of research centers of excellence. Annex 5 describes the most recent “excellence” initiatives implemented throughout the world.

**Box 5 – The German “Initiative for Excellence”**

In January 2004, the federal Ministry of Education and Research launched a national competition to identify about 10 universities with the potential of becoming elite universities. Extra funding will be provided under three windows: to entire institutions aiming to become world-class universities, to centers of excellence with international recognition, and to graduate schools intent of strengthening the quality of their programs.

After initial resistance from the States jealous of their traditional authority in the area of tertiary education funding, a compromise was reached and a joint commission was established, with representatives of the German Research Foundation and the Science Council.

In January 2006, the Commission selected 10 universities among 27 candidates, 41 proposals for centers of excellence among 157 submissions, and 39 graduate schools among 135 proposals. The majority of selected universities (7 out of 10) are located in two states (Baden-Württemberg and Bavaria) and only 10 percent of the winning centers of excellence are in the humanities and social sciences. Most of the selected graduate schools have a strong multi-disciplinary focus. A total of 2.3 billion dollars of additional funding will be made available to support the winning proposals over a period of four years.

Source: Kehm (2006)

Finally, it is important to stress that the national government is not the only major player when it comes to facilitating the establishment of world-class institutions. In large countries and/or federal systems, regional or provincial authorities can play a critical role, as illustrated by the active role played by the Californian authorities in designing and establishing an integrated system of tertiary education in the Sixties, or more recently in establishing special Innovation Funds to strengthen linkages between the research universities and the regional economy. Similarly, the Shanghai municipality has given active support to its leading universities in the past ten years as part of its accelerated development policies and, in the State of Nuevo Léon in Mexico, the business community has also contributed substantially to the success of the Technology Institute of Monterrey.
3.2 Strategic Dimensions at the Institutional Level

3.2.1 Leadership and Strategic Vision. The establishment of a world-class university requires, above all, a strong leadership, a bold vision of the institution’s mission and goals, and a clearly articulated strategic plan to translate the vision into concrete programs and targets.

Recent research on university leadership suggests that, in the case of top research universities, the best performing institutions have leaders who combine good managerial skills and a successful research career (Goodall, 2006). To be able to develop an appropriate vision for the future of the university and to implement this vision in an effective manner, the university president / vice-chancellor / rector needs to fully understand the core agenda of the institution and to be able to apply the vision with the necessary operational skills.

A crucial element of the vision is the discovery of a niche market towards which the institution will seek to build and maximize its comparative advantage. In that respect, it is important to underline that a university, even a world-class university, most likely cannot excel in all areas. Harvard University, widely recognized as the number one institution in the world, is not the best ranked university in all disciplines. Its strengths are especially noted in economics, medical sciences, education, political science, law, business studies, English and history.

Part of the vision-setting will therefore consist in delineating the main areas where the institution wishes and has the potential to operate at the forefront. Some world-class institutions, such as the Indian Institutes of Technology, have specialized in a few engineering disciplines. The London School of Economics is best known for outstanding scholarship in economics, sociology, political science and anthropology. Even though Swiss universities do not reach the top 50, the Lausanne Hotel Management School (Ecole Hôtelière de Lausanne), the only European School accredited by the New England Association of Schools and Colleges, is considered to be one of the best in the world together with the University of Nevada and Cornell University’s Schools of Hotel Administration.

In identifying a distinct area of emphasis, institutions aspiring to become world-class universities do not need to replicate what the current top universities do. They can innovate in many different ways. They can for instance choose a radically different approach to organize the curriculum and pedagogy of the institution, as the newly established Olin College in Massachusetts and LimKokWing University College of Creative Technology in Malaysia have attempted in the field of engineering and technology. Or they may opt for linking their transformation to shifting regional or local development opportunities, as illustrated by the example of Clemson University in South Carolina (see box 6).
Box 6 – Developing a New Vision at Clemson University

Clemson University, a land grant university in South Carolina traditionally focused on agriculture and mechanical engineering, has undertaken a radical transformation process in recent years. Based on an in-depth analysis of the conversion of South Carolina into one of the leading automotive regions in the US, Clemson University formed a strategic partnership with BMW with the aim of recreating itself as the premier automotive and motor sports research and education university. Its new vision statement specifically mentions the target of becoming one of the nation’s top-20 public universities (as measured by US News and World Report), up from rank 74 four years ago and 34 in 2005.


3.2.2 Sequencing. The time dimension is an important aspect that needs also to be factored into the strategic plan of the aspiring world-class university. Developing a culture of excellence does not happen from one day to the other. Proper sequencing of interventions and careful balance between the quantitative objectives are required in order to avoid experiencing the kinds of growing pains that some of the Chinese universities have encountered (Box 7).
Box 7 – Obstacles to the Transformation of Chinese Universities

There are signs that China’s plans to achieve world-class stature are meeting some obstacles. First is the concern that Chinese universities have expanded too quickly at the expense of maintaining quality. Second, the academic culture that demands quick results hampers innovative and long-term research efforts. While the “publish or perish” culture is strong in the United States, such pressures are often balanced with the recognition of the value of creativity and originality. Lack of undergraduate students with a strong foundation in science and technology is the third weakness. Without well-trained students entering the graduate programs, first-class faculty and laboratories will be underutilized. Fourthly, lack of academic freedom is a serious issue in China. Faculty and students are encouraged to question government policies or engage in debates on pressing issues in only a limited way, with some disincentive for creative thinking.

Finally, China’s vision of world class universities focuses almost exclusively on factors such as increased publications in international journals, up-to-date laboratories, more buildings, star professors and additional funding (Mohrman 2003). Yet the vision is largely imitative rather than creative. Ruth Simmons (2003), president of Brown University, emphasizes the importance of other factors: “the bedrock of university quality in the United States is peer review, a system in which standards are set by leaders of the field and those leaders are themselves challenged and judged by this process”. Simmons goes on to note that “universities promote the capacity of scholars to develop original work that is not immediately applicable or useful. Great universities are not only useful in their own time but in preparing for future times. What allows a great university to do that is as little interference from the state as possible. The role of the state is to provide resources but to give wide latitude to universities’ leaders to decide how scholarship is to advance.” Their universities might do better to focus on building world-class departments, institutes or schools, rather than trying to excel on all accounts (Altbach 2003).

It is important to stress that vision development and strategic planning are not a one-time exercise. In a highly competitive environment, the more successful organizations in both business and academia are those that are relentless in challenging themselves in the pursuit of better and more effective ways of responding to client needs. With constant replenishment of intellectual capital, performance is never static in the best universities. The most successful institutions are not content with relying on past accomplishments but always aspire to be among the best in the world and, internally, they create an atmosphere of competitiveness that lets them do just that.

Not even the most famous universities are immune from the necessity to evolve and adapt to changing circumstances, as Oxford University’s failed attempt at financial reform illustrates. In recent years, the University’s central authorities have faced the need for additional resources to be able to continue hiring internationally renowned professors and
researchers in an increasingly competitive market for academics. But they have been constrained by traditional governance arrangements whereby the bulk of Oxford University’s wealth is controlled by the individual colleges. One aspect of the reform proposals submitted in 2006 by John Hood, the new Vice-Chancellor recruited from New Zealand, was to give more power over these resources to the University’s central leadership, while also allowing for increased financial oversight by outsiders. But the reform was rejected by Oxford’s academic community (The Times, 2006).

3.2.3 Internationalization Dimension. One way of accelerating the transformation into a world-class university is to use the internationalization card effectively. An influx of top foreign students can be instrumental in upgrading the academic level of the student population and enriching the quality of the learning experience through the multi-cultural dimension. In this regard, the capacity to offer programs in a foreign language, especially English, can be a powerful attraction factor. Among the 100 top universities according to the SJTU ranking, 11 come from non native English speaking countries where some of the graduate programs are offered in English (Denmark, Finland, Israel, the Netherlands, Norway, Sweden, and Switzerland).

As discussed earlier, the ability to attract foreign professors and researchers is also an important determinant of excellence. Universities need to be able to offer incentives including flexible remuneration and employment conditions to bring on board, on a short or medium term basis, top academics from other countries. These individuals can help upgrade existing departments or establish graduate programs and research centers in new areas of competitive advantage. In cases where it is difficult to attract foreign faculty on a full-time basis, the university can start by bringing leading foreign scholars on a temporary basis.

To facilitate the contribution of foreign scholars, a number of aspiring world-class universities have formed fruitful partnerships with top universities in industrial countries. This was the case of the Indian Institutes of Technology in the early years of their establishment (see box 4). More recently, the National University of Singapore, one of the emerging world-class universities, has relied most on strategic alliances, for example with MIT, Harvard, Duke, Johns Hopkins University, Eindhoven University of Technology in the Netherlands, the Australian National University and Tsinghua University in China, to mention only the better known partner institutions.

Attracting leading scholars from the diaspora is another internationalization strategy that a few universities in India and China have implemented with success. Beijing University, for example, has hired hundreds of academics of Chinese origin. As part of its human resource strategy, the university closely monitors good Chinese scholars abroad and creates favorable conditions for their return.
A diaspora is a network of people coming from a same home country and living abroad. A successful diaspora network is characterized by the following three elements: (i) members of the diaspora are talented and show strong intrinsic motivation; (ii) they are involved in project implementation in their home country and serve as connectors, catalysts or vectors for projects development in the home country; (iii) its efficiency, continuity and development over time are based on concrete activities with measurable outcomes.

In most cases, diasporas and expatriate networks emerge spontaneously. However, government interventions can still be relevant to help develop or structure such initiatives. The first condition home countries need to fulfill in order to take advantage of these expatriate talents is to recognize them as an opportunity to develop a knowledge-based economy. Strategies to leverage diasporas vary with the country conditions on one hand, and the diaspora’s characteristics on the other hand. Nevertheless, a common and critical element to efficiently use expatriate talent is the existence of solid institutions.

An excellent illustration of efficient search diaspora network is GlobalScot, a network of high powered Scots from all over the world who use their expertise and influence as antennae, bridges, and springboards to generate projects in Scotland. Launched in 2002, this network has proven extremely attractive and efficient with 850 influential businesspeople participating in 2005, and therefore contributing to Scotland’s economic development strategy. Chile Global and Mexico Talent Abroad Network took GlobalScot as an inspiring model and are on the way to successfully adapt it to their respective specificities.

Diasporas as search networks can be compared to and learn from alumni networks. Therefore, there is a great opportunity for tertiary institutions to participate in the diaspora network process. Universities have indeed a potent comparative advantage to follow distinctive alumni, identify leaders abroad, and gradually build a search network. This is how successful diasporas begin.

Source: Kuznetsov, 2006
factor in enhancing institutional reputation. Needless to say that institutions functioning in English are more likely to engender such success.

In some cases, universities have also found it useful to hire a foreign professional to lead the institution through the proposed transformation process. South Korea, the UK and Australia are examples of countries where this has happened in recent years. Of course, this approach is not always well accepted. Bringing an outsider to lead a flagship university can hurt national sensitivities and not many countries have shown the disposition to undertake international recruitment searches to fill the highest university positions. But this is one of the ways in which institutions can challenge themselves into “thinking outside the box” and embracing a change management mindset.

In the case of science and technology oriented universities, the ability to attract research contracts from foreign firms and multinational corporations is a good measure of how the scientific standing of rising universities is recognized by companies. In recent years, a few Chinese and Indian universities have received important research contracts from North American and European firms, sometimes at the expense of universities in the countries of origin of the companies (Yusuf and Nabeshima, 2007).

3.2.4 Summary Checklist. The following critical questions need to be reviewed to guide the quest towards establishing world-class universities:

At the National Level
- How many world class universities are desirable and affordable?
- What strategy would work best in the country context: upgrading of existing institutions, merger of existing institutions, or creation of new institutions?
- What should be the selection process (in the first or second case)?
- How will the transformation be financed?
- What are the governance and management arrangements that must be put in place to support this transformation?
- What will be government’s role in this process?

At the Institutional Level
- Does the institution have a winning leadership team?
- What is the overall vision and what are the specific goals that the university is seeking to achieve?
- In what niche(s) will it pursue excellence in teaching and research?
- How will the internationalization of the university be achieved?
- What is the likely cost of the proposed qualitative leap and how is it going to be funded?
- How will success be measured? What outcome indicators and accountability mechanisms will be used?


4. Conclusion

Good is the enemy of great.
Jim Collins

The highest ranked universities are the ones that make significant contributions to the advancement of knowledge through research, teach with the most innovative curricula and pedagogical methods under most conducive circumstances, make research an integral component of undergraduate teaching, and produce graduates who stand out because of their success in intensely competitive arenas during their education and, more importantly, after graduation. It is these concrete accomplishments and the international reputation associated with these sustained achievements that make these institutions world class.

There is no universal recipe or magic formula for “making” a world-class university. National contexts and institutional set-ups vary widely. Countries must therefore choose, among the various possible pathways, a strategy that plays to its former strengths and present resources. But international experience provides a few lessons regarding the key features of such universities (high concentration of talent, abundance of resources, and flexible governance arrangements) and successful approaches to move in that direction, from upgrading or merging existing institutions to creating new institutions altogether.

Under any scenario, building a world-class university does not happen overnight. No matter how much money can be thrown at the endeavor, it is unrealistic to expect instant results. Creating a culture of excellence and achieving high quality outputs take many years.

Furthermore, the transformation of the university system cannot take place in isolation. The long term vision for creating world class universities, and its implementation, should be closely articulated with (i) the country’s overall economic and social development strategy, (ii) ongoing changes and planned reforms at the lower levels of the education system, and (iii) plans for the development of other types of tertiary education institutions in order to build an integrated system of teaching, research, and technology-oriented institutions.

In that respect, it is worth observing that, while world-class institutions are commonly equated with top research universities, there are also world-class tertiary education institutions which are neither research-focused nor operate as universities strictu sensu. The UK Open University, for example, is widely recognized as the premier distance education institution in the world, and yet it does not make the international rankings. Conestoga College in Ontario is ranked as the best community college in Canada, and in Germany the Fachhochschulen of Mannheim and Bremen have an outstanding reputation. Two European countries that have achieved remarkable progress as emerging knowledge economies, Finland and Ireland, do not boast any university among the top 50 in the world, but they have excellent technology-focused institutions. Even among universities, international rankings clearly favor research-intensive universities at the cost of excluding first-rate institutions that enroll primarily undergraduate students. As countries embark on the task of establishing world-class universities, they may also want to
consider the desirability of creating, besides research universities, excellent alternative institutions to meet the wide range of education and training needs that the tertiary education system is expected to satisfy.
Annex 1 - THES 2006 Country Ranking

<table>
<thead>
<tr>
<th>Country Ranking</th>
<th>Country</th>
<th>International Rank of Top University in Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>UK</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>China</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Australia</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>France</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>Japan</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>Singapore</td>
<td>19</td>
</tr>
<tr>
<td>8</td>
<td>Canada</td>
<td>21</td>
</tr>
<tr>
<td>9</td>
<td>Switzerland</td>
<td>24</td>
</tr>
<tr>
<td>10</td>
<td>Hong Kong</td>
<td>33</td>
</tr>
<tr>
<td>11</td>
<td>New Zealand</td>
<td>46</td>
</tr>
<tr>
<td>12</td>
<td>Denmark</td>
<td>54</td>
</tr>
<tr>
<td>13</td>
<td>India</td>
<td>57</td>
</tr>
<tr>
<td>14</td>
<td>Germany</td>
<td>58</td>
</tr>
<tr>
<td>15</td>
<td>South Korea</td>
<td>63</td>
</tr>
<tr>
<td>16</td>
<td>Netherlands</td>
<td>67</td>
</tr>
<tr>
<td>17</td>
<td>Mexico</td>
<td>74</td>
</tr>
<tr>
<td>18</td>
<td>Belgium</td>
<td>76</td>
</tr>
<tr>
<td>19</td>
<td>Ireland</td>
<td>78</td>
</tr>
<tr>
<td>20</td>
<td>Austria</td>
<td>87</td>
</tr>
<tr>
<td>21</td>
<td>Russia</td>
<td>93</td>
</tr>
<tr>
<td>22</td>
<td>Taiwan</td>
<td>108</td>
</tr>
<tr>
<td>23</td>
<td>Finland</td>
<td>116</td>
</tr>
<tr>
<td>24</td>
<td>Israel</td>
<td>119</td>
</tr>
<tr>
<td>25</td>
<td>Sweden</td>
<td>122</td>
</tr>
<tr>
<td>26</td>
<td>Thailand</td>
<td>161</td>
</tr>
<tr>
<td>27</td>
<td>Norway</td>
<td>177</td>
</tr>
<tr>
<td>28</td>
<td>Malaysia</td>
<td>185</td>
</tr>
<tr>
<td>29</td>
<td>Spain</td>
<td>190</td>
</tr>
<tr>
<td>30</td>
<td>Italy</td>
<td>197</td>
</tr>
</tbody>
</table>
### Annex 2 – Shanghai Jiao Tong University 2006 Country Ranking

<table>
<thead>
<tr>
<th>Country Ranking</th>
<th>Country</th>
<th>Rank of Top University in Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>USA</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>UK</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Canada</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>Switzerland</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>France</td>
<td>39</td>
</tr>
<tr>
<td>7</td>
<td>Netherlands</td>
<td>42</td>
</tr>
<tr>
<td>8</td>
<td>Denmark</td>
<td>46</td>
</tr>
<tr>
<td>9</td>
<td>Sweden</td>
<td>53</td>
</tr>
<tr>
<td>10</td>
<td>Germany</td>
<td>53</td>
</tr>
<tr>
<td>11</td>
<td>Australia</td>
<td>57</td>
</tr>
<tr>
<td>12</td>
<td>Israel</td>
<td>64</td>
</tr>
<tr>
<td>13</td>
<td>Norway</td>
<td>69</td>
</tr>
<tr>
<td>14</td>
<td>Finland</td>
<td>73</td>
</tr>
<tr>
<td>15</td>
<td>Russia</td>
<td>76</td>
</tr>
<tr>
<td>17</td>
<td>Singapore, Belgium, Italy, Brazil</td>
<td>102 – 150</td>
</tr>
<tr>
<td>21</td>
<td>Taiwan, South Korea, China, Spain, Argentina, Mexico</td>
<td>151 – 202</td>
</tr>
<tr>
<td>25</td>
<td>Czech Republic, Hong Kong, Ireland, Greece, New Zealand, South Africa</td>
<td>203 – 304</td>
</tr>
<tr>
<td>33</td>
<td>Hungary, India, Poland, Egypt</td>
<td>305 – 402</td>
</tr>
<tr>
<td>36</td>
<td>Chile, Turkey, Portugal, Slovenia</td>
<td>403 – 510</td>
</tr>
</tbody>
</table>

*Source: 2007 Institute of Higher Education, Shanghai Jiao Tong University*
Annex 3  Key Characteristics of World Class Universities

A world class university:

- has an international reputation for its research
- has an international reputation for its teaching
- has a number of research stars and world leaders in their fields
- is recognised not only by other world class universities, e.g., US Ivy League, but also outside the world of higher education
- has a number of world class departments (i.e., not necessarily all)
- identifies and builds on its research strengths and has a distinctive reputation and focus, i.e. its ‘lead’ subjects
- generates innovative ideas and produces basic and applied research in abundance
- produces path breaking research output recognised by peers and prizes, e.g., Nobel Prize Winners
- attracts the most able students and produces the best graduates
- can attract and retain the best staff
- can recruit staff and students from an international market
- attracts a high proportion of postgraduate students, both taught and research
- attracts a high proportion of students from overseas
- operates within a global market and is international in many activities, e.g., research links, student and staff exchanges, throughput of visitors of international standing
- has a very sound financial base
- receives large endowment capital and income
- has diversified sources of income, e.g., government, private companies sector, research income, overseas student fees
- provides a high quality and supportive research and educational environment for both its staff and students, e.g., high quality buildings and facilities/high quality campus
- has a first class management team with strategic vision and implementation plans
- produces graduates who end up in positions of influence and/or power, i.e., movers and shakers, e.g., Prime Ministers and Presidents
- often has a long history of superior achievement, e.g., Oxford and Cambridge in the UK and Harvard in the USA
- makes a big contribution to society and our times
- continually benchmarks with top universities and departments worldwide
- has the confidence to set its own agenda

Source:  Alden and Lin (2004)
Annex 4 - Higher Education Reform in Denmark: The University Act of 2003

Through reforms in four key areas—institutional autonomy, institutional leadership, quality assurance and internationalization--, Denmark is in the process of transforming its university system into an independent sector contributing to broad national success by answering more effectively to the evolving labor market that it serves.

Institutional autonomy: Increased independence for Denmark’s universities.

- As of 2003, all universities in Denmark are considered independent subsidiaries of the Ministry of Science, Technology, and Innovation.
- Funds are distributed based on established rates for research and on per student enrollments and completion, to establish more objective criteria for funding. Institutions are allowed to use their complete subsidies as they deem necessary, may also seek outside sources of funding, to complement the state contributions, and may establish profit-making activities.
- Performance Contracts, first introduced in 1999, serve as a kind of contract between the government and individual institutions regarding how that institution will seek to maximize its individual strengths. Institutions work to their strengths, as defined by themselves, and seek successes at points where they are most competitive.

Institutional leadership.

- Leadership at every level is balanced within and outside:
- Governance of the institution is primarily in the purview of an external majority university Board, whose members are elected, not appointed, and include representatives from both within and outside the university, including academic and administrative staff and students.
- Each university’s Rector serves at the will of the Board.
- Deans are hired and supervised by the Rector and in turn hire and supervise Department Heads

Annex 5 - Recent Research “Excellence” Initiatives

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of Target Institutions and Eligibility Criteria</th>
<th>Resources Allocated</th>
<th>Investment Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany Excellence Initiative 2006</td>
<td>40 graduate schools</td>
<td>$2.3 billion in total</td>
<td>Five year funding</td>
</tr>
<tr>
<td></td>
<td>30 Clusters of Excellence (universities and private sector)</td>
<td></td>
<td>Two rounds: 2006, 2007</td>
</tr>
<tr>
<td></td>
<td>10 Top-level research universities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain Korea 21 Program</td>
<td>• Science and Technology: 11 Universities</td>
<td>$1.17 billion in total</td>
<td>7 years</td>
</tr>
<tr>
<td></td>
<td>• Humanities and Social Sciences: 11 Universities</td>
<td></td>
<td>Two rounds in 1999</td>
</tr>
<tr>
<td></td>
<td>• Leading Regional Universities: 38 Universities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Professional Graduate Schools in 11 Universities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korea Science and Engineering Foundation (KOSEF)</td>
<td>1) Science Research Centers (SRC)/Engineering Research Centers (ERC): up to 65 centers</td>
<td>1) $64.2M / year</td>
<td>1) up to 9 years</td>
</tr>
<tr>
<td></td>
<td>2) Medical Science and Engineering Research Centers (MRC): 18 Centers</td>
<td>2) $7M / year</td>
<td>2) up to 9 years</td>
</tr>
<tr>
<td></td>
<td>3) National Core Research Centers (NCRC): 6 Centers funded in 2006</td>
<td>3) $10.8M / year</td>
<td>3) up to 7 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All 3 programs launched in FY 2002 or FY 2003</td>
</tr>
<tr>
<td>Japan Top-30 Program (Centers Of Excellence for 21st Century Plan)</td>
<td>31 Higher Education Institutions</td>
<td>$150 million / year (Program Total: 37.8B Yen)</td>
<td>5 year funding</td>
</tr>
<tr>
<td>Japan Global Centers of Excellence Program</td>
<td>50 – 75 Centers Funded per year (5 new fields of study each year)</td>
<td>50 – 500 Million Yen per center per year (~$400,000 – $4M)</td>
<td>5 years</td>
</tr>
</tbody>
</table>

2 http://www.dfg.de/en/research_funding/coordinated_programmes/excellence_initiative/
4 http://www.kosef.re.kr/english_new/programs/programs_01_04.html
5 http://www.jsps.go.jp/english/e-21coe/index.html
6 http://www.jsps.go.jp/english/e-globalcoe/index.html;
<table>
<thead>
<tr>
<th><strong>European Commission, Framework Programme 7 (FP7)</strong></th>
<th>TBD – determined by structure of Research Proposals (RFPs)</th>
<th>Based on number of RFPs with a “centre of excellence” structure</th>
<th>Launched in 2007, 2007-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>China 211 Project</strong></td>
<td>100 higher education institutions</td>
<td>$18 billion in 7 years ($400M to funding World Class Research Departments)</td>
<td>Launched in 1996</td>
</tr>
<tr>
<td><strong>China 985 Project</strong></td>
<td>34 research universities</td>
<td>28.3B Yuan</td>
<td>1999 – 2001</td>
</tr>
<tr>
<td><strong>Chinese Academy of Sciences (CAS) Institutes</strong></td>
<td>Mathematics and physics 15 Chemistry and chemical engineering 12 Biological sciences 20 Earth Sciences 19 Technological sciences 21 Others 2</td>
<td>CS$77.4 million per year since 1999 CS$47.3 million a year in 1997-1999 CS$437 million in total in 1988-1998</td>
<td>Operating since 1988 Permanent program since 1997</td>
</tr>
<tr>
<td><strong>Canada Networks of Centers of Excellence</strong></td>
<td>23 currently funded Networks of Centers of Excellence 16 previously funded Networks</td>
<td></td>
<td>Operating since 1988 Permanent program since 1997</td>
</tr>
<tr>
<td><strong>UK Funding for Excellent Units</strong></td>
<td>Universities with the highest marks after the Research Assessment Exercise</td>
<td>$8.63 billion disbursed after 2001 RAE</td>
<td>5 years for Research Council funded Centers</td>
</tr>
</tbody>
</table>

http://cordis.europa.eu/fp7/what_en.html#funding
http://www.nce.gc.ca/
http://www.hefce.ac.uk/research/funding/
http://www.rcuk.ac.uk/research/resfunding.htm
<table>
<thead>
<tr>
<th>Initiative</th>
<th>Groups of Researchers:</th>
<th>Funds</th>
<th>Launched/ Scheduled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile Millennium Science Initiative</td>
<td>3 Science Institutes: $1 million a year for 10 years;</td>
<td>$25 million in total in 2000-2004</td>
<td>Scheduled 15</td>
</tr>
<tr>
<td></td>
<td>5-12 Science Nuclei: $250 thousand a year</td>
<td></td>
<td>Every 5 years for nuclei and every 10 years for institutes</td>
</tr>
<tr>
<td>Denmark (Globalization Fund)</td>
<td>Funds to be allocated to research universities on a competitive basis</td>
<td>$1.9 billion between 2007 and 2012</td>
<td>Launched in 2006</td>
</tr>
<tr>
<td>NEPAD / Blair Commission for Africa (Proposed)</td>
<td>1) Revitalise Africa’s institutions of higher education</td>
<td>1) US$500 million a year, over 10 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Develop centres of excellence in science and technology, including African institutes of technology</td>
<td>2) up to US$3 billion over 10 years</td>
<td></td>
</tr>
<tr>
<td>Taiwan Development Plan for University Research Excellence</td>
<td>Selection and financial support of internationally leading fields</td>
<td>$400M</td>
<td>4 years</td>
</tr>
</tbody>
</table>

Elaborated by Natalia Agapitova, Michael Ehst and Jamil Salmi (last update 9 March 2007)

15 http://www.rae.ac.uk/
16 http://www.msi-sig.org/MSI/current.html
17 http://www.eurodad.org/articles/default.aspx?id=595
Bibliography

On World-Class Universities


On the Knowledge Economy and the Role of Tertiary Education


On Rankings


*Statistical Sources*


The UNESCO Forum on Higher Education, Research and Knowledge

Current Trends in Post-Graduate Research: A Global Overview

New Initiatives in International Cooperation in Support of Post-Graduate Studies

Jaime Arturo Ramirez
Federal University of Minas Gerais, Brazil
Dublin, Ireland, March 2008
Contents

• Introduction
• The situation of higher education
• State of higher education
• Investments in science & technology in LA and the Caribbean
• State of research and technology in LA and the Caribbean
• New initiatives in international cooperation in support of post-graduate studies
• What are the challenges we face?
• Structural projects fostered by IESALC
• Conclusions
The Situation of Higher Education

- Expansion of the knowledge society
- Expansion of the demand for higher education
- Differentiated qualities and segmentation between and within countries
- Development of graduate studies
- New cross-border providers
- Knowledge as a commercial commodity
- Common academic venues
State of Higher Education

60% of enrollments in higher education in LAC are concentrated in 3 countries:

- Brazil
- Mexico
- Argentina

The region has 13,991,517 students in higher education (2003). In contrast, it still has 37 million illiterates.

(1) IESALC / HE Report, 2000 - 2005
State of Higher Education

Total gross enrollment rate (Pop. 20 - 24 years) (GER) (2003)

GER > 45%
- Argentina
- Panama
- Chile

GER ≥ 30% & ≤ 45%
- Costa Rica
- Venezuela
- Uruguay
- Bolivia
- Dom. Republic
- Peru
- Cuba

Regional average: 28.5%
Average, developed countries: 54.6%
State of Higher Education

Total gross enrollment rate
(Pop. 20 - 24 years) (GER) (2003)

GER > 15% & < 30%
- Colombia
- Mexico
- Brazil
- Ecuador
- Paraguay
- Nicaragua
- Guatemala
- Honduras
- El Salvador
- Belize

Regional average: 28.5%
Average, developed countries: 54.6%

- Mexico & Brazil make up most of graduate enrollments, each having more than 100,000 students enrolled in the 4th educational cycle (2003);

The number of graduate students today surpasses that of undergraduate enrollments in the entire region in 1960.
Brazil, Mexico and Argentina concentrate 80% of the PhD programs in the region.

### PhD in Latin America

<table>
<thead>
<tr>
<th>Country</th>
<th>PhD</th>
<th>%</th>
<th>Universities with PhD programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brasil</td>
<td>1.056</td>
<td>48,3%</td>
<td>52</td>
</tr>
<tr>
<td>México</td>
<td>406</td>
<td>18,5%</td>
<td>80</td>
</tr>
<tr>
<td>Argentina</td>
<td>291</td>
<td>13,3%</td>
<td>s/d</td>
</tr>
<tr>
<td>Chile</td>
<td>103</td>
<td>4,7%</td>
<td>10</td>
</tr>
<tr>
<td>Cuba</td>
<td>95</td>
<td>4,3%</td>
<td>12</td>
</tr>
<tr>
<td>Perú</td>
<td>91</td>
<td>4,2%</td>
<td>17</td>
</tr>
<tr>
<td>Colombia</td>
<td>56</td>
<td>2,6%</td>
<td>17</td>
</tr>
<tr>
<td>Venezuela</td>
<td>48</td>
<td>2,2%</td>
<td>7</td>
</tr>
<tr>
<td>Uruguay</td>
<td>11</td>
<td>0,5%</td>
<td>1</td>
</tr>
<tr>
<td>Ecuador</td>
<td>9</td>
<td>0,4%</td>
<td>4</td>
</tr>
<tr>
<td>Bolivía</td>
<td>8</td>
<td>0,4%</td>
<td>5</td>
</tr>
<tr>
<td>Paraguay</td>
<td>7</td>
<td>0,3%</td>
<td>4</td>
</tr>
<tr>
<td>Panamá</td>
<td>5</td>
<td>0,2%</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2.188</td>
<td>100%</td>
<td>213</td>
</tr>
</tbody>
</table>

*Fuentes: Convenio Andrés Bello e IESALC (2003-2004)*
State of Higher Education

... Brazil is known for ...
State of Higher Education

... There is another Brazil emerging ...
State of Higher Education

Brazil

- Population: 185 millions;
- Area: 8.5 millions of Km² (half of South America)
- GDP: > US$ 800 billions (2007);
- > 10,000 PhD/year (2007) => 16,000 PhD/year (2011);
- 97% of the children (from 7 a 14 years) are in the school;

- only 25% of population aged 18-24 at university (40% in 2011)
- Oldest university is less than 100 years old;
- 1% of GDP invested in S&T;
State of Higher Education

Brazil Graduate System

• Education as a “State Policy”
• Funded by the Federal Government;
• Two funding agencies:
  • Capes (1951): national evaluation of the graduate system and scholarships)
  • CNPq (1951): grants for researchers
    • > 100,000 scholarships at undergraduate level (for top students)
Brazil Graduate System

- **Capes: Evaluation System**
  - Performed by academic peers;
  - Occurs each triennial;
  - Participation of 46 evaluation committees;
  - It involves more than 800 evaluators;

- **Result:**
  - 7: International standard performance
  - 6:
  - 5: very good
  - 4: good
  - 3: regular
State of Higher Education

Brazil Graduate System

• **Capes: Access to scientific information**
  
  • One of the greatest scientific databases in the world;
  
  • It allows access to international updated scientific full data through any terminal connected to the Internet located at authorized institutions;
  
  • Over 11,800 scientific journals and 125 referential bases available;
  
  • Use:
    • 15 million full texts downloaded/year
    • 32 million referential base accesses/year
    • 128,000 accesses/day
## State of Higher Education

### Brazil Graduate System

#### Number of Graduate Courses

<table>
<thead>
<tr>
<th>Level</th>
<th>1976</th>
<th>1996</th>
<th>2006</th>
<th>Geometric rate (% per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2006/76 [29 years and 2 months]</td>
</tr>
<tr>
<td>MS</td>
<td>490</td>
<td>1187</td>
<td>2224</td>
<td>5.3</td>
</tr>
<tr>
<td>PhD</td>
<td>183</td>
<td>630</td>
<td>1179</td>
<td>6.6</td>
</tr>
<tr>
<td>Total</td>
<td>673</td>
<td>1817</td>
<td>3403</td>
<td>5.7</td>
</tr>
</tbody>
</table>

(1) Starting year of graduate courses Capes evaluation process
(3) Courses recognized by CAPES on March 2006.

Source: CAPES/MEC.

- All fields
- 10% are professional master
State of Higher Education

Brazil Graduate System

grade

<table>
<thead>
<tr>
<th>Grade</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>84</td>
</tr>
<tr>
<td>3</td>
<td>677</td>
</tr>
<tr>
<td>4</td>
<td>801</td>
</tr>
<tr>
<td>5</td>
<td>478</td>
</tr>
<tr>
<td>6</td>
<td>144</td>
</tr>
<tr>
<td>7</td>
<td>75</td>
</tr>
</tbody>
</table>
### PhD Staff in Graduate Courses

<table>
<thead>
<tr>
<th>Year</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>19.604</td>
</tr>
<tr>
<td>2006</td>
<td>47.602</td>
</tr>
</tbody>
</table>

Source: Capes/MEC
## State of Higher Education

### Brazil Graduate System

#### Number of Degree Granted

<table>
<thead>
<tr>
<th>Level</th>
<th>1996</th>
<th>2006</th>
<th>Geometric rate (% per year) [10 years]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>10.499</td>
<td>32.280</td>
<td>12.4</td>
</tr>
<tr>
<td>PhD</td>
<td>2.985</td>
<td>9.366</td>
<td>14.6</td>
</tr>
<tr>
<td>Total</td>
<td>13.484</td>
<td>41.646</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Source: CAPES/MEC.

16,000 in 2011
State of Higher Education

Brazil Graduate System

Number of New Students

<table>
<thead>
<tr>
<th>Level</th>
<th>1996</th>
<th>2006</th>
<th>Geometric rate (% per year) [10 years]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>16.457</td>
<td>42.220</td>
<td>9.4</td>
</tr>
<tr>
<td>PhD</td>
<td>5.159</td>
<td>10.559</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>21.616</td>
<td>52.779</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Source: CAPES/MEC.
Investments in Science & Technology in LA and the Caribbean

Mean investment in science and technology in relation to GDP for each country of the region in 2004: **0.72 %**

Only Brazil (1.28%), Costa Rica (1%), Cuba (0.93%), Panama (0.9%), and Paraguay (0.85%) make investments above the mean.

Other rates:
- Argentina - 0.49%
- Mexico (federal expenditures) - 0.38%
- Canada - 1.96 %
- Spain - 1.07 %
- USA - 2.66 %

Investments in Science & Technology in LA and the Caribbean

- In 1990, Latin America accounted for 1.7% of world scientific production (ISI)

- In 2004, the figure for LA exceeded 3.7%

(Source: Institute of Science Information)
Investments in Science & Technology in LA and the Caribbean

Of 24 countries of the region, Argentina, Brazil, & Mexico concentrate **82.8 %** of total **scientific production - SCI**
(2004 figures / Cyted - Argentina)

Of 16 countries of the region, Argentina, Brazil & Mexico concentrate **78.3 %** of total **patent filings** (idem)
Investments in Science & Technology in LA and the Caribbean

Scientific Production (ISI) in Latin America

- Brazil
- Argentina
- Chile
- Mexico
- Venezuela
- Colombia
Brazil (ISI) production compared to other countries

Investments in Science & Technology in LA and the Caribbean

15th position
Investments in Science & Technology in LA and the Caribbean

Brazil x Germany
Investments in Science & Technology in LA and the Caribbean

Area
> 4 million km²

Population
> 100 million

GDP
> US$ 400.000 million

Source: R. Dauscha (ANPEI) 3ª CNCTI
New Initiatives in International Cooperation in Support of Post-graduate studies

Brazil

Goals

- To develop graduate studies in the world context.
- To support research groups mainly through international exchange programs.
- Flexibility and quality centered.
- **Reciprocity.**

- **South ⇒ North (South ⇔ North)**
- **South ⇔ South**
New Initiatives in International Cooperation in Support of Post-graduate studies

Programs

- Scholarships abroad (individual: only in strategic areas)
- Joint research projects
- University partnerships
- Doctoral Colleges
- Escola de Altos Estudos (*School of Advanced Studies*)
- Courses abroad (Africa: Angola, Mozambique)
New Initiatives in International Cooperation in Support of Post-graduate studies

Scholarships abroad

• CAPES finances 4,100 full scholarships to Brazilians abroad (under-graduate, full PhDs, Sandwich-PhD).

Scholarships for foreigners

• PROGRAM PEC-PG (Developing countries of Asia, Africa and Latin America)
New Initiatives in International Cooperation in Support of Post-graduate studies

Joint Research Projects

- CAPES + similar foreign agency of university;
- Co-financed;
- Common theme for research between two groups;
- Finances mobility of students and professors;
- Bi-national evaluation (projects selected according to the countries priorities);
New Initiatives in International Cooperation in Support of Post-graduate studies

Doctoral Colleges

- Scholarships for PhD students
- 12 months for Co-Supervision projects
- 18 months for Co-tutelle projects (2 diplomas)
- Fosters double diploma agreements
# New Initiatives in International Cooperation in Support of Post-graduate studies

## Brazil

Joint Research Projects (2007)

<table>
<thead>
<tr>
<th>Country</th>
<th>Program</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>PROBRAL</td>
<td>76</td>
</tr>
<tr>
<td><strong>Argentina</strong></td>
<td>SECYT</td>
<td>48</td>
</tr>
<tr>
<td><strong>Cuba</strong></td>
<td>MES</td>
<td>29</td>
</tr>
<tr>
<td>Spain</td>
<td>MECD</td>
<td>84</td>
</tr>
<tr>
<td>United States</td>
<td>CAPES / UNIV. TEXAS</td>
<td>07</td>
</tr>
<tr>
<td>France</td>
<td>COFECUB</td>
<td>122</td>
</tr>
<tr>
<td><strong>Portugal</strong></td>
<td>GRICES</td>
<td>93</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Univ. Wageningen</td>
<td>18</td>
</tr>
<tr>
<td><strong>Uruguai</strong></td>
<td>Universidad de la República</td>
<td>05</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>482</strong></td>
</tr>
</tbody>
</table>
What are the Challenges we face?

Challenges:

• Creation of a social conscience favorable to the process of integration that recognizes diversity, while valuing common cultural identity;

• Human resource training that makes it possible to successfully compete as a “block” in an increasingly integrated, but not always more unified world;

• Making education systems compatible with and atuned to each other, without homogenisation;
What are the Challenges we face?

**Challenges:**

- Expansion, with Quality and Equity
- Linking of universities with a national project and to regional integration projects in order to foster sustainable development of the countries of the region;
- Strengthening and creation of assessment and accreditation systems as strategic instruments for guaranteeing the quality of higher education and for the formulation and implementation of pertinent public policies;
- An appreciation of institutions of higher education as strategic instruments for sustainable development and successful insertion of Latin American and Caribbean countries within the knowledge society.
Structural projects fostered by IESALC

- Map of Higher Education in Latin America and the Caribbean;
- Trends in Higher Education in Latin America and the Caribbean;
- Graduate Program Accreditation and Quality Assessment Systems in Latin America and the Caribbean.
Conclusions

- The entry of Latin America and Caribbean countries into the knowledge society can only be achieved through Higher Education. Post-graduate studies play an important role in this issue.

- Higher Education is a State policy and an instrument of citizenship and national sovereignty.

- The Education For All goal of UNESCO must include, at least in the long-term, Higher Education for All.
THANK YOU!

www.iesalc.unesco.org.ve
Improving Graduate Education in Developing Countries

Jamil Salmi
Dublin, 5-7 March 2008
natural lab experiment: U. of Malaya vs. NUS

- early 1960s: 2 branches of University of Malaya
- today:
  - NUS ranked # 19
  - UM only # 192
outline of the presentation

• excellence in graduate education
• challenges for developing countries
• a new education paradigm
defining excellence

• self-declaration
The University of South Carolina is a rising star in higher education. What's behind the momentum?

- More than $50 million committed through the Faculty Excellence Initiative and Centenary Plan to recruit 250 top faculty
- Our new 500-acre Innovista research district, based on a "new urbanism" design, and representing a $250-million investment in excellence to solve problems and better society
- The new $22-million Arnold School of Public Health Research Center, a catalyst for leading research on childhood obesity, cancer, health disparities, and environmental threats
- The nation’s only NSF-funded Fuel Cell Research Center, and a major research and funding push to build energy independence through alternative and more eco-friendly energy sources
- No. 1 rankings for international business and exercise science (U.S. News & World Report and Academic Analytics)
- A growing national recognition. The Wall Street Journal recently included the University as one of eight flagships experiencing rising academic success, and The New York Times reports that South Carolina is considered the leader in driving the potential of the hydrogen economy.

Momentum. The University of South Carolina has it. Explore more at www.sc.edu/momentum.
defining excellence

- self-declaration
- reputation
- rankings
results and performance

- top graduates
- leading edge research
- vigorous technology transfer
critical dimensions

• concentration of talent
• abundant resources
• favorable governance
Excellence in Graduate Education Alignment of Key Factors

Concentration of Talent

- Students
- Teaching Staff
- Researchers

Excellence

- Technology Transfer
- Supportive Regulatory Framework
- Autonomy
- Academic Freedom
- Leadership Team
- Strategic Vision
- Culture of Excellence

Abundant Resources

- Public Budget Resources
- Endowment Revenues
- Tuition Fees
- Research Grants

Favorable Governance

Source: Elaborated by Jamil Salmi
U. Of Malaya vs. NUS

- talent
  
  • UM: selection bias in favor of Bumiputras, less than 5% foreign students, no foreign professors
  
  • NUS: highly selective, 43% of graduates students are foreign, many foreign professors
U. Of Malaya vs. NUS (II)

- **finance**
  - UM: $118 million, $4,053 per student
  - NUS: $750 million endowment, $205 million, $6,300 per student

- **governance**
  - UM: restricted by government regulations and control, unable to hire top foreign professors
  - NUS: status of a private corporation, able to attract world-class researchers (incl. Malaysians)
outline of the presentation

• excellence in graduate education

• challenges for developing countries
the challenges

• governance
the challenges

• governance
• brain drain
• resources
Comparison of US and UK Endowment Levels

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard University</td>
<td>28,916</td>
<td>Cambridge</td>
<td>4,000</td>
</tr>
<tr>
<td>Yale University</td>
<td>18,031</td>
<td>Oxford</td>
<td>4,000</td>
</tr>
<tr>
<td>Stanford University</td>
<td>14,085</td>
<td>Edinburgh</td>
<td>3200</td>
</tr>
<tr>
<td>University of Texas</td>
<td>13,235</td>
<td>Glasgow</td>
<td>240</td>
</tr>
<tr>
<td>Princeton University</td>
<td>13,045</td>
<td>King’s</td>
<td>200</td>
</tr>
</tbody>
</table>
the challenges

• governance
• brain drain
• resources
• digital divide
the digital divide

(i) Distribution of Internet Hosts

- Canada & United States (65.3%)
- Europe 22.4%
- Developing Countries (5.9%)
- Australia, Japan & New Zealand (6.4%)

(ii) Distribution of World Population

- Developed Countries (80.4%)
- Europe (12.0%)
- Australia, Japan & New Zealand (2.5%)
- Canada & United States (5.1%)
connectivity in Africa

• same bandwidth as an average household in the US
• 100 times as expensive as what an average US university pays
the way forward

- national priority
- vision and strategic planning
- strategic deployment of resources
REPORT OF THE VISITATION PANEL

TO THE UNIVERSITY OF GHANA

December 2007
the way forward

• national priority
• vision and strategic planning
• strategic deployment of resources
• internationalization (regional cooperation, diaspora)
internationalization

- language
- mobility
  - faculty
  - students
  - leaders
- joint / double degrees
- supportive technology
  - distance education
  - remote research
outline of the presentation

• excellence in graduate education
• challenges for developing countries
• a new education paradigm
new education paradigm

• learning by doing
other intriguing experiences

• Laurea University of Applied Science (Finland)
• Alverno College (USA)
• LimKokWing University of Creative Technology (Malaysia)
Prada phone
Razr luxury edition with lizard skin
Giorgio Armani-Samsung mobile
new education paradigm

• learning by doing
• creativity
creativity

“I didn’t know you could do that!”
new education paradigm

• learning by doing

• creativity

• e-learning / blended learning
social and economic progress is achieved principally through the advancement and application of knowledge.
A virtual laboratory for students of the sciences
Gather clues - Interview suspects - Analyze evidence
Solve a mysterious death

This activity is set in a research group that is developing an antivenom for spider bites. In the opening scene, Nelson Pogline, a talented graduate student, dies unexpectedly at a university reception. As a detective, you must use chemistry concepts to determine if this was murder and if so, solve the case. You can interview suspects using Quicktime movies, investigate the crime scene for clues with Quicktime Virtual Reality images, and analyze the evidence from the crime lab.

This activity requires basic knowledge of formula weight, stoichiometry and the scientific method to solve the mystery.

Additional concepts that are discussed include: molecular recognition, limiting reagents, and mass spectrometry.

Note to instructors: The Windows-based software is suitable for high school and college introductory chemistry students. Mixed Reception can be used as a homework assignment for individual students, or as an in-class group activity. Solving the case takes between 40 and 50 minutes.

Activity and Materials:

Activity:

Mixed Reception Activity [260 MB Zip file]
Installation instructions

Classroom Materials:

User Walkthrough [pdf]
Activity Worksheet [doc]
Periodic Table [pdf]
Final Report [doc]

Classroom CD's:
(CD includes activity and classroom materials)

Fill out a form to request free CD's
Email us for teacher solutions and hints
Download .iso file to make your own CD's

Please email us for additional information, or just to tell us what you think.
new education paradigm

- learning by doing
- creativity
- e-learning / blended learning
- open education resources
Welcome to MIT’s OpenCourseWare:

a free and open educational resource for faculty, students, and self-learners around the world. OCW supports MIT’s mission to advance knowledge and education, and serve the world in the 21st century. It is true to MIT’s values of excellence, innovation, and leadership.

MIT OCW:

- Is a publication of MIT course materials
- Does not require any registration
- Is not a degree-granting or certificate-granting activity
- Does not provide access to MIT faculty

Learn more about MIT OCW...

Nobel Prize winner featured on MIT OCW

MIT Professor Frank Wilczek has won the 2004 Nobel Prize in physics for his discoveries in the world of quarks. Check out his two courses published on MIT OpenCourseWare: Course 8.325 -- Relativistic Quantum Field Theory III, Spring 2003 and Course 8.213 -- Physics I, Fall 2003.

“Thanks for this opportunity. I read of this program in a newspaper, and I think that this is a unique opportunity for me to keep on studying and learning.”

—Mario Velasquez, self-learner from Guatemala Read more World Reaction...
MIT OpenCourseWare是美国麻省理工学院（MIT）的一项伟大创举。通过它，MIT将逐步把其所开设的全部课程的教学材料和课程公布于网上，供全世界的求知者和教育者们免费无偿地享用。

CORE（China Open Resources for Education）是在MIT OCW的启发下，由美国IET基金会发起，并联合北京大学创建的非官方机构。CORE以推进中美两国有高校之间的紧密合作与资源共享为使命，并相信这是世界教育发展的大势所趋。

CORE致力于为中国高校提供免费、便捷的全球开放式教育资源获取渠道。如今，CORE携手MIT将OpenCourseWare带到中国并建立起OCW镜像网站，为中国（尤其是高校）的广大教育者与求知者提供方便，以满足他们对这一宝贵资源日益增大的巨大需求。

CORE以“开放共享”和“精诚合作”二者作为其价值理念的核心，在不断为中国教育引入国外优秀教育资源的同时，CORE更将进一步中国高校及其优秀的教育资源传播至全世界，从而实现中国教育与国际教育的“双向接轨”。

与CORE的核心价值理念不谋而合的是，在OCW推出伊始，MIT校长Charles M. Vest曾充满期待地说：“我们坚信，不断地开放资源获取途径和鼓励合作伙伴参与将极大地推动教育的进步与发展。”CORE正期待着您的参与。

> 联系我们
Bienvenidos a ePALS
La mayor comunidad de aulas en línea del mundo y el principal proveedor de correo-e seguro para estudiantes

Más de 4,5 millones de estudiantes y profesores están adquiriendo nuevas destrezas y mejorando su proceso de aprendizaje con ePALS. Creado en 1996, ePALS cuenta con 90.725 perfiles de aulas que conectan a personas de 191 países y culturas, que aprenden conjuntamente y forman amistades. ¡Entérate de cómo!

Lo más destacado

English-to-Go
Herramientas para la enseñanza del inglés, utilizadas en todo el mundo, con contenidos actualizados a diario sobre acontecimientos actuales.

Miembros de:
- Chile
- Holanda/Países Bajos
- Canadá
- Estados Unidos
- Italia

están buscando contactos en:
- Argentina
- Reino Unido
- Irlanda
- China
- Japón

Haz clic en cualquier país de esta lista para ver los perfiles de miembros de ese país.
new education paradigm

- learning by doing
- creativity
- e-learning / blended learning
- open education resources
- regional / local engagement
resolution of local problems
Clemson University

- aims to become #20
conclusion

the end
Upgrading Graduate Programs for Dummies

Mary-Louise Kearney

Upgrade your knowledge – enhance, repair, connect, and adapt your universities!
conclusion

- alignment

- time dimension

- adaptation of doctoral programs to new education paradigm
  - integration of research and undergraduate studies
  - interactive pedagogical approaches
  - e-learning
The Potential of Open Learning for Postgraduate Study

Prof Brigid Heywood
Pro Vice-Chancellor (Research & Enterprise)
Current Structures
Responsiveness & Sustainability
Social Dynamics and a ‘connected’ model
• Distance learning versus ‘open’ supported learning
• Quality, quantity, functionality
• Physical location, resources, socio-economic demands – knowledge society within global context
Definitions......

• Distance learning
• The ‘open’ access model
• The Open University model - directly-registered students, (full and part time) and Affiliated Research Centres
Distance-learning model

- Part time doctoral training provision
- Combination of formal, taught through face to face and increasing elements of VLE based provision - balance of effort (30-50% ‘taught’ elements)
- Largely centred around association of doctoral candidate with physical HEI locus and academic team.
- Usually, non STEM social sciences, business administration disciplines.
- Recognised by funding bodies, quality assurance agencies, e.g. ESRC, QAA-UK, Middle States (USA).
Quality and Quantity

• Where part-time or distance learning programmes are available will look for evidence of flexible arrangements for access to resources such as library and computing facilities.

• To overcome problems of distance, and where materials are not available on the web, institutions should also seek to negotiate access to local HEI facilities for such students.
Responsiveness & Sustainability

• Tension between ‘proxy’ for research excellence (e.g. PGR completion rates, funding into institution) and sustainable growth of higher level skills and capacity building.

• Active debate surfacing around purpose and value of doctoral training, see Park (2007), for example.

• Major changes in key trends: population demographics, economic demand for higher level skills, technology developments, see Brightman Institute, for example.

• Conventional mechanisms for research dominated by physical research centres and dominated by HEI to HEI linkages supported by ‘business’. Current models dominated by processes which move people to resources - is this an appropriate structure(s) for the 21C?
The Doctoral Experience (1)

- More than half of postgraduate research students are pursuing their PhD part-time and have limited opportunities to benefit from experiential group learning activities that are so powerful for developing generic skills and the capacity for reflective learning.
- In addition, many full-time students spend substantial periods away doing ‘fieldwork’. During such times they too cannot participate directly in the kinds of experiential group learning activities that are so powerful for developing generic skills and the capacity for reflective learning.
- Increasingly utilise alternatives that can be accessed by students at a distance
The Doctoral experience (2)

• Key part of doctoral research training is learning what it means to be an active member of a research community, both local and global. Acquired by osmosis when physically co-located in a research group.

• Important that ‘distance’ research students do not become ‘second-class citizens’, invisible to their host research groups, and unaware of events and daily social life.

• Need to work synchronously and asynchronously with supervisors and other colleagues.
Open University Model - PGR

• 425 full time students on UK campus – significant EU and international cohort.

• 547 part time students distributed across EU

Adapted model

• Meeting demands of three PhD communities – QA issues equitable and appropriate provision; grant funding linked to award rates; UK REF.

• Cohort of full-time directly registered students on Walton Hall campus UK – only physically connected students (The OU systems responding to 225,000 UGs/PGTs)
Adapted Model (2)

- http://www.open.ac.uk/researchhighlights
- http://phdskills.open.ac.uk/
- e-portfolio
- Open Research Online (ORO)
The ‘connected’ model

- Social Networking – Social Learning
- Technology enhanced *versus* technology-enabled learning (Gates/Microsoft, 2008)
- Learning to live to climate change (Arup) - resources to people *not* people to resources (virtual Erasmus)
• By 2018, computers will be able to “routinely translate languages in real-time with the accuracy and speed necessary for effective communications” (“Emerging,” 2003, p. 8; see also Cetron, 2003). “New technology will transform higher education as we know it today” (Oblinger et al., 2001, p. 2), one example being the changes caused by broader use of e-texts and PDAs (Chick et al., 2002). By the year 2012, schools and colleges will routinely use “computerized teaching programs and interactive television lectures and seminars, as well as traditional methods” (“Emerging,” 2003, p. 8). Videoconferencing and other technologies will also help enrich distance media and provide many benefits of face-to-face instruction.
• Technology becoming more ubiquitous, used more competently by more people from all nationalities, age groups, and socioeconomic levels (Murray, 2003).

• 59% increase in the number of children accessing the Internet since 2000 (Murray, 2003).

• Cetron (2003) reports, the number of Internet users at approximately 500 million worldwide and predicted to double by 2008. One reason for the growth is a growing percentage of users outside the US (Murray, 2003, p. 37).
A different kind of ‘laboratory’

• U-tube, face book, BEBO
• Second Life Avatars
• Skype
• Crowd-sourcing, cloud tagging
• Vlogging, blogging, jumping
• Open source, creative commons
• The iphone generation = ubiquitous and pervasive technologies
• Kodak Moment
http://www.open.ac.uk/openlearn/home.php
http://www.open.ac.uk/africa/teaching_education_project_s.shtm

Without more and better education Africa will find it increasingly difficult to benefit from the global knowledge economy. The OU in Africa's teaching and learning projects are supporting students and teachers and training a new generation of educators, using innovative and affordable new technology to build human capacity in Africa.
The Flashmeeting Project

- The lightest possible video-conferencing software application

The Flashmeeting Project provides you with the technology for an instant meeting - any time, any place, any platform!

- Implemented using Adobe's Flash, the most widely available and most compatible of browser plugins, it is incredibly lightweight, efficient.

- [http://flashmeeting.open.ac.uk/](http://flashmeeting.open.ac.uk/)
UNESCO Forum on Higher Education, Research and Knowledge

Trends and Issues in Post Graduate Education: A Global Review

Heather Eggins,
Staffordshire University
UK
Encompassing Aim

A search for quality, efficiency and effectiveness

Problems

• Of definition
• Of availability of data
The Global Context

Powerful impact

• Knowledge society
• Demand for highly skilled, mobile labour
• International market economy
• Globalisation of world science and technological development
• Human capital of postgraduate quality recognised as a valuable asset
## Explosion of doctoral numbers

Registered doctoral students 2003/5

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>837,000</td>
</tr>
<tr>
<td>China</td>
<td>165,000</td>
</tr>
<tr>
<td>UK</td>
<td>111,000</td>
</tr>
<tr>
<td>Japan</td>
<td>75,000</td>
</tr>
<tr>
<td>France</td>
<td>70,000</td>
</tr>
<tr>
<td>India</td>
<td>65,000</td>
</tr>
</tbody>
</table>

Powell and Green 2007
Government Decisions

• Direct link to GDP
  South Africa

• Policy to establish broad educational base
  Singapore, Korea, China, India

• Funding
  a) To institutions
  b) To students
Government decisions (2)

• Setting of annual target numbers for students
  Brazil, Finland
• Proposals for new types of postgraduate degrees
  Brazil
• Delivery of doctoral degrees
  • Doctoral schools
  • Specification of role and funding
  • Evaluation
  • Provision of social guarantees
  Estonia
The consequences of mobility

- Growth in international students
- Constant ebb and flow of postgraduate students
- Loss of human capital
- Outward flows
  - From less developed countries
- Inward flows
  - To developed countries

BUT the ebb and flow is dynamic and shifting
Efforts to stem or reverse the brain drain

- Establishment of a research and technology infrastructure
- Growth in budget for research

  Tunisia 1% GDP

Establishment of high status, well paid academic profession

- Promotion linked to research findings and publications
- Collaborations with international partners
- ‘National Researchers System’

  Bonuses for research, regularly evaluated – Mexico
But…

• The spectre of:

  Low salaries

  Continuous political and economical instability

  Frequent persecution of intellectuals and repression

  Lack of government support for research and for universities
The role of the universities

- How best to establish suitable organisational structures for high quality doctoral programmes
  - Doctoral schools e.g Estonia
  - Graduate schools
- Development of structured programmes
  - Research methods
  - Transferable skills training
- Quality assurance
- Europe EUA report – Bologna third cycle
  - Equality of access
  - Flexibility in admissions
  - Assurance of “fairness, transparency and objectivity”
Supervision and quality assurance

- Guidelines for supervisors
- Training in supervision to be undertaken
- Expectation of publications in good quality journals – China
- Code of Practice for research programmes – UK
- Workload models
- The importance of quality assurance
  - Kite marking for the global market
Government policy can affect the delivery of doctoral education

Example of Australia

- Shift to adoption of outcomes model of funding
  - Marked increase in doctoral students – 37,685 in 2004
  - Diversification of doctoral studies
  - Long completion times and high attrition rates addressed
  - Emphasis on measured outcomes
- Universities encouraged
  - To make more careful selection of students
  - To monitor students more clearly
  - To make sure the topic was manageable
  - To make sure the right supervisors were appointed
Curriculum Change

Relevant areas of study commonly included are:

- Research methods
- Transferable skills development
- Studies in professional applied activities
  
  E.g - teaching
  
  - supervising research papers
  - reviewing research papers
- Publishing articles

Alongside the research and compilation of a thesis
Diversification of Post graduate courses

• Doctorates
  • Traditional
  • PhD based on published work
  • ‘Practice-based’ doctorate
  • ‘New Route PhD’
  • Joint doctorate
  • Professional Doctorate
Characteristics of the Professional Doctorate

• Focus on embedding research into professional practice

• Alternative means of “achieving the same advanced level of study and contribution” (UKCGE 2005)

• “A programme of advanced study and research which… is designed to meet the specific needs of a professional group external to the university and which develops the capability of individuals to work in their professional context” (UKCGE 2002)
Diversification of Post Graduate Courses

• Masters’ Degrees
  Tailored to the professions

• MBAs (Master of Business Administration
  Global coverage of Association of MBAs

• Traditional Masters’ as a step towards doctorates
Diversification of delivery and audience

- Online learning
- Distance learning
- Face-to-face
- Virtual mobility
- Lifelong learning
Recommendations

Within a context of political and economic stability

• Broad educational base
• Investment in research
• Policies to support higher education
• Evaluation and monitoring of programmes
• Quality assurance
• Careful choice of supervisors, with encouragement to publish
• Workload to reflect time needed for supervision
• Careful choice of students and research topics
Questions to consider

• The place of postgraduate skills in the developing world
• Does the diaspora help to solve the brain drain
• How best can a sound knowledge base be established in all continents
• How best can developing countries make use of the expansion
• How far is personal gain a main driver in the global labour market
• What is the likely future of e-learning and open learning
• What are the effects of league tables on global higher education
Conclusion

• The issue is one of human capital

• Each country should have the opportunity to become part of the knowledge society

• Loss of human capital, lack of resources and lack of research infrastructure creates further imbalances

• The trends are towards further expansion of postgraduate education, further diversification, further globalisation and further policy control and regulation by governments.
THE NEW POLITICS OF GLOBAL HIGHER EDUCATION – International Networking

Christopher Tremewan
UNESCO Forum, DCU, Dublin
12 March 2008
NETWORKS
<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td></td>
</tr>
<tr>
<td>Total number of students</td>
<td>500,000</td>
</tr>
<tr>
<td>Postgraduate</td>
<td>111,000</td>
</tr>
<tr>
<td>International students</td>
<td>66,000</td>
</tr>
<tr>
<td>Alumni</td>
<td>2,143,000</td>
</tr>
<tr>
<td>Staff</td>
<td>88,000</td>
</tr>
<tr>
<td>Annual Budget</td>
<td>US$ 10.4 billion</td>
</tr>
<tr>
<td>Library Items – Books and Journals</td>
<td>76 million</td>
</tr>
<tr>
<td>Research</td>
<td></td>
</tr>
<tr>
<td>Spin-off companies</td>
<td>555</td>
</tr>
<tr>
<td>Research and consultancy grants funding (awarded annually)</td>
<td>US$ 2.8 billion</td>
</tr>
</tbody>
</table>
‘By the end of 2020…China will achieve more science and technological breakthroughs of great world influence, qualifying it to join the ranks of the world’s most innovative countries.’ President Hu Jintao, China, January 2006

‘In 20 years global science will be driven by Indian scientists. There are new interfaces in science, with new rules, where new countries can contribute on an equal footing.’ Dr Vijay Raghavan, Director, National Centre for Biological Sciences, Bangalore, January 2006
New Politics – Back to the Future

Source: OECD, NZ Institute

THE ECONOMIC RISE OF ASIA

Distribution of global GDP since 1500

Western Europe
USA
Canada, Australia, New Zealand
All other countries
Rest of Asia
India
China

Asia population as a % of global population

Source: OECD, NZ Institute
The time when Europe competed mostly with countries that offered low-skilled work at low wages is long gone. Today, countries like China and India are starting to deliver high skills at low costs – and at an ever increasing pace. This is profoundly changing the rules of the game. There is no way for Europe to stop these rapidly developing countries from producing wave after wave of highly skilled graduates.

*Lisbon Council Policy Brief ‘The Economics of Knowledge’ p. 2*
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>Over 50% of world’s science and engineering doctorates from US</td>
</tr>
<tr>
<td>2001</td>
<td>EU granted 40% more science and engineering doctorates than US. By 2010, EU will produce twice as many.</td>
</tr>
<tr>
<td>1975</td>
<td>China graduated very few doctoral students</td>
</tr>
<tr>
<td>By 2003</td>
<td>13,000 doctoral students had graduated. 70% in science and engineering</td>
</tr>
<tr>
<td>In 2000</td>
<td>only 17% of undergraduate degrees in US in science and engineering</td>
</tr>
</tbody>
</table>

World average: 27%  
China: 52%

Source: Harvard Magazine, November/December 2005
Doctoral Graduates

Engineering Doctoral Degrees

Reproduced from: China’s Great Leap Forward: High Technology and Military Power in the next half Century, Hudson Institute, 2005
Rising Demand for Higher Education

Source: The Observatory on Borderless Higher Education, 2002 / Shih Choon Fong, NUS
APAIE Conference, Waseda University, 26-28 March 08 “The Next Wave in Asia-Pacific Higher Education”

The Asia-Pacific Association for International Education

**APAIE** is the international education organization of institutions and professionals in the region.

**APAIE** builds international cooperation among Asia-Pacific institutions of higher learning.

**APAIE** reflects the emergence of the Asia-Pacific as a global player in higher education.
Public investment in knowledge

Investment in knowledge as a % of GDP, 2002

- Portugal
- Ireland
- New Zealand
- Spain
- United Kingdom
- France
- Netherlands
- Australia
- Japan
- OECD
- Denmark
- Korea
- Finland
- United States
- Sweden

- Higher education
- Software
- R&D
Comparative Economic Performance
<table>
<thead>
<tr>
<th>Country</th>
<th>Public investment per EFTS (US$)</th>
<th>Total income per EFTS (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Zealand</td>
<td>$5,480</td>
<td>$11,690*</td>
</tr>
<tr>
<td>Australia– all universities</td>
<td>$6,990</td>
<td>$15,890</td>
</tr>
<tr>
<td>Australia – Go8</td>
<td>$10,000</td>
<td>$21,910</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>$7,410</td>
<td>$21,490*</td>
</tr>
</tbody>
</table>

*Auckland $13,679

Source: NZVCC, 2006
## Investment skewed

<table>
<thead>
<tr>
<th>Investment in tertiary education</th>
<th>New Zealand</th>
<th>Australia</th>
<th>Canada</th>
<th>United Kingdom</th>
<th>United States</th>
<th>OECD Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public expenditure as a percentage of GDP</td>
<td>1.7%</td>
<td>1.2%</td>
<td>2.0%</td>
<td>1.1%</td>
<td>1.4%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

Distribution of public expenditure:

<table>
<thead>
<tr>
<th></th>
<th>New Zealand</th>
<th>Australia</th>
<th>Canada</th>
<th>United Kingdom</th>
<th>United States</th>
<th>OECD Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Direct expenditure on institutions</td>
<td>56%</td>
<td>65%</td>
<td>79%</td>
<td>76%</td>
<td>82%</td>
<td>83%</td>
</tr>
<tr>
<td>- Financial aid to students</td>
<td>44%</td>
<td>35%</td>
<td>19%</td>
<td>24%</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>- Other</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Public expenditure as a percentage of GDP:

<table>
<thead>
<tr>
<th></th>
<th>New Zealand</th>
<th>Australia</th>
<th>Canada</th>
<th>United Kingdom</th>
<th>United States</th>
<th>OECD Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Direct expenditure on institutions</td>
<td>0.9%</td>
<td>0.8%</td>
<td>1.6%</td>
<td>0.8%</td>
<td>1.2%</td>
<td>1.1%</td>
</tr>
<tr>
<td>- Financial aid to students</td>
<td>0.8%</td>
<td>0.4%</td>
<td>0.4%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Source: NZVCC, 2006
In spite of constraints, NZ higher education is well positioned…

- Five of the eight NZ unis ranked in the top 500 Shanghai Jiao Tong 2007 rankings
- Three of the eight NZ unis in the top 200 Times Higher Education rankings (Auckland 50; higher in disciplines)
- NZ universities have a relatively long academic history established by scholars from Cambridge and Oxford.
- Institutional depth
- Connectedness
- Openness

BUT

Thresholds in face of increased competition
Rodrik on Economic Growth

- **Geography** (location, transport costs, climate, natural resources, technology diffusion from outside, disease burden...)

- **Integration** (trade, market integration)

- **Institutions** (rule of law, private property, governance, autonomy)
<table>
<thead>
<tr>
<th>Country</th>
<th>2005: No. in Top 50 *</th>
<th>2050: No. in Top 50**</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>37</td>
<td>15</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Germany</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total – G6</td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>Brazil</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Russia</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>India</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total – BRICs</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Singapore</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Korea</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Taiwan</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total – Rest of World</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

* Shanghai Jiao Tong Academic Ranking of World Universities 2005  ** 2050 “U21-SJT” Index
NZ demographic shifts

Auckland workforce by ethnic group

- Pacific Island: 15% (2001), 7% (2016)
- Asian: 23% (2001), 13% (2016)
- Maori: 11% (2001), 14% (2016)
- European: 51% (2001), 66% (2016)

New Zealanders aged 15-64 2016

Source: OECD, NZ Institute
Symbolic Demography
Transition

“Universities will lose between a fifth and a third of their staff in the first decade of the 21st Century”

“…between 40 and 60 per cent of professors in Australia, Austria, France, Germany, the Netherlands, Sweden and the UK [are] aged 55 or more”

“Britain ….will need to recruit 19,000 to replace those retiring in next ten years”

“Canada will need 2,500-3,000 each year for the next 10 years, compared with the 900 who are recruited at the moment.”

“The primary challenge of the next decade for Australian universities will be the replacement of the baby boom generation.”
Something large in the room
Responses to Shifting Power

‘The rise of innovation from China, India and Korea is feeding a climate of anxiety in Europe and the US that could lead to defensive responses. A combination of knowledge jobs being offshored and a heightened techno-nationalism in Asia could provoke a similar response in the West.’ The Atlas of Ideas: How Asian Innovation Can Benefit Us All (www.demos.co.uk)

Response strategy: unleash mass collaboration, be a magnet for talent, build the knowledge banks, lead global science towards global goals, get our story straight.

POSITIVE ENGAGEMENT
Shifting Power
## International Strategies

- Long-term investment in knowledge capital
- Bilateral partnerships
- Alliances (e.g. APRU, APAIE, U21 etc.)
- Targeted student and faculty mobility
- Joint degrees
- Research collaboration
- Emphasis on postgraduate research, PhDs
- Connecting the life sciences, technology and the social sciences and humanities around global questions
- Inspiring students to make a life-long intellectual quest
- Academic reform, flexibility, for strengthening international connectedness
Shifting Power – Beyond Nationality

- How can we ensure that universities continue to act upon the principles of collegiality when national competitiveness is increasing?

- What framework enables collaboration while competing?
Global Issues: collaboration unavoidable

- Can we sustain the current economic model?

- Will we be able to resolve competing interests:
  - Energy
  - Water
  - Environment
  - Trade
  - Skills and labour …?
'We have always been respected for our traditional export, knowledge! Does that not also make India a 'global superpower', though not in the traditional sense! Can this not be the power we seek in the next century?' *Prime Minister Manmohan Singh, India, November 2006.*
DNA = contestation of ideas

‘The pursuit of reason and rejection of traditionalism are so brilliantly patent as to be above need of argument.

If traditionalism were proper, the prophets would merely have followed their own elders (and not come with new messages).’

*Akbar, the Great Mughal, Emperor of India, 1590s*
The UNESCO Forum for Higher Education, Research and Knowledge

Current Trends in Post-Graduate Research: A Global Overview

Experts’ Workshop, Dublin City University, Ireland

5-7 March 2008

Programme
Wednesday 5 March

15.30  Arrival and Registration – DCU Albert College (Rm. AG01)

16.00  Afternoon Session

Chair and Welcome

Professor Maria Slowey, Vice- President for Learning Innovation and Registrar, DCU, Ireland

Opening

Dr Mary-Louise Kearney, Director, Secretariat of the UNESCO Forum on Higher Education, Research and Knowledge, UNESCO, France

Introductory Remarks

Professor Ulrich Teichler, Director, INCHER (International Centre for Higher Education Research), Kassel University, Germany

17.00  Keynote Address

Trends and Issues in Post Graduate Education: A Global Review

Professor Heather Eggins, Visiting Professor, Staffordshire University, United Kingdom

Discussant

Professor Gary Murphy, Dean of Graduate Research, DCU, Ireland

19.30  All participants invited to Reception, followed by dinner hosted by Professor Ferdinand von Prondzynski in the 1838 Club, DCU
Thursday 6 March 2008

09.00 Morning Session

Chair

Professor Pam Denicolo, Centre for Inter-Professional Postgraduate Education & Training, Co-convener Society for Research in Higher Education (SRHE) Graduate Network, University of Reading, UK

Theme 1: Research-based advanced degrees: regional issues and challenges

Speaker

Dr Jamil Salmi, Coordinator for Tertiary Education, World Bank, Washington DC, USA

Discussion

10.30 Coffee

11.00 Morning Session (continued)

Chair

Professor Antoine Zahlan, Consultant in Higher Education, Beirut, Lebanon

Theme 3: The Potential of Open Learning for Post-Graduate Study

Speaker

Professor Brigid Heywood, Pro-Vice Chancellor for Research and Enterprise, The Open University, UK

Discussion

13.00 Lunch
14.30 Afternoon Session

Chair

Professor Mammo Muchie, Director, Research Centre on Development Innovation and International Political Economy (DIIPE), Aarlborg University, Denmark

Theme 4: New Initiatives in International Cooperation in support of Post-Graduate Studies

Speaker

Professor Jaime Arturo Ramirez, Dean of Post–Graduate Studies and Professor of Electrical Engineering, Federal University of Minas Gerais, Belo Horizonte, Brazil

Discussion

16.00 Coffee

16.30 Afternoon Session (continued)

Chair

Dr Alpha Tejan Wurie, International Consultant in Education and former Minister of Education, Science and Technology, Sierra Leone

Theme 5: Networking amongst Research Universities to Enhance Quality and Excellence

Speaker

Dr Christopher Tremewan, Pro-Vice Chancellor for International Affairs, University of Auckland, New Zealand
Friday 7 March 2008

09.30  Morning Session

Chair

Dr Conor O’Carroll, Assistant Director, Irish Universities Association (IUA), Ireland

Theme 2:  The New Market for Advanced Degrees: Supply and Demand

Speaker

Professor Soumitra Dutta, Dean of External Relations, INSEAD Business School, Fontainbleau, France

Discussion

11.00  Coffee

11.30  Morning Session (continued)

Discussion and review of all themes

13.00  Lunch

14.00  Final Session

Chair

Dr Mary Louise Kearney, Director, UNESCO Forum for Higher Education, Research and Knowledge, Paris
Concluding Analysis

Professor Sir Peter Scott, Vice-Chancellor, Kingston University, United Kingdom

Draft Report Remarks and Main Orientations

Rapporteurs

Professor Ulrich Teichler, Director, INCHER, University of Kassel, Germany

Asa Olsson, UNESCO Forum on Higher Education, Research and Knowledge

15.30 Closure of the Workshop

Support for this event from the Graduate Research Office of DCU, the Irish Research Council for the Humanities and Social Sciences and the Irish Research Council for Science, Engineering and Technology is gratefully acknowledged.