



The UNESCO Forum for Higher Education, Research and Knowledge

Research in Diverse Social Contexts: Tensions, Challenges and Dynamics

Research in the Knowledge Society: Global and Local Dimensions

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I. Introduction

This workshop proposes an analysis of the diversity of research contexts across all regions and their implications for generating a sustainable knowledge base which can both underpin national policy-making for development and link into international research networks to keep abreast of new discoveries. The theme is inspired by the final indicator in the Template resulting from the *Special Initiative* to map and analyse research systems. Entitled *Tensions, Dynamics and Challenges*, this indicator identifies and examines the specific social contexts where research activity is facilitated by investment (eg Singapore, Chile, Qatar) or where this faces specific challenges and obstacles (eg Low Income Countries). Thus, favourable environments, limiting factors, and the diverse challenges posed by major social transformations (*inter alia*, globalization and the current world economic crisis) will be examined.

First, the concept of context merits attention. This is vital in order to move to a valid analysis of its many aspects. The Oxford Dictionary, 2nd Edition 2005 proposes the following definition:

Context : *the circumstances that form the setting for an event, statement, or idea and in terms of where it can be fully understood.*

From this definition and in relation to the study of research in context, the associated concepts of location, environmental features, relevance and ownership of production can be considered.

Social context is by its very nature a broad church and so its various dimensions may include : *governance trends, political climates, investment in knowledge and research by emerging economies, challenging geographical contexts such as small island states, levels of socio-economic development including the existence of a robust private sector and the small and medium enterprise (SME) sub-sector, multicultural societies, demographic shifts and the status of IT connectivity.* In analysing these aspects, the more abstract notions of time and space may function as complex variables.

As the debate unfolds towards the framing of possible recommendations, two questions remain problematic in terms of arriving at any final viable conclusion:

To what extent can (and should) the specificities of diverse research systems determine and legitimize methodologies for mapping and analysing their design, operation and outputs?

If specificity is admitted as the key criterion, how can the quality of a particular research system be assured so that it may interact effectively with its counterparts in other regions of the world to generate relevant knowledge and its optimal application?

These meta-questions should be kept in mind throughout the workshop deliberations so as to arrive at practical and viable recommendations for countries, whatever their level of development.

II. Knowledge and Research in Context: Global and Local Considerations

The worldwide interest in research systems (ie systems of higher education, research and innovation, HERI) attests to the importance of knowledge today. Knowledge can bring rich dividends for both countries and their citizens. However, it is increasingly urgent that knowledge serves the priorities of national social development agendas. In this regard, research and higher education (where research is extensively conducted) constitutes a key nexus. Issues such as R and D expenditure levels, cohorts of highly qualified people and investment in knowledge-related areas and cooperation arrangements must be studied in relation to the HERI systems where they are found.

The Knowledge Society and the Knowledge Economy have been driving social progress for the past two decades. Advances in communication and information technology are playing a major role in this process. However, a better description may be Knowledge Societies which take account of the enormous different political, social, economic and cultural contexts where knowledge is generated and shared. Worldwide, high-level knowledge – i.e. the sort which helps solve major global problems – demands that countries invest in crucial areas: higher education and notably research universities and research and national innovation systems. When this is neglected, the already significant gap between rich and poorer countries becomes even wider. In contrast, innovation may take place both inside (eg *technology transfer*) or outside academia (e.g. *creative citizen inventions*). However, it is important today for researchers to monitor this process and its impact on economic growth.

For Africa, special efforts remain vital to strengthen knowledge systems and higher education institutions which have been under-resourced in recent years due to the focus on basic education. Global problems (including the Millennium Development Goals but also others such as climate change and the stability of the world economy) are extremely complex areas and require expert investigation from multiple perspectives (i.e. thus exemplifying Mode 2 interdisciplinary knowledge). Against this background, the intrinsic value of the research function must be promoted via analysis of systems themselves: governance and policies, infrastructure (with high calibre research institutions and sound research universities), human resources and investment trends. In this way, countries may elaborate more effective policies which assure their sustainable growth and wellbeing.

For these reasons, it is essential to facilitate continuous debate on higher education, research and innovation systems so that researchers and wide stakeholders can exchange experiences – and, at all levels. On the national level, countries need to acquire the necessary capacity to map systems, to document their evolution and to benchmark progress against others of similar scale. Ownership of this process is vital as there is no single model for knowledge and research systems given their differing contextual diversity. But, this analysis of systems and dimensions is also a regional and global process whereby the stakeholders can better understand the determining factors involved which shape change and development and, thus, their specific roles in this chain of events.

Above all, research must help to build equitable and dynamic knowledge systems. Understanding research contexts, documenting and monitoring these at both national and wider levels and building context –relevant research systems, including universities, are vital components of this process.

III. The Importance of Research Today

III.1. The Knowledge Dividend

Over the past two decades, the sectors of research and knowledge production have undergone profound transformation and have emerged as main motors of development in a globalized world. This process has brought with it major changes in the landscape of higher education, notably the university sector. Of course, systems of knowledge production now extend far beyond the realm of higher education institutions since they cover a vast range of entities, *inter alia*, public laboratories, research centres and think tanks run by policy and civil society groups, industry and the private sector and the military complex.

As a result of this transformation, countries across all regions are facing increased demands to strengthen their capacities for research and knowledge production. This demand is rising despite the vast differences in the political, socio-economic and cultural of these national contexts which impact on their capacity to respond effectively. This demand has also given new importance to national knowledge-oriented institutions and often necessitates urgent efforts to renew systems and structures of higher education so that these countries can take their place in the Knowledge Society which is an ever changing and volatile global environment. In turn, this urgency to promote and reinforce research and higher education multiplies pressures on the funding, content and structures of knowledge systems. These challenges have become particularly overwhelming for middle and low income countries, thus increasing the risk of their further marginalization.

III.2 Promoting Knowledge Systems for Social Development

Knowledge generated by research is the base of sustainable social development. In this regard, three dimensions merit attention:

- .placing knowledge, including high-level scientific knowledge, at the service of development*
- .converting knowledge, in all its forms, into value via applications and assessment of impact*
- .sharing good practice to ensure widespread benefits.*

Despite trends towards greater global uniformity in many areas of society, there exists no single answer as to what constitutes the most appropriate structures, systems or policies for research, higher education or knowledge production. Because these crucial processes take place in varying historical, social, economic, political and cultural contexts, their outcomes cannot be uniform. Perhaps research and higher education could be structured in much more effective ways which means that experimentation in this direction should be encouraged and the findings widely debated and shared at regional and global levels.

Knowledge societies can vary widely in form and in their modus operandi and this cultural diversity must be celebrated as a hallmark of a vibrant and dynamic global society. For this reason, understanding local and indigenous knowledge through research is of the greatest importance.

Excellence has many manifestations and the search to define and conserve these can never be neglected because they witness the fundamental parity of cultures and of their knowledge systems.

Nevertheless, from the perspective of social development, the ongoing serious inequalities in this area remain unresolved and have even assumed new urgency. The Knowledge Divide (and thus the research gap) constitutes an issue to be reinforced without delay.

Recognizing and promoting excellence so as to discover and access new frontiers of knowledge is an imperative which should be possible for all countries whatever their level of economic development. Yet, these frontiers are often in the fields of science, technology and engineering, health care, agriculture and economics where highly educated and skilled human capital along with large-scale investment is essential so as to assure the appropriate context of enquiry.

Social development embraces an array of complex aspects including political governance, economic growth, employment trends and income distribution, education levels, access to health care, rural and urban population patterns, energy and the use of natural resources, along with factors affecting the quality of life such as private consumption, life expectancy and access to communication technology. These and other indicators are traditionally used by global organizations such as the World Bank, the UNDP and the OECD to measure progress (ie social and human development) in specific contexts. However, poverty remains a reality in many parts of the world and even inside high-income countries. While the war on poverty has brought significant improvements in certain contexts (East Asian economies being a relevant example), these often fluctuate according to global economic performance. Elsewhere, the problem remains dire, thus impeding human development which is sustained and productive. Until this battle is won, progress will remain the privilege of a minority of countries. Winning the battle will largely depend on equitable and affordable access to and the use of relevant knowledge.

111.3 Research and Higher Education: the Key Nexus

While national research structures are wider than those found in the higher education sector alone, the research function of academia remains a prime source of a country's knowledge base. Over the past decade, most industrialized states have strived to address the dual challenge of providing wider access to post-secondary education and training and of ensuring adequate investment in high-level research. This duality is proving to be a delicate balancing act which demands visionary policies and a more diversified funding base. Governments seek to build world-class systems which assure quality provision in both teaching and research. In contrast, universities wishing to be considered as "world-class" are usually aiming at research excellence and often with particular repute in STI domains.

Against this background, the challenges for these institutions are continuing to grow. Today, some 22 of the world's elite 25 research universities are located in one country, the USA. While American higher education deserves full credit for the breadth and resourcing of this sector, this monopoly cannot be expected to meet global needs in terms of research. For this reason, support for research universities has become an important priority in OECD countries. The rise in the status of the Shanghai Jiao Tong and similar ranking systems also attests to this situation. Though often viewed as controversial, these and similar instruments attempt to propose criteria to assess the research function of academia and have a strong bias towards S and T fields where measurement is relatively easy (e.g. numbers of high level faculty, of publications and of citations). An exception would be the Times QS World University Rankings whose indicators include peer review, graduate employability and teaching quality which are almost impossible to quantify.

At the same time, social justice would require that middle and low-income countries cannot be allowed to fall behind in the knowledge stakes. Investment in research is increasing in emerging

economies - Brazil, China, Singapore and South Africa being pertinent examples in this regard. Post graduate education and training, notably in STI fields, have assumed new importance to underpin this policy approach. Recent initiatives in Nigerian and Pakistani higher education illustrate this trend. These require their own resources, which are somehow found by governments although they are still struggling to resolve the issues related to literacy and lower levels of education.

However, overall, the situation of research universities in low income countries remains bleak and in need of rapid effective solutions. For example, 80% of PhD graduates in the LAC region are concentrated in just four countries (Brazil, Mexico, Argentina and Chile). Even the poorest nations require research capacity to progress and so it could be argued that support for the principle of a research university in these contexts is more urgent than ever before. Reaching this goal and maintaining the quality and relevance of these essential institutions requires national commitment and also must remain a major objective for international cooperation in the years ahead.

111.4 Major Challenges for Research

These initial remarks set the scene for a study of the challenges facing the research function and its environment as the first decade of the 21st century draws to a close. Issues of equity, quality, relevance, ownership and international networking lie at the heart of this debate and will be explored further later in this paper.

An ever growing number of nations of varying scale have decided to accord priority to developing their knowledge base, through higher education and research, and to commit the necessary resources to this goal. Success stories are becoming more common in all regions which is an encouraging sign. These are characterized by specific indicators:

- .innovative policies in higher education, research and STI*
- .a will to improve and profile the necessary infrastructure including universities*
- .efforts to train, retain and attract highly skilled human capital*
- .increased levels of investment in research and in higher education.*

Examples of this process include the significant rise in the numbers of Singapore's research scientists and engineers (RSEs) from 4329 in 1990 to 11 596 in 2004 and Qatar's commitment to investment in higher education and scientific research which, at 2.8% of its GNP, is the highest in the Gulf States. (Sources: UNESCO Forum Special Initiative Asia Report 2008:89; El Kaffas: Arab States Regional Research, Rabat 2007)

It is essential to chart these processes and to help promote their replication worldwide to render the global knowledge society a more level playing field.

IV. The Knowledge Society : A Global Overview

VI.1 Defining the Knowledge Society

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 knowledge base.

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." (Source: UNESCO: *Towards Knowledge Societies: 17*) Therefore, access to education and training for all is clearly a right for all citizens and an obligation for governments. Furthermore, each society already has its own kinds of

knowledge assets which should be recognized and protected so as to link and mesh with the new forms of knowledge promoted by the Knowledge Economy. Several guiding precepts are important:

.this sort of society must foster sharing of knowledge

.ICT creates new opportunities for reaching this objective

.knowledge societies are much wider and richer than the narrower information society

.this society can offer a fresh and relevant approach for the development of countries of the south.

Managing knowledge societies is a complex process involving a range of strategies and mechanisms which should operate effectively for optimal results. Elements range from traditional upstream aspects such as governance, policies and investment to downstream management of knowledge institutions and workers with due respect for their necessary interaction and adaptation as well as for specific cultural and ethical values.

IV.2 The Role of Higher Education and University Research in Knowledge Societies

Using the term “knowledge societies” suggests that countries should strive to foster their own individual version of the global Knowledge Society for which the domains of higher education and advanced research are one cornerstone. This principle of ownership is crucial in order to ensure that knowledge production via research and higher education are directly relevant to national development agendas. Since governance, the brain drain, resource levels and the widening digital divide are common challenges for both areas, the strategies designed to address these should be tailored to specific contexts.

For the higher education sector, the advent of massification has radically changed the traditional patterns of knowledge production, diffusion and application over the past two decades. Following the burgeoning enrolments between the 1970s and 1990s, demand has continued to rise and it is estimated that the world’s student population could reach 150 million by 2025. While this demand has been obvious in OECD countries (e.g. from 2.2% in the 1960s to 59% in 2002 in the USA), it is certainly not confined to these states. Strong population growth in Africa, Asia and Latin America and increased (though not total) enrolment in primary and secondary education has boosted demand at the tertiary level.

As is well known, this demand is varied in objectives and scope covering traditional academic and research-based teaching and learning to specialize and more practically oriented training. As a result, diversification of institutional mission has become essential so as to meet this range of provisions, which all find their legitimate place in the development of a nation’s cohort of skilled human resources. Moreover, this diverse landscape has led to the emergence of a new tertiary educational paradigm with specific characteristics namely the promotion of learning by doing and of individual creativity, the availability of wide access through both face-to face and open learning and engagement with regional and local priorities.

Regarding the role and contribution of research universities, these are characterized by top graduates, leading edge research and vigorous technology transfer. Critical dimensions are a concentration of talent, abundant resources and favourable governance which combine to assure excellence in graduate education and research output.

In contrast, when countries lose their base for academic excellence – through outdated policies, neglected institutions, the exodus of their best graduates and woefully inadequate investment in university research - their competitiveness in a global knowledge society will dwindle and finally disappear. By way of example, 50% of Colombia’s science PhDs are abroad and an estimated 47% of Ghanaian doctors work in other countries. The dangers of this process are evident and must be countered at all costs.

VI.3 Research and National Innovation Systems

Innovation systems may be regional, national and local in scope and depend on key components namely organizations and institutions:

.organizations are the formal structures that are consciously created with an explicit purpose and thus they are the principal players involved;

.institutions can be defined as the framework of norms, rules, legislation and routines which constitute the rules of the game.

Speaking at the 2006 UNESCO Forum Global Colloquium, Charles Edqvist, director of the Centre for Innovation Research and Competence in the Learning Economy (CIRCLE) at Lund University, Sweden, identified ten critical activities occurring in these systems:

. the provision of R and D investment to create new knowledge, primarily in engineering, medicine and the natural sciences

.capacity -building to create a highly skilled group in the labour force to be used in R and D

.the establishment of new product markets

.quality assurance mechanisms

.encouraging creative organizations which promote entrepreneurship and enhance the infrastructure to boost innovation

.networking through markets and mechanisms with interactive learning amongst the institutions involved

.creating enabling institutions which facilitate innovation (such as Intellectual Property Rights and tax laws, R and D investment, sound environmental and safety regulations)

.incubation activities to foster innovative projects

.financing of innovative processes to facilitate the commercialization of knowledge

.consultancy services for technology transfer and regarding the legal and commercial aspects of innovative activities.

From this checklist, it is true to say that countries with robust innovation systems privilege research in a variety of contexts which include universities and a thriving private sector. In OECD countries over the past decade, the changing external environment has seen governments place unprecedented emphasis on research as a key motor for national development. This has led to new challenges for research management and where universities have expanded their research links with industry, commerce and government, as well as with the community at large.

However, the picture in developing countries is much less rosy. For example, in Africa, gross domestic expenditure in R and D (GERD) as a percentage of the gross national product (GNP) continued to remain under 0.5% between 1992 and 2000 (*Source: UNESCO Institute of Statistics S and T Database June 2005*).

The descending levels of expenditure are replicated in a weakened university sector and in an often fledgeling private sector which does not benefit from government support. The decline of universities in Africa due to certain donor policies which favoured investment in basic education has led to widespread calls for emergency assistance including pledges from the G8 nations at their annual summits held in Gleneagles, UK in 2006 and in Heiligen, Germany in 2007 - the latter being preceded by a special pre-event on education, research and innovation as the base for sustainable development hosted by Italy in Trieste. As for the private sector, this has considerable potential as witnessed by the success of micro credit schemes in Asia through the Grameen Bank and similar bodies and by the presence of SMEs which survive frequently harrowing economic conditions to constitute the largest part of business activity in developing countries. For instance, Benin's thriving textile industry is controlled by small entrepreneurs who are invariably women. Despite these positive examples, overall, a more sound business infrastructure is needed to realize potential.

VI.4 Globalization In Practice: The Widening Knowledge Gap

The jury is still out on the long term effects of the globalized economy in terms of equitable social benefits. Very recently, this has been further exacerbated by the world economic crisis whose worst effects are still to be felt. It is true that astonishing growth has taken place in certain places and at certain times over the last few years. Often led by export-driven economic policies, this generated sudden wealth which seemed to help reduce poverty levels by bringing opportunities to middle and low-income countries in Africa, Latin America and Asia. The last region recorded the most spectacular growth with the rapid rise of China since 2000, the ongoing creditable performance of the East Asian Tigers and the sharp upturn in commodity prices in agriculture and raw materials which rose 75% in 2008 according to the International Monetary Fund. However, as economies are now slowing down, many gains have been cancelled and sustained growth is proving elusive.

With regard to access to knowledge, serious discrepancies continue to exist and these impact negatively on production and dissemination. These are the source not only of inequality but constitute the major impediment to sustained development. Two areas affected are CIT access and research productivity.

The extent of the digital divide is captured by comparing the distribution of Internet hosts with that of the world population which are almost diametrically opposed: 5.9% for the developing countries although these have 80.4 % of the world's population.

Another example is the state of health-related research in developing countries which helps to explain attendant problems such as the wasteful use of scarce resources, low patent production and limited publications in top scientific journals by researchers in the developing world. The Commission on Health Research for Development reports that GERD/GNP expenditure is between 2% and 3% in OECD economies but, once again, down to under 0.5% in developing Asian countries such as Indonesia and Thailand.

Until this situation improves, access to knowledge will be seriously inequitable and sustainable development will remain a distant and perhaps unreachable goal. In the immediate future, prospects are rather bleak due to the current state of the global economy. Many questions can be posed regarding the damage which continues daily. Already the chaos already provoked in the labour, industrial and banking sectors has proved the unpredictability of social transformations processes. Many of the gains from the 1990s and early years of the 21st century have been severely reversed. How this will ultimately impact on efforts to promote more equitable access to knowledge and research has yet to be understood. Since vulnerable social and economic contexts can expect to experience difficult and often wildly fluctuating conditions in the foreseeable future, experts

(including the research community) are challenged to make reliable predictions for more positive outcomes.

V. Research in Diverse Social Contexts: Challenges, Tensions and Dynamics

Discussion at the Experts' Workshop will surely demonstrate that each selected theme involves a wide and complex range of provocative questions. These necessitate reflection based on differing viewpoints and, in particular, on the exchange of experiences from which useful lessons – both positive and negative – have been drawn.

A sample of these is as follows:

Theme 1: Current Governance Trends and Implications for Research including Research Universities

- Since good governance is cited as one of the major pre-conditions for building sound national systems in education, health, agriculture etc), what strategies are effective for promoting this in volatile contexts?
- As there are examples of research being protected in conflict and post-conflict political situations, what factors have contributed to this?
- In 2010 (one decade into the 21st century), what are the principal tensions pertaining to the politics of knowledge?

Theme 2: Research Imperatives for Emerging Economies

- How has the paradigm shift in research from liberalism to more state interventionism impacted on the achievement of national development agendas across all regions?
- How is the “think global, act local “tension best resolved in these contexts?
- How are these contexts reacting to the current global economic crisis in order to maintain ground gained in their economic performances?

Theme 3: Organizing Research in Challenging Geographical Contexts

- As scale is a key factor in responding to supply and demand, what are the key elements in the planning of research at national and institutional levels?
- Is it viable to support the argument that every country should have at least one world-class research university ?
- Are other research arrangements more practical (eg regional universities)?

**Theme 4: Research Systems and Specific Challenges for Social Development:
(Outreach to key social partners, multiculturalism, changing demographics)**

- For research to have the optimal impact in relation to development issues, what is the role of social capital?
- Where universities are recognized as key actors in the social transformation process, what factors are in play to facilitate this?
- Can the social science research gain greater support through a “relevance –based” agenda?

Theme 5: Research and IT Connectivity - Opportunities for Innovation and Issues for Africa

- Concretely, what are the most promising opportunities for raising IT capacity in middle and low income countries, including those in Africa?
- What are the dynamics between the public and private sectors in helping to expand this capacity at national and local level?
- How can instances of successful innovative practices (ie the 3rd mission of universities) be shared for optimal impact?

VI. Conclusion: Towards Equitable and Dynamic Knowledge Societies via Research

Throughout this paper, the emphasis has been on the importance of building, maintaining and understanding context-relevant knowledge systems in a globalized world where knowledge has become an indispensable component for sustained social and human development. Central to these systems is research – as a key function of academic higher education and as a cornerstone of scientific capacity at national, regional and international levels. To understand and reinforce these systems is a threefold process:

- *understanding the context in which research is taking place is the primary focus.* This is the essential framework for formulating advice as to how this area can be strengthened. The examples cited have illustrated that contexts vary greatly and the forces shaping research have changed radically over the past decade;
- *documenting research systems* whether national or wider in their scope, via the collection of reliable data is a necessary base for action which would aim to improve them. Statistics and trends related to policies, infrastructure, human capacity and investment must be the basis of evidence-based policy-making which is intended to advance a country’s competitiveness and connectedness in a global environment as well as to address local challenges effectively. In the

later respect and for developing countries, the research dimension of the Millennium Developments Goals should be more clearly articulated since only this can underpin long term sustained solutions - and more importantly, this type of research is very prevalent and can inform policy-making in useful ways.

- **reinforcing research universities**, which are perhaps the single strongest component of knowledge systems and their potential as intellectual institutions with crucial social, economic and cultural impact. Though well recognized in principle, this potential in the poorest states has suffered from inadequate policies and investment over a lengthy period. Consequently, bold and forward-looking strategies are now urgently needed to try to bridge the gap created.

Given the unknown outcomes of the current global economic crisis, expertise in knowledge systems as they operate in diverse contexts has never been more important to the ongoing challenges related to sustainable development. Knowledge systems will certainly continue to evolve and become increasingly sophisticated. In a turbulent climate, opportunities to advance and benefit from the knowledge dividend may not be easily available to all countries. Nevertheless, equity demands that no state will be excluded in this regard and this should remain the prime policy objective.

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