UNESCO Regional Scientific Committee for the Arab States
First Regional Research Seminar

Restructuring and Differentiation of Patterns of Higher Education in
the Arab States:  
*Meeting the Challenges in the Present and the Future*
6-7 October 2004
Paris, France

*Theme: Research, Researchers and Graduate Studies*

Networks of International Collaboration:  
Keys to Research Advancement

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Introduction

This age is the knowledge-driven era. Challenges faced by nations today are numerous, and keys to overcoming the hurdles include the correct application of scientific knowledge and technology. Enhancing science and technology in developing countries has therefore become a true necessity and not a luxury. Hand-in-hand with it is research advancement. But improvement of research involves various actors, and each has a vital role to play. The Center for Special Studies and Programs at Bibliotheca Alexandrina hopes to contribute to this goal.

Challenges Faced

Humanity is facing various critical issues today. It is haunted by poverty, hunger and disease, despite the enormous improvements that have been achieved in human welfare in order to meet the Millennium Development Goals adopted by Member States of the United Nations in July 2006. Twenty-six percent of the children in the developing countries are malnourished and the threat of starvation and famine still exists in parts of the world\(^2\). More than 1.0 billion people survive on less than $1 a day, and every year, more than 10 million children die of preventable illnesses—30,000 a day\(^2\). Another concern is globalization, known by the World Bank as the growing integration of economies and societies around the world, as it shapes a new era of interaction among nations, economies and people. Although this era is opening many opportunities for millions of people around the world—through increased trade, new technologies, foreign investments, expanding media and Internet connections—the global integration process is uneven and unbalanced, with uneven participation of countries and people in the expanding opportunities of globalization. The new rules of globalization focus on integrating global markets, neglecting the needs of people that markets cannot meet. This can result in the concentration of power and marginalizing of the poor, both countries and people\(^3\).

Economic growth is a vital means to achieving human well-being in the face of all these challenges. It is necessary in order to meet the Millennium Development Goals, for two reasons. First, economic growth directly reduces income poverty for many households, increasing their savings and freeing resources for investments in human development. Without economic growth countries cannot expect to halve the proportion of people living in income poverty, the first target of the Goals. Second, economic growth tends to increase government revenue, which can in turn be spent on investments in human development (health, nutrition, education, and infrastructure)\(^2\).

Unfortunately there some 2 billion people—particularly in sub-Saharan Africa, the Middle East, and the former Soviet Union—living in countries that are being left behind. These countries have been unable to increase their integration with the world economy, and their ratio of trade to Gross Domestic Product (GDP) either remained flat or declined. On average, these economies have contracted, poverty has risen, and education levels have risen less rapidly than in the more globalized countries\(^4\).
Relieving the Challenges

The ability of a society to produce, select, adapt, commercialize, and use knowledge is critical for sustained economic growth and improved living standards. The World Development Report 1998/1999 stated that "today's most technologically advanced economies are truly knowledge-based…creating millions of knowledge-related jobs in an array of disciplines that have emerged overnight"[5]. In fact, knowledge economy variables are becoming significant determinants of economic growth[6]. It has been asserted that successful development necessitates closing the gap in knowledge, rather than just investing and closing the gap in physical capital[7].

Knowledge wealth ought to be converted to knowledge capital that should be effectively used to produce new forms of knowledge. This process requires two connected processes. The first is the dissemination of available knowledge, whereas the second is the production of new forms of knowledge in all fields: natural sciences, social sciences, the humanities, arts, literature, and others. This is in addition to its efficient utilization in all societal activities, in a continuous quest to advance human development, as it enables people to enlarge their capabilities and widen their horizon of choice[8].

Through its capacity to enhance productivity, knowledge forms the foundation of a country’s competitiveness, vital as international competition becomes increasingly intense. This change is most evident in OECD countries, where investments in the intangibles that make up the knowledge base of a country (e.g. research and development, higher education, computer software, patents) are equaling or even exceeding investments in physical equipment and material. Developing economies, while affected by these transformations, are not yet acquiring their benefits. This is because the capacity to generate and harness knowledge in the pursuit of sustainable development and improved living standards is not spread equally among all nations. Advanced economies enjoy the results of a self-promoting cycle in which the benefits of research help produce wealth and public support needed to enable continued investment in research and development (R&D) (Figure 1). In contrast, many developing countries have not built up their capacity to link knowledge to economic growth[9].

The principal hope, therefore, for overcoming underdevelopment and achieving competitiveness in developing countries is a mobilized, well-organized and well functioning knowledge system. No other development investment promises greater exponential returns in an era of knowledge intensity and knowledge-driven competition[8].

The gap between developing countries and knowledge societies is large and broadening rapidly. This divide must be addressed, and steps taken to tackle it[8].
According to the World Bank Development Report 2003: Sustainable Development in a Dynamic Economy, science and technology (S&T) can play a major role in addressing socioeconomic problems\textsuperscript{[10]}. Capacity-building in science and technology is an essential element in propelling knowledge-based development that alleviates demographic, urbanization, public health, and environmental pressures troubling the world. Successful economies, such as those of the “East Asian Tigers”, have achieved a lot by focusing on education and investing in R&D\textsuperscript{[1]}. By importing new technologies and building up their own national capacities to internalize the know-how and to apply them in domestic production, export and promote R&D effort, these countries have significantly—and quite rapidly—decreased the S&T gap between them and the more developed countries in many disciplines\textsuperscript{[11]}. 

There are striking differences between rich and poor countries in science and technology investment and capacity. It was estimated in 2002, that OECD member countries are accounted for 78.9\% of total investment in R&D; Brazil, China, India, and the newly industrialized countries of East Asia for 19.2\%; and the rest of the world for only 1.9\%\textsuperscript{[11]}.

This was emphasized in the Declaration on Science and the Use of Scientific Knowledge of the World Conference on Science for the Twenty-first Century: A New Commitment, convened by UNESCO and the International Council for Science (ICSU) in Budapest (Hungary) in 1999, which stated: “Most of the benefits of science are unevenly distributed, as a result of structural asymmetries among countries, regions and social groups, and between the sexes. As scientific knowledge has become a crucial factor in the production of wealth, so its distribution has become more inequitable. What distinguishes the poor (be it people or countries) from the rich is not only that they have fewer assets, but also that they are largely excluded from the creation and the benefits of scientific knowledge”\textsuperscript{[11]}.

Countries without a minimum scientific and technological capacity will suffer delays in realizing social and human benefits such as rising life expectancy, lower infant mortality, and improved health, nutrition, and sanitation. Such countries will be increasingly vulnerable to emerging threats\textsuperscript{[3]}.  

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure1.png}
\caption{Gross expenditure on R&D in developed and developing countries 2002}
\textit{Source: UNESCO Science Report 2005}
\end{figure}
It is therefore proving crucial that developing nations participate in this new age of science and technology, in order to become more than mere consumers of the technological exports of the industrialized countries.\(^1\)

Science and Technology development includes strategy development, competitive funding, promotion of research in priority areas, joint public-private sector technology development, as well as intellectual property rights.\(^5\) It is important that S&T be applied in policymaking and policy be used to promote S&T. Human resources must be strengthened, with the attraction, development, and retention of talent in the fields of S&T. Centers of excellence should be created, linking professionals from different locations via the new information and communications technology. This can also assist in regional cooperation between countries, to tackle similar problems.

It should be noted that S&T must be supported by a national commitment and an environment that encourages high-tech investment, plus widespread secondary education and solid tertiary education, to guarantee the continual supply of middle-level and highly qualified S&T personnel.\(^11\)

**Research and Development**

Mr. Koïchiro Matsuura, UNESCO Director-General, on the occasion of the opening of the *Global Research Seminar: Knowledge Society vs. Knowledge Economy, Knowledge, Power and Politics* on 8 December 2003, stated that:

"Higher education and research are key components for building a knowledge society. They are critical for innovation and change. In developed countries especially, higher education and research are at the heart of any vision of enduring growth and prosperity. Research, in fact, is a vital aspect of the link between knowledge and sustainable development."\(^12\)

Research and Development (R&D) are defined by UNESCO and OECD as follows:

"Research and experimental development comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."\(^11\)

The results, or output, of R&D take the form of new knowledge and competence, scientific breakthroughs, new discoveries or inventions, new or considerably improved products or services and innovative scientific and technical methods, etc.\(^11\)

Increased level of investment in research and development is generally correlated with improved GDP-growth outcomes. High-income nations devote a significantly greater share of their national resources to science and technology. According to the InterAcademy Council Report 2004 *Inventing a better future: A strategy for building worldwide capacities in science and technology*, they average 3281 scientists and engineers per million populations, while the middle-income nations average 788. Patents, an indication of S&T productivity, granted to residents of high-income nations average about 346 per million populations, whereas the middle-income nations average 10. Countries with major investment in R&D also have strong high-technology industrial and service sectors. Hence, it is important that efforts to
improve the overall capacity in science and technology be accompanied by increased public spending on research and development[1].

Sustaining long-term basic research, and linking it to societal goals, is necessary for generating new knowledge and beneficial technologies. In addition to combining global, national, and local institutions into effective research systems; linking academia, government, and the private sector in collaborative research partnerships; and integrating disciplinary knowledge into interdisciplinary, locally focused, problem-driven research and application efforts[1].

**Research in the Arab Countries**

It is not possible for Arab countries to benefit from global knowledge production and technology without investing in local production, local knowledge workers and local knowledge traditions. Overcoming current obstacles facing knowledge production in the region begins with understanding that R&D today is the weakest link in Arab innovation systems[8].

Researchers, or Research Scientists and Engineers (RSEs), are defined by OECD and UNESCO as “professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems and in the management of the projects concerned”[11].

The ratio of researchers to the total number of inhabitants describes the density of R&D human resources in relation to the size of the population. On average, there were some 894 RSEs per million inhabitants in the world during 2002. The general level in the developed countries was a little more than 3200 RSEs for every million inhabitants compared to 136 in Arab countries per million of population (Figure 2)[11].

According to the *UNESCO Science Report 2005: The State of Science in the World*, the world share of scientific publications in the Arab countries in 2005 was 0.9%, which fell within the advanced group of developing countries, which includes Brazil 1.4%, China 4.1% and India 1.9%. However, they were still far-away from the production levels of developed countries, such as Japan 10.8%, Germany 9.8%, and France 6.8% (Figure 3). Although scientific publication in the Arab world has increased considerably in the past three decades of the 20th century (the number of papers published by Arab scholars in specialized global periodicals increased from 465 papers in 1967 to nearly 7000 in 1995, i.e., 10% annually), this increase was modest in comparison with some developing countries, such as Brazil, China and East Asian Tigers like Korea [8].

Calculating the rate of increase in published scientific papers per one million people also helps instructively in comparing Arab scientific publication in relation to other countries. Based on that indicator, the number of scientific papers per one million people in China in 1995 was 11 times what it was in 1981. In South Korea, it was 24 times greater. In Arab countries, however, it was only 2.4 times greater, increasing
from 11 papers per one million people in 1981 to 26 papers in 1995. At the institutional level, only 26 Arab scientific institutions published more than 50 research papers each in 1995, while only five such institutions published more that 200 papers[8].
Among the indicators for measuring the quality of research in general, is the number of articles cited in reputable journals. The higher the quality of a research paper and the more it adds to human knowledge, the more references it attracts. The UNESCO Science Report 2005 measures this activity by the science citation index (SCI). The Report indicated that the number of frequently cited scientific papers per million inhabitants amounts to 0.02 in Egypt, 0.07 in Saudi Arabia, 0.01 in Algeria and 0.53 in Kuwait. This compares with 43 in USA and 80 in Switzerland\(^{[11]}\).

The number of patents registered by national and international patent offices provides valuable insights into the levels of technological capability, productivity and competitiveness of countries and regions\(^{[11]}\). Although the Arab region shows a modest share of scientific publication, it vanishes from the international map of patent registration (Figure 4). This shows that it is easier for an individual to publish than to produce a patent, and publishing is often required for promotion within academic institutions\(^{[13]}\).

Academicism in research is therefore another significant flaw. Researchers in many R&D institutes are rewarded and promoted on the basis of academic research and published scientific papers rather than for purposeful applied research and its contribution to solving problems faced by the production sectors. Research projects of interest to industry, firms, enterprises and services that help industry absorb and develop imported technologies and advance their innovation activities are few\(^{[8]}\).

Scientific publications and patents are useful but insufficient indicators of scientific research and technological development activity. They do not indicate the full spectrum of innovation activity, which is more related to development support products. Indicators related to innovation processes, such as the design and engineering of products, production processes and software, are not readily available.

![Figure 4. Patent applications filed by residents 2005](image)

Source: World Intellectual Property Organization’s Industrial Property Statistics

Innovative capabilities can, however, be measured by demonstrating the widespread presence of innovations in national and foreign markets that can be calculated and evaluated\(^{[8]}\).
Gross Expenditure on R&D (GERD) covers the total amount of money directly spent on R&D in a given country in a given year, independently of how this R&D has been financed. The estimated GERD as percent of GNP and sources of R&D funding in the Arab countries is 0.2% (Figure 5). This is very low in relation to other countries world-wide\cite{11}.

Arab scientists are therefore in need of resources, and it appears that valuable individual productivity is being wasted because of this shortage of resources. The Arab region’s relatively higher publication productivity with respect to GERD represents a waste of potential and is an indicator of the extensive brain drain of Arab scientific talent to other regions\cite{13}.

Emigration of highly qualified Arabs to the industrialized countries has been one of the most serious factors undermining knowledge acquisition in Arab countries. The trend is large-scale and is steadily accelerating. Data to adequately document the extent of this is not readily available, but it is estimated that by the year 1976, 23% of Arab engineers, 50% of Arab doctors, and 15% of Arab BSc holders had emigrated. Roughly 25% of 300,000 first degree graduates from Arab universities in 1995/96 emigrated. Between 1998 and 2000 more than 15,000 Arab doctors migrated\cite{8}.

Other than the incredible scale of emigration and its growth over time, there are many obstacles to building Arab knowledge societies that may be more serious than the brain drain itself. Surveys of highly qualified Arabs living abroad indicate that their main reasons for leaving are related to the absence of a positive societal environment and facilities that would allow them to play their role in the knowledge system and in the development of their countries. The lack of these conditions to a large number of highly qualified Arabs undermines efforts to build knowledge societies in Arab countries\cite{8}.

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{figure5.png}
\caption{Shares of world R&D expenditure (GERD) by selected regions/countries 2002(\%)
\textit{Source: UNESCO Science Report 2005}}
\end{figure}

Such emigration weakens both the production of knowledge and the demand for it, since the activities of such highly qualified personnel would have significantly increased both supply and demand had they remained in their countries. Ironically, the Arab brain drain is a form of reverse development since receiving countries evidently benefit from Arab investments in training and educating their citizens\cite{8}.
It is therefore imperative that action be taken to reduce this incredible loss of potential. Expertise and knowledge of the Arabs dispersed abroad should be tapped. Secondly, Arab expatriates should be provided with incentives to return to their countries either on temporary assignments or permanently. When they come back, they will do so with greater knowledge capital than that with which they left.\[^8\]

We must note that this will not occur unless conditions that allow these scientists to contribute to national development, and that encourage fulfillment in their personal, professional and public lives, are available in their countries. Creating such conditions is not an easy task, but is crucial so emigrants return to participate in creating a knowledge society and to share in the honor of seeing it materialize.\[^8\]

**Center for Special Studies and Programs (CSSP)**

Bibliotheca Alexandrina (BA) is committed to catalyzing the progress of science and technology in the region be it through initiation of projects that promote production of knowledge or through its dissemination. The Center for Special Studies and Programs (CSSP) was established by the Egyptian Presidential Decree No. 361 of 2002 as one of the cultural and scientific centers affiliated to the Library of Alexandria. It is an independent scientific non-profit institution chaired by Dr. Ismail Serageldin, Director of the Library.

CSSP profits greatly from being affiliated to the Bibliotheca Alexandrina, as many resources and facilities are provided by its different departments. The Library also has facilities conducive for research, as well as 320 computers, showing a significant availability of internet access. It has a special legislative structure as it is based on Law No. 1 for 2001, which made it an autonomous juridical person attached directly to the President of the Arab Republic of Egypt. This enables CSSP to avoid bureaucracy.

CSSP aims to cooperate with specialized international authorities, universities, and Egyptian or foreign centers concerning the conduction of scientific research in topics that are corresponding with the mission of the Library of Alexandria. It also seeks to prepare and execute special programs for training, publishing, organizing scientific conferences, and conducting appropriate technological applications, in addition to exploring scientific cooperation between Egyptian scientists and researchers and their peers worldwide.

**CSSP and Brain Drain**

In Egypt there are over 34,000 researchers in R&D (493 per million people), and approximately 31.7% PhD holders. Professionals and scholars such as PhD holders, who obtained their degrees abroad, can remain in the foreign country and continue the pursuit of their professional or academic careers, provided they can secure funding for their research. This ultimately leads to brain drain. They could also return to their original Egyptian institutions where research funds are scarce and they risk losing the knowledge they acquired, or they could pursue a career in the business sector, where their acquired knowledge can be applied.
CSSP would like to tackle the alienation problem faced by researchers upon their return to Egypt and their original institutions. It also recognizes the existence of a pool of untapped potential available in young researchers all over Egypt that are eager to collaborate with international institutions, however lack the process needed for such collaborations.

CSSP is especially concerned with the young post-doctoral scientists. It also recognizes that cooperation between scientific and technological communities is critical to enhance technology transfer, maintain high research quality, as well as provide opportunities for scientific contacts.

The Library of Alexandria has therefore launched a research grant program, through CSSP, to fund outstanding young postdoctoral scientists in Egypt, who undertake collaborative projects in the Natural Sciences, Mathematics and Information Technology.

The research grant program aims to support Egyptian S&T research and development, as well as decrease the widening scientific achievement gap between local scientists and their peers in developed countries. It tackles the unavailability of sufficient financing while evading bureaucracy faced by researchers in acquirement of funds. It also limits impediments faced by some, since selection is based on research excellence and not seniority, leading to equal opportunities for all researchers. CSSP hopes to act as a focal point, creating and sustaining networks of international collaboration through these research grants.

**Accomplishments**

Starting February 2004, the Bibliotheca Alexandrina has been offering annual research grants for young Egyptian postdoctoral researchers.

**Research Grants 2004:**

Advertisement was made through newspaper, in early 2004, for researchers to apply for research grants in the following areas: Agricultural Sciences, Earth Sciences, Biology, Information Technology, Biochemistry and Biophysics, Mathematics, Chemistry, Medical Sciences, Engineering Sciences and Technologies, as well as Physics and Astronomy.

Candidates, in order to be eligible for the grant, were required to have obtained a PhD degree within the past five years of the announcement date or will complete their PhD before the end of December of the announcement year of the grant. They were also required to be currently working at a public/private university or research center/institute within Egypt, in addition to being currently engaged or can arrange to work on a joint research project with foreign counterpart(s) at a university or research center abroad. Moreover, as RGs targets young postdoctoral researchers, candidates must not have exceeded 35 years of age by January of the announcement year of the grant. Universities and research institutes were targeted because this is where most research is performed.
Only grant applications submitted through the webpage disclosed in the advertisement, were considered, as CSSP insists on being parallel with the existing digital age. A number of 311 postdoctoral researchers applied; who then were short-listed according to the eligibility requirements disclosed in the advertisement. Out of the 220 short-listed proposals, 97 applicants fulfilled their required documents.

Selection of the final winners was made by a reviewing committee, based on the research's objectives, its clarity and originality, as well as the project design and budget. After the selection phase, the CSSP organized a celebration to announce the winners of the Research Grants for the year 2004, who counted to 9 winners. However, the contract was cancelled for one of them due to research misconduct. On the contrary, the State Incentive Award in Engineering was granted to one of the winners.

A special web page with a username and password was designated to each winner in order to follow-up with them. They were required to submit to it their progress reports and provide periodical information about their projects. Currently, 2 researchers have completed their grant period, while 3 researchers are in their final research phase, 3 are in their sixth phase.

**Research Grants 2005:**

In 2005, several upgrades were made to the RGs process. Firstly, the submission system of the grant applications was updated by implementing an online application system. Announcement was not only published in newspaper, however, also published through relevant organizations and universities websites. A total of 163 researchers applied for the grants. Eighty-two of them completely filled the online application form. After the first check, 74 applications were accepted and were submitted for reviewing. Furthermore, 32% of the accepted research proposals were in the area of Agricultural sciences while 22% were in the Engineering sciences and technologies field (Figure 6).

Secondly, the selection of the winning research proposals for the year 2005 was done through an International Review Committee for each research grant field. This committee was composed of international members of the Academy of Sciences for the Developing World (TWAS), Egyptian scientists living abroad, as well as, Egyptian scientists living in Egypt, in addition to general international reviewers from the four corners of the globe (figure 7).

Moreover, in order to facilitate the process of reviewing; all its steps are performed online. Reviewers log-in to their accounts on the BA/CSSP Grants Reviewers site, review research proposals assigned to each and in turn submit their appraisals online. Thus, all proposals for review, were viewed and downloaded, and their results were submitted via the Web.
Finally, a new selection process for the reviewed proposals was implemented to ensure its fairness and winners worthiness. The first selection is made based upon scores given to each proposal by the reviewers; the scoring system was based upon Project Objective, Project Design, Time Plan and Budget. Applicants who score higher than 50 out of a total score of 60 are the top-listed. The final selection is done by interviewing the top-listed candidates, re-scoring their proposals and finally selecting the winners.

Ten was the number of winners for the year 2005 and currently they are all in their second research phase.

**Research Grants 2006:**

The same RGs process steps were followed in the year 2006. The only additional feature was adding Proposal Guidelines to the website to guide applicants to the right method of writing a proposal seeking fund; in order to increase their chance to win the grants.
The number of applicants for this year had increased by 35% from the last year. Two-hundred twenty-two researchers applied for the grants, 53 of them completely filled the online application form and after the first check, 37 applicants were accepted and were submitted for reviewing. The 3 major fields of interest were Agricultural sciences, Chemistry and Engineering sciences (Figure 8).

![Figure 8. RGs 2006 Accepted Applicants by Field (53).](image)

Furthermore, more reviewers were invited to review research proposals. The total number of reviewers reached was 128 eminent scientists worldwide.

Currently, selection of the research proposals to be funded is underway. Selection is based on research quality and appropriate support will be provided for those selected to pursue their postdoctoral researches through direct international cooperation activities with their foreign counterparts in international institutions. This support includes many forms according to the needs of each researcher (e.g. equipment, travel and accommodation expenses).

**Future Plans**

The broad goal for CSSP over the following three years is to establish its research grants reputation and portfolio, in addition to help build links between the research projects proposed and the industry, in hope of implementing this research, and translating it into commercially marketable results. Portions of profit resulting from successful commercialization can be invested in financing future innovative activities, generating a sustainable R&D financing cycle. R&D would therefore move from being a drain on state and private sector budgets to a profitable investment that supports the Gross National Product, and further drives the wheel of development[8].

To advance its prospects of achieving that aim and increasing the involvement of the private sector in R&D, it is currently exploring possibilities with different personnel in the industry to build industry/academia relationships that can assist production and propel economic competitiveness.
CSSP plans to increase the number of grant beneficiaries. Significant resources will thus have to be available to fund these researchers. It also hopes to include projects in the Social Sciences and Humanities within the program, in addition to the Natural Sciences areas available at the moment.

It aims to provide summer programs and fellowships for undergraduates and school students, either on-site training, theoretical courses, or participation in development programs and events outside Egypt. Cooperation between CSSP and Midi-Pyrenees Regional Council in France is an example, where it has been agreed upon that Midi-Pyrenees Council will coordinate scientific exchange programs with CSSP that allows postdoctoral researchers to study at the Toulouse Universities and organize scientific conferences with mutual benefits.

The Center would also like to encourage the participation of postdoctoral researchers in the Supercourse, which is Internet-based distance learning material for health-related fields (medical, nursing, dental, veterinary, etc). CSSP will guide the researchers to browse the Supercourse available on the Library’s website and encourage them to select the copyright-free lectures available and simultaneously publish their lectures on the site.

The first progress in Supercourse project was by establishing the 'Diabetes Supercourse for the Middle East and North African Region' (MENA). This initiation is collaboration between the Bibliotheca Alexandrina (BA) and the WHO Collaborating Center at the University of Pittsburgh and it is supported by the World Diabetes Foundation (WDF).

The proposed program is not a research program. Instead it is translational, were the CSSP works to bring the best scientific research on prevention to the diabetes community. One cannot prevent diabetes and its complications effectively unless one has knowledge about the science of prevention, which the Supercourse is designed to do.

**Conclusion**

In the present phase of human progress, the acquisition, absorption and production of knowledge drive social and economic transformation. Eliminating barriers to empowerment of research and knowledge capacities requires numerous actions. Among them is increasing R&D funding, and intensifying research networking and cross-border cooperation between local Arab scientists and their international counterparts. CSSP aspires to provide a model that can be repeated, where a center catalyzing progress in each research field exists, rather than just one center overseeing all fields. Let us exploit this era of globalization of Science and Technology and bring about a greater involvement by the Arab countries in the world Research and Development effort.

**Acknowledgements**

The authors would like to thank the CSSP team, with special thanks to Mr. Abdallah Sobeih and Ms. Samar AbouelKheir. They would also like to thank the Bibliotheca Alexandrina at large.
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