

EDUCATION AND ACCESS TO MODERN KNOWLEDGE

by

Soedjatmoko

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In writing this paper I have become very much aware how vast the subject under discussion is, and how difficult it is to buttress the assertions made in this paper with available empirical research. This paper therefore should be seen as an impressionistic statement, based on visits to universities in a number of developing countries ; as an invitation for discussion, and at best, as a provisional research agenda. It deals with access to modern knowledge abroad, capabilities and weaknesses in reaching out for , and using and advancing modern knowledge through education , and domestic problems of access to modern knowledge.

Modern knowledge, understood to be science based knowledge of man , society and nature as well as the concepts, theories , metaphors and worldviews derived from it, has, as we are all aware, become possibly the most strategic asset in the development effort. In the final analysis development turns around the capacity of a nation to use science and technology to meet the challenges and opportunities it faces. Without it, the modernization of society - and of the soul -, involving the freeing of the individual from the conventional social constraints of tradition and religion, in favor of the internalized constraints shaped by a personal conscience that may or may not be rooted in religion or in a philosophical ethical configuration of values, may not be possible.

The powerful and continuing impact of the Third Industrial Revolution of biotechnology, micro-electronics and communication, and materials technology, as well as the recent advances in the basic sciences, has made that even more true.

There is no way in which the developing countries can hope to catch up, in whatever meaning of the term, with the industrial countries and their accelerated productivity growth, without themselves participating actively in this revolution. The converse is also true. If they do not succeed in being part of that revolution, they are doomed to fall outside the circle in which the major decisions affecting the future of the world and of their nations is going to be decided. The countries thus excluded would inevitable fall behind and lose their autonomy.

This challenge to the developing world occurs at a time when, except for

the NIC's in East Asia and Latin America, the process of industrialisation of the South, and the transition from a traditional agrarian economy has just moved beyond its initial phases. These countries already find it difficult to keep up with the rapid changes in their comparative advantage as commodity exporters, with the shifts from commodities, -now being replaced by substitutes through advances in materials technology-, to manufactured goods. And this is only part of the technology driven changes in the international division of labor, that are not only affecting relative competitive positions between the industrial countries, but also the relationship between the North and the South. In fact the widening gap between the North and the South has now also become a knowledge gap, most likely as intractable as the poverty gap itself.

Access to modern knowledge itself should however not only be seen in terms of access to state-of-the-art knowledge abroad, or to the need to enhance developing country capabilities in science and technology, in order to enable them to catch up or to become more internationally competitive. Industrial and developing countries alike will have to deal with the global problems of population and the maintainance of the global life support systems that will determine the governability of the human community and the habitability of the earth in the near future. Already massmigration across national boundaries and even across continental divides has begun to create social and racial tensions. These problems are nowhere as acute as on the border between the US and Mexico, and between the northern and southern riparian states around the Mediterranean basin., although not limited to these areas. This trend, impelled by the disparities between livingstandards and economic and population growth rates between the two sides, confronts any of the affluent industrial nations with three options.

One is to revive the and significantly enlarge the scale of the flagging international development effort.

Second, is to allow the free movement of people across national boundaries, as is already, in large measure the case with the free movement of capital.

The third option would be to accept the inevitability of multi-ethnic societies and to develop carefully calibrated policies relating the scale of intake to improved absorption and integration policies, that would reduce the likelihood of racial or ethnic conflicts.

The other problem concerns the inadequacy of the international response to global environmental degradation caused by the cumulative impact of human action. Even though one may dispute the claims of some environmentalists regarding, for instance, the greenhouse effect, and even

assuming the smallness of the probability that by the middle of the next century the US Midwest and the Soviet Ukraine may have turned into scrubdesert, and that by the end of the next century all coastal cities in the world may well be inundated, such probability can not be summarily dismissed on the basis of scientific uncertainty, given the long leadtime necessary to mount any concerted effort and the even longer time for any set of policies to show its effects. It will require adequate and timely collective technological as well as political responses on an unprecedented national and international scale.

Unless development becomes a global effort in which everybody's interest is at stake, and on a much larger scale, both sets of problems may well become unmanageable. It is no exaggeration to say that both industrial and developing countries and their educational systems are unprepared for this new set of tasks. The instruments for the effective management of global interdependence - a complex fragile pluralistic system in which no single country or group of countries is in control - are not yet in place. The instruments for the even larger task of global management even less. Access to modern knowledge as such may therefore not be enough. What is needed is N-S cooperation in bringing about through education the cognitive and attitudinal changes that are needed on such a massive scale, in order to fulfill these larger tasks as well.

The problem of access should also consider how profoundly some basic concepts in science are shifting today, and how much the effort to draw from modern science for new ideas on societal evolution and for new ideas and concepts in development, is like shooting at a moving target. For science itself is in transition. The new concepts that have emerged in the natural sciences concern the evolution of complex unstable systems. The study of open systems subject to flows of energy and matter has led to quite a new understanding of the manner in which forms, complexity and organisation emerge and develop. These studies which owe a great deal to the Nobel Prize winner Ilya Prigogine may well show the roots of innovation and the unification of the physical and human sciences in a new evolutionary vision. The concept of innovation which in turn is closely linked to the concept of self-organisation associated with all living systems, may provide a particularly suitable basis for reflections aimed at policy exploration in human and social systems. Some of these new concepts have already been applied in the study of urban systems, of population movements and in the management of fisheries, and may well prove extremely useful for a deeper understanding of the dynamics of the development process and of the growing complexity of issues at the global and the local level. It will however most likely be quite some time, if at

all, before we can expect the articulation of new grand theories of social evolution in the manner of the great but now exhausted ideologies which dominated the history of the first part of this century.

Access therefore should include participation at the cutting edge of scientific advance. We have in the 50's followed the wrong advice given to us then, not to go in for the basic sciences, but to go for the applied sciences. Except for those countries that ignored this advice, this very much condemned many developing countries to remain perpetual consumers of both the research of others and of their applications.

What does then, against this background, access to modern knowledge for developing countries and their educational systems mean? It means in the first place access to state-of-the-art scientific knowledge; secondly participation in work at the expanding frontier of science access, as well as participation in the process of conceptualisation and consensus building of the framework and instruments for the management of global interdependence.

In practice this means access to first rate universities and research institutions abroad, unlimited access to scientific and scholarly and professional journals, as well as to databanks. It means participation in the informal and formal networks of scientists and scholars and scholarly exchanges.

Study abroad, as we all know, is not without its problems. They are too well known to warrant a discussion here. Very often a graduate leaves the host country without having gotten to know its culture and how the scientific attitude and enterprise is imbedded in that culture. Having concentrated on his own research and he often returns home without having internalized the ethos of scientific inquiry, its intellectual rigor and continuous commitment. If such a person would have had the opportunity to stay for another year at a research institution to see how research is organised and managed, he might have a better chance to do so. And this might stand him in good stead upon his return when he may be entrusted with research management responsibility. Also studying in an affluent and stable country, for all the analytical skill and disciplinary rigor he has acquired, may not always prepare a student intellectually or psychologically for the multiple interlinkages and complexities of underdevelopment and its politics of instability or for the interrelationship between his discipline and the broader questions of institutional development and societal evolution in the context of which he will have to do his work back home., and with which he will inevitably be confronted. These problems do not of course in any way detract from the overall beneficial effect of serious study at good universities abroad.

Against this background the narrowing of access to scientific information through training and exchange, that is taking place in several major industrial countries is quite disturbing. The increased cost of study abroad is only partially compensated by scholarships. It would be extremely unfortunate if fear of competition, the commercialisation of scientific knowledge, or considerations of military security would limit access for developing country scientists and scholars. - (it would seem that the military provenance of much funding in the basic sciences has damaged the free flow of scientific information and the free exchange of scholars) - Access is the only way to enable these countries eventually to stand on their own feet and to make their contribution to the management of some of these global issues. It would be extremely difficult ultimately to contain the pressures towards a global redistribution of population or of wealth without a more evenly distributed scientific and technological capability worldwide - which is after all a wealth creating capability.

In speaking about access however it is good to remember the proverb that one can take a horse to the water, but cannot make him drink. There has to be both a desire and a capability to drink. Historically, countries seem, to more or lesser degrees, go through cycles of openness on the one hand and closedness and selfcentredness on the other. Selfconfidence may lead to the first, the second may result from a sense that the challenges and changes to be faced may stretch the adjustment capacity of society and its institutions beyond its limits. Developing countries too are subject to these cycles. Domestic problems may be so overwhelming, as to demand total and exclusive attention, except may be to make sure that enough foreign aid will be available. Concern for national and cultural identity; in part a reaction to the communications revolution mentioned later; considerations of security; the fear of contamination by Westernisation or Western political ideologies, and the resulting alienation are often very real, and have led for instance, to determining age limits, below which scholarships through government agencies are not available. There are often also other restrictions. There still is a real problem, it has to be confessed, of Eurocentrism, the continued colonisation of the mind, which has also contributed to the braindrain, although there are, of course, many other factors at play as well. There are cases of extreme, and often misplaced, self satisfaction at the progress made, and a corresponding lack of interest in enlarging access to the outside world and the changes through which it is going, and which are bound as some point to affect the country concerned. Pricing policies of books and journals do often not reflect an awareness of the great importance they have for keeping up with developments in the modern world.

All these, and other factors, have contributed to the underutilisation of available opportunities to have access to the sources of modern knowledge that in many cases has occurred.

As important therefore as unimpeded and broad access to external sources of knowledge is, is the awareness of the need for modern knowledge, and the internal capability to utilise to the fullest available opportunities and to create additional ones, to expand one's knowledge and the capacity to reach out to, to digest, adapt, improve, integrate and use knowledge. It is the strength and vigor of the national scientific establishment that constitutes the strategic factor in the overall learning capacity of the nation as a whole. But ultimately, it would seem to me that it are a nation's graduate schools which necessarily have to be of international quality, that may gradually lift the educational system as a whole over its weaknesses, and may develop the in depth international competence that will ensure the nation's competitiveness and autonomy.

In many developing countries however universities are seen as seedbeds of political unrest by the national authorities, and a great deal of energy is expended in keeping universities and their students under political control, often resulting in the suspension of free scientific inquiry, of the nurturing of intellectual curiosity, of independence of mind and intellectual and scientific creativity, for the sake of political conformity. It has in several countries led to the reduction of the university into an institute of higher vocational training of narrow gauged technicians, capable of handling certain research techniques, but incapable, and often not desirous, of independently defining and analysing the problems of their nation. Creativity is a very fragile flower. It can only blossom in a climate of academic freedom. Freedom has its risks but without creativity no nation can hold its own in this increasingly crowded, rapidly changing and highly competitive world into which we are all moving. Those nations that are not respectful of the political and social space that creativity needs, are bound to discover later, when it may be too late, how high a price will have to be paid for the impairment of a nation's possibly most strategic asset.

Universities have, justifiably, especially in the large, populous developing countries paid a high price in terms of quality already for both their own expansion, in response to popular demand for higher education, as well as for the expansion of the educational system as a whole. The latter was in a way an unavoidable concomitant of political independence. The lowering of standards that followed the inevitable shortage of qualified teachers, was ultimately reflected in the quality of university students and of

university teaching. The weakness of the private business sector in many developing countries turned the universities into almost the only channel for entry into the elite, and this brought into the university, students whose main interest was obtaining the degree, and not the pursuit of knowledge. Other weaknesses in the educational system in general also came to mar university education. Inadequate teaching capability led to low student performance. This in turn led to low teacher expectations, and this again to low performance. Thus the vicious circle was closed. It was maintained by teachers uncertain of their ground but with their authority buttressed by feudal notions of the subordinate position of students in relation to his "guru", and by powerful herd instincts on the part of students, rooted in traditional collectivist notions, always ready to ridicule and otherwise discourage any sign of nonconformist intellectual curiosity on the part of their more talented colleagues. The failure to abandon deeply ingrained habits of learning by rote has, apart from its generally recognized weaknesses, also reinforced the concept of knowledge as something static, to be transferred as is, and the notion that the purpose of educational institutions is merely the transmission of discrete bits of positive knowledge. The notion that the state of knowledge is in constant flux, and needs continuous review in light of new evidence or insights, and that knowledge has to grow to stay alive, either incrementally, or with jumps in cases of paradigm shifts, has remained alien to many transitional cultures. That many of these countries nevertheless have managed to produce some very good minds, says probably more about the natural intelligence of their people than of the quality of their educational system.

If one tries to answer the question: higher education for what purpose?, and how?, another problem emerges. Many universities in the developing countries have followed the university models of their former colonizers and have stuck to them, while in the country of origin the model has evolved, and continues to evolve, in response to new demands. By the same token continued Eurocentrism, reflecting the persistent colonisation of the mind, continues to rivet academic expectations in many, though not all developing countries, to the intellectual orientations and fashions at major academic centers in Europe and America instead of on their own problems. More recently it has started to dawn on people that often universities had been educating their students away from the pressing problems of their own country, adding to the tendencies that have led to the new transnational stratification described later, as well as to the brain drain.

Universities in the developing world have been confronted with the

persistent dilemma of how to keep up with scientific developments in the industrial world, and meet the needs of the modern sector of their nation on the one hand, and meeting the needs of the majority of their people, so often related to their intractable poverty on the other hand. Even when equal facilities were available, the best minds were almost inevitably pulled in the first direction because that is where the glamor and prestige is and where the future lies with all its economic rewards. Many universities have engaged in a variety of experiments to overcome this dichotomy, e.g. through several forms of study-service and a period of obligatory service at the village level, immediately after graduation. But the problem remains.

The persistence of the problem demonstrates in my mind the need for modern higher education not to remain separated from traditional culture and the traditional knowledge embedded in that culture: the fruits of centuries of popular experience. The natural and social sciences, but the humanities especially, have to make the connection with traditional culture. In Africa for instance some universities have responded by establishing centers of African studies. Similar experiments have been made in Asia. The humanities however will have to develop, apart from its linkages with the history of their own national culture and its regional subcultures, linkages also with modern technology. The more developing societies use modern technologies the more ethical judgements are required in the kind of decisions and choices that bear on the purposes for which, and the manner in which a particular technology is going to be used. The humanities must concern themselves with the social and ethical implications of technological choice in their society. They must become technologically literate, if the universities want to make a contribution to the integration of modern knowledge and its products with one's own culture. The universities must play a role in the self-renewal and re-interpretation of their own culture to meet new needs and possibilities, as well as in the integration of modern and science related elements in that culture, if developing countries want to retain their cultural authenticity and their educational systems do not want to become vehicles of national alienation, frustration, and cultural discontinuity. This will undoubtedly also enlarge the capacity of the university, and eventually the nation, to integrate into its culture a much larger amount of modern knowledge, without too much stress.

Universities must however not limit themselves to their own culture and to their own problems in this interdependent world with its globalized world economy. Developing nations will have to develop expertise on other countries, their languages and cultures. It is through such programs that

a nation's self-awareness is enhanced, and the kind of sensitivity to other culture is developed that is needed to be effective in today's pluralistic world.

Let me now say a few words about the final point: the domestic access to modern knowledge. It is, I believe a subject that should be treated in the context of the communications revolution and its impact on developing countries.

Modern communications technology has brought with it inklings of the global village. But so far, the only inhabitants of that village have been the transnational elites; those who live in the industrialized North and those in the South who have access to the global communications network. The current pattern of communications and transportation, to say nothing of the commercial culture imparted chiefly by the mass-media have aided a new stratification of the world's people into two classes that share very little information, experience and common concern. The wealthy transnational class is thus assimilated into a universe of communication and information that is not shared by the majority of mankind. The psychological distance between these two strata is in imminent danger of reaching the point where the only form of discourse between the top and the bottom is violence, punctuated by occasional spasms of charity.

The profound irony of this situation, I am sure, will not have escaped you. The very communications and information technology that has the potential to knit humankind together in ways never before possible, are now contributing to its fragmentation. Similarly while these technologies also have the potential to contribute to the democratisation and decentralisation of power, it is more often, and in many cases quite thoughtlessly, used in ways that centralise power even more.

The theme of today's discussion therefore challenges us also to consider the ways in which the poor and marginalised people of the world could be brought into the communications revolution in order for them to gain independent access to modern knowledge. For they too are decision makers in the development process. The aggregate of millions of decisions and choices by individuals and households can make or break population policies, maintain or exhaust the carrying capacity of specific environments, and ensure or undermine the stability of political systems.

In part that problem has been met by the expansion of the educational system, by developing non-formal systems and through various forms of

distance learning. The fact that for all the expansion of education the world over, the total number of illiterates has increased, indicates the failure of the educational systems to keep up with population growth. The most likely reason for this is the cost of conventional schools and teaching methods. Returning to the earlier paragraphs on the need to include the poor into the communications system, they too need access to modern knowledge to provide solutions to their own problems, which in the aggregate constitute national and even international problems. They also need to know the policy framework of incentives and disincentives that will make them act on the modern knowledge once it is available to them. What is needed obviously is a learning system that is not classroom based, but community based, using a mixture of modern and traditional information sources and technologies. Something that could conceivably be called "a poor man's learning system", in which modern knowledge relevant to people's needs is communicated using multimedia approaches through information cum entertainment environments and interactive learning circles in poor urban and rural communities in which its members actively participate in both the use and production of information in ways that are meaningful to the community and its individual members.

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