RELEVANCE AND RESPONSIVENESS OF TECHNOLOGY TRANSFER

Dr. Gloria C. Gatchalian
Project Director, Eulogio "Amang" Rodriquez
Institute of Science and Technology
The Philippines

The Asian continent, comprised of developing and underdeveloped countries, has become the recipient of Technology Transfer from the advanced countries of the West. It has been observed that technologies introduced to such countries are of second-class quality or even rejects. More often than not, these developing nations have become the laboratories of the West with the Asians as their guinea pigs. Furthermore, the technologies received adversely affect the environment. With this scenario Technology Transfer should be received with extreme caution. The aim should be to meet the basic needs of the people, preservation of their cultural and ethical values, development of their scientific and technological capabilities in the utilisation of their indigenous materials, and the conservation of their environmental resources.

In most cases, developing countries clearly experience numerous difficulties in harmonising their science and technological programmes with their national development efforts. These problems of integration are presently widely-recognised, but their scope, nature and implications are such that they should be carefully examined before policy conclusions can be drawn. One problem encountered is the inability of science and technology to penetrate all sectors of the economy that contribute to development, creating social conflicts and costs which have resulted from the introduction of science and technology in the region.1

Technology Transfer, as defined by many technologists, is the process by which technology is diffused so that it is utilised in places other than where it was generated. It will take place only when current interests, economic or otherwise, make it necessary. In addition, Transfer of Technology2 focuses not only on product and innovation, but also on the transfer of scientific and managerial skills which would enable the receiving group to utilise innovation effectively and further transfer it to other members of the population. The operational concepts emphasise the primary consideration in the planning and creation of mechanisms which allow people to develop social and political consciousness. The transfer process then focuses on the "how" as well as the "what" of technology.

With the above setting, Braid3 identified four players in technology transfer who include the Technologist, the Economist, the Communicator and the User - TECU.

1. Technologist - the person who is either the inventor, the innovator or the resource agent.
2. Economist - one who weighs the costs benefits and effectiveness of the technology.
3. Communication specialist or Communicator - the person who ensures that the technology is simplified, packaged, and repackaged so that it is made relevant to the user's need: recommends mechanisms for transfer and the design of messages based on cultural, social, psychological and political factors.
4. User - those whose needs, expectations and aspirations should guide the process of technology transfer.

RELEVANCE

1. Are the technologies introduced in one's country:

    a. compatible with people's needs?

        - is government control for their use desirable?
        - flexible so that a community does not get locked into using an unsuitable system? i.e., the rural areas comprising 70 per cent of Asia.

    b. directed more towards economic development which includes:

        - greater equity in income distribution?
        - removal of poverty?
        - creation of more employment opportunities?
        - greater self-reliance?

c. geared towards increased food productivity?

- with improved high-yielding variety?
- with increased food supply?

d. stressing the need to preserve the environment to abate environmental degradation and pollution?

- replenish the abused bios to perpetuate the bopta?

e. preserving cultural and traditional values and practices?

- promote the use of herbal medicine
- use of compost fertilisers
- natural fumigation of fruit trees
- match traditional practices with population control

2. Do the curricula in the educational system include appropriate technology to: develop the innate potentialities; stimulate the youth to pursue Science and Technology careers?
3. Does Science and Technology manpower development complement Transfer Technology; overcome the "brain drain" problems of developing countries; provide substantial incentives commensurate to their technological capabilities; develop manpower skills and expertise that ensures that science and technology are applied effectively to every area of the national economy; manpower capability to make use of resources available in the environment and the community?

RESPONSIVENESS

Is society responsive to the application of appropriate technologies being transferred?

1. Are the technologies able to stimulate the interest, understanding, appreciation and user's application to daily life so as to: increase their income; improve their health status; reduce energy consumption; effect of preservatives, natural antiseptics; lessen their workload; improve their physical, natural and social environment?
2. Has society, in the production and use of the technologies, enriched their value system in terms of their internalisation of these values attendant to Science and Technology development such as: self-actualisation; self-reliance; accuracy and honesty; creativity; objectivity; perseverance; courage; productivity; energy; building a new world.

In terms of the above-cited dimensions, some criteria have been formulated by Braid to evaluate technology within the development framework which are the:

- extent to which technology introduced is transformed through inputs from receiver groups;
- extent to which technology is suited to local needs and meets existing value systems and norms;
- extent to which technology transfer achieves a multiplier effect and replicability;
- effectiveness of receiver's associations in technology institutionalisation;
- effectiveness of collaboration or co-operation among governmental and private agencies so that complementation and sharing of resources is achieved;
- effectiveness of mechanisms which relate technology to natural resources such as energy and other urgent national problems;
- effectiveness of the project management aspect of technology transfer; extent to which the system builds a continuing process of feedforward and feedbacks among planners and users so that the latter are involved in future changes in strategies;
- extent to which the experience in technology transfer provides the people skills in administration; and the
- extent to which people have developed coping mechanism in the maintenance and sustenance of the application of the transferred technology.

In the light of utilising education as a means to disseminate Technology Transfer, characterised by relevance and responsiveness and considering the teacher, the human factor, as the tool for technology diffusion, it is highly recommended that the following occur:

1. Manpower Training of teachers by holding seminars with the focus on:

a. developing awareness of the status of the country's environment along;

a.1 degradation of natural resources like rivers, lakes, seas and forests;
a.2 conducting environmental impact assessment, presenting issues of the effect of an activity in the environment which may be beneficial to a certain group, but harmful to a greater number of living forms;

a.3 health status of the community cause and effect of some technologies;
a.4 survey of production and productivity levels of food sources and how they affect bios of all living forms; and,
a.5 pollution and their causative agents.

2. Enhance research and development, giving more incentives and awards for researchers and invesitgators to study the following:

a. status, trends and problems of the socio-political, socio-economic, educational, scientific and technological aspects of development that disturb environmental homeostasis, which affect the well-being of all bios;
b. conduct surveys of indigenous technology and drawing comparisons with foreign technology being adapted in the country;
c. conduct investigations of the cultural values and beliefs in the country which contribute to the preservation of cultural heritage which would enhance technological development at the same time replenishing the country's depleted natural resources;
d. undertake measures in the selection of foreign technologies appropriate for the demands of the country's environmental and survival needs.

3. Organize short-term courses, training programs for curriculum writers to update the curricula of all levels of education: preparatory, elementary, secondary and tertiary to develop cognitive, psychomotor and affective skills based on virtues of love and concern for one's environment; setting future directions with the need to preserve bios and environment where bios exists; and promoting awareness of the threats of abuse of enviornment on bios when unabated.
4. Tapping policy-makers to institute refresher courses in all branches of government concerned with policy-making functions requiring them to formulate legislature in the areas of their study as a prerequisite for the completion of the course. Due incentive and awards should be accorded these policy-makers.
5. Encourage outdoor teaching for the young, especially pre-schoolers. In their formative years they can easily absorb and internalise the affects of man's wrong-doings on their environment. Eventually, these young ones will be future leaders of the country. When, at an early age, are trained to love and preserve their world of bios, they can become effective disciples of biopolitics on this planet. The same is true of other youth sectors who must be brought close to nature to develop a deeper understanding of the intricacies of development as a result of man's activities.
6. Strengthen monitoring systems among educational institutions at the international level for transmitting worthy information of Innovations in Education and Development; sharing worthy inputs to preserve global bios.

REFERENCES

1. Science, Technology and Development in Asia and the Pacific, Castasia II, UNESCO, Paris, 1983.
2. Bhattasalil, B.N. Transfer of Technology Among the Developing Countries, Asia Productivity Organization, Tokyo, 1972.
3. Braid, Florangel Rosario, Communication Strategies for Productivity Improvement, Asia Productivity Organization Tokyo, 1983.

Dr. Gloria C. Gatchalian holds a Ph.D. in Education and is project director at the Eulogio Amang Rodriguez Institute of Science and Technology in the Philippines. A recipient of many scholarships and awards, she is member of various scientific organisations and has also been a UNESCO and IFS International Conference delegate in many countries.