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ABSTRACT

Despite the expansion of technical-vocational education and training (TVET) in nearly all Asia-Pacific countries during the past 10-15 years, many of the region's policymakers have called for greater and more effective integration of technical-vocational components in basic and general education curricula. The idea that technology education should be part of the general education curriculum is not totally new to Asia-Pacific countries. Technology education was introduced into the curricula of some Asian countries after World War II. In Australia, the National Training Reform Agenda, which sought to strengthen the links between senior secondary schooling, general education, TVET, and postschool options, emerged in the early 1990s. The Korean government decided to provide technology education for all secondary school students in 1989 and revised its curricula to include the following competencies: working with others in teams; communicating ideas/information effectively; solving problems and thinking creatively and critically; and using office technology. Increased attention toward curriculum integration has been increasingly evident in the United States, India (where efforts to vocationalize secondary education were initiated in 1986), the Philippines (where an entrepreneurship development was introduced in schools), and Japan (where technology education has been expanded to reflect environmental awareness and global considerations). (MN)

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INTEGRATION OF TECHNOLOGY EDUCATION IN BASIC AND GENERAL EDUCATION CURRICULUM IN ASIA-PACIFIC COUNTRIES

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INTEGRATION OF TECHNOLOGY EDUCATION IN BASIC AND GENERAL EDUCATION CURRICULUM IN ASIA-PACIFIC COUNTRIES[1]

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Colombo Plan Staff College for Technician Education, or CPSC, was established in 1973 as an inter-governmental organization of nineteen member countries from the Asia-Pacific region to improve the quality and relevance of technical-vocational education and the middle-level manpower in the member countries. CPSC has always pursued the policy of constructive intervention in the technical and vocational education systems for holistic development-oriented approaches for planning and management of technical-vocational education in the region.

Over the last ten to fifteen years, TVET has expanded considerably in almost all the Asia-Pacific countries. However, concerns have also been expressed for its fragmented approach and experts have voiced the need for greater and more effective integration of technical-vocational components in basic and general education curriculum. This need is felt even greater today in the context of new imperatives of the next millennium.

President Fidel V. Ramos, in his recent meeting with the policy-planners and Governing Board members of the Colombo Plan Staff College, highlighted that *"there is no doubt anymore that the social and economic progress of the Asia-Pacific region requires high quality innovative and relevant technology education systems."*

To develop a firm policy on this, the Sixth Regional Conference of Ministers of Education and those responsible for Economic Planning in Asia and the Pacific (MINEDAP-VI) recommended the member states of UNESCO:

> *"to promote stronger links between general education and technical-vocational education, and between technical-vocational education and industry, agriculture, and other fields, and to that end, the countries need to support the cooperative development of curricula which links science, humanities, and culture and traditional values to the word of work in each member-state."*

Today's computer ***guru***, Bill Gates, in his recent book, ***The Road Ahead***, provides an excellent review of the technological landscape for today, and the shape of technological revolution to come in the new millennium. Bill Gates most forcefully argues that to cope with that oncoming situation, ***education is our best investment***. Education must empower people of all ages, both sexes, and at inside or outside the classrooms. To harness our great human potentials in the basic and general education

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systems, we have to create appropriate learning opportunities through curriculum renewal and curriculum innovations, particularly integrating technology components into basic and general education.

The idea of technology education as a part of general education in the school curriculum is not totally new. After the end of the second world war, school curriculum in some Asian countries introduced technology education. The first time it was introduced in the secondary school curriculum in Japan, neither the teachers nor the parents understood the aims of this approach (Yoshio, 1976, Industrial Arts in Japan, Man, Society and Technology, Sept/Oct issue). Similarly, in Korea, in early years, parents often visited schools and asked the principals not to teach their children to be trained as carpenters. (Lee, 1995: Changing Challenges for the 21st Century, Keynote Address ICTES, International Conference on Technology in Schools, Otsu, Japan.)

The aims of technology education is much better understood today. Many pioneers have contributed their efforts for the development of curriculum integrating the technology components with a wider vision. There are still many issues to be resolved before its effect could be fully realized in all the countries in the Asia-Pacific region.

A review of some of the innovative curriculum documents developed in different countries may give us an opportunity to understand the issues and take a leadership role in organizing the content of technology education in general and basic education. However, the cultural background of each of the countries will determine the final outcome of such effects of curriculum renewal.

In Australia, the National Training Reform Agenda which emerged in the ealry 1990's sought to make the links between senior secondary schooling, general education, vocational education and training and post-school options much stronger. It has also been recognized that the forms of school and post-school links should be extended beyond the years of senior secondary years of schooling. It is in the earlier years of schooling that much vital work must be done to adequately prepare young people for the world of work.

Surveys of employers in Australia repeatedly indicate that the most important attribute the young employees must have is the correct attitude to work, skills which enable them to adopt the work quickly, and an understanding of the requirements of the job. Specialized job specific-training receives lower priority in view of rapid changes in technology and the production processes. The states and territories in Australia are in the process of implementation of the seven key competencies in school curricula. These are:

1. Collecting, analyzing and organizing information
2. Communicating ideas and information
3. Planning and organizing activities
4. Working with others and in teams
5. Using mathematical ideas and techniques
6. Solving problems
7. Using technology

Recent developments in enterprise education in Australia has also seen considerable work being done. The focus of enterprise education in Australia is not merely to develop entrepreneurship skills and knowledge but on developing skills of risk-taking, risk management, creativity, problem-solving and personal and collective endeavours.

The Korean government decided to provide technology education program for all secondary school students in 1989 when school curriculum revision was made. The program began in 1970 to give the students a basic understanding of the technology society in which they live.

The competencies that industries and businesses in Korea are looking for in the new employees are (see Lee.op.cit):

1. working with others in teams
2. communication of ideas and information effectively
3. solving problems, creative thinking and critical thinking
4. using office technology.

In USA, the SCAN's report (Secretary of Labour's Commission on Achieving Necessary Skills, 1992) cites a variety of essential skills for general education:

1. Foundation skills
   - basic skills
   - thinking skills
2. Personal qualities
   - responsibility
   - integrity
3. Interpersonal skills
   - working in teams
4. Understanding how systems work
5. Understanding how to allocate resources
   - time, money, space, technology, and staff
6. Skills in using computer
   - organizing and retrieving information
7. Understanding how to select, use and maintain technological tools.

The curricular concept of integrating or connecting school subject areas has gained significant attention in USA in recent years. Specific attention within the technology education field has been directed at integrating mathematics, science and technology. Based on careful examination of pilot demonstrations schools in the USA (Wicklein and Schell, 1995: Journal of Technology Education, vol 6, no 2) identified three primary factors affecting the success of the multi-disciplinary curriculum. These are: (1) teacher and administration commitment to the integration approach; (2) innovation and effort in curriculum redesign; (3) administration and teachers coordination of integration plan. Each of these factors are of paramount importance in providing school leadership in technology education and integrating it with general education.

In India, the National Policy on Education (NPE) 1986 gave a new impetus to the vocationalization of the education program which was revitalized with the launching of the vocationalization of secondary education and setting up of a Central Institute of Vocational Education (PSSCVVE) under the National Council for Educational Research and Training (NCERT).

The program envisages to provide technology-based vocational training to make it possible to provide large-scale employment in small-scale industries and also to develop self-employment based vocational courses. Vocational guidance is given to students, parents, teachers and general public regarding suitable educational and vocational choices through various media for success of the scheme. Basic education, especially in mathematics and science, can stimulate the qualities of curiosity, experimentation and adoptation and has a major role to play in the development of a technically literate society.

In the Philippines, the Department of Education, Culture and Sports (DECS) have introduced the entrepreneurship development program in schools. The program will provide the students with concepts, skills and strategies on continuing into small-scale business. The program has received special encouragement from the Secretary, Dr. Ricardo T. Gloria. This program may be linked with the EPP (Edukasyong Pantahanan at Pangkabuhayan) program in the elementary level.

Recently in Japan, new ways of thinking have been emerging, such as environmental awareness and global considerations, as inputs for technology education. The contents of technology education should be developed according to the stage of learning and also according to the economic and technological conditions of the country concerned. So, the specific content areas will vary from country to country. There is and will be an increasing need for flexible technology education programs to actively involve the students in the creative use of technology. It is necessary to develop a ***technology culture*** in government, industry, commerce and services to operate in a highly competitive global market economy. Technology education at all levels has a critical role to play to sustain the competitive edge of its manpower. One of the key technologies for the future is ***information technology***. The implications for learning and using computers in daily life has to be brought in focus in the basic education, secondary education and tertiary education systems. Integration of technology education in all sectors of education can transform the prospects for humanity.

Lack of well-trained technology education teachers and lack of resources for developing integrated curriculum for technology education are commonly cited problems in the Asia-Pacific region. In order to cope with these problems, international and regional cooperations are most important. Establishments of Regional Resource Centers for Integration of Technology Education in General Education, research and development of integrated curriculum and staff development will, in my view, be the most important priority areas of regional cooperation. Educational leaders from all the countries have to join hands, both formally and informally, to accept this formidable challenge for the 21st century.

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