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EDITORIAL

RESEARCH ACTIVITIES IN MALAYSIA FROM THE PERSPECTIVES OF USM MEDICAL SCHOOL; THE REALITY AND THE STRATEGY

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Introduction

Malaysia spends relatively little on research and development (R&D) compared with other technologically-advanced countries. For example, in the year 2000 only 0.5% of Malaysia's GDP was spent on R&D compared with 2.3% in Germany, 2.5% in the United States, 2.8% in Japan and 2.9% in South Korea. Under the Eighth Malaysia Plan, a total of RM 1.507 billion has been allocated to provide funding for various science and technology programmes through a grant scheme. Most if not all of the money goes to research institutions and these are mainly the public universities (IPTAs) and the Government Research Institutions (GRI). In the year 2000, out of 10,000 members of the local workforce of the country, meaning those in the public sectors, only 15 were involved in R&D. This compared poorly to countries such as South Korea (60), the United States (74), Singapore (83), Britain (95) and Japan (136) (1).

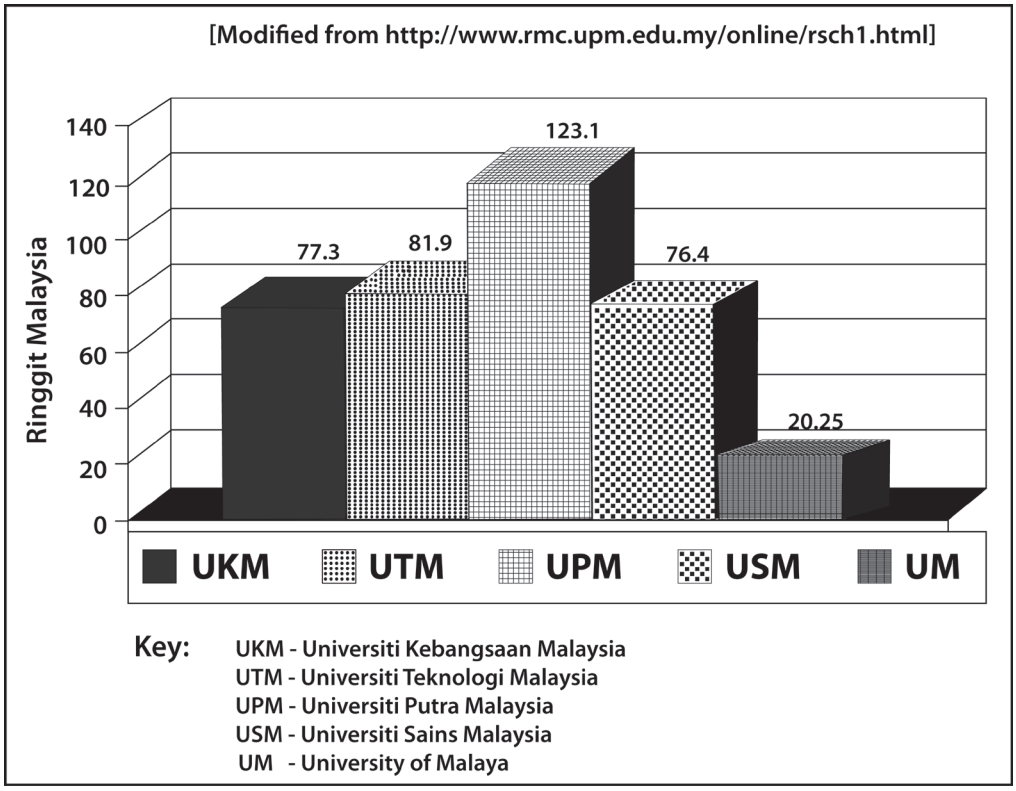
Researches In Major Public Universities in Malaysia

The major public universities which are active in research are Universiti Sains Malaysia (USM), Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Malaya (UM) and Universiti Teknologi Malaysia (UTM). The amount of funds allocated since the 7th Malaysia plan [figure 1] (2) and for the 8th Malaysia plan has been substantial. Most of research funds are disbursed by the Ministry of Science and Technology (MOSTE). Thus far, for a period from year 2000-2003 under the 8th Malaysia Plan the ministry has allocated a total of RM 358,895,326.00 to fund 1,245 projects in various public universities and government research institutions [figure 2] (3). Thirty-one institutions are recipients to a total of RM28,649,098 up to March 2003. For that period, UPM tops the list by obtaining RM 59.7 million Ringgit for the Experimental Applied research alone [figure 3] (4)

Each university has its own Research Administrative Departments, directly under the deputy vice chancellor of research to deal with administrative matters pertaining to research such as monitoring the flow of the funds and tracking the progress of researches done in that institution. Within the university, centers of research excellence are created and their creations are based mainly upon the success of researches in particular areas. For example, within the institutional framework of UKM, research centers of excellence such as the Institute of the Malay World and Civilization (ATMA), Institute for Environment and Development (LESTARI), Institute of Malaysian and International Studies (IKMAS), and the Institute of Microengineering and Nanoelectronics (IMEN) were specially set up to complement research initiatives within the 12 faculties in UKM. Within faculties, smaller centers are formed such as the Centre for Gene Analysis and Technology (CGAT) of Faculty of Science and Technology, and Centre for Advancement Engineering of the Faculty of Engineering. The Interim Laboratory of the National Institute for Genomic and Molecular Biology as well as the Malaysian Institute of Environment is located within the vicinity of the main campus, thus enhancing research collaboration between the institution and the industries. During the period of 2000-2002 UKM has received more than USD25 million (5).

In University Malaya, the research administrative center is called Research Management and Consultancy unit (better known

Figure 1: IRPA (total) Allocation for Public Universities in Malaysia for the 7th Malaysia Plan



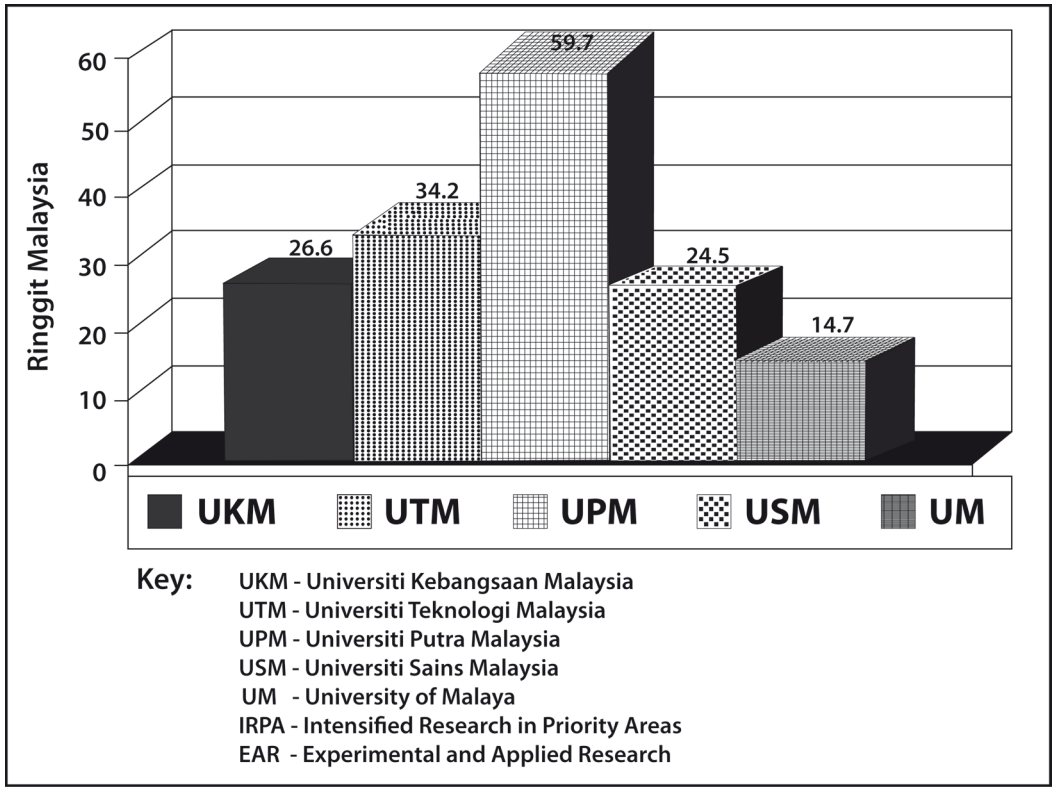
as IPPP). The centers of research excellence include COMBICAT (Combinatorial Technologies and Catalysis), GLYCOLIPIDS (Glycolipids Research Centre), UMMReC (University of Malaya Maritime Research Center, AMCAL (Advanced Material Characterization Allied Laboratory), MAPAF (Malaysian Proteomic Analysis Facility) and SUCXeS (Centre for Xenobiotic Studies), Photonic Research Center, Center for Xenobiotic Studies etc (6).

Likewise in UPM, the research administration unit is called the Research Management Centre (RMC) which is under the University Research Committee (URC). The role is in monitoring and evaluating IRPA long-term and short-term research projects on behalf of MOSTE. UPM has 13 faculties, 7 research institutes, 8 research centers, along with centers of excellence and the newly-setup 2 academies consolidating UPM's commitment to world class research. It now focuses on 544 research projects, a big feat indeed. Its scientists won 698 awards and prizes between 2002 and 2003 (7)

Figure 2: The Total Amount of Funds Allocated According To Category for the 8th Malaysia Plan (Up To March 31st 2003) (Ref. 3)

Project category	No of projects approved	The amount (RM) of grants allocated
Experimental and Applied Research (EAR)	1054	100,124,394
Prioritized Research (PR)	32 Programmes (147 Projects)	96,351,002
Strategic Research (SR)	8 Programmes (44 Projects)	162,419,930
Total	**1,245**	**358,895,326**

Figure 3: IRPA (EAR) Allocation For Public Universities In Malaysia For The 8th Malaysia Plan (by July 2003) For The Top 5 Public Universities



Research in Universiti Sains Malaysia (USM)

As one of the three public higher education institutions given the status of a 'Research Intensive University', USM offers excellent opportunities for research and education to both local and foreign scholars. Over the past six or seven years, the university has embarked on an ambitious programme of 'applied', 'market-driven' or 'priority-specific' research, which now accounts for some 70% of its total research effort (8). Like other universities, the research activities in USM are governed by a designated research administrative body called Research Creativity and Management Office (RCMO). The route taken for the development of academic excellence at USM has been the establishment of Research Centers and Units. Among these are Astronomy and Atmospheric Science Research Unit, Basic Education Research Unit, Centre for Drug Research, Centre for Marine and Coastal Studies, Centre for Policy Research, Doping Control Centre, National Poison Centre, Unit of Women and Human Resource Studies, Vector Control Research Unit, Centre for Archaeological Research Malaysia and a few more (9). Recently Institute For Research in Molecular Medicine (INFORMM) was created to boost many research projects in molecular biotechnology. USM has established extensive research links, both locally and internationally. International agencies include WHO, ILO, UNEP and others. Memoranda of Understanding (MOU) have been signed with more

Figure 4: The Amount of Grant Acquisition by USM from 2001 to 2003

Grant Type	2001 (Million Ringgit)	2002 (Million Ringgit)	2003 (Million Ringgit)
Short term	2.5	3.5	2.4
Fundamental	-	4.3	4.6
IRPA	-	67.2	13.9
External	10.8	96.2	11.4
Total	**10.8**	**96.2**	**32.3**

Key: USM - Universiti Sains Malaysia

Figure 5: Medals won by USM at national and international competitions (Ref 7)

	2001			2002			2003		
Total number of medals won at national level competition	G	S	B	G	S	B	G	S	B
	3	2	4	8	17	11	15	23	18
Total number of medals won at international level competition	2	1	-	7	3	-	1	2	1

Key: USM - Universiti Sains Malaysia

than 22 overseas universities and more than 13 local research institutions (9).

The University has obtained, up to March 2003 a total of RM 139.3 million (Figure 4) (7) from various sources, mainly from the government. Twenty two point four percent (22.4%) of this was awarded to the Health Campus and of this, 73.6% went to medical school (10). USM has also been a leader among the public universities in winning inventions at competitions at national and international level (figure 5) (7).

Research in School of Medical Sciences (SMS), USM

The School of Medical Sciences has been a leader and continues to maintain leadership in research at Universiti Sains Malaysia. The amount of grant funds in Ringgit Malaysia received by the SMS can be summarized in figure 6 and the break-up of these grants in figure 6a. The money received through 6th -8th Malaysia Plan thus far (up to July 2003) supported 145 long term projects under the Intensified Research in Prioritized Areas (IRPA), 296 short term projects, 6 Fundamental researches under the Fundamental Research Grants Scheme (FRGS), 29 incentive grants and 51 projects were funded by external grants, out of which 37 were from companies participating in clinical trials. There is a total of 223 lecturers of the School of Medical Sciences as of July 2003, the majority is in the rank of lecturers, comprising 152 persons. Out of the total number of academic staff, the non-contract lecturers make up 73.5%. Almost all of these non contract lecturers are holding or have held research grants and a total of 49.4% are principal investigators. Only 17.1% of the contract lecturers are or were participating in research.

There is an impressive increasing trend of the

Figure 6a: The Amount Of Grant Funds In Ringgit Malaysia Received By The Medical School, USM From The 6th To 8th Malaysia Plan [Up To July 2003]

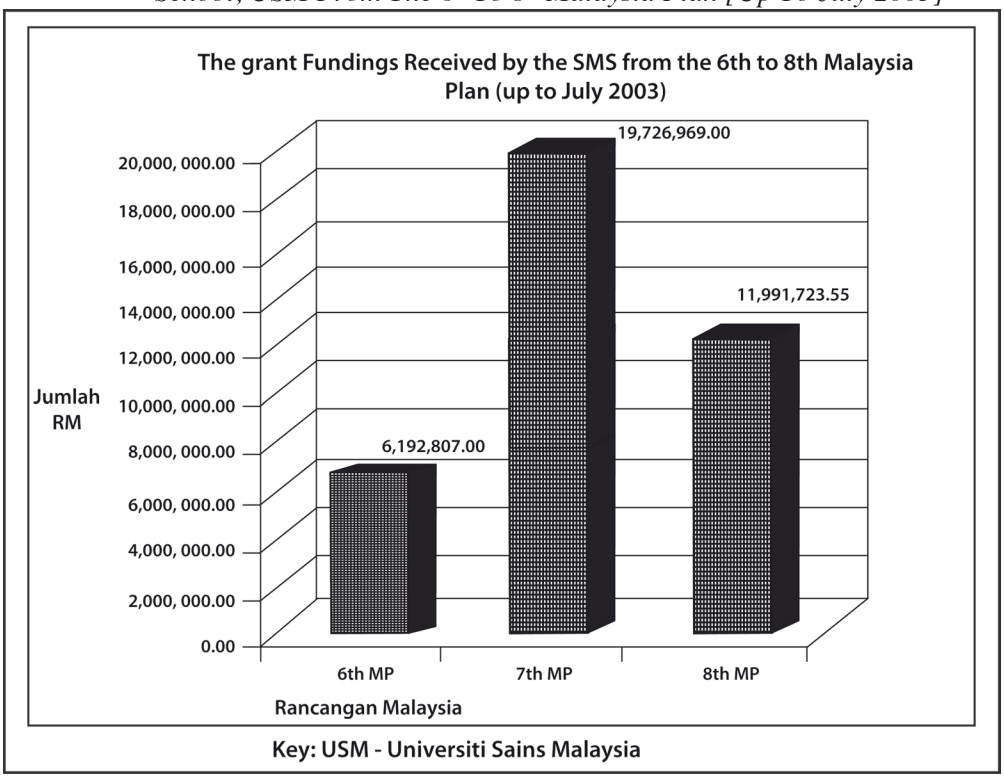
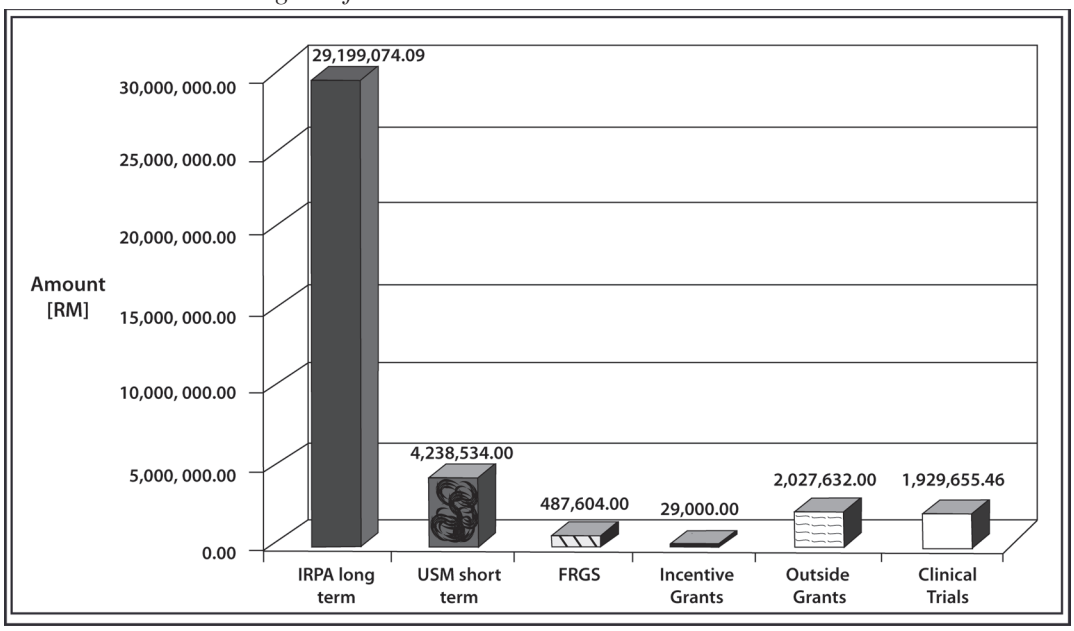


Figure 6b: The Amount Of Grant Funds In Ringgit Malaysia Received By The Medical School, USM From The 6th To 8th Malaysia Plan [Up To July 2003] according to various grant funds



number of grants held by the academic staff during the period through the 6th and 8th (up to July 2003) as depicted in Figure 7. The trend is similar to the increase in the number of academic staff in SMS (Figure 8). The medical school is proud to house seven of the 13 'young scientist' awards, 2 'National Scientist' awards and 2 Toray Foundation recipients in the country. The school have won several national

Figure 7: The Number Of Various Grants Held By Researchers At The Medical School, USM Through The 6-8th Malaysia Plan (Up To July 2003)

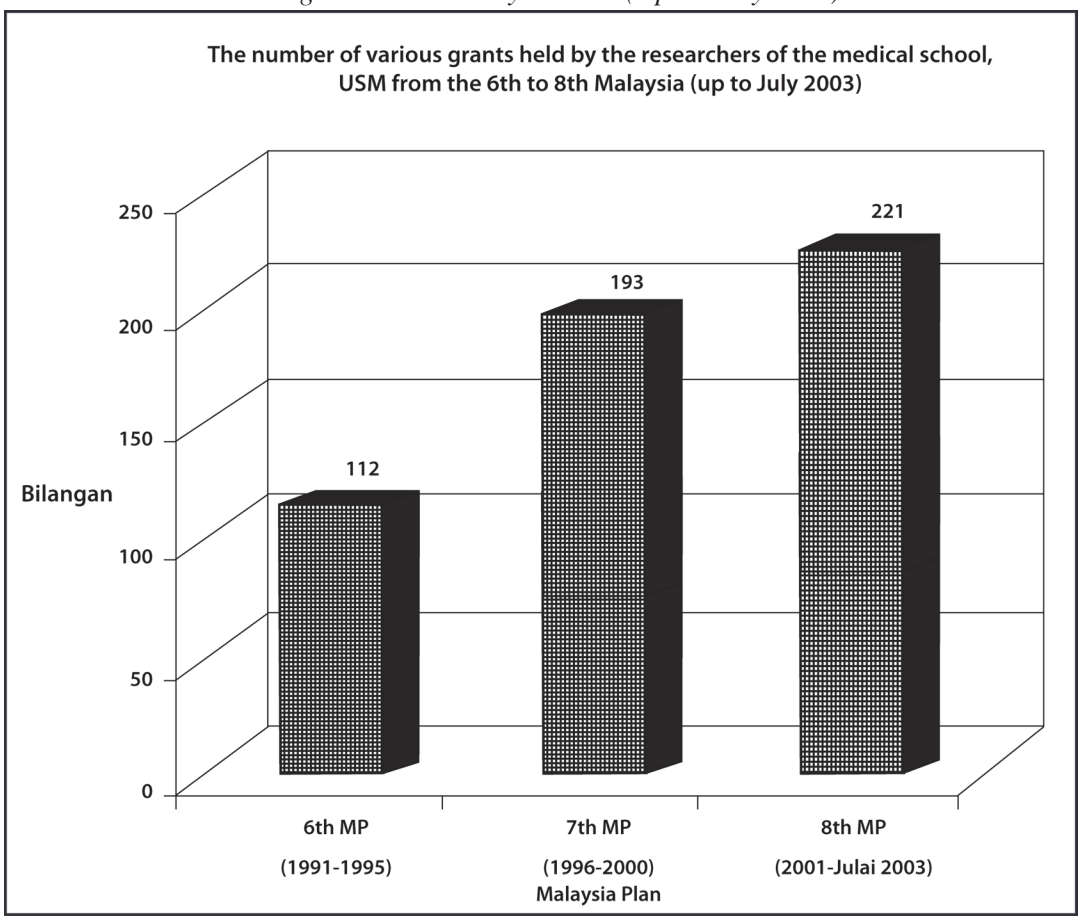
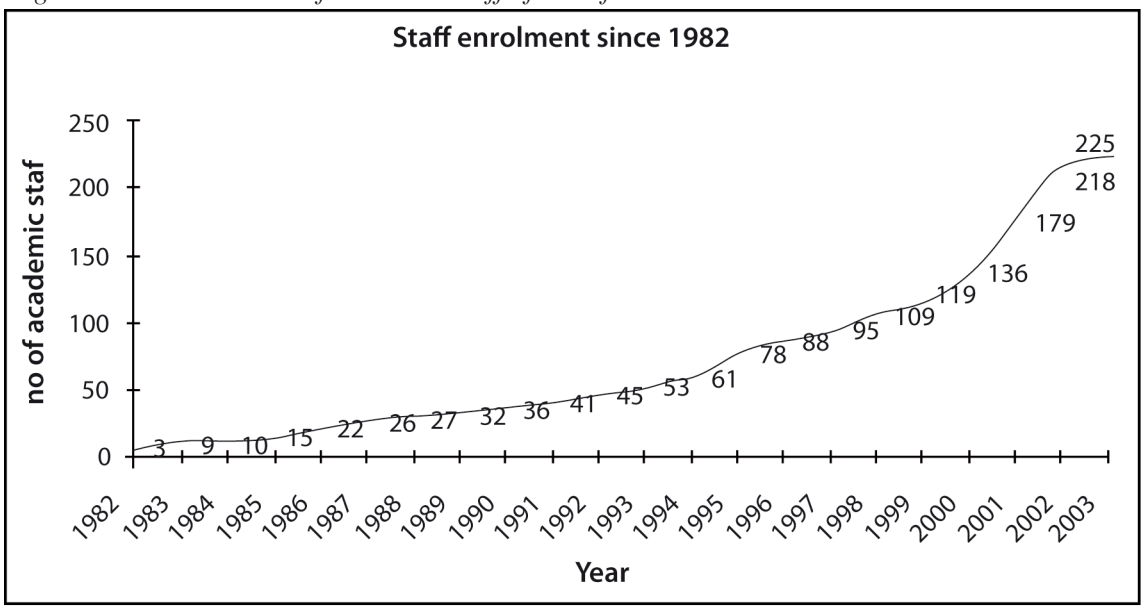


Figure 8: The enrolment of academic staff of SMS from 1982 to 2003



Key: SMS- School of Medical Sciences, Universiti Sains Malaysia

and international awards; among these are 9, I-TEX awards, 2 Geneva and 2 Nuremberg international invention competitions medals and many more (11). This achievement far exceeds the records of other medical schools in the country.

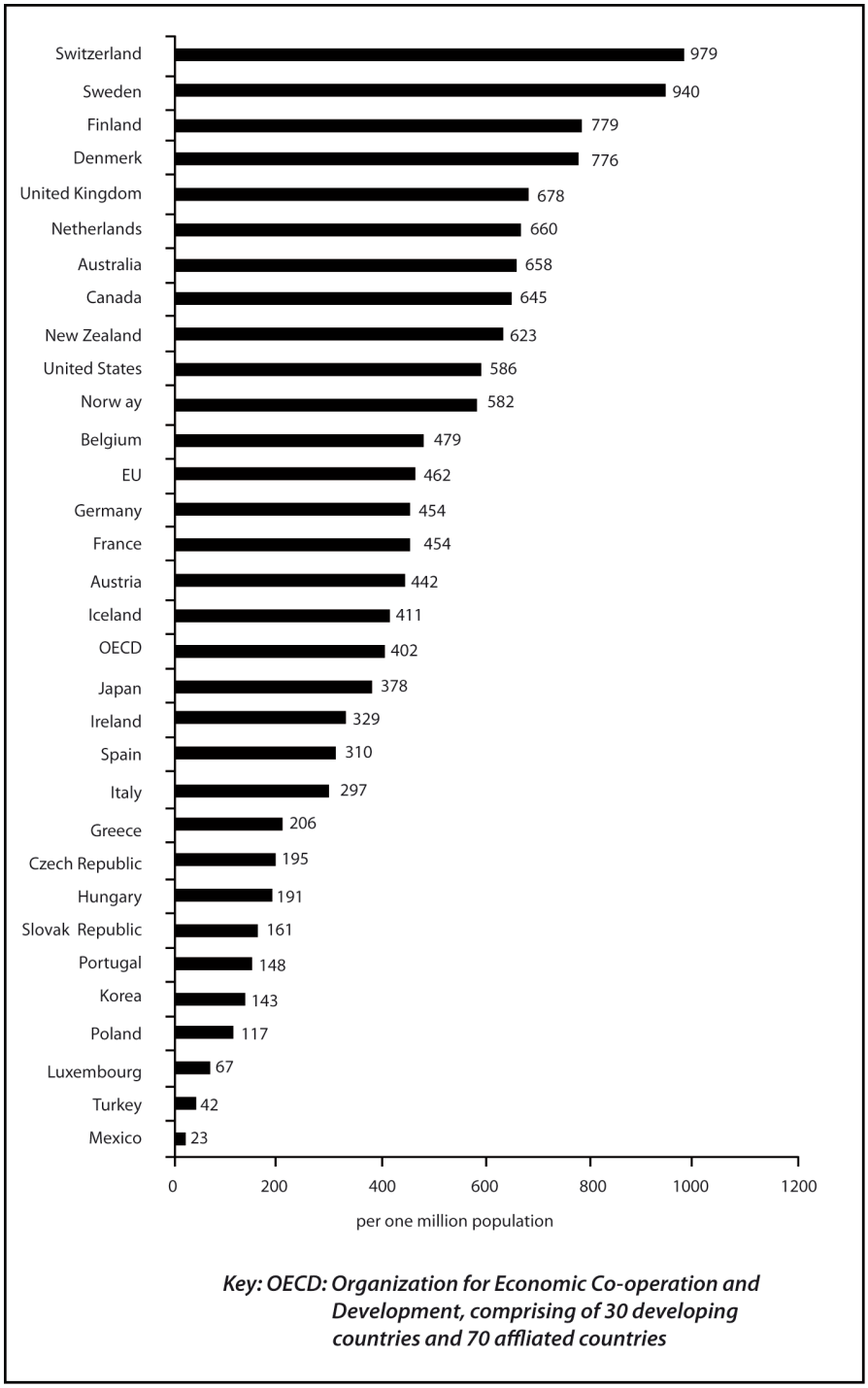
The Reality and the Strategy

Doing research is an expensive affair and the return is not comparable to the expenditure in most of the instances. Many of these researches are not interpreted into commercialization or entrepreneurial outcome. If we were to total up the number of research projects carried out by researches in public funded institutions, the figure is enormous. Have the researches cause significant impact in science and technology in the country? Can we equate medal tally with the quality of research? Have we achieved desired level of cooperation from the private industries in funding research projects? Some researches are not product-driven but rather knowledge-driven. Fundamental researches for example may not give tangible results despite expensive research funding. Have we obtained significant new knowledge/concepts from the fundamental researches?

Most of the researches are carried out for the 'survival' of the lecturers in tertiary institutions. The number of grants obtained is used to measure the 'productivity' of a lecturer and thus a point favorable for his promotion. It is without a doubt that knowledge and research is intertwined but in my opinion, Malaysian academicians have not reached or will not be able to reach the standard expected of them as long as the parameters of 'success' of an academic member of any public institution remains the same. The reasons are multifold. One of the major stumbling blocks is the perpetual shortage of academic staff teaching any particular course while the systems for promotion of these staff remain universal in all universities, publish or perish, the cliché remains. In order to be promoted one has to teach, write and publish articles, do research and for most in medical schools, do clinical services. It is almost impossible to be good in all of these aspects but somehow many are able to do so, few better than many others. For those few that are doing better, it will be better for the person and the institutions if the person could be relieved of other duties, like teaching, supervising, administration. However, this is not possible, nor does the person wants it as it may jeopardize his promotions.

The funding of research is still negligible. Public universities are expected to do good research but the universities are not capable to invest in buying up-to-date expensive equipment. The ministry that funds researches in public research institutions, mainly MOSTE is strict with their rules on funding or purchasing expensive equipments. The research output can be measured broadly by 3 'P'; Publications, Patents, Products. Can we use medal tally won at national and international competitions as the benchmark of our success? Will it ever be used to rank a university? USM was ranked the 57th

Figure 9: Scientific Publications Per Million Population in 1999 (ref 13)



out of 200 universities in Asia based on academic reputation, student selectivity, faculty resources, research (based on citations in academic journals, research funding, etc), financial resources and other notes (12). The first 'P' (number of papers published) remains the most important yardstick of a 'success' of a lecturer. The medical school of USM records a total number of 51 papers published in the year 2003 at national and international journal, mainly in low impact factor journals, improved from 24 papers published in the preceding year. The number of scientific publication relative to the population is high in Switzerland. In 1999 the country led many nations with 979 publications per million populations (Figure 9) (13). Malaysia is one of the countries of OECD [Organization for Economic Co-operation and Development] and sharing 402 publications with 99 other OECD countries in 1999 indicates the dismal status we are in, in terms of

publication ranking.

In my opinion, the way forward to improve the status we are in, is to have a complete restructuring of the way research is conducted in Malaysia. Ministry of Science and Technology should be separated from Ministry of Environment. MOSTE should redefine its requirement of at least 3 institutions must be incorporated in one PR (prioritized Research) or SR (Strategic Research) research program. Universities should rethink of the criteria to promote her academic staff so that quality research can take place. Lecturers are not 'enjoying' research because the 'benefits' are not immediately seen. In most universities overseas, the academic staffs compete to hold big research grants because they get a certain percentage of their income from it. Every time they get an article published in high impact factor journals, a bonus is added to their take home pay. In United States for example, not a single lecturer draws in exactly the same salary even if they have exactly the same qualification and their employment by the university begins on the same date. When he brings in a postgraduate student, he gets another 'percentage' from the student's fee. This is a typical age-old story of the carrot and the stick.

Conclusion

Malaysia is a rapidly progressive nation. We are on target to be a fully developed country by the year 2020. In order to become an industrially advanced and technologically competitive nation, the country needs to increase the expenditure to 2-2.5% of its GDP on research and development. Ministry of Science and Technology has to be separated from ministry of environment. Public-Private partnership in funding research must be increased. The public Universities must strategize to increase the quality of the research, improve the ranking of the university and at the same time compete with the private sectors which continue to entice the lecturers especially those in the medical schools.

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